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Chimpanzees' Contagious Yawning Evidence of Empathy, Not Just Sleepiness, Study Shows

Contagious yawning is not just a marker of sleepiness or boredom. For chimpanzees, it may actually be a sign of a social connection between individuals.

New research at the Yerkes National Primate Research Center, Emory University, may help scientists understand empathy, the mechanism thought to underlie contagious yawning, in both chimpanzees and humans. The research also may help show how social biases strengthen or weaken empathy.

Scientists at Yerkes discovered chimpanzees yawn more after watching familiar chimpanzees yawn than after watching strangers yawn. The Public Library of Science One (PLOS ONE) is publishing the study online on April 6, 2011.

Yerkes researchers Matthew Campbell, PhD, and Frans de Waal, PhD, propose that when yawning spreads between chimpanzees, it reflects an underlying empathy between them.

"The idea is that yawns are contagious for the same reason that smiles, frowns and other facial expressions are contagious," they write. "Our results support the idea that contagious yawning can be used as a measure of empathy, because the biases we observed were similar to empathy biases previously seen in humans."

Campbell is a FIRST postdoctoral fellow at Yerkes and Emory (Fellowship in Research and Science Teaching). De Waal is director of the Living Links Center at Yerkes and C.H. Candler Professor of Psychology at Emory.

They studied 23 adult chimpanzees that were housed in two separate groups. The chimpanzees viewed several nine-second video clips of other chimpanzees, in both groups, either yawning or doing something else. They yawned 50 percent more frequently in response to seeing members of their group yawn compared to seeing others yawn.

In humans, scientists have identified certain parts of the brain that are activated both when someone experiences

pain and when they see someone else experiencing pain. In these experiments, people tend to show more sensitivity for members of the same social group.

The results raise the question of whether contagious yawning among humans shows the same biases: favoring members of the same social group over different social groups.

The authors note one complication: chimpanzees live in small communities where unfamiliar individuals are by definition seen as members of a separate social group. In contrast, humans do not necessarily see strangers as belonging to an "outgroup." For this reason, the in-group/out-group distinction may be more absolute in chimpanzees than in humans. Chimpanzees in the wild are known to be extremely hostile to external groups, which probably adds to the effects found in this study.

The authors say that contagious yawning could be a window into social and emotional connections between individuals, and suggest that insight into barriers to chimpanzee empathy may help break down those barriers for humans.

"Empathy is difficult to measure directly because it is a largely internal response: mimicking the emotional response of another. Contagious yawning allows for a measurement of empathic response that is purely behavioral, and thus can be applied more widely," Campbell writes. "Anyone who wants to increase human empathy towards outsiders should consider that techniques to this effect could be tested out on chimpanzees and other animals."

Journal Reference: 1. Matthew W. Campbell, Frans B. M. de Waal. Ingroup-Outgroup Bias in Contagious Yawning by Chimpanzees Supports Link to Empathy. PLOS ONE, 2011; 6 (4): e18283 DOI: 10.1371/journal.pone.0018283