Journal of Economic Psychology 49 (2015) 1–14

Contents lists available at ScienceDirect

Journal of Economic Psychology

journal homepage: www.elsevier.com/locate/joep

Do negative emotions explain punishment in power-to-take game experiments?

Fabio Galeotti *

Université de Lyon, Lyon F-69007, France
CNRS, GATE Lyon Saint-Etienne, Ecully F-69130, France

ARTICLE INFO

Article history:
Received 26 September 2014
Received in revised form 7 March 2015
Accepted 20 March 2015
Available online 27 March 2015

JEL classification:
A12
C72
C91

PsycINFO Classification:
2360

Keywords:
Emotions
Punishment
Power-to-take
Experiment

ABSTRACT

An important branch of economic research on emotions has used power-to-take game experiments to study the impact of negative emotions, such as anger, irritation and contempt, on the decision to punish. We investigate experimentally the role that the specific punishment technology adopted plays in this context, and test to what extent punishing behavior can be truly attributed to negative emotions. We find that a large part (around 70%) of the punishment behavior observed in previous PTTG studies is explained by the technology of punishment adopted instead of negative emotions. Once this effect is removed, negative emotions do still play an important role, but the efficiency costs associated to them are much smaller.

1. Introduction

This study investigates the role played by the punishment technology in driving the behavior of responders in power-to-take game (PTTG) experiments, and tests to what extent it can be truly attributed to negative emotions, such as anger, irritation and contempt. The concept of emotion is an elusive one (Frijda, 2007). In psychology and neuroscience, it is used to describe a range of discrete, synchronized, and time-limited responses (including subjective experience, expression, bodily responses and action tendencies) of an individual to internal or external events (stimuli) which are relevant or significant to that individual (Phelps, 2009). A person experiences positive emotions, such happiness and joy, when his or her interests are satisfied or facilitated, and negative emotions, such as sadness and contempt, when his or her interests are prevented or opposed. Psychologists and neuroscientists have accumulated considerable empirical evidence suggesting that emotions play a very important role in the decision-making process (see, e.g., Frijda, 1986; Damasio, 1994; LeDoux, 1996; Picard, 1997). In particular, one important aspect of emotions is that they motivate the individual towards particular actions

* Address: GATE Lyon St. Etienne, 93 Chemin des Mouilles, 69130 Ecully, France. Tel.: +33 (0) 4 72 86 60 39.
E-mail address: galeotti@gate.cnrs.fr

http://dx.doi.org/10.1016/j.joep.2015.03.005
0167-4870/

depending on the context, type and intensity of the emotion experienced (Frijda, 1986). For instance, a fearful individual will have a tendency to run away from the stimulus responsible for his or her fear, while an envious person will tend to seek to possess the valued thing or person (Lazarus, 1991).

Over the last few decades, economists have also started to pay attention to the complexity of emotions on economic scenarios and have been trying to capture the range of possible roles that emotions play in the economic decision-making process. For instance, emotions have been proposed as an explanation for important economic phenomena such as cooperation (Frank, 1988; Fehr & Gächter, 2002) and decision-making under risk (Loewenstein, Weber, Hsee, & Welch, 2001), and are seen to have important consequences for many other economic phenomena, such as inter-temporal choices (Rick & Loewenstein, 2008), competition (Kräkel, 2008), bidding behavior (Bosman & Riedl, 2004) and bargaining behavior (Pillutla & Murnighan, 1996). The advent of neuroeconomics has then further pushed forward the interest of economists on the role played by emotions in the economic decision-making process (for a review on emotions and neuroeconomics, see Phelps, 2009). More recently, emotions have also been associated with the automatic and impulsive decision system of dual-process theories, according to which human behavior is the result of the interaction between this system and a controlled, reflective and rational one (Alos-Ferrer & Strack, 2014; Brocas & Carrillo, 2014; Schulz, Fischbacher, Thöni, & Utikal, 2014).

An important branch of economic research on emotions utilized experiments to study the impact of negative emotions, particularly anger, irritation and contempt, on the decision to punish (Bosman & van Winden, 2002; Bosman, Sutter, & van Winden, 2005; Ben-Shakhar, Bornstein, Hopfensitz, & van Winden, 2007; Hopfensitz & Reuben, 2009; Joffily, Masclet, Noussair, & Villeval, 2013).[1] This stream of research started with the seminal work of Bosman and van Winden (2002) on the PTTG. In the PTTG, there are two players, the 'take authority' (with income Y_{take}), and the 'responder' (with income Y_{resp}). The game is divided into two stages. In the first stage, the take authority selects a take rate $t \in [0,1]$, which is the proportion of the responder's income that will be transferred to the take authority at the end of the game. In the second stage, the responder chooses a destroy rate $d \in [0,1]$, which is the proportion of Y_{resp} that will be destroyed. Therefore, the payoffs of the game are $(1-t)(1-d)Y_{resp}$ for the responder, and $Y_{take} + t(1-d)\ Y_{resp}$ for the take authority.

If the subjects are rational profit-maximizing agents, the responder should not destroy if the take rate is less than 1, and should be indifferent between all possible destroy rates if the take rate is 1. Hence, from backward induction, the take authority should select $t = 1-\varepsilon$, where ε is an infinitesimal positive number. The PTTG can be interpreted as an ultimatum game with continuous opportunities to punish and can describe many economic situations where an agent can take away any part of the endowment of another agent (e.g. taxation, monopolistic pricing and principal-agent relationships) (Bosman & van Winden, 2002).

Most of the literature on the PTTG investigates the role played by negative emotions on responders' behavior through physiological (Ben-Shakhar et al., 2007) and self-report measures (Bosman & van Winden, 2002; Bosman et al., 2005). Both measures were found to be related to destruction decisions. In particular, participants who experienced intense anger, irritation and contempt punished their counterparts more often and more severely. This result seems to identify these negative emotions as the main driving force for punishing behavior, and the principal source of efficiency costs in this context.[2]

This literature on the PTTG adopts a technology of punishment characterized by a *non-constant* 'fine-to-fee' ratio. This parameter identifies "the income reduction for the targeted subject relative to the cost for the subject who requested the punishment" (Casari, 2005). The advantage of using this technology of punishment is that it reflects many economic and everyday situations modeled by the PTTG to a fairly accurate extent. Take, for instance, all the cases where a principal can set a less favorable incentive scheme (e.g. lower piece rate) for the agent in order to appropriate a larger share of the profit. The agent can retaliate by exerting a lower effort or going on strike in order to reduce the profit, even if this goes against his or her own material incentives (Bosman & van Winden, 2002). If the principal is particularly unfair, the agent can even quit the job and give up his or her entire salary to prevent the principal from benefitting from the agent's work. This will have little cost for the agent but a large one for the principal. On the contrary, if the principal is only slightly unfair, the agent will bear a much higher cost from punishing the principal. Another example is when, in a bipartisan coalition government, one political party (the leading one) takes the majority of the places in the cabinet or dictates most of the coalition's

[1] An individual experiences anger, irritation and/or contempt when he or she disapproves of someone else's action and, specifically in the case of anger and irritation, is also displeased about the undesirable event related to that action (Ortony, Clore, & Collins, 1988). According to the psychological literature on emotions (see, e.g., Lazarus, 1991), the action tendency that results from these negative emotions is an attack (which can be, for instance, psychical, verbal or symbolic) on the blameworthy agent. In economic environments, this may be translated into the destruction of the agent's resources, as it is hypothesized in the aforementioned economic studies on emotions and punishing behavior. Note that this impulse to attack does not necessarily result in actual behavior, and is often inhibited for personal and social reasons (Averill, 1983; Lazarus, 1991). If we look at the other discrete emotions considered in our study, they are not usually associated with aggressive tendencies (Lazarus, 1991). According to Ortony et al. (1988), some of these emotions (such as happiness and sadness) may not even involve an action tendency.

[2] Other well-established findings from the experimental literature on the PTTG show that people appropriate almost 60% of responders' income, while only 20% of the responders destroy income and usually all of it (Bosman & van Winden, 2002; Reuben & van Winden, 2010). Small differences were observed between an effort treatment (where endowments were earned by performing a preliminary individual real effort task) and a no-effort treatment (where endowments were exogenously given by the experimenter) (Bosman et al., 2005). A group version of the PTTG, where decisions were made by groups, produced the same results qualitatively as the no-group experiment (Bosman, Hennig-Schmidt, & van Winden, 2006). Furthermore, in a three-player version of the PTTG with one take authority and two responders, Reuben and van Winden (2008) show that responders who knew each other from outside the laboratory punish and coordinate more than strangers. The PTTG has also been used to study the influence of participation (Albert & Mertins, 2008), gender pairing (Sutter, Bosman, Kocher, & van Winden, 2009) and waiting time (Galeotti, 2013) on economic decision-making.