



Dancing in the dark: honeybees forage more successfully without the “dance language” in a human-modified environment

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Social insects often rely on information provided by nest mates to locate resources. By using socially acquired information foragers can potentially avoid time, energy and predation costs associated with individual learning. There are, however, circumstances in which social information might not be the best option and individuals should rely on individual learning or past experiences. Honeybees use the waggle dance to share information about the location of good food sites with nest-mates. However, the importance of this “dance language” in colony foraging success remains unclear. We tested if the spatial dance information affects colony foraging success in a human-modified temperate environment by comparing colonies that either had oriented or disoriented dances during 18 day treatment periods. Strikingly, we found that colonies with disoriented dances had greater foraging success. Bees exposed to disoriented dances reduced their dance following and observed fewer waggle runs. This change in social information-use suggests that bees can learn about the value of the dance and reduce their reliance on this signal when it transmits misinformation. In doing so they appear to achieve a higher foraging rate compared to colonies with oriented dances. An agent-based model confirms that under challenging foraging conditions, such as those experienced during our experiment, waiting for dance information can result in reduced colony foraging success compared to foraging without social information. These results raise the possibility that humans have created environments to which the waggle dance is not well adapted.