



## Equality as a benchmark for third-party punishment and reward: The moderating role of uncertainty in social dilemmas

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### ARTICLE INFO

#### Article history:

Received 28 December 2011

Accepted 28 June 2012

Accepted by field: Eric van Dijk, Craig D. Parks and Paul A.M. van Lange

#### Keywords:

Social dilemma

Cooperation

Equality

Sanction

Punishment

Reward

Uncertainty

Emotion

### ABSTRACT

The present paper focuses on third-parties' decisions to punish and reward in social dilemmas, and on the moderating role of environmental uncertainty (i.e., uncertainty about the size of the common resource). We argue and demonstrate that in social dilemmas third-parties use the equality rule as a strict benchmark to determine punishments (Study 1) as well as rewards (Study 2), but only under environmental certainty. Under environmental uncertainty, third-parties do not apply such a strict benchmark to distinguish cooperators from defectors. Instead, they appear to use the following rule: the more an individual group member has cooperated the less he/she should be punished (Study 1) and the more he/she should be rewarded (Study 2). As such, these findings are the first to demonstrate that third-party sanctioning decisions are moderated by environmental uncertainty.

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### Introduction

Our personal interests often conflict with the interests of the collective to which we belong. Such situations are generally referred to as *social dilemmas* (for an overview, see [Kopelman, Weber, & Messick, 2002](#)). A notable example of a social dilemma is the problem of preserving common resources (see e.g., [Hardin, 1968](#)). Many natural resources (e.g., energy, oil, water, fish, etc.) can be regarded as scarce collective resources that should be consumed sparingly in order to prevent them from becoming depleted. In such situations, people may face the dilemma that despite the collective's interest to restrict consumption, it may be in their personal interest to consume excessively. This dilemma of whether or not to restrict consumption of scarce resources is generally referred to as the *common resource dilemma*.

Large-scale environmental problems such as over-fishing, global warming, and pollution have all been identified as social dilemmas. Such dilemmas are not restricted to such large-scale settings, however. To give just one example, consider the dilemma that employees face in balancing their own goals with the demands of the organization (e.g., organizational citizenship behavior). The

main challenge in social dilemmas is how people can be prevented from putting their own interests first. How can people be induced to prevent collective tragedies? The literature has suggested several means to accomplish this goal (see e.g., [Kopelman et al., 2002](#)). One of the most extensively studied means to enhance cooperation is to install sanctions, either positive (rewards or bonuses for those who cooperate) or negative ones (punishments or fines for those who defect).

Sanctions are relatively straightforward means to increase cooperation, as they basically change the outcome structure of the social dilemma by increasing the attractiveness of cooperation (in the case of *positive sanctions*) or decreasing the attractiveness of defection (in the case of *negative sanctions*). Indeed, although some exceptions have been published (e.g. [Gneezy & Rustichini, 2000](#); [Mulder, Van Dijk, De Cremer, & Wilke, 2006](#)), the general picture emerging from earlier research is that sanctions – both positive and negative – can effectively increase cooperation (e.g., [Andreoni, Harbaugh, & Vesterlund, 2003](#); [Balliet, Mulder, & Van Lange, 2011](#); [McCusker & Carnevale, 1995](#); [Wit & Wilke, 1990](#); [Yamagishi, 1986](#); [Yamagishi, 1988](#)).

Whereas earlier research has repeatedly shown that sanctions – both rewards and punishments – can be effective in promoting cooperation, another critical question has received less attention, namely: How do those responsible for administering sanctions make their sanctioning decisions? More specifically, how do they

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determine who to sanction and how high these sanctions should be? Addressing this question is important, if only for the obvious reason that sanctions can only show their effects if someone decided to administer them. Governments need to decide to impose sanctions on their citizens; managers in organizations need to decide to give their employees bonuses, etcetera. So how do those in charge determine such sanctioning decisions? This is the question we aim to answer in the present paper.

### Equality as a benchmark for sanctions

In social dilemmas, sanctions generally serve the function of enforcing cooperation and deterring defection. In other words, sanctions can be used to uphold social norms of cooperation. Additionally, sanctions may be used to restore justice, by giving people their “just deserts” (Carlsmith, Darley, & Robinson, 2002). In numerous empirical studies (see e.g., Fehr & Fischbacher, 2004; Fehr & Gächter, 2002; Henrich et al., 2006), it has been demonstrated that people are willing to punish violators of cooperative norms, even when their own outcomes are not affected by such violations, and when such decisions to punish are costly. This phenomenon has generally been referred to as *third-party punishment*. Of course, in order to determine who to sanction third-parties need to distinguish cooperators from defectors. But how do third-parties make this distinction? In order to understand how sanctioning decisions are made, this question needs to be addressed. Remarkably, however, very little research to date has focused on this issue. Moreover, earlier research on third-party sanctioning has primarily focused on punishments, and has neglected third-parties' decisions to reward. With the present research, we aim to fill these gaps in the literature.

We argue that, in common resource dilemmas, third-parties may use the norm of equality to determine who to sanction. Experimental research on common resource dilemmas (e.g., Allison, McQueen, & Schaerfl, 1992; Allison & Messick, 1990; De Cremer, 2003; Rutte, Wilke, & Messick, 1987; Van Dijk & Wilke, 1993; Van Dijk & Wilke, 1995; Van Dijk, Wilke, Wilke, & Metman, 1999) has repeatedly shown that group members tend to adhere to the equality rule: that is, most of them harvest an equal share from the common resource, and they also expect their fellow group members to do so (Van Dijk, De Kwaadsteniet, & De Cremer, 2009). Furthermore, when group members find out that a group member has violated this rule by harvesting more than his/her share, they tend to respond in anger (De Kwaadsteniet, Van Dijk, Wit, & De Cremer, 2010). Altogether, these findings clearly demonstrate that in common resource dilemmas the equal division rule constitutes a strong social norm (see also Kerr, 1995; Messick, 1993). Based on this, we argue that, in common resource dilemmas, third-parties may use this norm of equality to distinguish cooperators from defectors. That is, when a group member has not harvested more than an equal share he/she will be labeled a cooperator, whereas if a group member has harvested more than this he/she will be labeled a defector.

To illustrate the above point, consider the simple example of five people sharing a common resource of 500 coins. In that case, equality prescribes that group members should harvest no more than 100 coins from that resource ( $500/5 = 100$ ). If all group members adhere strictly to this rule, this will lead to a fair division of the common resource, and collective overuse will be prevented (cf. Messick, 1993). Thus, general adherence to the equal division rule yields desirable collective outcomes, whereas only one group member violating this rule may already instigate a collective tragedy. As such, third-parties may respond in anger when being confronted with a group member harvesting more than an equal share, and may in turn decide to punish (and not reward) this individual.

Moreover, using the norm of equality as a strict benchmark for distinguishing cooperators from defectors provides them with a clear and justifiable criterion for both punishments and rewards. Therefore, we expect that third-parties will be inclined to reward those who harvested an equal share or less, and punish those who harvested more than that. In other words, we argue that, in common resource dilemmas, third-parties tend to use the harvest prescribed by the equal division rule as a benchmark for positive as well as negative sanctions.

### Environmental uncertainty and sanctions

At this point, it may be important to note that equality cannot always be so easily applied. That is, in order to apply the equal division rule people need to have sufficient information about the characteristics of the social dilemma situation at hand (see e.g., De Kwaadsteniet, Van Dijk, Wit, & De Cremer, 2006; De Kwaadsteniet, Van Dijk, Wit, & De Cremer, 2008). In many real-world social dilemmas, such information is uncertain. For instance, fishermen often do not know exactly how large the fish population is and how many fishermen are fishing from the same stock. Such uncertainty regarding the characteristics of the social dilemma at hand is generally referred to as *environmental uncertainty* (e.g., Messick, Allison, & Samuelson, 1988).

Numerous types of environmental uncertainty can be distinguished, several of which have been investigated in experimental research (e.g., provision point uncertainty, group size uncertainty, asymmetric uncertainty, etc.). Although the general picture emerging from such research is that environmental uncertainty tends to decrease cooperation (for an overview, see Van Dijk, Wit, Wilke, & Budescu, 2004), not all these forms of uncertainty necessarily decrease adherence to the equality rule. For instance, as Van Dijk et al. (1999) demonstrated, some types of uncertainty (e.g., uncertainty about the asymmetry of endowments) may even increase the use of equality. In the present paper, however, we will focus on a type of uncertainty that seriously impedes the employment of the equal division rule, namely uncertainty regarding the size of common resource (see e.g., Budescu, Rapoport, & Suleiman, 1990; De Kwaadsteniet et al., 2006; Gustafsson, Biel, & Gärling, 1999), or *resource size uncertainty*. Information regarding the size of the resource is vital to the employment of equality, since calculating an equal share requires dividing the resource by the number of group members.

Besides hampering the use of equality to determine one's own harvest, resource size uncertainty also limits the rule's use as a benchmark for sanctions. Put differently, under resource size uncertainty there is no exact point of reference that can be used to differentiate cooperators from defectors, thereby blurring the dividing line between “good” and “bad” behavior. Under such circumstances, the only thing that can be concluded is that relatively high harvests are less cooperative than relatively low harvests. Under resource size uncertainty (as compared to certainty), we can thus expect that third-parties will apply the following rule to determine their sanctioning decisions: the more an individual group member has harvested, the more he/she should be punished and the less he/she should be rewarded.

### Emotions as drivers of sanctions

We test the above reasoning in two experimental studies, using a single-trial common resource dilemma paradigm (cf. Budescu et al., 1990; De Kwaadsteniet et al., 2006; De Kwaadsteniet et al., 2008; De Kwaadsteniet et al., 2010; Gustafsson et al., 1999). The first study focuses on third-parties' decisions to punish, and the second one focuses on third-parties' decisions to reward. However,

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