



## **A nice twist on partner choice theory**

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## RECOMMENDATION

# A nice twist on partner choice theory

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**Based on reviews by:**  
Two anonymous reviewers

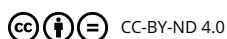
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### A recommendation of

Geoffroy F, Baumard N, and André JB. Why cooperation is not running away. *bioRxiv* 316117, ver. 5 peer-reviewed and recommended by *PCI Evol Biol* (2019). DOI: 10.1101/316117



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In this paper, Geoffroy et al. [1] deal with partner choice as a mechanism of maintaining cooperation, and argues that rather than being unequivocally a force towards improved payoffs to everyone through cooperation, partner choice can lead to “over-cooperation” where individuals can evolve to invest so much in cooperation that the costs of cooperating partially or fully negate the benefits from it. This happens when partner choice is consequential and effective, i.e., when interactions are long (so each decision to accept or reject a partner is a bigger stake) and when meeting new partners is frequent when unpaired (so that when one leaves an interaction one can find a new partner quickly). Geoffroy et al. [1] show that this tendency to select for overcooperation under such regimes can be counteracted if individuals base their acceptance-rejection of partners not just on the partner cooperativeness, but also on their own. By using tools from matching theory in economics, they show that plastic partner choice generates positive assortment between cooperativeness of the partners, and in the extreme case of perfectly assortative pairings, makes the pair the unit of selection, which selects for maximum total payoff.

This study is a nice contribution to the literature that illustrates potential complexities with partner choice as a mechanism for cooperation, including how the proximate mechanisms of partner choice can significantly alter the evolutionary trajectory of cooperation. Modeling choice as a reaction norm that depends on one's own traits also adds a layer of realism to partner choice theory.

The authors are also to be commended for the revisions they made through the review process. Earlier versions of the model somewhat overstated the tendency for fixed partner choice strategies to lead to over cooperation, missing some of the important features in

previous models, notably McNamara et al. [2] that can counter this tendency. In this version, the authors acknowledge these factors, mainly, mortality during partner choice (which increases the opportunity cost of forgoing a current partner) and also the fact that endogenous distribution of alternative partners (which will tend to be worse than the overall population distribution, because more cooperative types spend more time attached and less cooperative types more time unattached). These two factors can constrain cooperation from “running away” as the authors put it, but the main point of Geoffroy et al. [1] that plastic choice can create selection against inefficient cooperation stands.

I think the paper will be very stimulating to theoretical and empirical researchers working on partner choice and social behaviors, and happy to recommend it.

## References

- [1] Geoffroy F, Baumard N, and André JB. Why cooperation is not running away. *bioRxiv* 316117, ver. 5 peer-reviewed and recommended by *PCI Evol Biol* (2019). DOI: 10.1101/316117.
- [2] McNamara JM, Barta Z, Fromhage L, and Houston AI. The coevolution of choosiness and cooperation. *Nature* 451 (2008), 189. DOI: 10.1038/nature06455.

## Appendix

Reviews by Two anonymous reviewers, DOI: 10.24072/pci.evolbiol.100063