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Contagious yawning may not be linked to empathy; still largely unexplained

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While previous studies have suggested a connection between contagious yawning and empathy, new research from the Duke Center for Human Genome Variation finds that contagious yawning may decrease with age and is not strongly related to variables like empathy, tiredness and energy levels.

The study, published March 14 in the journal *PLOS ONE*, is the most comprehensive look at factors influencing contagious yawning to date.

The researchers said a better understanding of the biology involved in contagious yawning could ultimately shed light on illnesses such as schizophrenia or autism.

"The lack of association in our study between contagious yawning and empathy suggests that contagious yawning is not simply a product of one's capacity for empathy," said study author Elizabeth Cirulli, Ph.D., assistant professor of medicine at the Center for Human Genome Variation at Duke University School of Medicine.

Contagious yawning is a well-documented phenomenon that occurs only in humans and chimpanzees in response to hearing, seeing or thinking about yawning. It differs from spontaneous yawning, which occurs when someone is bored or tired. Spontaneous yawning is first observed in the womb, while contagious yawning does not begin until early childhood.

Why certain individuals are more susceptible to contagious yawning

remains poorly understood. Previous research, including neuroimaging studies, has shown a relationship between contagious yawning and empathy, or the ability to recognize or understand another's emotions. Other studies have shown correlations between contagious yawning and intelligence or time of day.

Interestingly, people with autism or schizophrenia, both of which involve impaired social skills, demonstrate less contagious yawning despite still yawning spontaneously. A deeper understanding of contagious yawning could lead to insights on these diseases and the general biological functioning of humans.

The current study aimed to better define how certain factors affect someone's susceptibility to contagious yawning. The researchers recruited 328 healthy volunteers, who completed cognitive testing, a demographic survey, and a comprehensive questionnaire that included measures of empathy, energy levels and sleepiness.

The participants then watched a three-minute video of people yawning, and recorded the number of times they yawned while watching the video.

The researchers found that certain individuals were less susceptible to contagious yawns than others, with participants yawning between zero and 15 times during the video. Of the 328 people studied, 222 contagiously yawned at least once. When verified across multiple testing sessions, the number of yawns was consistent, demonstrating that contagious yawning is a very stable trait.

In contrast to previous studies, the researchers did not find a strong connection between contagious yawning and empathy, intelligence or time of day. The only independent factor that significantly influenced contagious yawning was age: as age increased, participants were less

likely to yawn. However, age was only able to explain 8 percent of the variability in the contagious yawn response.

"Age was the most important predictor of contagious yawning, and even age was not that important. The vast majority of variation in the contagious yawning response was just not explained," Cirulli said.

Because most variability in contagious yawning remains unexplained, the researchers are now looking to see whether there are genetic influences that contribute to contagious yawning. Their long-term goal in characterizing variability in contagious yawning is to better understand human diseases like schizophrenia and autism, as well as general human functioning, by identifying the genetic basis of this trait.

"It is possible that if we find a genetic variant that makes people less likely to have contagious yawns, we might see that variant or variants of the same gene also associated with schizophrenia or autism," Cirulli said. "Even if no association with a disease is found, a better understanding of the biology behind contagious yawning can inform us about the pathways involved in these conditions."

Provided by Duke University Medical Center