

Cats seem to grasp the laws of physics

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Researcher Saho Takagi holding her cat. Credit: Mayu Takagi

Cats understand the principle of cause and effect as well as some elements of physics. Combining these abilities with their keen sense of hearing, they can predict where possible prey hides. These are the findings of researchers from Kyoto University in Japan, led by Saho Takagi and published in Springer's journal *Animal Cognition*.

Previous work conducted by the Japanese team established that cats predict the presence of invisible objects based on what they hear. In the present study, the researchers wanted to find out if cats use a causal rule to infer if a container holds an object, based on whether it is shaken along with a sound or not. The team also wanted to establish if cats expect an object to fall out or not, once the container is turned over.

Thirty [domestic cats](#) were videotaped while an experimenter shook a container. In some cases this action went along with a rattling sound. In others it did not, to simulate that the vessel was empty. After the shaking phase, the container was turned over, either with an object dropping down or not.

Two experimental conditions were congruent with physical laws, where shaking was accompanied by a (no) sound and an (no) object to fall out of the container. The other two conditions were incongruent to the laws of physics. Either a rattling sound was followed by no object dropping out of the container or no sound while shaking led to a falling object.

The cats looked longer at the containers which were shaken together with a noise. This suggests that cats used a physical law to infer the existence (or absence) of objects based on whether they heard a rattle (or not). This helped them predict whether an object would appear (or not) once the [container](#) was overturned.

The animals also stared longer at containers in incongruent conditions, meaning an [object](#) dropped despite its having been shaken noiselessly or the other way around. It is as if the cats realized that such conditions did not fit into their grasp of causal logic.

"Cats use a causal-logical understanding of noise or sounds to predict the appearance of invisible objects," says Takagi.

Researchers suggest that species' surroundings influence their ability to find out information based on what they hear. The ecology of cats' natural hunting style may therefore also favor the ability for inference on the basis of sounds. Takagi explains that hunting cats often need to infer the location or the distance of their prey from sounds alone because they stake out places of poor visibility. Further research is needed to find out exactly what [cats](#) see in their mind's eye when they pick up noises, and if they can extract information such as quantity and size from what they hear.

More information: Saho Takagi et al, There's no ball without noise: cats' prediction of an object from noise, *Animal Cognition* (2016). [DOI: 10.1007/s10071-016-1001-6](https://doi.org/10.1007/s10071-016-1001-6)

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