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Subliminal Smells Bias Perception About a Person's Likeability

EVANSTON, Ill. --- Anyone who has bonded with a puppy madly sniffing with affection gets an idea of how scents, most not apparent to humans, are critical to a dog's appreciation of her two-legged friends. Now new research from Northwestern University suggests that humans also pick up infinitesimal scents that affect whether or not we like somebody.

"We evaluate people every day and make judgments about who we like or don't like," said [Wen Li](#), a post-doctoral fellow in the [Cognitive Neurology and Alzheimer's Disease Center](#) at Northwestern's [Feinberg School of Medicine](#) and lead author of the study. "We may think our judgments are based only on various conscious bits of information, but our senses also may provide subliminal perceptual information that affects our behavior."

"Subliminal Smells Can Guide Social Preferences" was published in the December issue of *Psychological Science*. Besides Li, the study's co-investigators include Isabel Moallem, Loyola University; [Ken Paller](#), professor of psychology in the [Weinberg College of Arts and Sciences](#) at Northwestern; and [Jay Gottfried](#), assistant professor of neurology at Feinberg and senior author of the paper.

Minute amounts of odors elicited salient psychological and physiological changes that suggest that humans get much more information from barely perceptible scents than previously realized.

To test whether subliminal odors alter social preferences, participants were asked to sniff bottles with three different scents: lemon (good), sweat (bad) and ethereal (neutral). The scents ranged from levels that could be consciously smelled to those that were barely perceptible. Study participants were informed that an odor would be present in 75 percent of the trials.

Most participants were not aware of the barely perceptible odors. After sniffing from each of the bottles, they were shown a face with a neutral expression and asked to evaluate it using one of six different rankings, ranging from extremely likeable to extremely unlikeable.

People who were slightly better than average at figuring out whether the minimal smell was present didn't seem to be biased by the subliminal scents.

"The study suggests that people conscious of the barely noticeable scents were able to discount that sensory information and just evaluate the faces," Li said. "It only was when smell sneaked in without being noticed that judgments about likeability were biased."

The conclusions fit with recent studies using visual stimuli that suggest that top-down control mechanisms in the brain can be exerted on unconscious processing even though individuals have no awareness of what is being controlled.

"When sensory input is insufficient to provoke a conscious olfactory experience, subliminal processing prevails and biases perception," Paller said. "But as the awareness of a scent increases, greater executive control in the brain is engaged to counteract unconscious olfaction."

The acute sensitivity of human olfaction tends to be underappreciated. "In general, people tend to be dismissive of human olfaction and discount the role that smell plays in our everyday life," said Gottfried. "Our study offers direct evidence that human social behavior is under the influence of miniscule amounts of odor, at concentrations too low to be consciously perceived, indicating that the human sense of smell is much keener than commonly thought."

The study adds to a growing body of research suggesting that subliminal sensory information -- whether from scents, vision or hearing -- affects perception. "We are beginning to understand more about how perception and memory function," Paller said, "by taking into account various types of influences that operate without our explicit knowledge."

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