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Is there a coordination cost to cooperative transport?

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The coordination of social insects, despite their relatively simple cognitive capacities and decentralized organization, has drawn much attention from biologists, as well as from engineers seeking design inspiration for collective robotics. Group work can lead to synergy, or social facilitation, but several studies instead show that groups perform worse than expected from a simple sum of their members' abilities. Cooperative transport in ants is an excellent system to investigate how the performance of the group is influenced by its size. We investigated this in the desert ant *Aphaenogaster cockerelli*, which is particularly adept at group retrieval of large food items. These ants normally encircle objects to carry them, making it difficult to identify the specific contribution of each transporter. To simplify the process, we presented ants with artificial loads designed to make all ants pull in a similar orientation. We examined teams of two, three, and four ants, with loads designed so that all individuals pulled equal weight (i.e., load weight was proportional to team size). The results showed a social facilitation effect in retaining individuals in a team, with ants less likely to cease pulling as team size increased. Individual ants transported the dummy faster than ants working in teams but all teams travelled at the same speed. These results imply that, when working in teams, individuals either spent energy to coordinate with teammates or reduced their effort. We discuss these results in relation to earlier findings of enhanced efficiency through teamwork in collective transport by army ants.