Relative Value Perception in ants

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When choosing between two options, a common and sensible strategy is to choose the highest value option. In order to do this, both options must be judged in terms of their value and compared to each other. The way value is judged thus has strong effects on which option is ultimately chosen. Traditionally, value was considered absolute. However, with ongoing research on value judgments in humans, it was accepted that value is often relative, and based on former experience or an expectation. Similarly, animals were traditionally considered rational decision makers that assigned fixed values to options. However, the study of negative contrast effects suggested that for some animals, as in humans, value may not be fixed but relative to a reference point. Here we show a higher food acceptability in ants when they had previous experience with a lower quality food source (e.g. 0.1M - then 0.5M; positive contrast) than when they received the same quality food all along (e.g. 0.5M - then 0.5M; control), and lower acceptability when previously confronted with high quality food (e.g. 2M - then 0.5M; negative contrast). Contrast effects occurred not only when ants collect private information outside the nest, but also when information was received through interactions with other nestmates inside the nest. Collective foraging decisions by ants are usually assumed to be driven solely by stronger recruitment to the better resource. However, information gained inside the nest is likely to contribute to the system of colony-level decision making. Relative value perception can therefore be expected to have strong effects not only on the individual behaviour of animals, but also on the collective behaviour of insect colonies, allowing colonies to ignore usually acceptable options in favour of better ones.