

THE GOOD, THE BAD AND THE UGLY: COOPERATION, PUNISHMENT AND SPITE IN CHIMPANZEES

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One of the longest-standing questions in evolutionary research concerns the origins of cooperation. Much recent discussion asks whether direct reciprocity is enough to maintain cooperation under the threat of free-riding. One possible solution to the problem is punishment. Inflicting harm on noncooperators can serve to stabilize cooperation in groups of humans. One important question is, does punishment stabilize cooperation in nonhuman primates? Another question is, what are the psychological mechanisms that influence punitive behaviour and other harmful behaviours such as spite. To answer these questions, we adapted methods from experimental economics to ask whether chimpanzees are punitive and spiteful. Using adaptations of the dictator (Jensen et al., 2006, *Proc R. Soc B* 273: 1013-1021), money burning (Jensen et al., 2007a, *Proc. Natl. Acad. Sci.*, 104: 13046-13050) and ultimatum games (Jensen et al., 2007b, *Science*, 318, 107-109), we found that chimpanzees were not averse to disadvantageous inequity; they were indifferent to the consequences of their actions on others, and to outcome disparities. They were vengeful in that they reacted aggressively to harmful behaviour, but there was no evidence that they were negatively reciprocal, nor sensitive to unfairness. We propose that one of the features that underlies human cooperation is a concern for the welfare of others; positive social concerns, such as empathy, motivate helpful acts and negative social concerns, such as spitefulness, motivate harmful ones. Together, these social motivations might constitute a uniquely human tendency for what is sometimes called strong reciprocity.

Keywords: reciprocity, social preferences, behavioural economics, social concern