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Outcome valence and externality valence framing in public good dilemmas ☆

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ABSTRACT

The aim of this paper is to examine how framing influences people' s cooperation behavior in social dilemmas. In Experiment 1 we investigated the influence of outcome valence (positive vs. negative outcome) and externality valence (positive vs. negative externality) framing on players' willingness to cooperate in a repeated public good game. We found a significant interaction effect on first-round cooperation, indicating larger cooperation rates when there is a negative outcome valence and a positive externality on others. Furthermore, this effect remained largely stable when comparing cooperation over all rounds, resulting in 45–63% increased cooperation compared to the other conditions. In Experiment 2 we replicated the effect in an applied vignette study, lending support for the generalizability of this framing effect. Taken together, these findings suggest that public goods provisions may be increased substantially by framing the situation's outcome valence as negative rather than positive.

1. Introduction

Pollution, global warming, overpopulation, and the destruction of rainforests are all examples of challenging problems that humanity faces today. These situations pose a conflict between individuals' personal interests and the collective interest, leading to a social dilemma (Dawes, 1980; Kollock, 1998; Komorita & Parks, 1994). For instance, not separating trash saves time and effort for an individual but has negative consequences for society. Similarly, not donating to a cancer foundation is financially beneficial for the individual but hinders the development of better treatments. In either situation, everyone can equally profit from the public good (i.e., clean environment, effective cancer treatment), irrespective of whether he/she has contributed to its provision. Therefore, individuals have an incentive to "free-ride" on others' contributions. If, however, too many people do so, the public good might not be provided in the first place, and all individuals will be worse-off.

Because of the tremendous practical relevance, it is important to identify the factors that can explain and improve cooperative behavior in social dilemmas. Besides structural factors that affect the situation's incentive structure (e.g., reward and

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punishment, for a meta-analysis see Balliet, Mulder, & Van Lange, 2011; decreasing the personal cost of cooperation, e.g., Isaac & Walker, 1988), simply framing the exact same situation in different ways can affect cooperation and coordination. For instance, labeling a social dilemma as a "community game" compared to a "stock market game", makes cooperation more likely (Ellingsen, Johannesson, Mollerstrom, & Munkhammar, 2012). In a similar vein, a social frame increased giving in a dictator game (Brañas-Garza, 2007). Moreover, it has been shown that framing the situation as taking resources from an already present public good ("take-some" framing or common-pool resource dilemma) compared to framing it as resources that need to be contributed in order to provide the public good ("give-some" framing), causes individuals to adopt different coordination rules when there is endowment or interests asymmetry (van Dijk & Wilke, 1995, 2000). Furthermore, fMRI research has shown that framing can also influence cognitive functioning, showing that positive versus negative outcome frames lead to differences in brain activity (e.g., Gonzalez, Dana, Koshino, & Just, 2005).

Studying framing effects in social dilemmas is important for at least two reasons. First, when using artificial lab experiments to learn about real-world decision-making, we need to use appropriate games that capture both the incentive structure and the framing of the situation of interest to ensure high external validity. For instance, in public good games the typical framing is about doing or not doing something *good* for society, whereas many environmental problems might be better framed as a dilemma between doing or not doing something *bad* for society (Moxnes & Van der Heijden, 2003; Van der Heijden & Moxnes, 2012). Second, there may be real-world social dilemmas that could be re-framed. This might be particularly fruitful if certain framings increase cooperation more than others, providing a cost-neutral manipulation to increase social welfare.

In this paper, we therefore propose and systematically investigate two framing-dimensions that are relevant to real-world social dilemmas but have received only little attention in previous research: outcome valence and externality valence. Outcome valence refers to whether individuals will have a positive or negative outcome, irrespective of their behavior. In contrast, externality valence refers to whether an individual's transfer to the public good will have a positive or negative effect on others.

Contributions in the standard public good game are actions with a positive externality on others that generate a positive outcome (i.e., a positive public good). In many real-world social dilemmas, however, people need to cooperate on the reduction of negative outcomes, for example, bad air quality in a city or a negative working atmosphere in a company. Moreover, there are situations in which individuals need to decide whether to give themselves negative resources or to impose a negative externality on others, for example, bringing hazardous waste to a public collection facility (costly for the individual) or disposing it with the regular waste (costly for society). Table 1 shows real-world examples for all four combinations of the externality valence and outcome valence dimensions.

Taken together, in contrast to the classic public good game, where individuals' actions may have a positive externality on others and individuals' outcomes are positive, both outcome valence and externality valence may be positive or negative.

We present two studies, in which we orthogonally manipulate both dimensions in an artificial but highly controlled public good experiment (Experiment 1), and show the practical relevance of the obtained effect by replicating it in an applied game setting (Experiment 2). In the following section, we will explain what the essence of these framing dimensions is, how they relate to each other, and what behavioral differences could be expected.

1.1. Related literature

There is only indirect support for the assumption that people both perceive and act differently in social dilemmas with positive or negative outcomes. For instance, research on social discrimination has shown that in-groups become less discriminative towards out-groups when it comes to negative outcome distributions, as opposed to positive outcome distributions (Buhl, 1999; Mummendey, Otten, Berger, & Kessler, 2000; Mummendey et al., 1992). Mummendey and Otten (1998) have argued that groups might find it less normatively appropriate to discriminate in allocations of negative outcome valence and that such situations might evoke a feeling of "common fate", causing people to see the dilemma as a problem that needs to be solved collectively. Similarly, research by Van Beest, Van Dijk, De Dreu, and Wilke (2005) on coalition formation shows that participants are less likely to exclude others when they negotiate about negative outcomes, opposed to positive outcomes. In addition, they find that participants tend to have more fairness concerns when there are negative outcomes. Taken together, people might have different norms or values when it comes to negative outcomes. Applying these arguments to an intragroup public good setting, individuals' willingness to cooperate might be greater in a situation with a negative compared to a positive outcome valence.

Regarding a positive vs. negative externality valence, previous research provides some more direct evidence. Andreoni (1995) argued that the "warm-glow" experienced when a person's action has a positive externality on others has a stronger influence on motivating cooperative behavior than avoiding the "cold-prickle" when a person's action has a negative externality. Furthermore, the pride that a person feels from creating a positive externality might be attributed rather to the person her-/himself, which is in line with attribution theory (for a review on attribution theory, see Kelley & Michela, 1980), whereas the feeling of guilt stemming from an action with a negative externality might be shared with others (Wilson, 1993). In line with this reasoning, it has been shown that cooperation in public good games is larger if actions will yield a positive rather than a negative externality on other players (Andreoni, 1995; Fujimoto & Park, 2010; Park, 2000; Sonnemans, Schram, & Offerman, 1998).