



The behavioral validity of the strategy method in public good experiments [☆]

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ABSTRACT

We compare the strategy method and the direct response method in public good experiments in a within-subject design. This comparison is interesting because the strategy method is frequently used to investigate preference heterogeneity. We find that people identified by the strategy method as conditional cooperators also behave as conditional cooperators under the direct response method. Free-rider types contribute systematically less than all others. Overall, our results support the behavioral validity of the strategy method in public good experiments.

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1. Introduction

In this paper we provide a within-subject comparison of the strategy method and the direct response method in the public goods game. Existing evidence strongly suggests that people are heterogeneous with respect to their willingness to contribute to public goods conditional on others' contributions.¹ A large part of this evidence comes from experiments that use a

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¹ See, e.g., Fischbacher, Gächter, and Fehr (2001), Burlando and Guala (2005), Kurzban and Houser (2005), Chaudhuri and Paichayontvijit (2006), Bardsley and Moffatt (2007), Kocher, Cherry, Kroll, Netzer, and Sutter (2008), Muller, Sefton, Steinberg, and Vesterlund (2008), Duffy and Ochs (2009), Grimm and Mengel (2009), Herrmann and Thöni (2009), Thöni, Tyran, and Wengström (2009), Rustagi, Engel, and Kosfeld (2010), Levati and Zultan (2011); and Volk, Thöni, and Ruigrok (2012) for studies which all find heterogeneity with regard to conditional cooperation. Some studies did not focus on conditional cooperation but on individual differences in warm glow and errors (see, e.g., Brandts & Schram, 2001; Palfrey & Prisbrey, 1997; and Goeree, Holt, & Laury, 2002).

variant of the strategy method (Selten, 1967). In these experiments subjects are asked (in an incentive compatible way) how much they would like to contribute to the public good dependent on how much others contribute. According to the strategy method most people are either classified as conditional cooperators or free rider types. The question we ask in this paper is: Can we uncover this heterogeneity also in experiments conducted in the 'usual' direct response method? Put differently, what is the relationship of expressed preferences as measured by the strategy method and actual behavior in public good games played under the direct response method? To our knowledge, not much is known about this relationship.² At a methodological level this relationship concerns the behavioral validity of the strategy method, that is, the question whether the strategy method and the direct response method yield similar conclusions about preference heterogeneity.

Our research question mandates a within-subject design. Therefore, every subject participates in two conditions. In the first (which we call the P-experiment), we measure people's preferences toward voluntary contributions in an incentive-compatible way. The P-experiment is a one-shot game to avoid contamination with strategic incentives. Our instrument to elicit contribution schedules is a variant of the strategy method that uses the same strategy set as the standard public good game. The main concept behind the P-experiment is to ask subjects how much they will contribute to the public good conditional on *each* of the other group members' possible average contribution (rounded to integers).

In the second condition (the C-experiment), people actually contribute to a public good as in most public goods games in the literature (see, e.g., Chaudhuri, 2011; Gächter & Herrmann, 2009; Zelmer, 2003). We report two types of experiments, which differ in the number of repetitions of the C-experiment. In our main experiments, we repeat the C-experiment ten times, using a random matching protocol. In a further experiment, designed as a robustness check, we repeat the C-experiment only once.

We also elicit subjects' beliefs about other group members' contributions in the C-experiment. This allows us (i) to assess the relationship between one's own contribution and the expected contributions of others and (ii) to make a point prediction how much this individual will contribute in the C-experiment, given his or her expressed preferences in the P-experiment and stated beliefs in the C-experiment. This is also the reason why in the main experiments we use repeated decisions in the C-experiment. In the C-experiment we expect contributions to depend on the beliefs about others' contributions. Testing this requires us to get contribution decisions for more than one belief.

Our design permits us to assess consistency of expressed preferences and behavior because we elicit people's preferences and observe the same person in another comparable environment. Our design will also allow us to see whether there are systematic deviations from predicted contributions which are specific to preference-type. The disadvantage of repeated C-experiments is that repetition might induce some strategic bias. The purpose of our additional one-shot experiment is to check for the robustness of our conclusions if a potential strategic bias is excluded by design. For our main analysis we use the design and data of Fischbacher and Gächter (2010); the data of the one-shot experiments come from new sessions.

In Fischbacher and Gächter (2010) the main focus is to explain belief formation and to use the P-experiment and elicited beliefs in the C-experiment to explain the stylized fact that contributions in repeatedly played public goods experiments almost always decline over the course of an experiment (see also Neugebauer, Perote, Schmidt, & Loos, 2009 and Ambrus & Pathak, 2011 for an analysis of this decline). The present paper is complementary to Fischbacher and Gächter (2010) but asks two more specific questions: what is the degree of consistency of preference types as elicited in the P-experiment and behavior as revealed in the C-experiment, and are the deviations, if they occur, specific to preference-type? At a methodological level this is the question about the relationship between the strategy method and the direct response method, if one wants to use the strategy method as a means to measure preference types. For instance, do people classified by the strategy method as conditional cooperators (free riders) also behave as conditional cooperators (free riders) under the direct response method?

Our most important result, reported in Section 3, is that the strategy method and the direct response method yield qualitatively similar results: people classified as conditional cooperators in the P-experiment also behave as conditional cooperators in the C-experiment. People classified as free riders contribute significantly less than all others. However, some of them did contribute to the public good in the contribution game, but basically only in the first half of the experiment. We also find that consistency between expressed cooperation preferences and actual contributions increases over time. The data of our one-shot experiments, reported in Section 4, corroborate our main conclusion: behavior under the strategy method and the direct response method are consistent. Overall, we see our paper as a contribution to the ongoing methodological debate on the usefulness of the strategy method (e.g., Brandts & Charness, 2000; Brandts & Charness, 2011; Brosig, Weimann, & Yang, 2003; Gächter & Thöni, 2010; Muller et al., 2008; Roth, 1995; Volk et al., 2012).

² Some previous studies combined questionnaires and experiments. Offerman, Sonnemans, and Schram (1996), Park (2000) and van Dijk, Sonnemans, and van Winden (2002) elicit social value orientations and compare them to behavior in public good environments. They find that the social value orientation is positively correlated with contributions to public goods. Brandts and Schram (2001) use questionnaires to classify people as free riders and cooperators. Our paper is most closely related to Burlando and Guala (2005). Burlando and Guala (2005) use a mixture of methods to classify types: They use an algorithm based on the strategy method, value orientation tests, experimental choices, and questionnaires. As we will explain below, the main differences to our paper are that we (i) use the strategy method to make a point prediction about a subjects' contribution to a public good and that we (ii) elicit beliefs, whereas Burlando and Guala (2005) confine their attention to the average contribution behavior of their classified types.

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