



Skewness-adjusted social preferences: Experimental evidence on the relation between inequality, elite behavior, and economic efficiency



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ARTICLE INFO

Article history:

Received 20 February 2016

Revised 2 May 2017

Accepted 2 May 2017

Available online 3 May 2017

JEL Classification:

C91

D31

H41

Keywords:

Experiment

Inequality

Social preferences

Elites

Non-linear public good game

ABSTRACT

In this paper, we model social preferences as a function of the skewness of the distribution of initial endowments. Skewness is a measure of the asymmetry of the distribution of endowments around the mean. We argue that skewness reflects the social distance between 'elite' players with high initial endowments and other players with lower endowments, better than variance and concentration measures like the Gini-coefficient. We hypothesize that elite players become more selfish with increasing skewness and therefore contribute less to a public good in the framework of a one-shot non-linear public good game. The results of an experimental test, in which we systematically vary the distribution of endowments between treatments, confirm that the model is able to correctly explain the observed pattern of contribution behavior. We find that cooperation and efficiency are lowest with right-skewed distribution of endowments. Our paper therefore improves the understanding of the behavioral link between inequality and efficiency.

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1. Introduction

The questions of how (rising) inequality influences people's behavior, the selfishness of their actions, and economic efficiency is a hotly debated issue both in many academic disciplines and in the public.² Recent work in psychology and economics suggests that upper-class individuals act less ethically than lower-class individuals (e.g. Piff et al., 2012). Trautmann et al. (2013) give an overview of how different dimensions of being upper class (wealth, income, education) are associated with different ethical and unethical behaviors. Even though there is no clear-cut evidence that members of the elite are more selfish in general, it seems to be an empirical regularity that their behavior differs from non-elite people in some dimensions.

In this paper, we neither attribute behavioral differences between the 'elite' and the rest of society to endowment differences

nor to self selection (a positive correlation between selfishness and endowment); rather we hypothesize in line with Cote et al. (2015) and Heap et al. (2016) that the inequality in the society itself makes elite members more selfish and less generous. Thus, we offer a new perspective on the relation between inequality, elite behavior, and economic efficiency.

Inequality, however, is an imprecise term that has many facets. To be more precise, we believe the shape of the endowment distribution in terms of its skewness to cause individual behavioral responses of elite members. Skewness is a measure of the asymmetry of the distribution of endowments around the mean. At the societal level, these responses then affect economic efficiency (in the Kaldor-Hicks sense). In our opinion it is self-evident to focus on skewness as it reflects the social distance between elite players with high initial endowments and other players with lower endowments, better than variance and concentration measures like the Gini coefficient. In a group with a right-skewed endowment distribution, a small high-endowment elite is contrasted with a large number of low-endowment players; in a group with a symmetric endowment distribution equally sized groups of high- and low-endowment players interact. Certainly, an elite player's perception of her social position in relation to low-endowment players will differ between these two groups.

We formalize these consideration by means of a skewness-adjusted model of social preferences, a modification of

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¹ We thank Matthias Greiff, Bernhard Kittel, James Konow, Roland Menges, Martin Missong, Joe Oppenheimer, Valentin Schröder, Rupert Sausgruber, Henning Schwardt, Björn Vollan for helpful comments. All remaining errors are our own.

² For example, Piketty (2015) calls for putting distribution back at the center of economics. A recent special report of the Organisation for Economic Co-operation and Development (2015) was titled "In It Together: Why Less Inequality Benefits All".

Charness and Rabin (2002). In the framework of this model, we are able to test the hypothesis that the more skewed the endowment distribution is, the greater is the weight that a high-endowment player assigns to her own payoff (the terms ‘more skewed’ and ‘increasing skewness’ mean that probability mass is shifted from the upper to the lower tail of the endowment distribution, that is, it becomes more right-skewed). The experimental test is done by means of a three person non-linear public good game. We systematically vary the variance, the skewness and also the Gini-coefficient of the endowment distribution in order to compare their influence on social preferences and individual contributions to the public good. Due to the non-linearity of the payoff function, the social optimum in terms of highest group payoffs is achieved with moderate contributions. As a consequence of increasing selfishness in high-income players treated with more skewed endowment distributions, we expect to observe group efficiency to be suboptimal and to decrease in skewness.

The experimental results show that the skewness-adjusted social-preference model is able to explain both individual contributions and the level of group efficiency. Selfishness is smallest and group contributions are largest in groups with left-skewed endowment distribution; selfishness is highest and contributions are lowest in groups with right-skewed endowments distribution. This effect is shown to be primarily due to the fact that the selfishness of high-endowment players is positively correlated with the skewness of the initial distribution of endowments. Together with the finding that group contributions are higher than the purely selfish and lower than group-payoff maximizing utilitarian prediction in all treatments, we draw the conclusion that efficiency is lowest if inequality in terms of skewness is highest, that is, if the endowment distribution is right-skewed.

The rest of the paper is organized as follows. Section 2 reviews the relevant literature. Section 3 presents the skewness-adjusted social-preference model and derives hypotheses. In Section 4, we give a description of the experimental design. Section 5 presents the results of the experiment. Section 6 concludes.

2. Literature review

Our work touches several branches of the literature, which are briefly summarized here. The next two paragraphs link our work to previous work on elites in psychology and economics.

Recent work in psychology suggests that upper-class individuals behave less ethically than lower-class individuals. Grossmann and Varnum (2011), Kraus and Keltner (2009), Kraus et al. (2011) and Lammers et al. (2012) find that upper class individuals show more dispositional attributions, less empathic accuracy, more self-interest and less engagement in social interactions. For instance, Piff et al. (2012) show that the less-ethical behavior of upper-class individuals can also be observed in real-life situations such as breaking the law of the road more frequently. Trautmann et al. (2013) give an overview of how different dimensions of being upper class (wealth, income, education) are associated with different ethical and unethical behavior. For example, they show that only wealthy people (not people with high income or high education) judge ‘cheating on taxes’ more often as not being ‘unethical’. Even though there is no clear-cut evidence that members of the elite behave always more selfish, it seems to be an empirical fact that members of elites behave in some dimensions differently from non-elite members.

The basic idea that the behavior of the elite is important to consider in the politico-economic system is not new. Sokoloff and Engerman (2000), Acemoglu et al. (2005) and Glaeser et al. (2003) highlighted the importance of elites in the process of development of countries. For example, Glaeser et al. (2003) stress the probability of having efficient institutions, which induce posi-

tive effects for development of a society, to be reduced in the presence of high inequality. The rationale behind this argument is that if inequality is high, the elite has an interest in securing their own stakes. We do not want to overemphasize the link between this work and experimental work, but it seems to us that understanding how members of the elite are affected by the shape of the distribution is also essential for understanding how inequality has an effect on development.

The literature offers a broad variety of concepts for modeling social preferences. Depending on the relative weights given to own and other persons’ payoff or utility, one can allow for altruism, envy, inequality aversion, efficiency preferences, competitive preferences and so on (for an overview, see Fehr and Schmidt, 2006; Erlei, 2008). Different formal models of social preferences have been introduced, for example, by Fehr and Schmidt (1999), Bolton and Ockenfels (2000) and Charness and Rabin (2002). Our social preference functional is a modification of the Charness and Rabin (2002) model, adjusted for skewness in the three-person case (for details see the next section).

We test our skewness-adjusted social preference model within the framework of a non-linear public good game. See Laury and Holt (2008) for a general overview of non-linear public good experiments. Prominent examples of non-linear public good experiments are Isaac and Walker (1998) and Vesterlund (2012). We decided to use a non-linear game, because they have interior Nash-equilibria and group efficiency is not necessarily highest where the sum of individual contributions is highest, that is, over-contribution is possible.

A bunch of papers analyze the effect of inequality in terms of endowment heterogeneity on contributions using linear public good experiments, comparing treatments with equal and unequal endowments (Isaac and Walker, 1988; Sutter and Weck-Hannemann, 2003; Cherry et al., 2005; Buckley and Croson, 2006; Anderson et al., 2008; Keser et al., 2014; Reuben and Riedl, 2013). Bergstrom et al. (1986) and Chan et al. (1996, 1999) analyze the effect from endowment heterogeneity on contributions in a non-linear public good experiment. See Zelmer (2003) for a meta-analysis. Their findings are mixed, but the overall effect of inequality on contributions seems to be negative. Put differently, endowment heterogeneity seems to stimulate selfish behavior in subjects playing public-goods games.

The following two recently published papers are most closely related to our work. Heap et al. (2016) find that endowment inequality has an effect only on public good contributions of the ‘rich’ players, while the contributions of the ‘poor’ players are not affected by inequality. The paper carefully shows that the lower contributions on part of the rich are not caused by their higher endowments but by inequality. However, the authors do neither provide a theoretical foundation of their observations nor focus on the shape of the endowment distribution. Cote et al. (2015) propose a similar causality running from inequality to selfishness of high-income individuals. They find evidence in a nationally representative survey that only in the most unequal US states, higher-income individuals are less generous than lower income individuals. They add supporting experimental evidence from a dictator game: high-income individuals give less than low-income individuals only if inequality is high. In contrast to Cote et al. (2015), we use a three-player public good game instead of a dictator game and systematically vary the shape of the endowment distribution.

We make four contributions to these literatures: First, we present a new social-preference functional, which models social preferences as a function of the skewness of the endowment distribution. Second, we show how such preferences can affect the contribution behavior of the better-off in a public good game. Third, we present experimental evidence that better-off subjects react to skewness in the way hypothesized and show that relative utility-

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