



The psychology of social dilemmas: A review

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ARTICLE INFO

Article history:

Received 22 December 2011

Accepted 21 November 2012

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

Keywords:

Social dilemma

Human cooperation

Trust

Reward

Punishment

Self-interest

Social decision making

ABSTRACT

Broadly defined, social dilemmas involve a conflict between immediate self-interest and longer-term collective interests. These are challenging situations because acting in one's immediate self-interest is tempting to everyone involved, even though everybody benefits from acting in the longer-term collective interest. As such, greater knowledge of social dilemmas should help us understand not only the theoretical puzzles of why people cooperate (or not) but also the ways in which cooperation in groups and organizations can be maintained or promoted. This article reviews different types of social dilemmas, highlights recent developments in the field (especially within psychology), and suggests some new avenues for future research. We illustrate that the field of social dilemma is growing and flourishing in terms of theory, interdisciplinary collaboration, and applicability, producing insights that are novel, replicable, and applicable to many social situations where short-term self-interest is at odds with the long-term interests of teams, organizations, or nations.

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Introduction

Many of the world's most pressing problems represent social dilemmas, broadly defined as situations in which short-term self-interest is at odds with longer-term collective interests. Some of the most widely-recognized social dilemmas challenge society's well-being in the environmental domain, including overharvesting of fish, overgrazing of common property, overpopulation, destruction of the Brazilian rainforest, and buildup of greenhouse gasses due to overreliance on cars. The lure of short-term self-interest can also discourage people from contributing time, money, or effort toward the provision of collectively beneficial goods. For example, people may listen to National Public Radio without contributing toward its operations; community members may enjoy a public fireworks display without helping to fund it; employees may elect to never go above and beyond the call of duty, choosing instead to engage solely in activities proscribed by their formally defined job description; and citizens may decide to not exert the effort to vote, leaving the functioning of their democracy to their compatriots.

As the preceding examples illustrate, social dilemmas apply to a wide range of real-world problems; they exist within dyads, small groups, and society at large; and they deal with issues relevant to a large number of disciplines, including anthropology, biology, eco-

nomics, mathematics, psychology, political science, and sociology. Given their scope, implications, and interdisciplinary nature, social dilemmas have motivated huge literatures in each of these disciplines. Several excellent reviews of this literature exist, but many are dated or are narrowly focused on a specific variable that influences cooperation in social dilemmas. In the present paper, we build on past reviews by outlining key principles relevant to the definition of social dilemmas, summarizing past reviews, discussing recent developments in the field, and identifying future research directions with the potential to shed additional light on this important and ever-developing field.

Social dilemmas: beyond the prisoner's dilemma and immediate consequences

Social dilemmas come in many flavors. Sometimes cooperation means giving or contributing to the collective, sometimes it means not taking or consuming from a resource shared by a collective. Sometimes the time horizon is short, even as short as a single interaction, sometimes it is long-lasting, almost without an end as in ongoing relationships. There are social dilemmas involving two persons, and social dilemmas involving all people living in a country, continent, or even world. Not surprisingly, the diversity in social dilemma settings has led researchers to offer a range of different definitions for the concept. In his *Annual Review of Psychology* article, Dawes (1980) was one of the first who formally coined the term social dilemma, which he defined as a situation

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in which (a) each decision maker has a dominating strategy dictating non-cooperation (i.e., an option that produces the highest outcome, regardless of others' choices), and (b) if all choose this dominating strategy, all end up worse off than if all had cooperated (i.e., a deficient equilibrium). But as we will see, while focusing on the crux of the dilemma, this definition does not do justice to some other outcome structures (or more precisely, interdependence structures) that also captures the conflict between self-interest and collective interest, which include not only the prisoner's dilemma, but also the chicken dilemma, and the assurance dilemma (or trust dilemma). This definition also does not include the temporal or time dimension (e.g., Messick & Brewer, 1983; Van Lange & Joireman, 2008), because consequences can be immediate (short-term) or delayed (long-term). Such a more inclusive conceptualization allows us to include social traps, social fences, public good dilemmas, and resource dilemmas (see Table 1). We briefly discuss both features in turn.

Prisoner's, chicken, and assurance dilemmas

The well-known Prisoner's Dilemma has often been used as the basis for defining social dilemmas, which is also evident in Dawes' definition. We suggest that two other outcome interdependence structures can also be viewed as social dilemmas, if one relaxes the requirements for a dominating strategy and a single equilibrium. These structures include the Chicken and the Assurance (or Trust) Dilemma. In both dilemmas, the individual vs. collective conflict essential to social dilemmas is retained: there is a non-cooperative course of action that is (at times) tempting for each individual, and if all pursue this non-cooperative course of action, all end up worse off than if all had cooperated.

In the *Chicken Dilemma*, each person is tempted to behave non-cooperatively (by driving straight toward one's "opponent" in an effort to win the game), but if neither player cooperates (swerves), both parties experience the worst outcome possible (death). Clearly, Chicken does not involve a dominating strategy, as the best decision for an individually rational decision maker depends on what he or she believes the other will do; if one believes the other will cooperate (swerve), the best course of action is to behave non-cooperatively (and continue driving ahead); however, if one is convinced that the other will not cooperate (will not swerve), one's best course of action is to cooperate (swerve), because it is better to lose the game than to die. There are interesting parallels between Chicken and situations in which people are faced with the dilemma whether to maintain honor or status at nearly any risk (see Kelley et al., 2003).

The *Assurance (Trust) Dilemma* also lacks a dominating strategy, and is unique in that the highest collective and individual outcomes occur when both partners choose to cooperate. This correspondence of joint and own outcomes might suggest that the solution is simple, and there is no dilemma. However, if one party considers beating the other party to be more important than

obtaining high outcomes for the self and others, or is convinced the other will behave competitively, the best course of action is to not cooperate. Thus, like the Chicken Dilemma, the Assurance Dilemma is a situation in which there is a non-cooperative course of action that can (at times) be tempting for each individual, and if all pursue this non-cooperative course of action, all are worse off than if all had cooperated.

The temporal dimension

We often see that the consequences for self can be immediate or delayed, just as the consequences for the collective can be immediate or delayed. This temporal dimension is exemplified in *social traps*, or situations in which a course of action that offers positive outcomes for the self leads to negative outcomes for the collective. Examples of delayed social traps include the buildup of pollution due to overreliance on cars, and the eventual collapse of a common fishing ground as a result of sustained overharvesting. Given their emphasis on "consuming" or "taking" a positive outcome for the self, social traps are often called *take some dilemmas*, a classic example of which is the *commons (or resource) dilemma*.

These social trap situations may be contrasted with *social fences*, or situations in which an action that results in negative consequences for the self would, if performed by enough people, lead to positive consequences for the collective. Examples of delayed social fences include the eventual deterioration of a company's positive culture due to employees' unwillingness to engage in extra-role (or organizational citizenship) behaviors, such as being a good sport and helping new employees adjust, and the gradual deterioration of an education system due to taxpayers' unwillingness to fund school levies. Given their emphasis on "giving" something of the self (such as time, money, or effort), social fences are often called *give some dilemmas*, a classic example of which is the *public goods dilemma*, which have been extensively studied by economists in particular.

Definition and history

We define social dilemmas as situations in which a non-cooperative course of action is (at times) tempting for each individual in that it yields superior (often short-term) outcomes for self, and if all pursue this non-cooperative course of action, all are (often in the longer-term) worse off than if all had cooperated. This definition is inclusive of the well-known prisoner's dilemma, as well as the Chicken Dilemma and the Assurance (or Trust) Dilemma, and it includes the "correlation" with time, such that consequences for self are often immediate or short-term, while the consequences for the collective often unfold over longer periods of time. We suggest that this provides a fairly comprehensive definition of social dilemmas. At the same time, we acknowledge that other important distinctions are not included. One such distinction is the difference between *first order dilemma*, which represents the initial dilemma,

Table 1
Classification of social dilemmas (after Messick and Brewer (1983)).

	Collective consequences	
	Immediate	Delayed
Social traps		
• Take some dilemmas	Commuting by car (vs. public transportation, or carpooling) leads to daily traffic congestion and stress	Harvesting as many fish as one can from a common resource eventually leads to the collapse of the resource
• Commons/resource dilemmas		
Social fences		
• Give some dilemmas	Electing to not contribute to a community-funded fireworks show results in cancellation of the show	Choosing to not engage in extra-role behaviors that benefit one's company eventually leads to a deterioration of the company's positive culture
• Public goods dilemmas		

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