



## Gender effects and cooperation styles in the Facebook community: A quasi-experimental assessment



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### ABSTRACT

This paper examines gender effects reported in a quasi-experimental implementation of a social dilemma using Facebook profile owners as subjects. By sending personal invitations via Facebook interest groups, we were able to recruit a fairly large number of participants ( $N = 216$ ) who participated in a “one-shot” variation of the Voluntary Contribution Mechanism (VCM). In addition to participating in the social dilemma, participants provided information about their online profile and their attitude towards Facebook. We observed gender effects on the cooperation style of participants who use Facebook frequently in order to communicate not only with friends and family but also with work colleagues and business acquaintances.

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### 1. Introduction

The comparison of the altruistic behaviour of males to that of females has been a matter of debate in the literature due to the profound implications that it has for the study of cooperation and teamwork. When the latter relates to a recruitment decision, bringing altruists onto a team project can be a significant factor for its success (Carli & Eagly, 1999). A quite prominent way of evaluating altruistic behaviour among individuals is observing their behaviour in online communities and online social networking sites (SNSs), mainly due to the fact that these provide a rich repository of recorded social interactions which can be related to other aspects of behavioural research (Boyd & Ellison, 2008). While the sense of “community” established by exhibiting cooperative behaviour (e.g. contributing to a common good) is fuzzy to conceptualise on SNSs, participant’s behaviour on these sites can be considered as a proxy for other behavioural attitudes such as communication and use of language.

Nonetheless, information sharing on these websites has been a significant contributing factor in their success, shifting the overall focus to social media as a primary source of information and knowledge sharing (Wodzicki, Schwämmlein, & Moskaliuk,

2012). In that context, behavioural intentions to share information depend on the willingness of SNS users to cooperate with others with whom they might hold strong or weak social connections depending on their “offline” interaction and their position in an individual profile owner’s network (Park, Choi, Hwang, & Paek, 2012). The latter has been addressed in the literature as a digital case of social capital (Lin, 2002).

From a theoretical perspective, the case of “social capital” and its formation by participation can be considered a theoretical viewpoint, whereas cohesive interactions between strangers contribute to a *public good* (Portes & Vickstrom, 2011). In that context, this *participatory behaviour* is an important aspect that characterises the potential of an individual to cooperate with others in working towards a common good (Bakker & de Vreese, 2011; Scheufele, 2002). This cooperative attitude can be influenced by the nature and use of the communication medium and can lead to the creation of digital commons that become synonymous with a public good, as in the context of any other digital community (Kollock & Smith, 1996, 2002). In that context, the evaluation of gender differences in altruistic or cooperative behaviour on social media can provide an interesting insight into how and why they are used (Tang, Ross, Saxena, & Chen, 2011; Wang, Burke, & Kraut, 2013). In addition, examining behavioural aspects in the context of an online social networking site is essential in order to assess how willing individuals are to cooperate with complete strangers, as well as the influence that the medium exerts on them to cooperate in pursuit of a common or *public good*.

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While gender differences in altruistic behaviour for the sake of the public good have been the subject of many studies on behavioural and experimental economics (for a review see Croson and Gneezy (2009)), we believe it is important to examine how such differences are manifested in the context of online social networks formed and sustained through the Internet. In particular, the objective of this study is to investigate gender differences in the cooperation styles of Facebook profile owners, taking into account the intended communication usage (labelled as “intention to use”) and the intensity of Facebook use (labelled as “intensity of use”).

This study contributes to the literature by examining gender differences in the context of a social dilemma. The cooperation scenario that we used in this study is based on a quasi-experimental use of the Voluntary Contribution Mechanism (VCM) introduced by Isaac and Walker (1988). By implementing an online version of the VCM and inviting Facebook profile owners to participate, we were able to match individuals to groups and assess their cooperation styles in connection with two basic constructs that relate to Facebook use, namely intention (in a professional or personal manner) and intensity (based on the construct of Ellison, Steinfield, & Lampe (2007)). To this end, this paper is structured as follows: Section 2 describes the theoretical model, the constructs, and the rationale for the analysis and the theoretical hypotheses; Section 3 provides the analysis of the data collected using the survey instrument and hypotheses testing; a discussion of the results is provided in Section 4, along with how they compare with previous literature; and the study is concluded in Section 5 with a discussion of limitations and issues for future research.

## 2. Study design

Gender differences with regard to altruistic behaviour have been studied extensively in cases of online information seeking (Garbarino & Strahilevitz, 2004; Hargittai & Shafer, 2006; Large, Beheshti, & Rahman, 2002). An early study by Sheehan (1999) found that women are in general more concerned about their privacy than men when it comes to sharing personal information with others. In that direction, a study by Hoy and Milne (2010) also found that women are more private and proactive than men regarding their Facebook communications. In a similar fashion in the field of online communities a review by Chermak and Krause (2002) outlined that gender matters when participants know the roles that they are going to play. Their study also revealed that women are more generous (i.e. they contribute more) than men.

As aforementioned in the introduction, this study aims to assess the interplay of four distinct elements of social and online behaviour: (a) cooperation styles derived from an individual’s behaviour in the context of a social dilemma; (b) the intensity of Facebook use measured by a set of different elements related to an individual’s own Facebook activity; (c) the role of communication intention in relation to Facebook use (business contacts/family and friends); and finally (d) the effect this has on gender differences with respect to altruistic behaviour. We outline the experimental variables in the sections that follow.

### 2.1. Variables

As mentioned in Section 1, the social dilemma that was used in order to assess cooperative behaviour in our model was a non-payment configuration of the VCM, also known in the literature as the *public goods game* (Isaac & Walker, 1988).

In the public goods game, a participant is assigned to a group along with other subjects and is given a certain number of tokens. The participant then faces the dilemma of deciding how many of those tokens (which can also be real money) to contribute (or not) to a public pot. Once every subject has made his/her decision,

the remaining tokens from their initial contributions are added to an even split of the sum of tokens that have been contributed by the group members to the public pot. This type of social dilemma theorises two types of participants/players: the *altruists* (those who contribute all the tokens given to them to the pot) and the *free riders* (those who contribute none of their tokens to the public pot).

According to game theory, the Nash equilibrium of this dilemma dictates that every participant will contribute nothing to the public pot, as the calculation of the payoff for each individual subject participating in the game is maximised when the individual contribution is zero. For the contribution to be “irrational” for the participant, a multiplication factor ( $\alpha$ ) is usually added to the pot. The amount of tokens given to each participant can be denoted as  $P_e$ . From this amount, an amount  $P_c \leq P_e$  can be contributed to the public pot. For a participant ( $i$ ) taking part in the social dilemma, his/her payoff can be expressed as follows:

$$\pi_i = P_{e(i)} - P_{c(i)} + \alpha_i \sum_i P_{c(i)} \quad (1)$$

The multiplication factor for each participant ( $\alpha_i$ ) describes the benefit that the participant receives from contributing to the public pot. On the above equilibrium, if no one contributes, then the payoff for each participant will be  $\pi_i = P_{e(i)}$ , while if everyone contributes the payoff will be  $\pi_i = \alpha_i \bar{P}_e$ , where  $\bar{P}_e$  denotes the average contribution per participant. If the benefit received from each participant in the social dilemma ( $\alpha_i$ ) is less than one, then the solution to  $\max(\pi_i)$  implies that the value of the multiplication factor is less than one ( $\alpha_i < 1$ ). Depending on the amount contributed to the pot and the type of decision (whether one individual has prior information about the other individuals’ contributions or not), we can classify the altruistic behaviour of the participants in a social dilemma (Croson, 2007) formalised using the VCM as follows.

#### 2.1.1. Altruists (AL)

Altruists are the class of participants in the social dilemma who contribute all the tokens they have for the sake of the public good as represented by the public pot in the game ( $P_e - P_c = 0$ ). According to theory, altruists may also apply reciprocity in the belief that contributing to the common good will benefit them if the amount in the pot is maximised.

#### 2.1.2. Free riders (FR)

Free riders, or defectors, are the class of participants in the social dilemma who contribute none of the tokens that have been given to them, expecting to maximise their profits following the rational approach and complying with the Nash equilibrium of the cooperation game. In that case, the defectors can be identified by the value of their contribution ( $P_c = 0$ ).

#### 2.1.3. Conditional and unconditional cooperators (CC and UC)

Another approach to understanding how cooperation evolves in the social dilemma is to make use of the so-called “strategy method” to elucidate the choice of the participants. This can be seen as a theoretical case of information asymmetry on the part of the participant where he/she is better informed about the contribution of the others and can decide to contribute after all the contributions from the other participants have been revealed. In that case, the social dilemma is configured in states where the average contribution  $P_{cs}$  at stage  $s$  is displayed to the participant, who then decides on a contribution  $P_{cjs}$  taken from the initial amount. For each individual stage  $S = \{1, 2, 3, \dots\}$  and contribution  $P_{cj}$ , the sum of the contributions for each stage can be seen as:  $C_i = \sum_{s=1}^k P_{c(i)} - P_{c(s)}$ . If the value of  $C$  is zero, then the participants at any given stage contribute to the average contribution of the others. However, if the value is constantly below zero then the individual is classified as an unconditional cooperator.

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