

The evolution of sanctioning institutions: an experimental approach to the social contract

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A vast amount of empirical and theoretical research on public good games indicates that the threat of punishment can curb free-riding in human groups engaged in joint enterprises. Since punishment is often costly, however, this raises an issue of second-order free-riding: indeed, the sanctioning system itself is a common good which can be exploited. Most investigations, so far, considered peer punishment: players could impose fines on those who exploited them, at a cost to themselves. Only a minority considered so-called pool punishment. In this scenario, players contribute to a punishment pool before engaging in the joint enterprise, and without knowing who the free-riders will be. Theoretical investigations (Sigmund *et al.*, *Nature* 466:861–863, 2010) have shown that peer punishment is more efficient, but pool punishment more stable. Social learning, i.e., the preferential imitation of successful strategies, should lead to pool punishment if sanctions are also imposed on second order free-riders, but to peer punishment if they are not. Here we describe an economic experiment (the Mutual Aid game) which tests this prediction. We find that pool punishment only emerges if second-order free riders are punished, but that peer punishment is more stable than expected. Basically, our experiment shows that social learning can lead to a spontaneously emerging social contract, based on a sanctioning institution to overcome the free rider problem.

Reference:

Boyu Zhang, Cong Li, Hannelore de Silva, Peter Bednarik and Karl Sigmund, The Evolution of Sanctioning Institutions: an experimental approach to the social contract, *Experimental Economics*, DOI: 10.1007/s10683-013-9367-7

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