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Commentary on: Glowacki, L. (2023). The Evolution of Peace, Behavioral and Brain Sciences

Is peace a human phenomenon?

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Abstract

Peace is a hallmark of human societies. However, certain ant species engage in long-term inter-group resource sharing, which is remarkably similar to peace among human groups. We discuss how individual and group payoff distributions are affected by kinship, dispersal and age structure; the challenges of diagnosing peace; and the benefits of comparing convergent complex behaviours in disparate taxa.

Main text

Peace depends on the precarious balance between the shared benefits it brings to a whole community, and what an individual may gain from disrupting that peace (Glowacki 2023). Glowacki provides an elegant explanation for the origin of peace between human groups, and why the conditions tipping this balance in favour of peace are rare. Peace, i.e. long-lasting positive-sum intergroup relationships, is unknown among other mammal species, even those capable of short-term intergroup cooperation (Fruth and Hohmann 2018, Connor et al. 2022), and yet, peace is not a uniquely human phenomenon. Certain ant species engage in long-term, non-aggressive, mutual resource exchange between nests (Robinson 2014, Robinson and Barker 2017, Burns et al. 2020). Indeed, both ants and humans display the full range of inter-group behaviours, from extreme hostility to remarkable harmony (Pisor and Surbeck 2019, Rodrigues et al. 2022). This raises intriguing questions about why peace arises in these two ecologically and taxonomically distinct groups.

Glowacki's model of differing payoffs for individuals and groups provides a compelling framework for considering the emergence and maintenance of peace in humans (Glowacki 2023). This framework is generalizable to ants: in ant colonies consisting of close kin, the payoffs are more homogenous, because workers gain from successful conflicts only through benefits to their queen. This interdependence relaxes the tension between the individual-level and group-level benefits (Rodrigues et al. 2022). Where within-group relatedness is relatively low, 'policing' is a potential mechanism, in both humans and ants, repressing the competitive tendencies of belligerent individuals. In social insects, policing is typically associated with multiple-mating and the concomitant decrease in within-group relatedness (Liebig et al. 1999, Foster and Ratnieks 2000). Among humans, there is suggestive evidence for a similar association between policing and lower within-group relatedness (Kümmerli 2011). Moreover, kinship between groups means that asymmetric payoffs need not compromise intergroup cooperation, and may even favour between-group altruism (Pisor and Surbeck 2019, Rodrigues et al. 2022).

Spatial context shapes intergroup relationships: for human societies, group isolation can lead to peace, while the presence of neighbours promotes conflict (Glowacki 2023). The relationship between geographical distance and the potential for peace becomes more complex when we make explicit the dynamics of groups: both the value of resources and the risk of conflict with kin are higher when interacting with near neighbours (Taylor 1992). In the simplest scenario, these effects cancel each other out, and thus geographical distance does not have a straightforward effect on intergroup relationships (Rodrigues et al. 2022). Between-group movement changes the payoff distributions by inflating between-group relatedness, which, in some contexts, increases the costs of intergroup conflict through risk of harm to kin, and promotes the maintenance of peaceful local intergroup interactions, especially during conflict with other unfamiliar groups (Rodrigues et al. 2023).

Across societies, proclivity for warfare differs among group members (Glowacki and McDermott 2022), often with older members attempting to curb younger members' higher inclination towards conflict (Glowacki 2023). Social insects also show age-related behaviour, but in contrast, riskier tasks, including fighting, are typically undertaken by older individuals

(Cammaerts-Tricot 1975, Robinson 1987, Uematsu et al. 2010). The key difference here is in the individual-level age-dependent costs and benefits (Rodrigues 2018). Among humans, a younger male's fairly low risk of injury during an intergroup raiding party is outweighed by the benefits of increased resources and/or reputation, despite community-level costs arising from the loss of peace and the associated likelihood of retaliatory raids. Older individuals may have a greater risk of injury, and stand to gain less from accruing additional resources or reputation after they have already reproduced (Glowacki 2023). Among social insects, workers' reproductive potential is highest when young; even in societies with reproductive division of labour, young workers often have active ovaries (Page and Peng 2001). Young workers thus incur individual costs if killed in intercolony conflict, whereas older workers have no potential for direct fitness through reproduction, and therefore their behaviour is driven solely by the inclusive-fitness benefits of group defence. At the group-level, the mode of group formation strongly affects group composition and cohesion over time. In ants that exhibit intergroup cooperation, groups founded by a few individuals split into networks of related interconnected nests, whereas in humans, both group formation and development are more fluid. Thus, age-specific individual-level payoffs differ in humans and ants, and a group's demographic composition may have a species-specific influence on the emergence of peace.

Peace is more than simply the absence of war (Glowacki 2023). In human societies, we have cultural information that helps us distinguish peaceful coexistence from fearful avoidance, although both might result in superficially similar behaviours (Pisor and Surbeck 2019). Among non-human animal groups, conflict avoidance is a major behavioural driver (Morris-Drake et al. 2022, Rodrigues et al. 2022, Triki et al. 2022) and many apparent examples of intergroup tolerance may be the product of ongoing active conflict reduction. Although we are currently limited to identifying peaceful outcomes rather than peaceful intentions in non-human animals, evidence is accumulating for the cognitive complexity of social insects, including emotion-like states in bees that are consistent with those in vertebrates, measured behaviourally and chemically (Chittka and Rossi 2022). As methods of measurement continue to become more sophisticated, we may get closer to determining the mental states of non-human animals during peaceful interactions.

Parallels between human socio-cultural evolution and comparable processes in social insects provide an opportunity to relinquish an anthropocentric perspective and identify the essence of a behavioural phenomenon (Gowdy and Krall 2013, Robinson and Barker 2017, DeSilva et al. 2021). Some similarities between ants and human societies are likely due to the emergent properties of complex social systems, irrespective of the nature of their component parts, others are due to an intriguing convergence, where similar endpoints are reached through differing evolutionary mechanisms. Such convergent examples offer the opportunity to identify necessary and sufficient steps and alternative pathways to a given endpoint. The occurrence of long-lasting, positive-sum, interdependent intergroup relationships in both humans and ants has the potential to provide new insights into the evolution of peace.

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