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Let us buy sustainable! The impact of cash mobs on sustainable consumption: Experimental results☆

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ABSTRACT

Cash mob is a practice where groups of people gather at local shops to buy a given product (usually with a strong sustainable feature) and make their decisions visible to the general public. With our paper we aim to assess the effectiveness of the cash mob as a behavioural tool and provide a better understanding of the behavioural triggers of consumers' decision making process. We run a laboratory experiment where we mimic sustainable consumption and the cash mob treatment is embedded in a sequential game structure with/without an environmental frame. We find that the cash mob treatment has a positive gross effect, that is, the share of sustainable consumers is significantly higher in treated sessions. We also document a significant effect of expectations about the number of those eliciting a sustainable behaviour depending on participants' previous choices. Our results suggest that cash mob-like mechanisms can help to solve social dilemmas like sustainable consumption with entirely private solutions (not based on punishment like taxes but on positive action), and with no costs for government budgets.

1. Introduction

The increasing importance of environmental concerns and sustainable consumption behaviours have made urgent a better understanding of all those actions coordinated to trigger a social change and our paper aims to contribute to this debate. Perfectly rooted in the literature calling for the need of a new radical approach to consumers' decision processes, we prove, quantify and critically assess the effect of cash mobs as a behavioural trigger for social change. Cash mob is a relatively new phenomenon and, to our knowledge, scarcely considered by the academic literature. We aim to fill this gap in the literature and to provide an adequate theoretical support to better understand the process underlying the decision making process regarding sustainable consumption. Our empirical analysis on cash mobs relies on a game theoretical framework named Vote-with-the-wallet.

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' practice to purchase sustainable products in order to reward sustainable producers. The general public perceives the vote with the wallet as an important tool to supplement the institutional effort in making the market more sustainable. For instance, the amount of consumers willing to pay extra money for products of companies committed to social and environmental sustainability has been increasing over time by around 10 percent (KPMG International, 2015). The financial sector is also moving towards more sustainable investments. In 2014, the United Nations have launched the Montreal Carbon Pledge, an agreement within a group of funds of around 10 billion dollars of assets under management. The funds commit to measure the carbon footprint of their portfolios and eventually

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to vote with the wallet to reduce their carbon footprint in order to push listed companies toward environmental sustainability.

With cash mobs we instead refer to a new practice where groups of people (cash mobbers) gather at local selling places and 'vote with the wallet' by buying a given product and making their decisions visible to the general public. Cash mobs are flash mobs with a shopping action[2] and they may be considered a social marketing technology as they combine communication, social networking and collective behaviour (Kotler and Zaltman, 1971; Andreasen, 1993). Cash mobs are a relatively recent emerging phenomenon. The first cash mob in the US was organised 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'.[3] In Italy, the organisations aiming to attract the interest of the public opinion on the social costs of gambling created a specific form of cash mob called 'slotmob', where participants gather to buy at local cafeterias with no slot machines (in the first two years of the initiative, more that 200 cash mobs have been organised in Italy).[4] 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 13 May and 15 May 2016.[5]

Our research creates an experimental setting that aims to reproduce the main stylised features of a cash mob in a vote-with-the-wallet framework where participants are asked to choose between a 'sustainable' and a conventional product. First, a subgroup of participants (cash mobbers) reveal their sustainable choice; second, the rest of participants (non-cash mobbers) make their choice. In particular, we will answer the following research questions: (1) Do people buy more sustainable when cash mobs are implemented? (2) Is the effect, if any, driven more by cash mobbers or non-cash mobbers? (3) Are 'green' cash mobs, that is cash mobs for environmental sustainable products, more effective?

Many behavioural tools have proven their effectiveness in boosting sustainable consumption. For instance, social labelling (Cornelissen et al., 2007), eco-labelling (Song et al., 2019), and other nudges in different fields (Lehner et al., 2016). Our 2 × 3 design introduces the cash mob treatment into the vote with the wallet game (Becchetti et al., 2018). In our cash mob treatment a subset of participants may or may not reveal their choice to the other participants, if this is the sustainable choice. In doing that, we stylise the main features of a cash mob applied to sustainable products: (i) the opportunity for a limited group of consumers (i.e., first movers) to purchase the sustainable product and disclose publicly their decision; (ii) the information received by the other subjects (i.e., second movers) about the number of cash mobbers before they make their choice.

Given that the baseline game is blind with respect to the two products characteristics, we also consider two slightly different version, a green frame and a conformity treatment. In the green frame the sustainable product is explicitly defined as environmentally sustainable. In the conformity variant participants are informed about other participants' choices being in a previous similar session.[6] The three above described treatments share similar experimental characteristics, that is all participants are told about the number – but not the identity – of sustainable consumers in the previous round and all participants are asked the expected number of sustainable consumers in each round before making the choice.

Our study leads to interesting findings together with more established ones. We document, as it is customary in the experimental 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. Our paper extends the existing literature in two novel directions. First, it studies the impact of a given number of sustainable consumers on other consumers' decisions. In this respect, consistently with the literature on collective decisions and leadership, we find that letting people reveal their cooperative choice will increase cooperation in the whole game. Second, our analysis controls for ex ante expectations of consumers about the number of consumers. Specifically, we investigate whether a positive surprise (i.e., a greater number of cooperators than the one expected) produces more cooperation in the next round. Regarding this behavioural feature, we find that positive surprise increases the free-riding reaction for non-sustainable consumers, while increases the cooperation for sustainable consumers.

The rest of the paper is structured as follows. Section 2 places our experiment within the proper literature, Section 3 illustrates the theoretical model of the vote with the wallet game, Section 4 describes the experiment, descriptive statistics are shown in Section 5, the econometric analysis and findings are presented in Section 6, Section 7 discusses implications of our results, and last section concludes.

2. Literature review

Our paper originally contributes to different subfields of research in the sustainable consumption literature. From a behavioural perspective, sustainable choices depend on a series of individual- and context-related factors (Kostadinova, 2016). Consumers with pro-social preferences make sustainable choices based on product availability, the intrinsic value of their action (Schwartz, 1977), and, more interestingly, their perception that the choice can change other consumers' and suppliers' behaviour towards sustainable decisions. Most empirical studies have shown a gap between declared willingness to pay for and actual sustainable purchases (Gupta and Ogden, 2009; Kollmuss and Agyeman, 2002; Pickett-Baker and Ozaki, 2008). Among the various interpretations, one says that consumers perceive their individual action to have an insignificant effect on the environment. Our experimental setting aims to contribute to this strand of the literature by investigating whether the opportunity to influence other consumers' behaviour increases responsible consumption.

The environmentally framed treatment of our experiment also speaks to the literature focussing on eco-labelling. Eco-labelling has significantly developed in the last decades as a market-based tool of voluntary environmental policies. This recent development can be explained by the fact that environmental sustainability cannot always be considered as an experience good; thus, it often requires tools to bridge the information asymmetry between producers and consumers (Akerlof, 1970; Karl and Orwat, 1999; Van Amstel et al., 2008; Schubert and Blasch, 2010). While eco-labels represent opportunities for firms to differentiate their products (Nadaï, 1999), they become

[2] 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'.

[3] "'Cash Mobs' profit locally owned stores". Retrieved from https://www.pri.org/stories/2012-02-23/cash-mobs-profit-locally-owned-stores.

[4] "Slot Mob", NeXt Nuova Economia X Tutti. Retrieved from http://www.nexteconomia.org/project/cash-mob-etico/slot-mob/.

[5] "World Fairtrade Challenge – more than 1.8 million coffee lovers join the world's largest coffee break", Fairtrade International. Retrieved from http://www.fairtrade.net/new/latest-news/single-view/article/world-fairtrade-challenge-more-than-18-million-coffee-lovers-join-the-worlds-largest-coffee-brea.html.

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

convenient options only if consumers' willingness to pay for environmental characteristics is strong enough to compensate costs of higher environmental standards. Firms can also be tempted by greenwashing, the firms' practice to deceive consumers about their environmental policy. This is more likely to happen with low expected punishment costs in case of detection. Therefore, institutions play a key role in monitoring and regulating eco-labels to ensure labels are reliable and to avoid greenwashing. In this respect, (Bratt et al., 2011) emphasise the importance to create eco-labels using a transparent and participated process involving institutions, producers, and consumers.

From a corporate social responsibility (CSR) perspective our analysis 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, and they generally identifying an equilibrium price premium for the latter (Cason and Gangadharan, 2002; Rode et al., 2008; Vasileiou and Georgantzís, 2015). With specific reference to sustainable consumption, Goggins et al. (2019) and Solér et al. (2020) have recently acknowledged the importance of infrastructures and governances to enhance consumers' sustainable choices. Their paternalistic approach, though important, does not identify what consumers may actively do since it does not model sustainability drivers of the actions of other actors except for producers and institutions. Therefore, the role of the demand side, and the sustainability oriented consumers in particular, has often been under-researched.

Our research also contributes to the debate by addressing the effectiveness of cash mobs as behavioural tools. Our empirical strategy focuses on the role of information in making sustainable decisions within the multiplayers prisoner's dilemma (Andreasen, 1997; Song et al., 2019; Choisdealbha et al., 2020), looking at cash mobs as a technology able to trigger a behavioural change in consumers' choices. With a special focus on the green frame, we look at how third parties' benefits fit into consumers' decision making process. Attitudes towards green consumption have been recently addressed in different contexts (see, for instance, Ritter et al., 2015, and Sun et al., 2019 for an investigation in Brazil and China, respectively). Finally, sustainable consumption is linked to emotions: both self and others' behaviour related emotions concur in increasing responsible consumption, with positive self behaviour related emotions (i.e., pride, warm glow, generativity and prosocial behaviour) being more impactful (respectively, Wang and Wu, 2016; Iweala et al., 2019; Shiel et al., 2020; do Paço et al., 2019).

From a methodological point of view, our experimental setting has been framed in order to overcome the main methodological criticisms in Wells (1997). Those participating in our experiment were given choices perfectly compliant with the real world situation they are likely to face on a daily basis. Given our focus on information processing, rather than on the mere consumption choice, our experimental setting is also able to capture the main dynamics of the in-context behaviour rather than a 'in-lab' artificial proxy.

The design of our experiment is also built on the literature on product responsibility and CSR using natural field experiments. In this respect, the effect of fair trades labels has been tested for coffee in US supermarkets by Hainmueller et al. (2015) and on eBay by Hiscox et al. (2011). Both studies tested for the willingness to pay for a responsible premium and find that sales increase by approximately 10 percent and 23 percent respectively. On environmentally friendly goods, Vlaeminck et al. (2014) and Becchetti et al. (2020) conducted experiments in Belgian and Italian supermarkets, respectively, finding similar positive effects of eco-friendly labels. Environmentally friendly labels, though, may not be always perceived as high-quality products (Loureiro, 2003; Van Doorn and Verhoef, 2011). The presence of ethical and environmental values motivating the purchase of responsible products has also been specifically investigated. In this respect, Loureiro and Lotade (2005), Hudson et al. (2012), Sörqvist et al. (2013), Becchetti et al. (2019), and Contini et al. (2020) showed a significant heterogeneity in responsible consumers' willingness to pay. Using theoretical models and laboratory experiments, other contributions have shown that a reference to social norms has strong effects on pro-social behaviour (Brekke et al., 2003; Griskevicius et al., 2008; Goldstein et al., 2008; Goldstein and Cialdini, 2009; Allcott, 2011).

Last but not least, many contributions in the literature of social dilemmas wonder which policy measures may increase the degree of cooperation. Just to quote some qualifying examples Fehr and Gächter (2000) examine the role of private punishment, Masclet et al. (2003) and Noussair and Tucke (2005) the role of non-pecuniary 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. (2018) look at the impact of feed-in tariff-like mechanisms introducing balanced budget systems of subsidies or 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. For its characteristics our game cannot be considered as being part of the cheap talk pre-play communication literature (since participants 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; Clark and Sefton, 2001; Figueres et al., 2012, among others) for its sequential structure where information on other participants' choices plays an important role.

A similar approach can be found in the literature on leadership in the public good (see, for instance, Arbak and Villeval, 2013; Gächter et al., 2012; Güth et al., 2007; Haigner and Wakolbinger, 2010; Kocher et al., 2013; Levati et al., 2007; Levy et al., 2011; Moxnes and Van der Heijden, 2003; Rivas and Sutter, 2011). In this last branch of the literature any player can know only the decision of a previous player, which is usually a single player. Empirical results agree that cooperatively inclined leaders would make their group performing better, as long as they implement a conditional cooperation strategy: trust, attract other cooperative players and punish non-cooperative players (Kosfeld, 2020). The literature on social dilemmas also analyses the role of leaders using evolutionary game theory, and finds that the pivotal players who publicly commit to adopt generous strategies can contribute to the evolution of the other players' cooperation (Stewart and Plotkin, 2013). In this respect, institutions can play a key role as pivotal players and organise coalitions enforcing mutual cooperation (Hilbe et al., 2014). Also, leaders' influence has been shown to operate on hierarchical multi-levels (Schaubroeck et al., 2012), suggesting that relationships between co-buyers as in the case of cash-mob may offer opportunities to increase cooperative choices cannot only influence their employees. Our study also provides an original contribution to the literature that investigates the role of opinion leadership and social contagion. Social contagion works after controlling for marketing effects (Iyengar et al., 2011), the effectiveness of leaders varies across stages (Iyengar et al., 2015), and it is based by cultural norms (Van den Bulte and Stremersch, 2004).

Our experimental setting lies in the intersection between single leader and institutional-organised leader coalitions. Despite their long-standing tradition in social sciences, leadership studies lack of a significant number of experimental studies (Yammarino, 2013). Therefore, we contribute to this literature with an experiment that isolate the impact of a group of leaders in leader–follower dynamic interaction process, an approach that is currently preferred to unidirectional static leader influence on groups (Yammarino, 2013). More specifically, our structure differs from previous experiments in the field as it mimics the effect of a cash mob, where more than one participant can choose first, the identity is not revealed, and the set of leaders (cash mobbers) change randomly in each round. 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. In addition, a laboratory experiment is the most suited methodology as it allows us to net out any possible concurring effect related to peer's characteristics or cultural aspects. A more recent experimental application on climate change attitudes and organised groups shows that leadership prevent people from being selfish under critical situations (Liu and Hao, 2020).

3. The vote with the wallet game

Following Becchetti and Salustri (2019), we consider n buyers who can choose between a sustainable product (i.e., vote responsibly, or vR) and a conventional product (i.e., vote conventionally, or vC). The sustainable product has an extra cost of γ vis-á-vis the conventional product, with the cost of the conventional product conveniently normalised to zero. The choice of the sustainable product generates a positive externality that gives a benefit β to all buyers, multiplied by the number of the sustainable buyers, and a non-pecuniary effect α_i, which is non-negative and strictly positive if buyer i has other-regarding preferences. Each individual $i = 1, \dots, n$ obtains a utility equal to

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

where $s^i \in \{vR, vC\}$ is the subject i's strategy and $j \in \{0, \dots, n-1\}$ is the number of sustainable buyers among the i's co-buyers.

Note that, in order to avoid unnecessary complexity, we assume that all buyers share the same preferences toward the sustainable good and the cost differential component by implicitly assuming a one-to-one mapping in their utility function.

Therefore, the vote with the wallet game can be described by $VWG = (N, (s^i)_{i\in N}, (g^i)_{i\in N})$, where $N = \{1, \dots, n\}$ is the set of subjects, $s^i = \{vR, vC\}$ 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, $((vR)_{i\in R}, (vC)_{i\in C})$ if $\gamma < \frac{1}{n}\beta + \alpha_i$ for each $i \in R$ and $\gamma \geq \frac{1}{n}\beta + \alpha_i$ for each $i \in C$, where R and C are set of conventional and sustainable buyers, respectively. We note that, if there exist m buyers such that $\frac{1}{n}\beta + \alpha_i < \gamma < \frac{m}{n}\beta + \alpha_i$, we are in a prisoner's dilemma since the NE will include at least m conventional buyers but is Pareto dominated by the strategy set where these m buyers buy the sustainable product.

4. The experiment

4.1. Design

Our experiment aims to investigate buyers' behaviour in the VWG game with and without the cash mob treatment. The 2 × 3 experiment design is composed by different finitely repeated versions of the VWG game. In the baseline treatment (BL) a group of 10 participants 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 end-game effects.[7] Each participant 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 participant receives a benefit of 3 tokens for each participant buying product A. In this way we give a monetary counterpart to the positive externality created by the purchase of the sustainable product in the VWG model described in the previous section. At the end of each round the number of participants 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 participant i choosing product k, for $i = 1, \dots, 10$ and $k \in \{A, B\}$, is represented by

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

where c_k is the cost of choosing product k, which is 10 if $k = A$ and 5 if $k = B$, and $ProductA_j$ is a dummy variable equal to 1 if participant j chooses product A.

With reference to our vote-with-the-wallet theoretical benchmark described in Section 3, the experiment gives a monetary value to the public good component of the sustainable product (product A) and reproduces the cost differential (5 tokens) between the sustainable and the conventional product. It does not model explicitly the third non-pecuniary component α of the utility function (1) since such component is assumed to be subject specific and crucially determining individual decisions. More specifically, if nothing else matters in participant's choice, a component α with a utility value of more (less) than 5 tokens implies the choice of the sustainable (conventional) product. As a consequence, the payoff structure described above entails a free-riding problem because the purchase of product B is a strictly dominant strategy for each participant when $\alpha < 2$.

In order to test whether participants have correctly understood the game, following Fischbacher and Gächter (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.

In the baseline treatment, the sequence of decisions in each round includes three steps: (i) before playing, participants are asked to indicate their beliefs about the number of subjects who choose product A in that period (as in Fischbacher and Gächter, 2010). In order to provide an incentive for correct beliefs, the subject(s) with the most accurate belief in the randomly selected round is (are) paid 3 tokens; (ii) participants choose their either product A or product B; (iii) the experimenter gives information about the share of participants choosing product A.

Our treatment consists in a cash mob version of the VWG game (CM). The cash mob version differs from the corresponding baseline version since, at the beginning of each round, five randomly selected participants are given the possibility to reveal their sustainable choice, that is either they reveal they will buy product A or they do not reveal any information. If they reveal, they will necessarily buy product A, otherwise they can choose in the second stage together with the rest of participants. Note that after the first stage is completed the number of cooperators (i.e., product A buyers) is publicly revealed but the individual identities are kept anonymous. The sequence of events in each round in the cash mob treatments works as follows: (i) participants are asked to indicate their beliefs about the number of subjects who will choose product A in that period; (ii) a subset of five randomly selected participants 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 participants (in order to incentivise the formulation of correct beliefs, we pay and extra amount of 3 tokens to the participant(s) with the most accurate belief(s)); (iv) the remaining participants make their choice; (v) the experimenter gives information about the share of subjects choosing product A.

In addiction we introduce two slightly different versions, namely the green frame (baseline plus green, BLg, and cash mob plus green, CMg) and the conformity treatment (baseline plus conformity, BLc, and cash mob plus conformity, CMc). In the green frame, product A is explicitly named as a green product, that is, a product with "less environmental

[7] While it is well known that in discrete-time finitely repeated games there exists a negative end-game effect on the share of cooperators (see, among others, Selten and Stoecker, 1986), we do not know whether in this case an end-game effect would lead to more or less cash mobbers, since the cash mob may have a reciprocity or a free-riding effect. Therefore, we decided not to ask participants the probability of the end-game, an information that would have complicated the game without any significant advantages.

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	

impact or less detrimental to human health" than Product B.[8,9] In the conformity treatment we inform participants, before they make their choice, about what other participants have chosen in a previous session with the same treatment in order to test whether reactions change when information on choices does not affect their payoffs directly.

Given the six above described treatments (i.e., the baseline versions BL, BLg, and BLc, and the three corresponding cash mob variants, CM, CMg, and CMc) any complete session is composed by a combination of two treatments for a total of 20 rounds. We apply a crossover design considering the sequence of treatments (cash mob in the first or in the last 10 rounds), and we deal with six different combinations of the three baseline treatments with their cash mob variants (see Table 1). The crossover design would validate our results regardless of the order of the treatments, as the cash mob might be more or less effective if played in the first 10 rounds. At the end of the session each participant fills a questionnaire providing additional information on socio-demographic characteristics.

All experiments were programmed and conducted at the London School of Economics and Political Science Behavioural Research Lab using the 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 min.

4.2. Hypothesis testing

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

Hypothesis 1: (no cash mob effect)

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

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

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

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

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

Hypothesis 3: (no green frame effect)

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

The third hypothesis tests whether the green frame significantly affects cooperative choices per se.

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

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

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)

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

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

Hypothesis 6: (no conformity effect under the cash mob treatment)

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

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

5. Descriptive statistics and hypothesis testing

Table 2 shows that our sample is gender balanced (51.7 percent of females) and the average number of cooperators (i.e., sustainable buyers) per session-round in the overall experiment is 4.3 showing

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

[9] Note that the frame changes the name of the good only and keeps everything else constant, including the payoffs. A similar approach has been investigated by Liberman et al. (2016) who show the label manipulation in the prisoner's dilemma settings.

Table 3
Hypothesis testing.

Treatment (1) vs (2)	Obs	% of Cooperators (Std. Dev.) (1) vs (2)	χ^2	P-value	B-test
BL vs CM (aggregate)	1200	33.2 (0.471) vs 39.7 (0.490)			
BLg vs CMg (aggregate)	1200	41.5 (0.493) vs 53.7 (0.499)			
BLc vs CMc (aggregate)	1200	42.0 (0.494)vs 50.7 (0.500)			
BL vs BLg	1200	33.2 vs 41.5	8.905	0.003	0.050
BL vs BLc	1200	33.2 vs 42.0	9.979	0.002	0.028
CM vs CMg	1200	39.7 vs 53.7	23.625	0.000	0.000
CM vs CMg (no CMbers)	600	31.0 vs 42.7	8.775	0.003	0.049
CM vs CMc	1200	39.7 vs 50.7	14.657	0.000	0.002
CM vs CMc (no CMbers)	600	31.0 vs 40.7	6.096	0.014	0.222
BL vs CM	600	33.0 (0.471) vs 36.7 (0.483)			
CM vs BL	600	42.7 (0.495) vs 33.3 (0.472)			
BLg vs CMg	600	45.0 (0.498) vs 55.7 (0.498)			
CMg vs BLg	600	51.7 (0.501) vs 38.0 (0.486)			
BLc vs CMc	600	44.0 (0.497)vs 44.3 (0.498)			
CMc vs BLc	600	57.0 (0.496) vs 40.0 (0.491)			
BL all vs CM no CMbers (aggregate)	900	33.2 (0.471) vs 31.0 (0.463)			
BL all vs CM CMbers (aggregate)	900	33.2 (0.471) vs 48.3 (0.501)			
CM no CMbers vs CM CMbers (aggregate)	600	31.0 (0.463) vs 48.3 (0.501)			
BL all vs CM no CMbers	450	33.0 (0.471) vs 26.0 (0.440)			
BL all vs CM CMbers	450	33.0 (0.471) vs 47.3 (0.501)			
CM no CMbers vs CM CMbers	300	26.0 (0.440)vs 47.3 (0.501)			
CM no CMbers vs BL all	450	33.3 (0.472) vs 36.0 (0.482)			
CM CMbers vs BL all	450	33.3 (0.472) vs 49.3 (0.502)			
CM CMbers vs CM no CMbers	300	36.0 (0.482) vs 49.3 (0.502)			
BLg all vs CMg no CMbers (aggregate)	900	41.5 (0.493) vs 42.7 (0.495)			
BLg all vs CMg CMbers (aggregate)	900	41.5 (0.493) vs 64.7 (0.479)			
CMg no CMbers vs CMg CMbers (aggregate)	600	42.7 (0.495) vs 64.7 (0.479)			
BLg all vs CMg no CMbers	450	45.0 (0.498) vs 43.3 (0.497)			
BLg all vs CMg CMbers	450	45.0 (0.498) vs 68.0 (0.468)			
CMg no CMbers vs CMg CMbers	300	43.3 (0.497)vs 68.0 (0.468)			
CMg no CMbers vs BLg all	450	38.0 (0.486) vs 42.0 (0.495)			
CMg CMbers vs BLg all	450	38.0 (0.486)vs 61.3 (0.489)			
CMg CMbers vs CMg no CMbers	300	42.0 (0.495) vs 61.3 (0.489)			
BLc all vs CMc no CMbers (aggregate)	900	42.0 (0.494) vs 40.7 (0.492)			
BLc all vs CMc CMbers (aggregate)	900	42.0 (0.494) vs 60.7 (0.489)			
CMc no CMbers vs CMc CMbers (aggregate)	600	40.7 (0.492)vs 60.7 (0.489)			
BLc all vs CMc no CMbers	450	44.0 (0.497) vs 33.3 (0.473)			
BLc all vs CMc CMbers	450	44.0 (0.497) vs 55.3 (0.499)			
CMc no CMbers vs CMc CMbers	300	33.3 (0.473) vs 55.3 (0.499)			
CMc no CMbers vs BLc all	450	40.0 (0.491) vs 48.0 (0.501)			
CMc CMbers vs BLc all	450	40.0 (0.491) vs 66.0 (0.475)			
CMc CMbers vs CMc no CMbers	300	48.0 (0.501) vs 66.0 (0.475)			

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). χ^2-test and B-test (Bonferroni test) are shown for independent observations only.

significant departure from the Nash Equilibrium. On average, almost half of the randomly selected participants for cash mob actually decided to cash mob (51.1 percent), that is the average number of cash mobbers is 2.5. Almost half of the sample (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).

To test our hypotheses we first look at static findings and then explore dynamic results. 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 seems to indicate that the green frame acts as a stronger motivator for subjects' cooperative choices in the cash mob treatments. The effect of green frame is in line with the experimental literature that explain the cooperation gap in public games between positive and negative externality (see Andreoni, 1995, and Park, 2000). We call the difference measured in the first three rows of Table 3 the *gross cash mob effect* since we include in the comparison both those who have the possibility of cash mobbing (i.e., revealing their cooperative choice ex ante) and those who have not.

In rows 4 and 5 we find that both the green frame and the conformity treatment significantly rise 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.

Our crossover design also allows us to explore if the effect of the cash mob changes when cash mob is played before the baseline treatment. To test for this possible change, we also measure 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

Table 4
The impact of Cash Mob on the sustainable 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)

(*continued on next page*)

in the last 10 rounds. Overall, we find that 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. All our tests are robust to the Bonferroni correction (Table 3, column 6), which deals with multiple testing and reduces the probability of observing at least one significant result due to chance.

As for the cash mob treatments, data include also choices of the subset of participants who are given the possibility of participating to cash mobs by revealing ex ante their choices. These participants

Table 4 (*continued*).

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

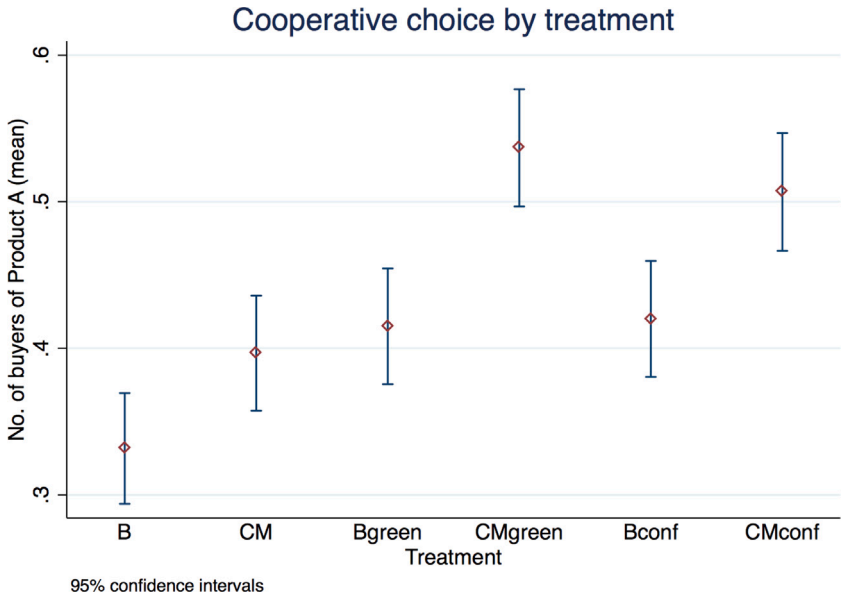


Fig. 1. Descriptives of the cooperative choices. Legend: Average share and 95% confidence intervals of cooperative buyers in each treatment. Treatments aggregate 10-round observations from 6 sessions.

are actually treated heterogeneously with respect to standard participants 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 who do not have the possibility 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, the cash mob increases (reduces) cooperation of those who choose later and do not have the opportunity of becoming cash mobbers. Results are in this case inconclusive and do not lead to reject the null. We find in all cases slight and not significant differences in the shares of cooperation choices between non-cash mobbers in cash mob treatments and all other participants in the corresponding non-cash mob treatments (Table 3). 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.

6. Descriptive dynamics and econometric findings

A limit of static tests is that they do not properly treat choices that are correlated with each other (i.e., choices of the same subject 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.

First, we start by inspecting the cooperative choices for each treatment/frame (Fig. 1) and under aggregate baseline and cash mob treatments (Fig. 2). Fig. 1 shows that cooperative choices increase when the cash mob is implemented regardless the green and conformity versions, and that under these versions themselves cooperative choices are even higher. When we look at the dynamics of participants' choices, we observe that the cash mob treatment, when implemented after the baseline, keep the cooperative choices constant over rounds, while, when performed first, it shows higher cooperation that declines (Fig. 2). In addition, we separate the effect at treatment–sequence level, where baseline–cash mob and cash mob–baseline treatments are presented separately (Figs. 3(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, Fig. 3(c)) and after the conformity treatment (from around 37 to around 60 percent, Figs. 3(e)), and when the cash mob

Table 5
The impact of Cash Mob on the sustainable 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.

treatment is interrupted in the conformity treatment (from around 53 to around 40 percent, Fig. 3(f)).

Our last descriptive investigation addresses the difference between cash mobbers (i.e., participants who cooperate first and disclose their choice) and cooperators among non-cash mobbers (i.e., participants who cooperate after they observe the number of cash mobbers). Fig. 4 confirms the high share of cooperators under the green frame and the conformity treatment, with the latter showing a slight decline, even though it does not clearly inform about the dynamics of non-cash mobbers in response to cash mobbers. Thus, we will investigate further this point throughout the following econometric analysis.

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

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

where $\mathsf{PrA}_{i,t}$ is a (0/1) dummy equal to 1 if the ith subject chooses product A at round t; $\mathsf{Cash\ Mob}_t$ 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 sustainable buyers in the previous round (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 non-linear effects. Belief$_{i,t,m}$

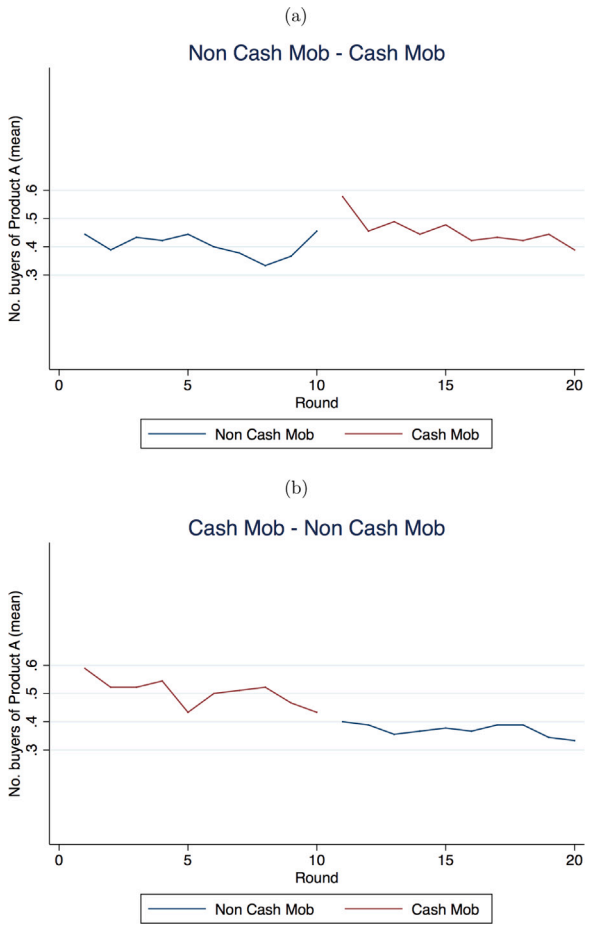


Fig. 2. Share of cooperative buyers (by sequence-treatment). Legend: Average share of cooperative buyers in each round under the Baseline – Cash Mob sequence (a) and the Cash Mob – Baseline sequence (b). Baseline includes BL, BLg, and BLc treatments; Cash Mob includes CM, CMg, and CMc treatments. Each sequence aggregates observations from 9 sessions.

represents the expectation of the individual i at time t on the number of sustainable buyers (i.e., cooperators). We include in the estimate a dummy for each possible number of expected sustainable buyers (from 0 to 10) here as well in order to capture non-linear effects. $\mathsf{Surprise}_{i,t-1}$ captures the difference between $\mathsf{Belief}_{i,t-1,h}$ and the actual number of sustainable 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 participant expects a number of sustainable buyers higher than what is actually the case) and one when it is lower than -1 (representing the positive surprise since the participant expects a number lower than what is actually the case); the intermediate values $-1, 0, +1$ represent cases in which there is no surprise or the surprise is limited and are the omitted benchmark. We as well control for the previous round participant'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 as a 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 subjects' geographical origin. We cluster standard errors at session level to control for within group dependency.

In Tables 4 and 5 we propose pooled and panel fixed effect estimates for four different specifications where we gradually 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 also controls for the error in expectations about the number of cooperators, and the fourth is the full specification described above accounting for asymmetric effects in expectation errors conditionally on the previous participant's cooperative/non-cooperative choice.

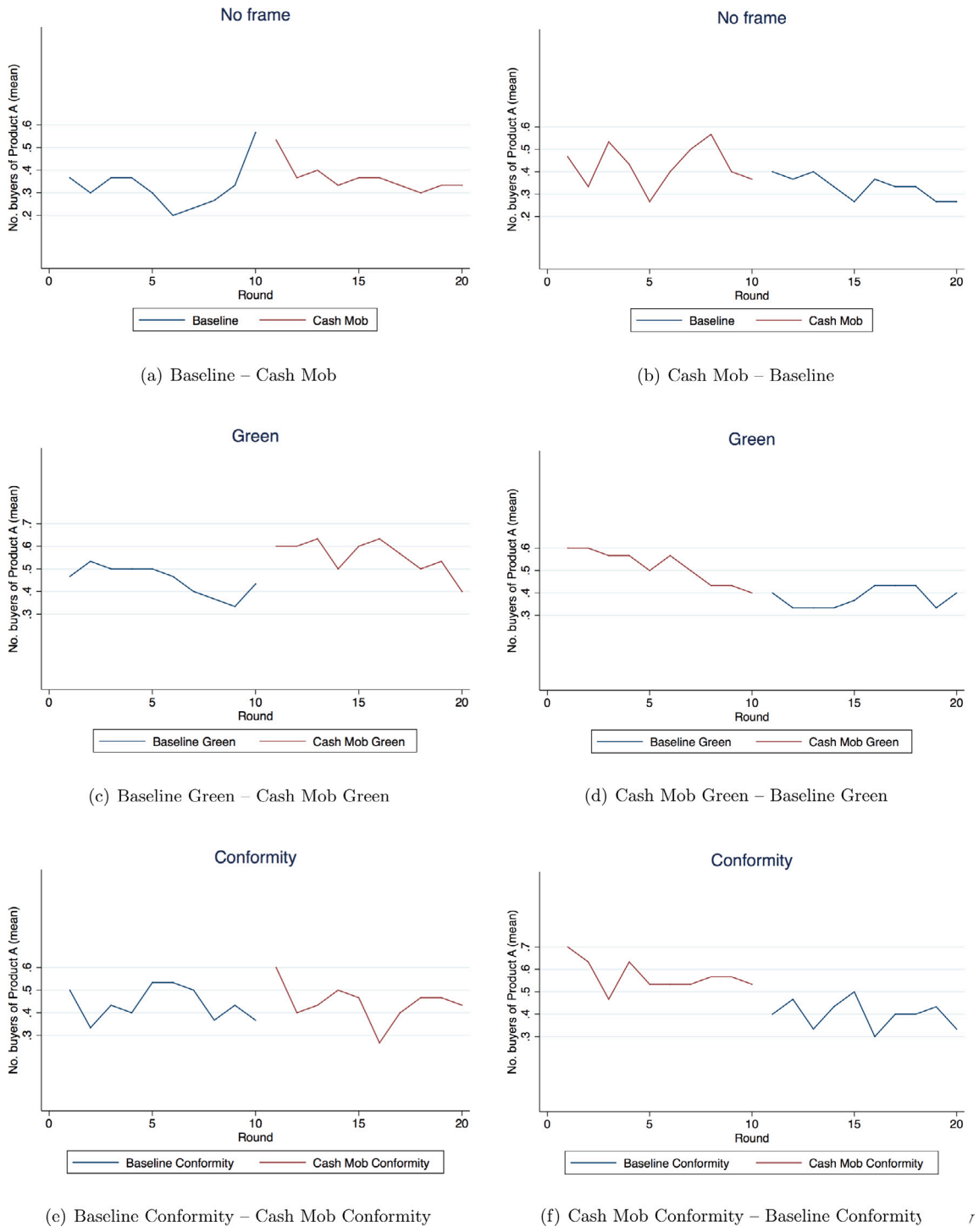
Table 6
The impact of the number of CMbers on the sustainable choice of non CMbers (panel, margins).

Variables		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.

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 measure 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 participants' payoff, it produces lower negative reciprocity reactions thereby slightly raising the level of cooperation in the game.

Results from column 1 show that experiment dynamics matter 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 participants did not cooperate. As already said above, in our experiment the difference in payoffs between the two participant's strategies (i.e., product A vs. product B) is invariant



(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

Fig. 3. Share of cooperative buyers (by treatment). Legend: Average share of cooperative buyers in each round under different sequences of treatments. Each sequence aggregates observations from 3 sessions.

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 the information more efficiently and we introduce coefficients that capture the effect of subject's expectations on the number of cooperators in each round. Coefficients on expectations have the expected pattern since the probability of subject'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 make that of round dummies no longer significant. The effect is extremely strong and concentrated when the expected number of cooperators is higher (between 7 and 9).

In our third and fourth specifications we test whether, in addition to the previously reported effects, subjects' choices are also influenced

Table 7
The net impact of Cash Mob on the sustainable 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

by their expectation errors. As explained above we create an omitted benchmark of low expectation error (correct or error of one unit in both directions of the guess of the number of cooperators) 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 predicted) 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 our findings support this thesis. The positive and significant coefficient of past cooperators in presence of negative surprises shows that they do not react as negatively as the other subjects to the positive surprise (Table 3, column 4). This is consistent with the results of Croson and Shang (2008), who show that positive (respectively, negative) social information increases (respectively, decreases) cooperation. Note as well that the inclusion 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 subjects. This methodology captures only within (across round) effects and loses sight of all between effects. The green frame effect is a between effect (it does not vary across rounds for the same individual) and therefore it cannot be captured in fixed effect estimates. 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 subjects who become cash mobbers produces a positive effect on the probability of choosing the cooperative choice in the subsample of the other subjects 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 their choices, to a 33 percent higher probability

Table 8
The net impact of Cash Mob on the sustainable 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

when five cash mobbers decide to cash mob.[10] Note that this finding does not contradict what found in static tests. The number of non-cash mobbers choosing the sustainable 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 does not significantly differ 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.

7. Discussion and policy implications

There are three aspects of our findings which are particularly relevant for a discussion on the role of sustainable consumers on responsible consumption. First, cash mob-like mechanisms may enhance sustainable consumption reducing some of the negative consequences of the traditional mechanisms examined so far in the literature, such taxes (Chen and Hu, 2018), per unit consumption costs (Choisdealbha et al., 2020), or the difficulties in establishing a new infrastructural framework (Solér et al., 2020). However, because of the difference we found between net and gross effects, cash mobs are more effective as the number of cash mobbers increases.

Second, sustainable consumption is significantly influenced by personal beliefs on other consumers' choices. Our findings improve established results in psychological aspects of sustainable consumption (Zhao et al., 2014; Wang and Wu, 2016). In particular, what we found suggests that consumers increase sustainable consumption when they consumed sustainable and realise there are more sustainable consumers than expected, while they persist in non-sustainable consumption if they had chosen standard products earlier. This has important implication in communication strategy, suggesting that social comparison information (Allcott, 2011) should be combined with, for instance, a promotional campaign targeted to non-sustainable consumers.

Third, we can benefit from our experimental setting that allows us to draw generalisable conclusions as we do not focus on a given market or product. On one hand, this benefit comes at the cost of external validity, which may occurs when cash mobs are implemented in real contexts. In fact, other behavioural tools like nudging have been differently effective in different domains (Lehner et al., 2016). On the other hand, we believe that every policy maker should be aware of the psychological attitudes of consumers in order to design an optimal policy depending on general and context-specific evidence.

Future research on sustainable consumption should investigate the role of sustainable consumers who may act as leaders. In particular, it would be interesting to see how our findings differ when applied to a given product or when the initial endowment is heterogeneous across consumers. In addition, a more integrated scenario would analyse the impact of cash mobbers on producers. In fact, cash mob helps not only the increase of a given product purchase, but also the link between purchase and ethical and environmental motivation, which may serve a signal for producers.

While cash mobs are organised by non-institutional agents, and institutions can hardly support specific products not to violate competition laws, there are still two main policies that institutions can

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

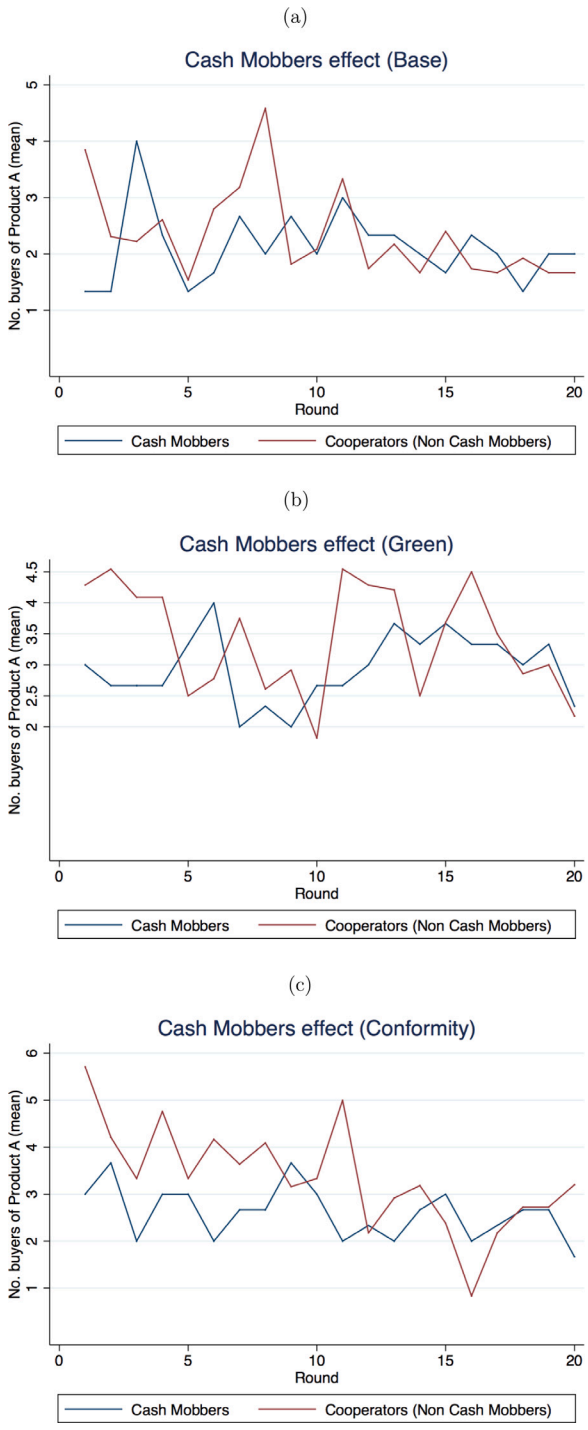


Fig. 4. The effect of CMbers (by treatment). Legend: Average share of cash mobbers and cooperative choices among non-cash mobbers in each round under three versions (Baseline (a), Green (b), and Conformity (c)). Cash mobbers represent participants who disclose first their cooperative choice. Non-cash mobbers represent participants who first observe the number of cash mobbers and then make their decision.

implement to stimulate consumers' behavioural change. First, there is a wide set of fiscal tools (e.g., carbon taxes, tax credits on durable goods, green consumption taxes), direct public investment, and regulatory instruments that allows institutions to choose green options and phase out environmentally harmful products. More directly, institutions can consume responsibly (Becchetti and Salustri, 2016) setting minimum environmental criteria or green procurement rules and purchase sustainable options with competitive conditions.

Second, institutions can as well organise sustainable flash mobs, that is public non-market actions where people gather and publicly manifest for a given interest. However, the advantage of cash mobs versus flash mobs is that they do not just aim to reveal preferences of a given group of people but also their revealed choices and willingness to pay on the market and therefore are a much stronger signal toward companies and market supply.

A key factor that makes cash mobs successful is their organiser's coordination and mobilisation capacity. More recently, two worldwide events that shared these characteristics have been *Fridays For Future* international environmental movement (https://fridaysforfuture.org/) and labour movements during international worker's day. To translate these events into a cash mob, it would be enough to invite all participants to buy a given set of sustainable, commonly consumed, and largely achievable products. This would help replace ordinary consumption with cleaner consumption. Media attention and large participation of such big events would ensure an amplification to the cash mob signal much stronger than that mimicked in our laboratory experiment.

To sum up, the amount of cash mobbers and media coverage are the factors to operate with in order to maximise cash mob effectiveness, that is both cash mobbers and non-cash mobbers expectations on the multiplicative effects of their sustainable purchase can be positively affected as shown in the experiment, thereby making cooperation easier.

8. Conclusions

A new awareness regarding the sustainability of the modern economic systems matched with a renewed interest in behavioural tools prompted us to address the effectiveness of cash mobs as a new class of marketing tools. Our research provides an experimental assessment of the role of cash mobs as behavioural triggers of a social change. In this experiment we investigate this classic problem by devising an original type of social dilemma called 'vote-with-the-wallet' game, where buyers have to choose between a sustainable and a standard product. We enrich our study with the analysis of 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 sustainable consumers' dilemma with an elicited voluntary action of a subset of subjects.

The results of our empirical analysis are mainly about the effect of cash mob and green frame on the probability of choosing a sustainable product over a generic one (co-operating). We document that the cash mob mechanism has a significant gross effect, but an insignificant net effect, in raising sustainable consumption of cash mob buyers. In fact, we observe a significantly higher sustainable consumption during cash mob treatments. Likewise, we show that the explicit definition of a product as environmentally sustainable (green frame) and conformity treatments help to increase the impact of cash mobs. In other words, when sustainable consumers boost products that are explicitly acknowledged as environmental friendly, the other consumers are more likely to follow the cash mobbers. In addition, we also find that the cash mob and the green frame prevent the standard cooperation decline in social dilemma experiments. This is particularly relevant if we want to know how persistent sustainable consumption may be after being promoted by cash mobbers. Another interesting result concerns the role of buyers' expectations. We document that those buyers who underestimate the number of sustainable consumers are less likely to buy sustainable products.

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?

Together with what examined in the discussion section, further research along this line may help to find answers to these new questions and to those regarding what drives the inner decision making process of a broadly defined consumption. Nonetheless, our research sheds a new light on a recently introduced behavioural tool which looks promising and particularly effective in triggering a pro-social behaviour. This is extremely relevant to policy makers, especially in that it is able to overcome the costly private punishment process. From a methodological point of view, our rigorous experimental setting is able to overcome the main empirical challenges posed by the standard literature, thus paving the way for further experimental research on consumers' behaviour.

CRediT authorship contribution statement

Leonardo Becchetti: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing. **Maurizio Fiaschetti:** Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing. **Francesco Salustri:** Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.jclepro.2021.128419.

References

Akerlof, G.A., 1970. The market for lemons: Quality uncertainty and the market mechanism. Q. J. Econ. 84 (3), 488–500.

Allcott, H., 2011. Social norms and energy conservation. J. Public Econ. 95 (9–10), 1082–1095.

Anderson, C.M., Putterman, L., 2006. Do non-strategic sanctions obey the law of demand? The demand for punishment in the voluntary contribution mechanism. Games Econom. Behav. 54 (1), 1–24.

Andreasen, A.R., 1993. A social marketing research agenda for consumer behaviour researchers. In: McAlister, L., Rothschild, M.L. (Eds.), Advances in Consumer Research, Vol. 20. pp. 1–5.

Andreasen, A.R., 1997. Prescription for theory-driven social marketing research: A response to goldberg's alarms. J. Consum. Psychol. 6 (2), 189–196.

Andreoni, J., 1995. Warm-glow versus cold-prickle: the effects of positive and negative framing on cooperation in experiments. Q. J. Econ. 110 (1), 1–21.

Arbak, E., Villeval, M.-C., 2013. Voluntary leadership: motivation and influence. Soc. Choice Welf. 40 (3), 635–662.

Becchetti, L., Pelligra, V., Salustri, F., 2018. The impact of redistribution mechanisms in the vote with the wallet game: experimental results. Soc. Choice Welf. 51 (4), 595–619.

Becchetti, L., Salustri, F., 2016. The political economy of the vote with the wallet. Associazione Italiana per la Cultura della Cooperazione e del Non Profit. Aiccon Working Paper 146.

Becchetti, L., Salustri, F., 2019. The vote with the wallet game: Responsible consumerism as a multiplayer Prisoner's Dilemma. Sustainability 11 (4), 1109.

Becchetti, L., Salustri, F., Scaramozzino, P., 2019. Making information on CSR scores salient: a randomized field experiment. Oxford Bull. Econ. Stat. 81 (6), 1193–1213.

Becchetti, L., Salustri, F., Scaramozzino, P., 2020. Nudging and corporate environmental responsibility: A natural field experiment. Food Policy 97, 101951.

Bratt, C., Hallstedt, S., Robért, K.H., Broman, G., Oldmark, J., 2011. Assessment of eco-labelling criteria development from a strategic sustainability perspective. J. Cleaner Prod. 19 (14), 1631–1638.

Brekke, K.A., Kverndokk, S., Nyborg, K., 2003. An economic model of moral motivation. J. Public Econ. 87, 1967–1983.

Carpenter, J.P., 2004. When in Rome: conformity and the provision of public goods. J. Socio-Econ. 33 (4), 395–408.

Carpenter, J.P., 2007. The demand for punishment. J. Econ. Behav. Organ. 62 (4), 522–542.

Cason, T., Gangadharan, L., 2002. Environmental labeling and incomplete consumer information in laboratory markets. J. Environ. Econ. Manag. 43 (1), 113–134.

Chen, W., Hu, Z.H., 2018. Using evolutionary game theory to study governments and manufacturers' behavioral strategies under various carbon taxes and subsidies. J. Cleaner Prod. 201, 123–141.

Choisdealbha, Á.N., Timmons, S., Lunn, P.D., 2020. Experimental evidence for the effects of emissions charges and efficiency information on consumer car choices. J. Cleaner Prod. 120140.

Cialdini, R.B., Trost, M.R., 1998. Social influence: social norms, conformity and compliance. In: The Handbook of Social Psychology, Vols. 1–2, fourth ed. McGraw-Hill, New York, NY, US, pp. 151–192.

Clark, K., Sefton, M., 2001. The sequential prisoner's dilemma: Evidence on reciprocation. Econ. J. 111 (468), 51–68.

Contini, M., Annunziata, E., Rizzi, F., Frey, M., 2020. Exploring the influence of Corporate Social Responsibility (CSR) domains on consumers' loyalty: an experiment in BRICS countries. J. Cleaner Prod. 247, 119158.

Cornelissen, G., Dewitte, S., Warlop, L., Yzerbyt, V., 2007. Whatever people say I am, that's what I am: Social labeling as a social marketing tool. Int. J. Res. Mark. 24 (4), 278–288.

Croson, R., Shang, J., 2008. The impact of downward social information on contribution decisions. Exp. Econ. 11 (3), 221–233.

do Paço, A., Shiel, C., Alves, H., 2019. A new model for testing green consumer behaviour. J. Cleaner Prod. 207, 998–1006.

Falkinger, J., Fehr, E., Gächter, S., Winter-Ebmer, R., 2000. A simple mechanism for the efficient provision of public goods: experimental evidence. Am. Econ. Rev. 90 (1), 247–264.

Fehr, E., Gächter, S., 2000. Cooperation and punishment in public goods experiments. Amer. Econ. Rev. 90, 980–994.

Figueres, C., Masclet, D., Willinger, M., 2012. Vanishing leadership and declining reciprocity in a sequential contribution experiment. Econ. Inq. 50 (3), 567–584.

Fischbacher, U., 2007. z-Tree: Zurich toolbox for ready-made economic experiments. Exp. Econ. 10 (2), 171–178.

Fischbacher, U., Gächter, S., 2010. Social preferences, beliefs, and the dynamics of free riding in public goods experiments. Amer. Econ. Rev. 100 (1), 541–556.

Fischbacher, U., Gächter, S., Fehr, E., 2001. Are people conditionally cooperative? Evidence from a public goods experiment. Econom. Lett. 71, 397–404.

Gächter, S., Nosenzo, D., Sefton, M., 2012. Who makes a good leader? Cooperativeness, optimism, and leading-by-example. Econ. Inq. 50 (4), 953–967.

Goggins, G., Fahy, F., Jensen, C.L., 2019. Sustainable transitions in residential energy use: Characteristics and governance of urban-based initiatives across europe. J. Cleaner Prod. 237, 117776.

Goldstein, N.J., Cialdini, R.B., 2009. Normative influences on consumption and conservation behaviors. In: Wänke, M. (Ed.), Social Psychology of Consumer Behavior. Psychology Press, New York, pp. 273–296.

Goldstein, N., Cialdini, R., Griskevicius, V., 2008. A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. J. Consum. Res. 35 (3), 472–482.

Griskevicius, V., Cialdini, R.B., Goldstein, N.J., 2008. Social norms: An underestimated and underemployed lever for managing climate change. Int. J. Sustain. Commun. 3, 5–13.

Gupta, S., Ogden, D.T., 2009. To buy or not to buy? A social dilemma perspective on green buying. J. Consum. Mark. 26 (6), 376.

Güth, W., Levati, M., Sutter, M., Van Der Heijden, E., 2007. Leading by example with and without exclusion power in voluntary contribution experiments. J. Public Econ. 91 (5–6), 1023–1042.

Haigner, S.D., Wakolbinger, F., 2010. To lead or not to lead: Endogenous sequencing in public goods games. Econom. Lett. 108 (1), 93–95.

Hainmueller, J., Hiscox, M.J., Sequeira, S., 2015. Consumer demand for fair trade: Evidence from a multistore field experiment. Rev. Econ. Stat. 97 (2), 242–256.

Hilbe, C., Wu, B., Nowak, M.A., 2014. Cooperation and control in multiplayer social dilemmas. Proc. Natl. Acad. Sci. 111 (46), 16425–16430.

Hiscox, M.J., Broukhim, M., Litwin, C., 2011. Consumer demand for fair trade: New evidence from a field experiment using eBay auctions of fresh roasted coffee. Available at SSRN 1811783.

Hudson, D., Gallardo, R.L., Hanson, T.R., 2012. A comparison of choice experiments and actual grocery store behavior: An empirical application to seafood products. J. Agric. Appl. Econ. 44 (1), 49–62.

Iweala, S., Spiller, A., Meyerding, S., 2019. Buy good, feel good? The influence of the warm glow of giving on the evaluation of food items with ethical claims in the UK and Germany. J. Cleaner Prod. 215, 315–328.

Iyengar, R., Van den Bulte, C., Lee, J.Y., 2015. Social contagion in new product trial and repeat. Mark. Sci. 34 (3), 408–429.

Iyengar, R., Van den Bulte, C., Valente, T.W., 2011. Opinion leadership and social contagion in new product diffusion. Mark. Sci. 30 (2), 195–212.

Karl, H., Orwat, C., 1999. Environmental labelling in Europe: European and national tasks. Eur. Environ. 9 (5), 212–220.

Kocher, M., Pogrebna, G., Sutter, M., 2013. Other-regarding preferences and leadership styles. J. Econ. Behav. Organ. 88, 109–132.

Kollmuss, A., Agyeman, J., 2002. Mind the gap: Why do people act environmentally and what are the barriers to proenvironmental behavior? Environ. Educ. Res. 8 (3), 239–260.

Kosfeld, M., 2020. The role of leaders in inducing and maintaining cooperation: The CC strategy. Leaders. Q. 31 (3), 101292.

Kostadinova, E., 2016. Sustainable consumer behavior: Literature overview. Econ. Altern. 2, 224–234.

Kotler, P., Zaltman, G., 1971. Social marketing: an approach to planned social change. J. Mark. 35 (3), 3–12.
KPMG International, 2015. Currents of change, survey of corporate responsibility reporting. Retrieved from https://home.kpmg.com/cn/en/home/insights/2015/11/kpmg-international-survey-of-corporate-responsibility-reporting-2015.html.
Lehner, M., Mont, O., Heiskanen, E., 2016. Nudging–A promising tool for sustainable consumption behaviour? J. Cleaner Prod. 134, 166–177.
Levati, M., Sutter, M., Van der Heijden, E., 2007. Leading by example in a public goods experiment with heterogeneity and incomplete information. J. Confl. Resolut. 51 (5), 793–818.
Levy, D.M., Padgitt, K., Peart, S.J., Houser, D., Xiao, E., 2011. Leadership, cheap talk and really cheap talk. J. Econ. Behav. Organ. 77 (1), 40–52.
Liberman, V., Samuels, S.M., Ross, L., 2016. The name of the game: Predictive power of reputations versus situational labels in determining prisoner's dilemma game moves. Pers. Soc. Psychol. Bull. 30 (9), 1175–1185.
Liu, C.J., Hao, F., 2020. The impact of social and ecological factors on environmentally responsible behavior. J. Cleaner Prod. 254, 120173.
Loureiro, M.L., 2003. Rethinking new wines: implications of local and environmentally friendly labels. Food Policy 28 (5–6), 547–560.
Loureiro, M.L., Lotade, J., 2005. Do fair trade and eco-labels in coffee wake up the consumer conscience? Ecol. Econ. 53 (1), 129–138.
Masclet, D., Noussair, C., Tucker, S., Villeval, M.C., 2003. Monetary and nonmonetary punishment in the voluntary contributions mechanism. Amer. Econ. Rev. 93 (1), 366–380.
Moscovici, S., 1985. Social influence and conformity. In: Lindzey, G., Aronson, E. (Eds.), The Handbook of Social Psychology, Vol. 2, third ed. Random House, New York, pp. 347–412.
Moxnes, E., Van der Heijden, E., 2003. The effect of leadership in a public bad experiment. J. Confl. Resolut. 476, 773–795.
Nadaï, A., 1999. Conditions for the development of a product ecolabel. Eur. Environ. 9 (5), 202–211.
Nikiforakis, N., Normann, H.T., 2008. A comparative statics analysis of punishment in public good experiments. Exp. Econ. 11, 358–369.
Noussair, C., Tucke, S., 2005. Combining monetary and social sanctions to promote cooperation. Econ. Inq. 43 (3), 649–660.
Park, E.S., 2000. Warm-glow versus cold-prickle: a further experimental study of framing effects on free-riding. J. Econ. Behav. Organ. 43 (4), 405–421.
Pickett-Baker, J., Ozaki, R., 2008. Pro-environmental products: marketing influence on consumer purchase decision. J. Consum. Mark. 25 (5), 281–293.
Ritter, A.M., Borchardt, M., Vaccaro, G.L., Pereira, G.M., Almeida, F., 2015. Motivations for promoting the consumption of green products in an emerging country: exploring attitudes of Brazilian consumers. J. Cleaner Prod. 106, 507–520.
Rivas, M.F., Sutter, M., 2011. The benefits of voluntary leadership in experimental public goods games. Econom. Lett. 112 (2), 176–178.
Rode, J.R., Hogarth, M., Le Menestrel, M., 2008. Ethical differentiation and market behavior: An experimental approach. J. Econ. Behav. Organ. 66, 265–280.
Schaubroeck, J.M., Hannah, S.T., Avolio, B.J., Kozlowski, S.W., Lord, R.G., Treviño, L.K., Dimotakis, N., Peng, A.C., 2012. Embedding ethical leadership within and across organization levels. Acad. Manag. J. 55 (5), 1053–1078.
Schubert, R., Blasch, J., 2010. Sustainability standards for bioenergy – A means to reduce climate change risks? Energy Policy 38 (6), 2797–2805.
Schwartz, S., 1977. Normative influences on altruism. Adv. Exp. Soc. Psychol. 10, 222–279.
Selten, R., Stoecker, R., 1986. End behaviour in sequences of finite prisoner's dilemma supergames. J. Econ. Behav. Organ. 7, 47–70.
Shiel, C., do Paço, A., Alves, H., 2020. Generativity, sustainable development and green consumer behaviour. J. Cleaner Prod. 245, 118865.
Solér, C., Koroschetz, B., Salminen, E., 2020. An infrastructural perspective on sustainable consumption-Activating and obligating sustainable consumption through infrastructures. J. Cleaner Prod. 243, 118601.
Song, L., Lim, Y., Chang, P., Guo, Y., Zhang, M., Wang, X., Yu, X., Lehto, M.R., Cai, H., 2019. Ecolabel's role in informing sustainable consumption: A naturalistic decision making study using eye tracking glasses. J. Cleaner Prod. 218, 685–695.
Sörqvist, P., Hedblom, D., Holmgren, M., Haga, A., Langeborg, L., Nöstl, A., Kågström, J., 2013. Who needs cream and sugar when there is eco-labeling? Taste and willingness to pay for 'eco-friendly' coffee. PLoS One 8 (12), e80719.
Steiger, E.M., Zultan, R., 2014. See no evil: Information chains and reciprocity. J. Public Econ. 109, 1–12.
Stewart, A.J., Plotkin, J.B., 2013. From extortion to generosity, evolution in the literated Prisoner's Dilemma. Proc. Natl. Acad. Sci. 110 (17), 6913–6918.
Sun, Y., Liu, N., Zhao, M., 2019. Factors and mechanisms affecting green consumption in China: A multilevel analysis. J. Cleaner Prod. 209, 481–493.
Van Amstel, M., Driessen, P., Glasbergen, P., 2008. Eco-labeling and information asymmetry: a comparison of five eco-labels in the Netherlands. J. Cleaner Prod. 16 (3), 263–276.
Van den Bulte, C., Stremersch, S., 2004. Social contagion and income heterogeneity in new product diffusion: A meta-analytic test. Mark. Sci. 23 (4), 530–544.
Van Doorn, J., Verhoef, P.C., 2011. Willingness to pay for organic products: Differences between virtue and vice foods. Int. J. Res. Mark. 28 (3), 167–180.
Vasileiou, E., Georgantzís, N., 2015. An experiment on energy-saving competition with socially responsible consumers: opening the black box. J. Behav. Exp. Econ. 58, 1–10.
Vlaeminck, P., Jiang, T., Vranken, L., 2014. Food labeling and eco-friendly consumption: experimental evidence from a belgian supermarket. Ecol. Econom. 108, 180–190.
Wang, J., Wu, L., 2016. The impact of emotions on the intention of sustainable consumption choices: evidence from a big city in an emerging country. J. Cleaner Prod. 126, 325–336.
Wells, W.D., 1997. Comment on social marketing: Are we fiddling while rome burns? J. Consum. Psychol. 6 (2), 197–201.
Yammarino, F., 2013. Leadership: Past, present, and future. J. Leadersh. Organ. Stud. 20 (2), 149–155.
Zhao, H.H., Gao, Q., Wu, Y.P., Wang, Y., Zhu, X.D., 2014. What affects green consumer behavior in China? A case study from Qingdao. J. Cleaner Prod. 63, 143–151.