

Commentary on Glowacki (forthcoming). The evolution of peace.
Behavioral and Brain Sciences

**Peace is a form of cooperation,
and so are the cultural technologies which make peace possible**

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Abstract While necessary parts of the puzzle, cultural technologies are insufficient to explain peace. They are a form of second-order cooperation---a cooperative interaction designed to incentivize first-order cooperation. We propose an explanation for peace-making cultural technologies, and therefore peace, based on the reputational incentives for second-order cooperation

This is an insightful analysis of the evolution of peace, using the lens of game theory. We propose to complement it, by exposing the cooperative dilemma underlying peace-making cultural technologies. While necessary parts of the puzzle, cultural technologies are insufficient to explain peace—they replace one cooperative dilemma with another. We propose a solution based on prosocial reputation. Cultural technologies, such as informal leadership, may be designed to amplify reputational incentives—in which case they replace a difficult cooperative dilemma with one which is easier. This is not just theoretical nitpicking. Taken together, the author’s account and our complement can generate testable predictions regarding the conditions under which peace-making cultural technologies, and therefore peace, may evolve.

As the author rightfully points out, peace is the solution to a cooperative dilemma. In small-scale societies as well as in decentralized urban gangs, war, like defection, exacts a toll on the entire group; yet it is beneficial for certain individuals. If nothing keeps these individuals in check, war is the only Nash equilibrium.

Implicit in this account however, is that peace cannot be explained by reputation—or other canonical explanations for cooperation, such as kin altruism (Hamilton, 1963) and reciprocity (Axelrod & Hamilton, 1981). In the iterated prisoner's dilemma that the author considers, cooperation is a Nash equilibrium when the benefit of a prosocial reputation exceeds the temptation to cheat (Nowak & Sigmund, 1998; Panchanathan & Boyd, 2003). War ends up being the only Nash equilibrium because certain individuals find it beneficial to cheat *even* when considering the reputational cost of deviating from peaceful behavior. In other words, peace can be characterized as the solution to a *hard-to-solve* cooperative dilemma—a cooperative dilemma for which reputation provides insufficient incentives.

To achieve peace, humans need to create additional incentives. The author rightfully insists on the central role played by cultural technologies—norms, social structures, mechanisms and institutions, which change the underlying incentive structure (North, 1990; Ostrom, 1990; Powers, Schaick, & Lehmann 2016; Henrich & Muthukrishna, 2021). Humans rely on cultural technology to change the rules of the game, and invent peace. To quote the author, peace becomes a possible solution when “decentralized societies develop internal social structures, including age or status groups, or informal but powerful leadership”.

Yet, the author does not mention that cultural technologies are themselves the solution to a cooperative dilemma. Age, status groups, and informal leaders need not necessarily work towards the objectives of the group. Instead, they can advance their own objectives. As the author acknowledges, even though they often promote cooperation within the group (Garfield, Syme, & Hagen, 2020), e.g. by working towards peace (Fry et al., 2021; Glowacki & Gonc, 2013), informal leaders sometimes use their power and influence to promote their self-interest at the expense of the collective (Singh, Wrangham, & Glowacki, 2017).

Cultural technologies are a form of *second-order cooperation* —a cooperative interaction aimed at promoting cooperation (Yamagishi, 1986; Ostrom, 1990; Persson, Rothstein, & Teorell, 2013). In and of themselves, they are insufficient to explain peace. Cultural technologies allow humans to solve the first-order cooperative dilemma. Yet, they introduce another, second-order cooperative dilemma in its place. It seems we are back to square one.

Our solution is to view cultural technologies as technologies specifically designed to leverage reputation. Cultural technologies need not lead us back to our starting point, because second-order cooperation need not be as hard-to-solve as first-order cooperation. Humans can design cultural technologies which: (i) provide sufficient incentives for the hard-to-solve cooperative dilemma, and (ii) are themselves underlain by an *easy-to-solve* cooperative dilemma, that *can* be stabilized by reputation. When this is the case, cultural technologies (and reputation) are sufficient to explain peace (see Figure).

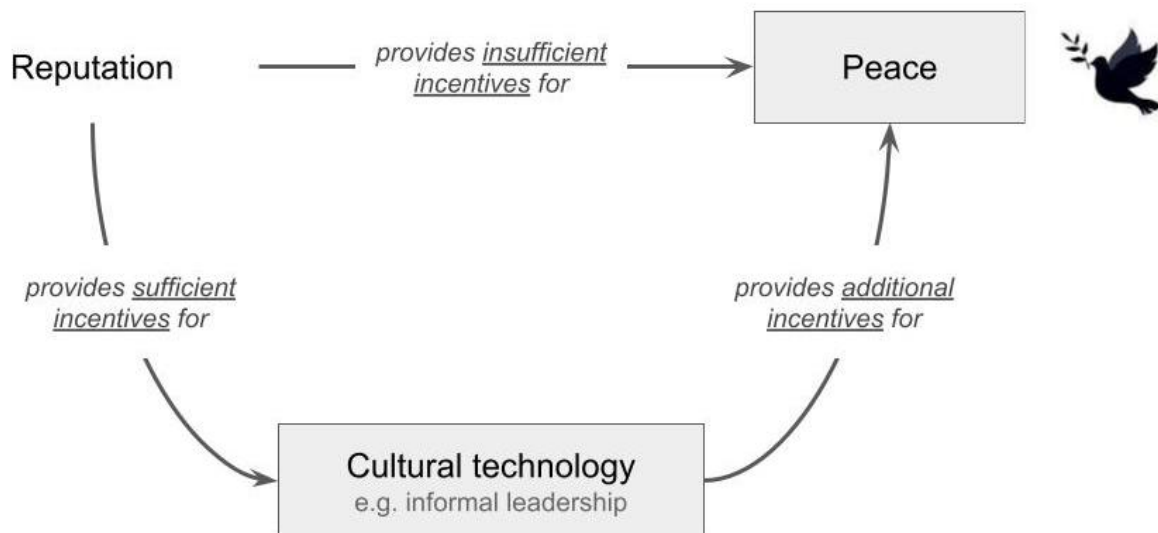


Figure: An explanation for peace through cultural technology.

Informal leaders, for instance, seem decidedly incentivized by reputation. Across small-scale societies, leadership is associated with social status and prestige (Garfield et al., 2021). Leaders tend to enjoy high social capital (Glowacki & von Rueden, 2015), and high social and material

benefits (Garfield et al., 2020; Gurven et al., 2000; Sugiyama, 2004; von Rueden, 2014). Leaders have a lot to lose by defecting. If they cheat, and promote self-serving warfare at the expense of the collective, they stand to lose their very position, and all its accompanying benefits.

In line with the author's account, there is nothing specific about peace or peace-making cultural technologies. Cultural technologies allow humans to scale up cooperation—beyond the limited scope of what can be achieved with reputation alone. Our complement further clarifies the “ironic” logic of peace uncovered by the author. Peace with another group is just one instance of large-scale cooperation. War along that group against another coalition is another such instance. Both depend on the ability to stabilize cultural technologies, that is to solve a second-order cooperative dilemma.

We can derive testable predictions from this idea. Cooperation is not infinitely scalable, because second-order cooperation cannot be made infinitely cheap and still provide sufficient incentives for first-order cooperation. We expect higher ability to establish peace-making cultural technologies, and therefore peace, when individuals have a stronger incentive to invest in their prosocial reputation—e.g. in longstanding communities, in which the shadow of the future looms large (Axelrod & Hamilton, 1981; Ostrom 1990), or in contexts of material security, in which individual's immediate needs are already met (Lie-Panis & André 2022, Mell, Baumard & André 2021).

References

- Axelrod, R., & Hamilton, W. D. (1981). The evolution of cooperation. *Science*, *211*(4489), 1390-1396
- Fry, D. P., Souillac, G., Liebovitch, L., Coleman, P. T., Agan, K., Nicholson-Cox, E., ... & Strauss, S. (2021). Societies within peace systems avoid war and build positive intergroup relationships. *Humanities and Social Sciences Communications*, *8*(1)
- Garfield, Z. H., Schacht, R., Post, E. R., Ingram, D., Uehling, A., & Macfarlan, S. J. (2021). The content and structure of reputation domains across human societies: a view from the evolutionary social sciences. *Philosophical Transactions of the Royal Society B*, *376*(1838), 20200296
- Garfield, Z. H., Syme, K. L., & Hagen, E. H. (2020). Universal and variable leadership dimensions across human societies. *Evolution and Human Behavior*, *41*(5), 397-414
- Glowacki, L., & Gonc, K. (2013). Customary institutions and traditions in pastoralist societies: neglected potential for conflict resolution. *conflict trends*, *2013*(1), 26-32
- Glowacki, L., & von Rueden, C. (2015). Leadership solves collective action problems in small-scale societies. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *370*(1683), 20150010
- Gurven, M., Allen-Arave, W., Hill, K., & Hurtado, M. (2000). "It's a wonderful life": signaling generosity among the Ache of Paraguay. *Evolution and Human Behavior*, *21*(4), 263-282.
- Hamilton, W. D. (1963). The evolution of altruistic behavior. *The American Naturalist*, *97*(896), 354-356
- Henrich, J., & Muthukrishna, M. (2021). The origins and psychology of human cooperation. *Annual Review of Psychology*, *72*, 207-240
- Lie-Panis, J., & André, J. B. (2022). Cooperation as a signal of time preferences. *Proceedings of the Royal Society B*, *289*(1973), 20212266
- Mell, H., Baumard, N., & André, J. B. (2021). Time is money. Waiting costs explain why selection favors steeper time discounting in deprived environments. *Evolution and Human Behavior*, *42*(4), 379-387
- North, D. C. (1991). Institutions. *Journal of economic perspectives*, *5*(1), 97-112

Nowak, M. A., & Sigmund, K. (1998). Evolution of indirect reciprocity by image scoring. *Nature*, 393(6685), 573-577

Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge university press

Panchanathan, K., & Boyd, R. (2003). A tale of two defectors: the importance of standing for evolution of indirect reciprocity. *Journal of theoretical biology*, 224(1), 115-126

Persson, A., Rothstein, B., & Teorell, J. (2013). Why anticorruption reforms fail—systemic corruption as a collective action problem. *Governance*, 26(3), 449-471

Powers, S. T., Van Schaik, C. P., & Lehmann, L. (2016). How institutions shaped the last major evolutionary transition to large-scale human societies. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 371(1687), 20150098

von Rueden, C. (2014). The roots and fruits of social status in small-scale human societies. *The psychology of social status*, 179-200

Singh, M., Wrangham, R., & Glowacki, L. (2017). Self-interest and the design of rules. *Human Nature*, 28, 457-480

Sugiyama, L. S. (2004). Illness, injury, and disability among Shiwiar forager-horticulturalists: Implications of health-risk buffering for the evolution of human life history. *American Journal of Physical Anthropology: The Official Publication of the American Association of Physical Anthropologists*, 123(4), 371-389

Yamagishi, T. (1986). The provision of a sanctioning system as a public good. *Journal of Personality and social Psychology*, 51(1), 110