



The effects of induced emotions on pro-social behaviour



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ABSTRACT

Emotions are commonly experienced and expressed in human societies; however, their consequences on economic behaviour have received only limited attention. This paper investigates the effects of induced positive and negative emotions on cooperation and sanctioning behaviour in a one-shot voluntary contributions mechanism game, where personal and social interests are at odds. We concentrate on two specific emotions: anger and happiness. Our findings provide clear evidence that measures of social preferences are sensitive to subjects' current emotional states. Specifically, angry subjects contribute, on average, less than happy subjects and overall welfare as measured by average net earnings is lower when subjects are in an angry mood. We also find that how punishment is used is affected by moods: angry subjects punish harsher than happy subjects, *ceteris paribus*. These findings suggest that anger, when induced, can have a negative impact on economic behaviour.

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1. Introduction

Emotions are pervasive in many social environments and interactions, characterising key aspects of our everyday relations. For instance, the experience and display of emotions play an important role in fostering and maintaining cooperative relationships, even when contracting is not complete or even absent (Fessler and Haley, 2003 and Bowles and Gintis, 2005). In psychology, there is a long tradition of investigating moods and emotions¹ suggesting that humans often make different decisions depending on their current feeling states due to the use of different processing strategies (Bless et al., 1996; Schwarz and Clore, 1996), cognitive capacities (Isen, 1987; Mackie and Worth, 1989) or mood maintenance motivations (Isen, 1987; Wegener et al., 1995). Previous psychological research also reveals an association between emotions and normative judgments and decisions (for reviews, see Forgas, 1995; Schwarz, 1990 and Loewenstein and Lerner, 2002). The relevance

of emotions has been emphasised from an evolutionary perspective as well. For example, Frank (1988) argues that natural selection has favoured those whose decisions are influenced by emotions. Relatedly, it has been suggested that individuals displaying positive emotions increase their reproductive success, as they are more attractive to other members of the society (see Fredrickson, 2005). By contrast, the role of emotions has been largely neglected in traditional economic decision-making theories. Mostly, these theories assume economic agents to be fully-rational, self-interested, emotionless maximizers of expected utility. This consequentialist framework does not need to be devoid of emotions as one could incorporate expected emotions that are anticipated to occur as the result of the outcomes of different choices into a theoretical model. However, expected emotions are not the only channel through which emotions can affect choices (see Rick and Loewenstein, 2008). Immediate emotions, experienced at the moment of choice, are a bigger challenge to the consequentialist framework and have received less attention.

This paper uses experimental methods and techniques from social psychology to shed light on our understanding of the causal link between immediate emotions and behavioural outcomes in public good games with and without punishment. Public good games have long been studied in the social science literature (e.g. Andreoni, 1988; Ostrom et al., 1992; Isaac et al., 1994; Brandts and Schram, 2001; Coats et al., 2009; and Ostrom and Volland, 2010) as they capture the tension between personal interest and social benefit which characterises

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¹ Psychologists usually make a distinction between moods (which are typically long-lasting states) and emotions (which are typically short-lived states). They also used the term "affect" which normally encapsulates both emotions and moods (Forgas, 1992). Yet, in this paper, we are not concerned with making such a distinction and therefore use these terms interchangeably. It is also worth noting that the procedures used to induce moods and emotions are practically the same (for a brief discussion, see Fredrickson, 2005).

many real life social dilemmas. In their very nature, dilemmas are loaded with emotions. The most effective way of analysing the causal effect of immediate emotions is to experimentally manipulate emotions by inducing them.

In this paper, we design an experiment to investigate the impact of induced emotions on two behavioural measures of social preferences: cooperation and sanctioning behaviour. We examine the issue of how induced emotions affect behaviour in a game that has played a major role in the social preference literature: the voluntary contributions mechanism (VCM) with punishment.² In our implementation of this game, individuals randomly form groups of 3 members and decide how much of their initial endowment to voluntarily contribute to a common resource. The setup is parameterised such that selfish and rational individuals would contribute nothing and keep their whole endowment for themselves; whereas social efficiency is achieved when all individuals contribute their total endowment to the common good. The game is completed with the addition of a second stage in which individuals are informed about the contributions of the other group members and are given the opportunity to reduce the income of their counterparts by assigning costly sanctioning points to other group members.³ The game is played only once providing us with a cleaner test for the initial existence of the effects of induced emotions on behaviour. We concentrate on two emotional states: anger and happiness, which are two of the six so-called “primary or universal” emotions (see Damasio, 1994).⁴ We induce these emotions by showing short video clips to participants before they make their contribution decision.

Our main findings suggest that induced emotions play a significant role in shaping behaviour in the voluntary contribution mechanism with and without punishment. In particular, angry subjects contribute significantly less than happy subjects. They also tend to punish their counterparts harsher (when we control for deviations from the punisher's contribution behaviour) compared to subjects in a happy mood. Overall welfare is also affected by induced emotions: average earnings are significantly lower for angry subjects than for happy subjects. To this extent, we provide evidence that anger, when induced, causes a negative impact on economic behaviour and reduces efficiency at least in the very short run.

This paper contributes to the emerging literature that sheds empirical light on the forces that determine the content of acceptable standards of behaviour. Most studies have focused on whether and how self-reported emotions are correlated with a broad range of economic behaviours (see, e.g., Charness and Grosskopf, 2001; Sanfey et al., 2003; Xiao and Houser, 2005; Meshulam et al., 2011; Bolle et al., 2014; Stanton et al., 2014). Related to this paper, there exists evidence based on correlations for the role played by emotions in both cooperation and punishment decisions. For instance, Hopfensitz and Reuben (2009) have shown the importance of emotions in the decision to cooperate in a two-period game involving two players. Other studies have shown that positive (negative) emotional states are associated with higher (lower) contributions in a VCM context (Joffily et al., 2014). As for the decision to punish, some studies have suggested that negative emotions such as anger predict the application of costly punishment (Pillutla and Murnighan, 1996; Fehr and Gächter, 2000; Bosman and Van Winden, 2002; Sanfey et al., 2003; Ben-Shakhar et al., 2007;

² In the past, psychological experiments have explored the impact of induced emotions on cooperation (e.g., Hertel and Fiedler, 1994; Hertel et al., 2000). However, to the best of our knowledge, no previous experiment explores the behavioural consequences of induced emotions on cooperation in an incentive compatible environment. Additionally, we extend the literature by assessing the extent to which negative reciprocity (as measured by individuals' willingness to punish) is sensitive to subjects' current affective states.

³ The voluntary contribution mechanism with punishment we examine was first introduced by Fehr and Gächter (2000) and since then, a growing body of experimental literature has emerged investigating the ability of punishment to sustain high cooperation levels and to regulate self-interested behaviour (for reviews, see Gächter and Herrmann, 2009; Chaudhuri, 2011).

⁴ The other four such emotions are sadness, fear, surprise and disgust.

Andrade and Ariely, 2009; Hopfensitz and Reuben, 2009; Cubitt et al., 2011; Joffily et al., 2014; Dickinson and Masclot, 2015). However, the emotions studied in these papers are coming about endogenously either through initial dispositions or through the observation of choices made in the experiment. The originality of this paper is that emotions are induced exogenously using video clips. This allows for a causal attribution that is lacking in previous studies.⁵

Our paper is organised as follows. Section 2 outlines the experimental design and procedures. Section 3 states the hypotheses and Section 4 presents the experimental results. Section 5 discusses the findings and concludes.

2. Experimental design and procedures

2.1. Voluntary contributions mechanism with punishment

Our experimental design centres on a game with two stages. In the first stage subjects are randomly assigned to a three-person group. Each subject is endowed with 20 tokens and has to decide how many of them to keep and how many to contribute to the public good (described as a “project” to subjects). Each token kept increases the own monetary payoff by one experimental currency unit (ECU). Each token contributed to the public good increases the payoff of every group member by 0.5 ECUs. The payoff function from the first stage is given by Eq. (1).

$$\pi_i^1 = 20 - g_i + 0.5 \cdot \left(g_i + \sum_{j=1}^2 g_{j \neq i} \right), \quad (1)$$

where g_i ($0 \leq g_i \leq 20$) denotes the number of tokens contributed to the public good by group member i .

In the second stage subjects can see the profile of contributions of the other two group members and are given the opportunity to assign costly punishment points to each of the other two group members. Subjects could assign up to 5 punishment points. Each punishment point costs the punisher 1 ECU and the recipient of the punishment 3 ECUs. Thus, the cost-to-impact ratio is 1:3. The total payoff from both stages is computed as follows:

$$\pi_i = \pi_i^1 - \sum_{j \neq i} p_{ij} - 3 \cdot \sum_{j \neq i} p_{ji}, \quad (2)$$

where π_i^1 denotes group member i 's payoff from the first (contribution) stage and p_{ij} the punishment points group member i assigns to group member j .

Conditional on each subject i being motivated to maximise Eq. (2), the unique subgame perfect equilibrium requires that subject free-ride completely in the first stage and refrain from punishing in the second stage.

2.2. Design and procedures

We implement a 2×2 factorial between-subject design. One factor that we manipulate is subjects' emotions; we either induce them to be positive or negative. The other one is the announcement of a second stage punishment phase, which is either announced or not at the beginning of the experiment. Table 1 summarises the experimental treatments.

We induce positive and negative emotions by exposing subjects to scenes from short video clips. There is a large body of literature in psychology on mood induction procedures. These, for example, include the imagination of emotionally driven events, the use of emotional statements whereby subjects are asked to try and feel the associated

⁵ There are a few notable exceptions that report causal effects of induced emotions. These include effects on altruistic behaviour in dictator games (Capra, 2004), overbidding in an auction environment (Capra et al., 2010), labour productivity (Oswald et al., 2015), generosity in a gift-exchange game (Kirchsteiger et al., 2006) and time preferences (Ifcher and Zarghamee, 2011).

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