



## Lost in translation: interspecies waggle dance communication in Asian honeybees

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The waggle dance is the only known example of a symbolic communication system produced by non-human animals. Through the dance honeybees communicate the distance, direction and quality of food sources or nesting locations to their sisters. The waggle dance is ubiquitous within the genus *Apis*, but the 12 currently recognised honeybee species differ remarkably in how they orientate their dances. The most basal dwarf honeybee species produce dances on a horizontal dance floor at the top of their colonies, directly pointing at the direction of their goal. The more derived giant open nesting and cavity nesting honeybee species dance on vertical surfaces, using the sun's current azimuth to indicate the direction of their goal relative to gravity. The waggle dance is an innately produced behaviour, but how do honeybees know when and where to perform their dances? Does behavioural plasticity have a role to play at all? To test these questions, I created mixed species colonies of red dwarf honeybee (*A. florea*) hosts and giant Asian honeybees (*A. dorsata*) or Asian hive bees (*A. cerana*) as fostered nestmates. Both *A. cerana* and *A. dorsata* bees were able reach foraging age on their host colonies. Despite their extreme size difference, *A. dorsata* bees were keen followers of *A. florea* waggle dances. The majority of waggle dancing *A. dorsata* bees produced their dances on the horizontal dance floor with their hosts, but neither species successfully recruited the other with their dances. The much more derived *A. cerana* bees were less likely to follow the dances of their *A. florea* hosts, and most of their dances were produced on the vertical side of the colony, or underneath a curtain of their *A. florea* hosts. Despite this, some *A. cerana* bees did dance on the horizontal *A. florea* dance floor, and at least one instance of recruitment of an *A. cerana* bee by an *A. florea* dancer was observed. My results demonstrate the remarkable behavioural plasticity of honeybee waggle dancers.