

DOMINANCE STYLE AND VOCAL COMMUNICATION IN NON-HUMAN PRIMATES

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Understanding the variables that shape the use and evolution of vocal communication in non-human primates can inform understanding of how language evolved. Social complexity might drive communicative complexity (Freeberg et al. 2012). Dominance style (the strictness with which the dominance hierarchy is enforced; ranging from ‘despotic’ to ‘tolerant’; de Waal and Luttrell, 1989) is an important, but often overlooked, measure of social complexity and its relationship with vocal communication is largely unknown. As the outcomes of social interactions in more tolerant societies are more uncertain (Dobson, 2012), we predicted that more tolerant individuals and species would have a greater need for more frequent and more diverse vocal signals to negotiate their social interactions. Here, we provide evidence that dominance style is associated with vocal usage and repertoires at both individual and phylogenetic levels in primates.

At the inter-individual level, we considered given tolerance and received tolerance separately as there are different reasons for expecting dominant and subordinate individuals within tolerant relationships to communicate more frequently than those in despotic relationships. Considering these two measures separately should also allow us to infer whether tolerance puts pressure on dominant individuals to communicate more, or whether a more tolerant social environment relaxes constraints on subordinate individuals' communication. For our four behavioural dominance style variables (aggression symmetry, counter aggression, aggression intensity and grooming symmetry) we were able to obtain given and received tolerance measures for individuals by including only interactions with lower-ranking partners, or higher-ranking partners, respectively, in their calculations. We predicted that both i) given and ii) received tolerance versions of each variable would be associated with a higher rate of vocalising. At the interspecific level, we calculated the four dominance style variables per species, and combined them into a 'dominance style index'. We predicted that this index would be associated with three aspects of vocal repertoires, all of which were obtained from previous literature. Using Bayesian analyses on these observational data from 111 wild groups of 26 species, we show that more tolerant individuals vocalise at a higher rate, but more despotic species have a wider range of hierarchy-related vocalisations in their repertoires. We found little evidence that tolerance received from higher-ranking partners is related to vocal rate, or that more tolerant species have larger vocal repertoires in terms of overall repertoire size or number of social vocalisations. Our findings indicate that tolerance is related to vocal usage more strongly as a result of increased pressure for more tolerant individuals to communicate more, than alleviation of constraints on communication for lower-ranking individuals. Taken together, our findings indicate that dominance style is a valuable social variable for understanding vocal usage and evolution in primates.

References

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