**Christof Neumann[1,2,3,4,5], Lars Kulik[1,2], Muhammad Agil[6], Antje Engelhardt[3,4], Anja Widdig[1,2]**

[1]Junior Research Group of Primate Kin Selection, Max-Planck-Institute for Evolutionary Anthropology, Leipzig, GER
[2]Institute of Biology, Faculty of Bioscience, Pharmacy and Psychology, University of Leipzig, Leipzig, GER
[3]Junior Research Group of Primate Sexual Selection, Department of Reproductive Biology, German Primate Center, Göttingen, GER
[4]Courant Research Centre 'Evolution of Social Behaviour', Georg-August-Universität, Göttingen, GER
[5]Comparative Cognition Group, Université de Neuchâtel, Neuchâtel, CHE
[6]Faculty of Veterinary Medicine, Bogor Agricultural University, Bogor, IDN

Correspondence: christofneumann1@gmail.com

## Coalitions, dominance rank and reproductive success in wild male crested macaques

Coalition formation is one of the most striking forms of cooperation in the animal kingdom. Yet, there is substantial variation between taxa in how coalitions translate into fitness benefits. In this study, we investigated the link between dominance rank trajectories, coalitions and reproductive success in two groups of wild male crested macaques (*Macaca nigra*), a species with high male reproductive skew. We observed 212 coalitions involving 37 males and used linear mixed models to test how a suite of parameters (individual, social and related to single coalitions) influenced future rank of individual males. We found that males participating in coalitions achieved higher future ranks than targets of coalitions, independent of the expected relationship between age and dominance status. Additionally, revolutionary coalitions had stronger effects on future rank than conservative and bridging coalitions. Moreover, rank change depended on feasibility of coalitions (difference in dominance scores between coalition partners and their target) and on whether males formed coalitions with other males or with females. Finally, we link coalitions to reproductive success by showing that rank (as a consequence of coalitions) closely predicted paternity success. The existence of this link is further supported by the absence of coalitions in the context of directly breaking up consortships of males with fertile females. In sum, our results provide important new insights into the mechanisms underlying coalition formation in male primates and support the idea that one of the major paths by which coalitions affect reproductive success and ultimately fitness is through influencing male rank trajectories.