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Journal of Economic Behavior & Organization

journal homepage: www.elsevier.com/locate/jebo

Economic incentives and social preferences: Causal evidence of non-separability



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ARTICLE INFO

Article history:

Received 19 March 2014

Received in revised form 23 August 2014

Accepted 28 October 2014

Available online 4 November 2014

JEL classification:

C91

D44

H41

Keywords:

Contests

Public goods

Rent-seeking

Social preferences

Separability

Laboratory experiments

ABSTRACT

This paper investigates the hypothesis that the objective function of economic agents is non-separable in economic incentives and social preferences. We study fixed-prize contests in a 2×2 experimental design, varying orthogonally the degree of competition of the incentive mechanism (all-pay auction vs. lottery) and the presence or absence of social returns to bidding (public good vs. rent seeking). The results indicate that both stronger competition and the presence of the public good have positive main effects on bids. More importantly, we find a negative interaction between stronger competition and the presence of the public good, leading us to reject separability. These findings provide causal evidence that economic incentives may negatively affect pro-social behavior. More generally, they indicate that social preferences should be taken into account for the optimal design of incentive mechanisms.

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1. Introduction

Economists commonly assume that agents' objective functions are separable in economic incentives and social preferences (e.g., Rabin, 1993; Fehr and Schmidt, 1999; Levitt and List, 2007). This implies that responses to economic incentives are independent of individuals' social preferences or, likewise, that pro-social behavior is unaffected by the presence of economic incentives. Several recent theoretical studies, however, suggest that economic incentives may interact with, and often adversely affect, social preferences (e.g. Kreps, 1997; Benabou and Tirole, 2006; Schmidt, 2011). At the empirical level, a growing literature provides evidence for several mechanisms that may explain such an interaction: incentives may provide information about the principal, frame the decision situation, compromise an individual's sense of autonomy, or affect the process by which people learn new preferences (Bowles and Polanía-Reyes, 2012; see also Gneezy et al., 2011).

An important limitation of the recent empirical literature supporting the notion of non-separability is that it only provides *indirect* evidence. The empirical strategy followed in virtually all the relevant experimental studies is to compare the observed effects of a given incentive mechanism with those that would be predicted theoretically under separability

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(Bowles and Polanía-Reyes, 2012).¹ If the performance of the incentive mechanism differs from the theoretical predictions, it is inferred that economic incentives have interacted with social preferences. Such evidence, however, is generally compatible with several alternative explanations other than non-separability, such as the role played by risk attitudes or cognitive demands. Given that an incentive mechanism could under-perform (or over-perform) *per se*, irrespective of social preferences, the available evidence is generally not informative about the impact of economic incentives on social preferences.

In this paper we argue that, in order to obtain causal evidence of non-separability between economic incentives and social preferences, it is necessary to compare the effectiveness of incentives while exogenously manipulating the elicitation of social preferences. Causal evidence of non-separability can be obtained only if the performance of economic incentives is systematically related to the elicitation of social preferences. In order to illustrate this point, we focus on prize-based incentive mechanisms for the private provision of public goods as a relevant application.

Several recent studies have investigated the performance of various types of contests as fundraising mechanisms. Most of this literature has focused on either stochastic contests, i.e., lotteries, or deterministic contests, mostly all-pay auctions (e.g. Morgan, 2000; Morgan and Sefton, 2000; Goeree et al., 2005; Landry et al., 2006; Lange et al., 2007; Carpenter et al., 2008; Faravelli and Stanca, 2012), while a smaller number of studies have compared the two types (Davis et al., 2006; Orzen, 2008; Schram and Onderstal, 2009; Corazzini et al., 2010; Duffy and Matros, 2012; Onderstal et al., 2013).² In a lottery, each player wins the prize with a probability equal to the ratio of her bid and the sum of all bids. On the contrary, in an all-pay auction the highest bidder is awarded the prize with certainty. The two types of contest are characterized by a different marginal effectiveness of effort. The marginal impact of effort is lower in a lottery than in an all-pay auction, where the payoff discontinuity provides a greater incentive to outbid the competitors. As a result, for a finite number of players, revenues are expected to be higher in an all-pay auction than in a lottery. The different marginal impact of effort in the two incentive mechanisms implies that competition is milder in a lottery, while it is stronger in an all-pay auction.

In accordance with the theory, all-pay auctions typically outperform lotteries in the absence of public goods (see, e.g., Davis and Reilly, 1998; Potters et al., 1998; Sheremeta et al., 2012). However, Corazzini et al. (2010) and Orzen (2008) find that this is not the case when these two contests are used as fundraising mechanisms. More specifically, while Corazzini et al. (2010) find a positive and significant difference between the lottery and the all-pay auction, Orzen (2008) reports higher bids in the lottery but the difference is not significant. These results suggest an interpretation based on the adverse effect of competition on social preferences. If agents care about social returns to the public good, in addition to their private returns, such other-regarding motive may be crowded out by the competition introduced by the incentive mechanism. While a lottery, representing relatively mild competition, only partially crowds out other-regarding motives, an all-pay auction, characterized by stiffer competition, can be expected to have a stronger crowding out effect.

In the present work we investigate this conjecture by providing a direct test of non-separability between economic incentives and social preferences. To this purpose, we implement a laboratory experiment based on a 2×2 design by orthogonally manipulating two treatment variables: the degree of competition of the incentive mechanism (all-pay auction vs. lottery) and the presence or absence of social returns (public good vs. rent-seeking). Our key hypothesis is that the degree of competition introduced by the incentive mechanism interacts with agents' attitudes towards the redistribution implied by the public good. More specifically, we hypothesize that a more competitive setting leads agents to be less pro-social – or more anti-social – with respect to redistribution. Importantly, while the adverse effect of stronger competition on attitudes toward redistribution is expected in the public good setting, where bids are shared among group members, such an effect can be ruled out in the rent seeking setting, where bids are not shared among group members. Therefore, non-separability between economic incentives and social preferences can be tested by focusing on the interaction between the all-pay auction mechanism (stronger competition) and the public good setting (presence of redistribution). Under the null hypothesis of separability, the interaction is expected to be positive. A negative interaction between stronger competition and the presence of redistribution would thus provide causal evidence of non-separability.

We should note that, given the payoff externalities that are involved in contests, several other types of social preferences, such as spite or envy, could play a role even in the absence of the public good component (e.g. Herrmann and Orzen, 2008; Eisenkopf and Teyssier, 2013). However, to the extent that these other types of social preferences are orthogonal to the public good component, their presence does not affect the interaction between stronger competition and positive social returns. Sheremeta (2013) suggests various other extensions, besides social preferences, that may interact with the degree of competition, such as mistakes, judgemental biases and utility of winning. As pointed out in Sheremeta (2010), the utility of winning plays a fundamental role in explaining individual bids in contests. This could also explain the negative interaction between competitiveness and pro-social preferences, as the utility of winning may be enhanced in a pure rent-seeking setting, while it may be mitigated in the presence of a public good.

¹ "Our empirical strategy (based on experimental results) is to observe the total effect of incentives on behavior and to note whether this differs from the predicted direct effect in order to infer the effects of incentives on (unobserved) social preferences [...]" (Bowles and Polanía-Reyes, 2012, p. 368).

² Konrad (2009) provides a general overview of contest design. See Dechenaux et al. (2014) for a recent comprehensive review of experimental studies on contests.

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