

GDN/CERGE-EI RRC Project RRC12+53

Non-Technical Summary - Fragmented Networks and Sustainable Cooperation¹

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The paper discusses how people reach collectively optimal outcomes when they do not arise naturally out of self-interest. In particular, it studies how social structure can facilitate the emergence of such cooperative behaviour. It focuses on two types of relationships usually embedded in the social structure:

- information flows – whose behaviour can one observe
- enforcement possibilities – who can one sanction

The structural aspect of interest here is fragmentation – that is how hard it is to reach others within a group. The study assesses the effects of fragmented information and enforcement on cooperation and compares their relative importance. Thus, it provides guidance for policy/managerial decisions aimed at improving collective efforts (e.g. public good provision, work-team performance).

The presented research is based on data collected in an economic experiment with a total of 256 subjects. During this experiment participants played a game simulating the problems of non-selfish cooperation (public good game). For the different setups of the game the social structure was the only variant. It was modelled as a network – a simple graph defining information flows and enforcement possibilities. A total of seven networks was used, and individual networks differed systematically in their level of fragmentation.

The importance of fragmentation of social structures is highlighted by comparing outcomes of the used networks. The main findings of this paper suggest that:

- severe information fragmentation leads to less cooperation
- mild information fragmentation does not necessarily lower cooperation
- fragmentation of enforcement lowers enforcement but does not lower cooperation
- unrestricted enforcement accompanied by restricted information leads to severe welfare losses

This has serious implications for practical policy considerations. In particular, when trying to improve public good provision, one should:

- focus on measures that improve communication and information flows within a community
- avoid measures expanding enforcement without corresponding expansion in information

Besides that, the article has serious implications for literature focusing on social network analysis as it identifies:

- fragmentation as a key source of declining collective performance

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- information as a central element for theoretical predictions about network performance

To conclude, this paper stresses the role of information structure in promoting cooperation. It should be of primary importance to a policy-maker – without improving information flows, expansion of enforcement is unlikely to solve problems posed by fragmentation.

Keywords: public good, cooperation, networks, fragmentation