

Chimp study shows evidence of synaesthesia

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Common chimpanzee in the Leipzig Zoo. Image credit: Thomas Lersch, via Wikipedia.

(PhysOrg.com) -- In the never-ending struggle to understand how the human brain works, all manner of experiments are dreamed up and carried out. In one new one, for example, researchers in Japan have been testing chimps to see if they possess brain connections that cross the senses. In human terms, it's known as synaesthesia, the phenomenon where a person associates one sensation with another; feeling colors for example or associating higher musical tones with lighter colored objects. Vera Ludwig, a German researcher, has teamed with colleagues at Kyoto University in testing chimps to see if they have such traits. In their study, published in the *Proceedings of the National Academy of Sciences*, the team describes how chimps did better or worse matching colored objects when a high or low noise was played.

The idea was to see if [chimps](#) associate high noises with light colored objects, as people tend to do, and low noises with dark colored objects. To find out, they trained six chimps to sit in front of a computer monitor and to play a matching game. In the game, three squares are displayed, a single small one in the center of the screen and two larger ones above it. The larger squares are identical except that they are either black or white. To get a treat, the chimp must correctly identify, by touch, which of the two larger squares matches the color of the smaller one. Then to test for synaesthesia they randomly played either a high noise or a low one while the chimp was trying to choose. The test was run over and over with the small square being shown for a very short period of time.

After tallying up the results, the researchers found that the chimps did slightly better (93% versus 90%) at choosing the right colored square when matching white squares with high notes and black ones with low. This, the researchers say, shows that chimps do have some innate [sense](#) of synaesthesia.

These results by themselves may not by themselves truly answer the question of whether chimps really do have some degree of synaesthesia, but they do add to the body of research on the topic, all of which suggests that such abilities are innate, rather than learned, which means that such abilities may hold the key to explaining why humans developed complex speech and chimps and other animals have not.

At any rate, after finishing up with the chimps, the team did the same study with humans, but because the volunteers were so accurate at choosing the right square, they weren't able to draw any real conclusions regarding [synaesthesia](#), but they did find that people seem to choose more speedily when the tones "matched" the colors displayed.

More information: Visuoauditory mappings between high luminance and high pitch are shared by chimpanzees (*Pan troglodytes*) and humans,

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Abstract

Humans share implicit preferences for certain cross-sensory combinations; for example, they consistently associate higher-pitched sounds with lighter colors, smaller size, and spikier shapes. In the condition of synesthesia, people may experience such cross-modal correspondences to a perceptual degree (e.g., literally seeing sounds). So far, no study has addressed the question whether nonhuman animals share cross-modal correspondences as well. To establish the evolutionary origins of cross-modal mappings, we tested whether chimpanzees (*Pan troglodytes*) also associate higher pitch with higher luminance. Thirty-three humans and six chimpanzees were required to classify black and white squares according to their color while hearing irrelevant background sounds that were either high-pitched or low-pitched. Both species performed better when the background sound was congruent (high-pitched for white, low-pitched for black) than when it was incongruent (low-pitched for white, high-pitched for black). An inherent tendency to pair high pitch with high luminance hence evolved before the human lineage split from that of chimpanzees. Rather than being a culturally learned or a linguistic phenomenon, this mapping constitutes a basic feature of the primate sensory system.

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