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Reciprocal trading for direct fitness benefits

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It is widely believed that helpful behaviour benefitting a receiver at immediate fitness costs to the donor results mainly from kin selection. In contrast, our experimental and observational data show that in Norway rats and cooperatively breeding cichlids, kinship is less efficient than reciprocal commodity trading in generating altruistic help. Experiments under controlled laboratory conditions with dogs, rats and cichlids reveal that mutual cooperation is triggered by a permanent negotiation process between members of dyads or groups, by which same or different commodities can be traded against one other. Furthermore, both simulations and analytical models have shown that negotiated reciprocity can entail higher evolutionarily stable levels of cooperation than those based on kin selection. This indicates that appropriate behavioural responsiveness may be an important target of selection in highly social animals.