



Resource scarcity and antisocial behavior

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ABSTRACT

This paper examines whether exposure to persistent resource scarcity on the commons affects pastoralists' readiness to engage in antisocial behavior towards their fellow commons users. The region under study is divided into two areas according to exogenous variations in biomass production stemming from geological peculiarities. We conducted a joy-of-destruction game with pastoralists from both areas and provide evidence for a positive relationship between antisocial behavior and long-term exposure to scarcity. Antisocial behavior among villagers occurs twice as often in an area where resources are scarcer and competitive pressure is higher. Our results remain robust to the inclusion of various controls, including beliefs, socio-demographics, absolute and relative income, and within-group inequality. If one interprets decreasing another participant's payoff below one's own as a tendency towards conflict behavior, our results suggest a higher risk of conflict among resource users in areas of greater scarcity.

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1. Introduction

Scarcity is a fundamental principle in economics. In a world of scarce resources, human needs exceed the means, and scarcity conditions human behavior. Scarcity may be conducive to social welfare as it provides incentives to allocate resources efficiently. Yet, scarcity may also encourage people to engage in antisocial activities that are detrimental to overall welfare, such as theft or conflict. So far, the relationship between resource scarcity and conflict behavior has been mainly explored at the macro level, with a strong focus on violent intra- and interstate conflict due to climate shocks (e.g. Burke et al., 2009; Homer-Dixon, 1999; Hsiang et al., 2013; Miguel et al., 2004; Zhang et al., 2007) and to a lesser extent (and with mixed evidence) due to different resource endowments (Brunnschweiler and Bulte, 2009; Collier and Hoeffler, 1998). At the most basic level however, conflict and other consequences of scarcity originate from an individual's behavior. Also, the mechanisms through which scarcity spurs conflict remain debatable. Most studies argue that scarcity affects productivity and income as well as income inequality (see references cited in Hsiang et al., 2013). Herein, we experimentally investigate whether the long-term exposure to resource scarcity increases pastoralists' readiness to engage in antisocial money-burning behavior, which can be interpreted as a tendency

towards conflict behavior. Scarcity creates competition on the commonly managed grazing lands, and we conjecture that a greater exposure to scarcity and competition can negatively affect resource users' dispositions towards others and reduce the inhibition threshold to engage in antisocial acts.

Antisocial or spiteful preferences can be loosely defined as a desire to harm others at a cost to oneself in the absence of motives of reciprocity. Related experimental studies show that spiteful behavior is surprisingly widespread (e.g. Abbink and Sadrieh, 2009; Cason et al., 2002; Fehr et al., 2008; Herrmann et al., 2008; Herrmann and Orzen, 2008; Kebede and Zizzo, 2011; Saijo, 1995; Zizzo and Oswald, 2001; Zizzo, 2003), suggesting that an exclusive focus on pro-sociality may come at the cost of drawing an incomplete picture of human behavior. Real-life examples for antisocial behavior include violence against others, vandalism and other forms of harmful conflict behavior (Abbink and Sadrieh, 2009). Yet, despite growing evidence for its existence, little is known about the conditions under which antisocial attitudes are likely to evolve.

A major challenge to addressing the link between scarcity and antisocial behavior is that an individual's propensity to inflict damage on others is difficult to observe. In natural contexts, often multiple motives for harmful behavior exist that operate at the same time. This suggests that an experimental approach is warranted, in which the conflict setting can be controlled and the impact of scarcity can be carefully separated from other potential motives that may evoke antisocial acts. In order to elicit an individual's readiness to engage in antisocial behavior,

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we conducted the joy-of-destruction minigame (Abbink and Herrmann, 2011). In this one-shot, two-player game, endowments are equal and subjects can decide to sacrifice income in order to lower another persons' payoff below one's own. The experimental setup removes all conventional reasons to engage in such money-burning behavior: No material gain is achieved by money destruction, no wrongdoing is punished, no inequality is reduced and anonymity prevents social comparison and status seeking. Hence, in a narrow interpretation, our experiment captures antisocial attitudes including a person's readiness to harm others.

Instead of employing students as a subject pool and inducing scarcity as a function of time, endowment or attempts (see e.g. Shah et al., 2012), we relate real-life variations in resource scarcity to the experimental play of pastoralists from southern Namibia who subsist on extensive livestock production on jointly managed grazing lands. We recruited pastoralists from two geographically proximate areas that are similar with respect to their political, cultural, religious, climatic and social background. The main difference between the areas is the variation in biomass production. This difference is exogenous from human behavior and stems from geological peculiarities of the study site. To substantiate and quantify this difference, we use remote sensing data based on the 23-year average biomass production as a measure for different degrees of resource scarcity. The design of our study allows us to examine whether antisocial attitudes are more prevalent among pastoralists who have been competing for fewer resources for a long period of time.

We hypothesize a positive relationship between the exposure to persistent resource scarcity and the incidence of antisocial behavior. In our study site, the most important channel through which scarcity may evoke antisocial attitudes is competitive pressure among direct neighbors: More extreme scarcity on the commons leads to an intensification of competition (Brander and Taylor, 1998; Grossman and Mendoza, 2003). We believe that the close link between scarcity and competition is highly relevant in the context of our study site, where pastoralists share rangelands with fellow villagers, and hence compete for the same resources within a limited radius. Shleifer (2004) argues that ethical behavior is often costly and competition may undermine ethical behavior as it can drive down income and reduce the willingness to pay for ethical behavior.¹ Brandts et al. (2009) recently demonstrate that the (short-term) exposure to (experimentally induced) competition can negatively affect individuals' disposition towards others. This in turn may lower the inhibition threshold to engage in harmful money-burning behavior. Models of social evolutionary theory further show that spite can be an evolutionary stable trait and postulate a positive relationship between resource scarcity and the occurrence of spite (e.g. Gardner and West, 2004; Lehmann et al., 2006, 2009). Scarcity, the argument goes, creates conditions in which actors may benefit from engaging in costly behaviors that reduce the vital rates of competitors by harming them, even when the actor faces a cost. This follows from the fact that spiteful acts can decrease competition and increase the relative (inclusive) fitness (Lehmann et al., 2009). Accordingly, we assume that people facing a higher degree of real-life scarcity, and hence more intense competition, are more concerned about outcompeting others and less reluctant to engage in spiteful acts.

Recently, a number of researchers have begun to empirically study parochial altruism, i.e. kindness towards members of the own group and aggressive spite towards members of an 'out group' (e.g. Abbink et al., 2012; Choi and Bowles, 2007; De Dreu et al., 2012). This literature highlights, among other things, that exposure to intergroup competition (and hence the existence of a joint opponent) can foster social cohesion and within-group cooperation. However, it is important to note that our paper distinguishes from these studies as we are focusing

on the occurrence of spiteful behavior among people of the same group (i.e. *intragroup* spite), and, most importantly, in the absence of preceding intergroup competition and an external opponent whom to blame for the scarce conditions.²

In line with our ex-ante hypothesis, we find evidence for a strong positive relationship between scarcity of natural resources and spite. One-third of all subjects are willing to reduce a fellow resource users' income at their own cost. This kind of spiteful money-burning behavior occurs twice as often in areas with greater scarcity, suggesting that a higher exposure to persistent scarcity and competitive pressure can evoke antisocial attitudes.

Several aspects arise in interpreting this result as causal. For example, the difference between areas might be due to some unobserved heterogeneity other than resource scarcity, resulting in omitted variable bias. Further, it could be that people displaying a higher propensity to engage in conflict exploit their resources more aggressively, leading to degradation (i.e. reverse causality). We address these concerns in several steps. First, given that variations in resource availability are due to different soil types in the study region, we argue that reverse causality is unlikely. The same applies for potential selection bias through migration within and between areas. Access to grazing lands is generally restricted and largely depends on the affirmation of traditional authorities and local water user associations. These institutional arrangements successfully prevent outsiders from intruding the communal lands. In line with that, none of the settlements considered in this study report migratory movements of livestock or people over the last decade. Households in the study site are entitled through customary rights to use the grazing lands around a permanent livestock post that remains the same over time, but which can get lost if the household moves elsewhere. The threat of losing access to the commons in combination with poor labor market conditions in the study region provide strong incentives to stay and continue farming in the assigned area. Third, all participants share the same ethnicity, are Christians, speak the same language and live in the same constituency. Hence, variation in behavior between groups is unlikely to be rooted in cultural, religious or societal differences, which are frequently stressed as important contextual factors shaping behavior. Finally, our results remain remarkably robust after employing various controls, including individual beliefs, absolute income, relative income, within-group inequality, social relationships and share of lifetime spent in the place of residence.

Our paper contributes to three strands of literature. First, there is an emerging literature that examines the relationship between broader contextual factors and the evolution of preferences. Experimental studies in this vein have investigated how – inter alia – market integration (Henrich et al., 2001), religion (e.g. Henrich et al., 2010), exposure to different political systems (Brosig-Koch et al., 2011; Ockenfels and Weimann, 1999), and production technologies (Leibbrandt et al., 2013) affect behavior and report remarkable evidence in favor of endogenous preference formation. While we are interested in the effects of long-term scarcity on behavior (i.e. the emergence of conflict), others have begun to investigate the effects of conflict on social preferences (i.e. the consequences of conflict). Voors et al. (2012) report that exposure to civil war in Burundi increased altruism, and Bauer et al. (2014) observe an increase in people's egalitarian motivations towards their

² Since we focus on persistent long-term exposure to scarcity rather than sudden changes in the availability of resources, our study also distinguishes from an emerging body of literature that examines the impact of natural disasters on preferences and behavior (e.g. Cassar et al., 2011; Castillo and Carter, 2011; Chong et al., 2011; Miguel, 2005). Studies in this vein have obtained mixed results. For example, Chong et al. (2011) investigate the consequences of the 2010 earthquake in Chile on trust and trustworthiness. They find no differences in trust between people who were seriously affected by the earthquake and those who were not affected, but report lower levels of trustworthiness for the first mentioned. By contrast, Cassar et al. (2011) find that Thai victims of the 2004 Asian Tsunami are substantially more trusting and more risk-averse, as well as more trustworthy than non-victims. A more extreme example for the adverse consequences of natural disasters are reported by Miguel (2005), who finds a sharp increase in the murder of elderly women in Tanzania after the occurrence of floods or droughts.

¹ Indeed, Balafoutas et al. (2012) show that sabotage among sportsmen increases – especially from less qualified sportsmen – when violations of ethical behavior becomes costless.

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