

TOOLBOX

Come-hither rat cry could measure social interest

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Call response: Researchers can use an eight-armed maze with a speaker at one end to see if rats are attracted to friendly calls from their peers.

When navigating a maze, rats move toward happy rodent sounds and away from those signaling alarm, according to a review published 4 February in the *Journal of Neuroscience Methods*¹. The method could be used to assay social behavior in rodent models of autism.

Despite the many literary allusions to being “as quiet as a mouse,” rodents emit several vocalizations. They just do so in the ultrasonic range, which are inaudible to the human ear. Researchers use these vocalizations as **a proxy for language** when assessing rodent models of autism.

Rats produce cries at three distinct frequencies: a 20-kilohertz (kHz) cry when pups are separated from their mothers, a 50-kHz cry during play or when they are tickled and a 22-kHz cry when afraid, as in the presence of a predator.

One method to assay the function of these cries is to use a maze with eight branches and a speaker emitting a certain frequency of call at one end^{2, 3, 4}. An automated system with a video camera scores how much time the rats spend in the three arms closest to the sound and the three that are farthest away.

The review analyzes three studies using this method in which researchers used a 50-kHz cry from a rat smelling its absent cage-mate and a 22-kHz cry from a rat trained to expect foot shocks. Overall, the studies show that rats tend to be more active when they hear the 50-kHz cry and less so when they hear a 22-kHz one. Rodents freeze when they sense danger, so this suggests that the 22-kHz call is a warning, the researchers say.

Rats tend to spend significantly more time in the branches near the 50-kHz cry than in those farther away. For example, in one study, juvenile males spent an average of 39 seconds in the arms closest to the 'social' call and an average of 2 seconds on the opposite side of the maze. In contrast, they avoid the branches closest to the 22-kHz cry.

Juvenile rats of either gender and adult females are more likely to respond to 50-kHz cries than are adult males. The gender difference among adults suggest that rats use these calls during mating.

References:

- 1: **Seffer D.** *et al. J. Neurosci. Methods* Epub ahead of print (2014) [PubMed](#)
- 2: Wöhr M. and R.K. Schwarting *PLoS One* **2**, e1365 (2007) [PubMed](#)
- 3: Wöhr M. and R.K. Schwarting *Pharmacol. Biochem. Behav.* **94**, 285-295 (2009) [PubMed](#)
- 4: Wöhr M. and R.K. Schwarting *Neurobiol. Learn. Mem.* **98**, 154-164 (2012) [PubMed](#)