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日本語要約

Moralistic gods, supernatural punishment and the expansion of human sociality

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Since the origins of agriculture, the scale of human cooperation and societal complexity has dramatically expanded^{1, 2}. This fact challenges standard evolutionary explanations of prosociality because well-studied mechanisms of cooperation based on genetic relatedness, reciprocity and partner choice falter as people increasingly engage in fleeting transactions with genetically unrelated strangers in large anonymous groups. To explain this rapid expansion of prosociality, researchers have proposed several mechanisms^{3, 4}. Here we focus on one key hypothesis: cognitive representations of gods as increasingly knowledgeable and punitive, and who sanction violators of interpersonal social norms, foster and sustain the expansion of cooperation, trust and fairness towards co-religionist strangers^{5, 6, 7, 8}. We tested this hypothesis using extensive ethnographic interviews and two behavioural games designed to measure impartial rule-following among people ($n = 591$, observations = 35,400) from eight diverse communities from around the world: (1) inland Tanna, Vanuatu; (2) coastal Tanna, Vanuatu; (3) Yasawa, Fiji; (4) Lovu, Fiji; (5) Pesqueiro, Brazil; (6) Pointe aux Piments, Mauritius; (7) the Tyva Republic (Siberia), Russia; and (8) Hadzaland, Tanzania. Participants reported adherence to a wide array of world religious traditions including Christianity, Hinduism and Buddhism, as well as notably diverse local traditions, including animism and ancestor worship. Holding a range of relevant variables constant, the higher participants rated their moralistic gods as punitive and knowledgeable about human thoughts and actions, the more coins they allocated to geographically distant co-religionist strangers relative to both themselves and local co-religionists. Our results support the hypothesis that beliefs in moralistic, punitive and knowing gods increase impartial behaviour towards distant co-religionists, and therefore can contribute to the expansion of prosociality.

Subject terms: Human behaviour Social anthropology Cultural evolution Social evolution

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References

1. Richerson, P. J. & Boyd, R. Complex societies: the evolutionary origins of a crude superorganism. *Hum. Nat.* **10**, 253–289 (1999)
2. Turchin, P. in *Cultural Evolution: Society, Technology, Language, and Religion* (eds Richerson, P. J. & Christiansen, M. H.) 61–73 (MIT Press, 2013)
3. Fehr, E., Fischbacher, U. & Gächter, S. Strong reciprocity, human cooperation, and the enforcement of social norms. *Hum. Nat.* **13**, 1–25 (2002)
4. Turchin, P., Currie, T. E., Turner, E. A. L. & Gavrilets, S. War, space, and the evolution of Old World complex societies. *Proc. Natl Acad. Sci. USA* **110**, 16384–16389 (2013)
5. Johnson, D. D. P. God's punishment and public goods. *Hum. Nat.* **16**, 410–446 (2005)
6. Norenzayan, A. *Big Gods: How Religion Transformed Cooperation and Conflict* (Princeton Univ. Press, 2013)
7. Norenzayan, A. *et al.* The cultural evolution of prosocial religions. *Behav. Brain Sci.* <http://dx.doi.org/10.1017/S0140525X14001356> (2015)
8. Schloss, J. P. & Murray, M. J. Evolutionary accounts of belief in supernatural punishment: a critical review. *Relig. Brain Behav.* **1**, 46–99 (2011)
9. McNamara, R. A., Norenzayan, A. & Henrich, J. Supernatural punishment, in-group biases, and material insecurity: experiments and ethnography from Yasawa, Fiji. *Relig. Brain Behav.* **6**, 34–55 (2016)
10. Rossano, M. J. Supernaturalizing social life. *Hum. Nat.* **18**, 272–294 (2007)
11. Sosis, R. & Bressler, E. R. Cooperation and commune longevity: a test of the costly signaling theory of religion. *Cross-Cultural Res.* **37**, 211–239 (2003)
12. Sosis, R. & Ruffle, B. J. Religious ritual and cooperation: testing for a relationship on Israeli religious and secular kibbutzim. *Curr. Anthropol.* **44**, 713–722 (2003)
13. Atran, S. & Henrich, J. The evolution of religion: how cognitive by-products, adaptive learning heuristics, ritual displays, and group competition generate deep commitments to prosocial religions. *Biol. Theory* **5**, 18–30 (2010)
14. Pew Research Centres *The Future of World Religions: Population Growth Projections 2010–2050*. http://www.pewforum.org/files/2015/03/PF_15.04.02_ProjectionsFullReport.pdf (2015)
15. Botero, C. A. *et al.* The ecology of religious beliefs. *Proc. Natl Acad. Sci. USA* **111**, 16784–16789 (2014)
16. Watts, J. *et al.* Broad supernatural punishment but not moralizing high gods precede the evolution of political complexity in Austronesia. *Proc. R. Soc. Lond. B* **282**, 20142556 (2015)
17. Haidt, J. & Kesebir, S. in *Handbook of Social Psychology* 797–832 (Wiley, 2010)
18. Purzycki, B. G. The minds of gods: a comparative study of supernatural agency. *Cognition* **129**, 163–179 (2013)
19. Purzycki, B. G. Tyvan *cher eezi* and the socioecological constraints of supernatural agents' minds. *Relig. Brain Behav.* **1**, 31–45 (2011)

20. Purzycki, B. G. *et al.* What does God know? Supernatural agents' access to socially strategic and non-strategic information. *Cogn. Sci.* **36**, 846–869 (2012)
21. Atkinson, Q. D. & Bourrat, P. Beliefs about God, the afterlife and morality support the role of supernatural policing in human cooperation. *Evol. Hum. Behav.* **32**, 41–49 (2011)
22. Shariff, A. F. & Rhemtulla, M. Divergent effects of beliefs in heaven and hell on national crime rates. *PLoS ONE* **7**, e39048 (2012)
23. Bering, J. M., McLeod, K. & Shackelford, T. K. Reasoning about dead agents reveals possible adaptive trends. *Hum. Nat.* **16**, 360–381 (2005)
24. Piazza, J., Bering, J. M. & Ingram, G. 'Princess Alice is watching you': children's belief in an invisible person inhibits cheating. *J. Exp. Child Psychol.* **109**, 311–320 (2011)
25. Shariff, A. F., Willard, A. K., Andersen, T. & Norenzayan, A. Religious priming: a meta-analysis with a focus on prosociality. *Personal. Soc. Psychol. Rev.* **20**, 27–48 (2016)
26. Henrich, J., Heine, S. J. & Norenzayan, A. The weirdest people in the world? *Behav. Brain Sci.* **33**, 61–83 (2010)
27. Henrich, J. *et al.* Markets, religion, community size, and the evolution of fairness and punishment. *Science* **327**, 1480–1484 (2010)
28. Cohn, A., Fehr, E. & Maréchal, M. A. Business culture and dishonesty in the banking industry. *Nature* **516**, 86–89 (2014)
29. Hruschka, D. *et al.* Impartial institutions, pathogen stress and the expanding social network. *Hum. Nat.* **25**, 567–579 (2014)
30. Chuah, S.-H., Hoffmann, R., Ramasamy, B. & Tan, J. H. W. Religion, ethnicity and cooperation: an experimental study. *J. Econ. Psychol.* **45**, 33–43 (2014)
31. Xygalatas, D. *et al.* Extreme rituals promote prosociality. *Psychol. Sci.* **24**, 1602–1605 (2013)

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Contributions

J.H., A.N. and B.G.P. conceived the study, prepared protocols, managed project communication and initiated manuscript preparation. C.A., Q.D.A., E.C., R.A.M., A.K.W., B.G.P. and D.X. collected data. B.G.P. conducted all analyses, made all graphs, Tables and illustrations. All authors participated in developing and refining protocols, experimental design and in manuscript preparation.

Competing financial interests

The authors declare no competing financial interests.

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Extended data figures and tables**Extended Data Figures**

1. Extended Data Figure 1: Map of the eight field site locations. (124 KB)

Map from R package 'maps' (2015). R version by Ray Brownrigg. R package version 3.0.0-2 (<http://CRAN.R->

project.org/package=maps).

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2. Extended Data Figure 2: Proportion of sample listing moral and virtue items for moralistic and local gods' dislikes and likes by site. (280 KB)

a, b, We asked participants to freely list up to five things that moralistic and local gods dislike and like. These free-list items were subsequently coded by two independent coders using 12 categories (see Supplementary Information section S4.1.1 for the methods). Items listed first are the most salient items in participants' models of gods' concerns. Error bars have a total breadth of 10%. Note that Indo-Fijians (Lovu) did not answer questions about local gods.

3. Extended Data Figure 3: Mean moralistic and local gods' knowledge and punishment scales by site. (179 KB)

a, b, Error bars represent 95% confidence intervals of the mean. Lovu (Indo-Fijians) did not answer questions about local gods, and Yasawans' (native Fijians) attributions of ancestor spirits' knowledge had a mean and standard deviation of zero. Note that local gods often punish for non-moralistic reasons. See Supplementary Information sections S4.1 and S4.2 for methods and analyses.

4. Extended Data Figure 4: Plot of differences between size of actual allocations and allocations from binomially distributed sample of the same size. (100 KB)

The halfway mark of 15 indicates the predicted mean of all cups. Bars above zero on the y axis indicate higher frequencies of allocations than predicted, and those lower indicate fewer individuals than predicted. Note the cluster of extremely lower-than-predicted values immediately after the cut-off point of 15.

5. Extended Data Figure 5: Per cent of sample by allocation amount to distant cup in local co-religionist (grey) and self games (black) as compared to binomial distribution (white). (81 KB)

For both games, allocations lean towards the left of a theoretically ideal binomial distribution suggesting that overall, participants biased allocations towards themselves ($n = 591$) and local co-religionists ($n = 589$) at the expense of geographically distant co-religionists.

Extended Data Tables

1. Extended Data Table 1: Models accounting for allocations to anonymous distant co-religionists with punishment–knowledge aggregate scales (332 KB)

Supplementary information

PDF files

1. Supplementary information (1.4 MB)

This file contains Supplementary Text and Data – see contents pages for details.

Other

1. Supplementary Data (75 KB)

This file contains the primary data set.

2. Supplementary Data (75 KB)

This file contains the dataset with extreme values removed.

3. Supplementary Data (70 KB)

This file contains the dataset for use with STATA

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4. Supplementary Data (162 KB)

This file contains the stacked data set.

5. Supplementary Data (152 KB)

This file contains the stacked data set for use with STATA

Excel files

1. Supplementary Data (176 KB)

This file contains the primary data set in xlsx format with codebook.

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