



Understanding Human and Social Behavior



A fundamental understanding and predictive capability of human behavior dynamics from individuals to societies.

- **Enabled capabilities**

- Predictive models supporting strategic, operational, and tactical decision making and planning
- Real time cultural situational awareness
- Immersive training and mission rehearsal
- Cross cultural coalition building

- **Key research challenges:**

- Conflicting theories
- Data management and fusion
- Mathematical complexity
- Validation of models

Costly Punishment Across Human Societies

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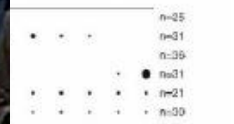
Recent behavioral experiments aimed at understanding cooperation have suggested that a willingness to punish others, may be part of human psychology. However, because most experiments have been conducted in industrialized societies, generalizations of these insights to the species as a whole are uncertain. Here, we report the results from 15 diverse populations show that the willingness to administer costly punishment as a way to punish others varies substantially across populations with altruistic behavior across populations. This gene-culture coevolution of human altruism and cooperation needs to explain.

For tens of thousands of years before formal contracts, courts, and constitutions, human societies maintained important forms of cooperation in domains such as hunting, warfare, trade, and food sharing. The scale of cooperation in both contemporary and past human societies remains a puzzle for the evolutionary and social sciences, because, first, neither kin selection nor reciprocity appears to readily explain altruism in very large groups of unrelated individuals and, second, canonical assumptions of self-regarding preferences in economics and related fields appear equally ill-fitted to the facts (1). Reputation can support altruism in large groups; however, some other mechanism is needed to explain why reciprocity should be linked to prosociality rather than selfish or neutral behavior (2). Recent theoretical work



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tions (1,2). Such experiments have even begun to probe the neural underpinnings of punishment (14, 15). These results are important, because the use of costly punishment can explain important pieces of the puzzle of large-scale cooperation. However, like previous mental games used to study altruism, experiments have been conducted exclusively among university students. It is not known whether such findings are the peculiarities of students and/or from industrialized societies or whether they indeed capturing species character. Our earlier research used experimental data in 15 diverse societies to measure the willingness to punish others regarding behavior (1, 16). We found that the willingness to administer costly punishment varied across societies and that the willingness to punish others was not explained by the level of education or by the level of university students. In general, we found that the willingness to punish others was more variable in more diverse societies and that the willingness to punish others was more variable in more diverse societies and that the willingness to punish others was more variable in more diverse societies.



- **Select breakthroughs**

- Early success of simple models
- Success of social network analysis
- Prediction of crowd tipping points