



Starting small toward voluntary formation of efficient large groups in public goods provision



Gary Charness^{a,*}, Chun-Lei Yang^{b,1}

^a Department of Economics, University of California Santa Barbara, Santa Barbara, CA 93106-9210, USA

^b Research Center for Humanities and Social Sciences, Academia Sinica, Taipei 115, Taiwan, ROC

ARTICLE INFO

Article history:

Received 7 February 2013
Received in revised form
29 December 2013
Accepted 9 March 2014
Available online 29 March 2014

JEL classification:

C91
A13
B49
C79
C92
D71
H41

Keywords:

Economies of scale
Exclusion
Exit
Experiment
Merger
Public goods
Redemption
Social efficiency
Voluntary group formation
Voting

ABSTRACT

We test a mechanism whereby groups are formed voluntarily, through the use of voting. These groups play a public-goods game, where efficiency increases with group size (up to a limit, in one treatment). It is feasible to exclude group members, to exit one's group, or to form larger groups through mergers involving the consent of both merging groups. We find a great degree of success for this mechanism, as the average contribution rate is very high. The driving force appears to be the economies of scale combined with the awareness that bad behavior will result in exclusion or no admission. However, an important additional component is that it is possible for previous outsiders to later redeem themselves by becoming high contributors, typically in efficient large groups.

© 2014 Elsevier B.V. All rights reserved.

1. Introduction

While achieving cooperation is beneficial or even critical for groups or societies, doing so may be problematic since individual incentives often conflict with socially efficient actions. Even if individuals feel inclined to help out, they may lose

* Corresponding author. Fax: +1 805 893 8830.

E-mail addresses: charness@econ.ucsb.edu (G. Charness), cly@gate.sinica.edu.tw (C.-L. Yang).

¹ Fax: +886 2 27854160.

the taste for cooperating when they see other individuals not doing their share. The issue of how to successfully implement collective action when there is a prospect of such free riding is a vital topic in public economics.

Experiments have been used to investigate the provision of public goods since at least [Marwell and Ames \(1979\)](#). The basic idea is that each individual has an endowment to allocate between private goods and public goods, with a contribution to the public good creating more social surplus than a contribution to the private good. However, each individual only receives a fraction of the amount contributed, so that it is rational to allocate one's endowment to private goods. The typical pattern in standard public-goods games is that of moderate initial contributions declining steadily over time. How can long-term efficiency be sustained?

One approach involves identification of individual contributions and voluntary punishment. While some studies show that the level of cooperation can be sustained fairly well, punishment inevitably involves sacrifice to lower the payoff of another individual (although it may nevertheless provide a net benefit). Punishment may also undermine altruistic cooperation or even backfire in form of anti-social punishment against individuals exhibiting pro-social behavior.²

An alternative approach is to allow the group in question to evolve endogenously, as with *assortative matching*.³ The notion that choosing partners can foster cooperation or contribution in the real world is potentially quite important. We follow this approach in our paper, providing and experimentally testing a more flexible and 'realistic' mechanism for voluntary group formation. Specifically, we start with small groups, combine features of exit and exclusion, allow groups to grow quickly with a merging stage, and also permit individuals who have been excluded to reform. Our intention is to demonstrate the effectiveness of this overall approach, in the hopes that this flexible mechanism can be adapted to a variety of environments. Indeed, the combination of these features leads to a very high contribution rate.

There are many real-world environments in which there are strong incentives to form large groups due to *economies of scale*. However, the expansion and exploitation of the potential size advantage is limited by the problem of solving the inherent free-riding problem, even under the condition of *voluntary* but *restricted* group association (among other organization issues). Producers' cooperatives and firms with workforce participation have existed all over the world and in different stages of economic development (see [Bonin et al., 1993](#); [Dow, 2003](#), for example). Common examples of adjustment of membership and its size pertain to partnerships practicing law, medicine and accounting in advanced market economies.

One motivating example for our study, both for the type of mechanism and group dynamics and for the demographic magnitude on the lives of those in the society, is China's rural collectivization movement in the 1950s. After the land reform that redistributed production means from the rich to the poor in late 1940s, the Chinese Communist Party experimented with promoting voluntary cooperation in form of mutual aid teams (MATs) among farmers, to exploit economies of scale. Attempts to begin with large-sized MATs failed miserably; following this initial failure, the Party recommended that MATs should *start small* with 3–5 households and repeatedly stressed that the formation was *voluntary*, in the hope that peasants would learn how to solve the induced incentive problems, develop mutual trust, and eventually merge into larger-sized MATs to exploit the full size of economies of scale ([Shue, 1980](#)). This voluntary phase of China's rural collectivization movement was a great success. Since farmers had the right to exit, the potential free-riding problem must have been overcome for the MATs to stay together.⁴

Of course, the relevance of the issue goes far beyond this example. Field examples include joint ventures between research consortiums and mergers between firms, where there are economies of scale involved. Municipal governments may also form larger groups for the purpose of sharing the cost of public goods. Business partnerships can involve exit, exclusion, and mergers, and typically start small. Cooperative corporate culture can be nurtured by starting small, as [Weber \(2006\)](#) shows experimentally with a coordination game. Co-authorship involves exit and exclusion and can even involve mergers on large projects. The matter of endogenous group-formation is fairly pervasive in the field and how to take advantage of scale economies while attaining efficient outcomes is an important question.

The implied challenge for (experimental) economists is to provide evidence in this regard. We investigate whether starting small and allowing bi-directional movements of groups on a voluntary basis may indeed steadily foster mutual trust within the group, to fully exploit economies of scale in the large-size PG problem, in the manner of retreat and regroup. As [Olson \(1971, p. 36\)](#) put it, "The movement in and out of the group must no longer be ignored." Of course, there are numerous potential sets of rules that implement the voluntary bi-directional movement feature in a regrouping mechanism, with our choice involving exit, exclusion, and mergers being one of these sets.

The basic structure of our mechanism for group evolution allows for an ebb and flow in a dynamic environment. In addition to exit, there are four key features of our design. One is that contributions are more valuable in larger groups. Another is the possibility of exclusion, which affords would-be cooperators insurance that they will be safe from would-be free-riders. One or both of the first two are present in a number of papers in the literature, such as [Ehrhart and Keser \(1999\)](#), [Cinyabuguma et al. \(2005\)](#), [Page et al. \(2005\)](#), and [Ahn et al. \(2008, 2009\)](#); we review this literature in detail in Section 2.

² See [Fehr and Gächter \(2000\)](#), [Masclot et al. \(2003\)](#), [Fehr and Rockenbach \(2003\)](#), [Fehr et al. \(2007\)](#) and [Herrmann et al. \(2008\)](#).

³ [Sober and Wilson \(1998\)](#), [Frank \(1988\)](#), and [Bergstrom \(2002\)](#) show that cooperative behavior can survive if it entails advantages over selfish behavior; these advantages can include an improved chance of being matched with like-minded individuals and a better chance of avoiding undesirable elements of the population. [Sethi and Somanathan \(2003\)](#) provide a survey of theories of assortative matching.

⁴ For detailed discussion of the role of exit in the 1950s Chinese agricultural MATs with reference to economic theory, see [Lin \(1990\)](#) and [Putterman and Skillman \(1993\)](#) among others. [Hinton, 1966](#) Appendix A1 provides further discussion related to this issue.

Download English Version:

<https://daneshyari.com/en/article/883537>

Download Persian Version:

<https://daneshyari.com/article/883537>

[Daneshyari.com](https://daneshyari.com)