

Male and female cats respond differently to distressed kittens

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Female domestic cats adjust their response to kitten calls depending on how urgent they sound, according to a study published in the open access journal *BMC Evolutionary Biology*. Independent of their own experience of raising kittens, female cats distinguish between kitten calls that convey different levels of urgency and react accordingly, researchers at Hannover Medical School and the University of Veterinary Medicine Hannover, Germany have found. Male cats do not adjust their response in similar ways.

This study is the first to examine if in non-human mammals such as [domestic cats](#) where fathers do not take part in raising their young, males adjust their behavior in response to specific audio cues in the voice of their offspring. The researchers also examined this response in females, and whether females that had never raised offspring before showed similar behavioral adjustment.

The researchers found that female cats responded about 10 per cent faster to kitten calls that conveyed high arousal - greater urgency - than to kitten calls that conveyed low arousal. This indicates that female cats are able to evaluate the emotional content of kitten calls and that they adjust their motivation to respond accordingly. Male cats did not show a more urgent response to kitten calls that signified high arousal.

Wiebke Konerding, first author of the study, said: "Surprisingly, male and female cats did not differ in their overall responsiveness to low arousal calls, but female cats adjusted their responsiveness if the state of

arousal changed. Male cats did not do so. We were also surprised to find that prior experience at raising kittens was not necessary for female cats to respond differently to low and high arousal kitten calls."

These results indicate that the ability to adjust their responses to the emotional cues of kitten calls is an ingrained sex difference between male and female adult cats that is not triggered by experience, according to the researchers.

As male cats do not take part in raising their offspring, kitten calls and the urgency conveyed in them may not have the same relevance for them as for female cats. This may cause male and female cats to process what they hear differently. The auditory system in female cats may have evolved in a way that is adapted to the specific properties of kitten calls, although further research is needed to find out if the auditory system in male domestic cats is physically different from that of females. Maternal but not paternal care in cats may also have influenced the evolution of sex-specific differences in emotional processes in male and [female cats](#).

To assess how the male or female sex of adult cats and the high or low arousal conveyed by kitten calls affected the adults' response times, the researchers used 14 calls from seven kittens - four males and three females, nine to 11 days of age - recorded in two different contexts:

- Low arousal, in which a kitten was spatially separated from its mother and siblings for three minutes and left undisturbed.
- High arousal, in which a kitten was taken out of the nest box for three minutes lifted off the ground and turned on its back.

The researchers had previously shown that high arousal kitten calls differ from low arousal ones for example in duration and pitch.

The researchers also performed acoustic analyses for the 14 selected

kitten calls to confirm the previously found acoustic differences. The recorded calls were played to 17 adult cats - nine males and eight females, aged one to eight years. To control for experience, half of the females had not previously raised kittens.

Wiebke Konerding explained: "We didn't know whether these acoustic differences would be behaviorally meaningful - that is if they would trigger different responses in adult cats. We identified acoustic cues related to the fundamental frequency - the pitch - of the infant cry that correlated with how quickly the females responded. For example, they responded more quickly to faster changes in frequency."

In order to compare experienced and inexperienced cats, only calls of unrelated kittens were used. Further research is needed to determine if cats are more sensitive to the familiar, individual signatures of their own offspring's voices than to the voices of strange kittens.

More information: Wiebke S. Konerding et al, Female cats, but not males, adjust responsiveness to arousal in the voice of kittens, *BMC Evolutionary Biology* (2016). [DOI: 10.1186/s12862-016-0718-9](https://doi.org/10.1186/s12862-016-0718-9)

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