



# Ostracism and the provision of a public good: experimental evidence<sup>☆</sup>

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## ABSTRACT

We analyze the effects of ostracism on cooperation in a linear public good experiment with fixed partner design. Our results show that introducing ostracism increases contribution levels significantly except in first and last periods. Despite reductions in group size due to ostracism, the net effect on earnings is positive. This effect is in contrast to most alternative mechanisms aimed at increasing cooperation rates studied in the literature on public good experiments.

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## 1. Introduction

The practice of excluding members of communities, groups and teams to enforce norm conformity and cooperation has been evidenced in almost all civilizations and known cultures (Gruter and Masters, 1986; Williams, 2001). Ostracism,<sup>1</sup> the act of excluding, has been widely documented and analyzed in many disciplines. Indeed, regulating and sanctioning behavior by ostracizing non-contributing members can be found in animals (Goodall, 1986; Lancaster, 1986), and humans (Wiessner, 2005; Kurzban and Leary, 2001; Williams et al., 2000; Boehm, 1999; Mahdi, 1986) alike. Ostracism has, however, not only been observed in animal groups, primitive cultures and ancient civilizations, but has also been observed in modern societies – for instance, with respect to strike-breakers or whistle-blowers, as well as to low performers in team production settings (see Durkheim, 1933; Gordon, 1975; Francis, 1985; Williams, 2001). There exist many economic contexts, such as team production or other social dilemma problems, where it is feasible to ostracize individuals for the lifetime of the project

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<sup>1</sup> The word ostracism comes from the Greek *ostrakismos*, describing a practice originating in Athens as a political device instituted, probably by Cleisthenes in 508 B.C., as a constitutional safeguard for the Athenian democracy. Athenian citizens would cast a vote by writing on *ostraca*, shards of pottery, to remove for a period of ten years any person who threatened the harmony and tranquility of the body politic.

when monitoring and punishment are decentralized. Moreover, [Gaspard and Seki \(2003\)](#) provide an empirical example of a local fishery demonstrating elements of ostracism. In general, ostracism is the consequence of breaking an established rule or a social norm. In the former case, ostracism is normally enforced exogenously, while in the latter case ostracism is imposed endogenously according to self-established criteria.

The objective of this paper is to analyze the effects of ostracism using a controlled laboratory experiment. Our experimental design models situations, such as team work involving peers, when the latter have some influence upon team membership, a constellation that arises in particular in project teams within public administrative bodies, firms or in small-scale entrepreneurial activities, but also in local fisheries. More specifically, we investigate the effects of ostracism on contribution levels to a public good as well as on the overall welfare by applying a multi-period public good game with a partner matching design. Our experimental design provides the members of six-person groups with information on the contribution levels of the other five and with the possibility of casting a vote in order to exclude one member. A member is ostracized from the group if she obtains at least 50% of the votes. Excluded members no longer share any of the benefits of the public good and are also excluded from voting. In other words, ostracized members are fully excluded from all future group activities.<sup>2</sup> Although even a zero-contributing member does not directly reduce the other group members' payoffs, and in that respect is harmless to the group, we find that participants frequently ostracize the lowest contributor, thereby reducing the potential group productivity. A large fraction of voting activity and actual ostracism takes place during the first periods of the experiment. Remarkably, most of the remaining members usually converge towards full or almost full contribution, a situation that is sustained in most periods, although cooperation breaks down towards the end of the experiment.

Many different forms of punishment exist, and previous experiments have demonstrated how sanctions among peers work quite effectively in fostering cooperation in groups. Exclusion is a powerful instrument when other, direct forms of punishment (from pay cut to imprisonment), usually enforced by formally established institutions, are not available. Especially in contexts where group interaction acquires a social meaning, exclusion or the threat thereof can constitute a powerful deterrent against behavior that does not correspond to the social norm. The possibility of ostracism can take different forms: people can be excluded from ongoing or future projects, from the team or from other relationships that form a natural complement to work (such as lunch or social events). An example, often cited in the economics literature on punishment, is [Francis \(1985\)](#), where ostracism for “scabs” breaking strikes is discussed.<sup>3</sup> Again, the existence of social relationships outside work reinforce the motivational effectiveness of exclusion mechanisms, and this is possibly one of the reasons for fostering social activities outside the workplace such as excursions, parties or sports tournaments.

In the following section we discuss the related literature. In Section 3 we present the experimental design and procedures and in Section 4 we derive predictions, first based on standard game-theoretic assumptions and second considering “social preferences”. In Section 5 the results and in Section 6 the concluding remarks are presented.

## 2. Related literature

Theoretical research on the voluntary provision of public goods indicates that individuals have incentives to free-ride, leading to an inefficient provision under voluntary contribution.<sup>4</sup> In contrast to this, people do contribute to public goods both in experimental laboratories (e.g. [Ledyard, 1995](#); [Zelmer, 2003](#)) and in the field ([Ostrom, 1990](#); [Gaspard and Seki, 2003](#); [Wiessner, 2005](#)). Experimental results have, however, consistently shown that it is difficult to sustain high contribution levels over time (e.g. [Isaac and Walker, 1988](#); [Andreoni, 1988](#); [Croson, 1996](#)).

One explanation for these results is that a large fraction of the observed behavior can be characterized either as that of a free-rider or as that of a conditional cooperator, willing to cooperate only as long as she expects others to do so as well. The actual speed of the decline of contribution levels over time depends on the proportion of free-riders and conditional cooperators in the group (e.g. [Keser and van Winden, 2000](#); [Fischbacher et al., 2001](#)). In that respect, [Gunnthorsdottir et al. \(2001\)](#) and [Gächter and Thöni \(2005\)](#) show that re-matching of participants according to previous contribution levels results in high and sustainable contributions in groups of highly cooperative participants, while contributions are low in groups of non-cooperative participants.

Several mechanisms conjectured to sustain cooperation have been explored experimentally. Two important issues related to these mechanisms concern the questions of what constitutes an unacceptably low contribution to the public good and which punishment device(s) is then to be used.<sup>5</sup> The trigger for punishment can either be introduced exogenously by using a predetermined rule or endogenously, where each group member decides when punishment should take place. For instance, [Galbiati and Vertova \(2008\)](#) show that an exogenously imposed sanctioning rule, together with a minimum required contribution level, results in a positive effect on contribution levels. [Guillén et al. \(2007\)](#) design a step-level public good experiment with and without a centralized punishment institution, finding that even after punishment is removed, the

<sup>2</sup> Although it would be interesting to study cooperation in a more complex setting where ostracized members are re-integrated into the group, our design focuses on complete exclusion, a situation that resembles more closely project based team work, where exclusion will last at least for the lifetime of a particular project.

<sup>3</sup> Indeed, the workers that agreed to work during the mine strikes in the UK in the 1980s are still sanctioned today for their behaviour.

<sup>4</sup> See [Hirshleifer and Rasmusen \(1989\)](#) for a theoretical discussion of ostracism as an effective tool for promoting cooperation in repeated finite and infinite prisoner's dilemma games.

<sup>5</sup> In addition to punishment, reward mechanisms have also been explored in a public good context, for instance by [Sefton et al. \(2007\)](#).

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