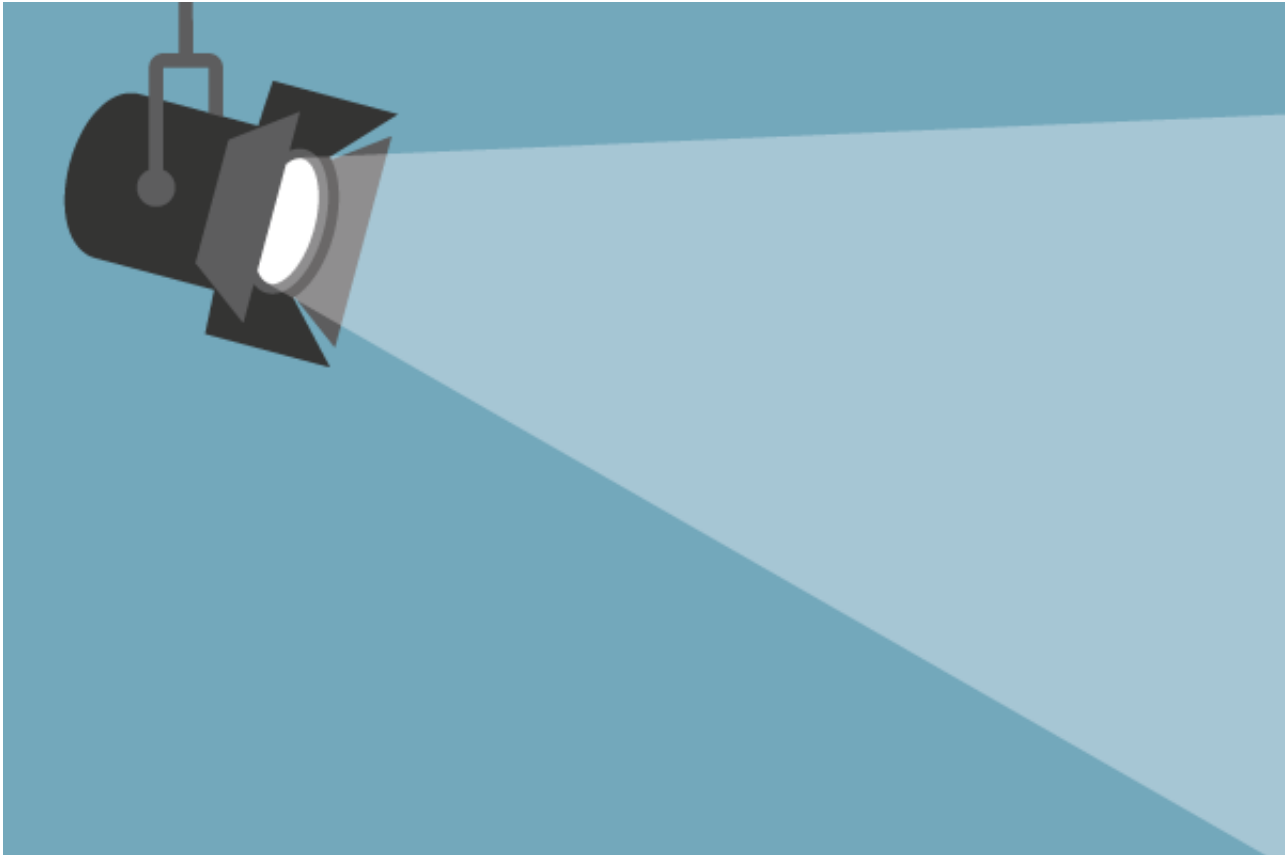


# Teaching: What the Nose Knows / Attentional Control

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Teaching *Current Directions in Psychological Science* offers advice and guidance about teaching a particular area of research or topic covered in this peer-reviewed APS bimonthly journal, which features reviews covering all of scientific psychology and its applications.

**Edited by C. Nathan DeWall**

[Teaching Students What the Nose Knows](#)

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## Teaching Students What the Nose Knows

*By C. Nathan DeWall, University of Kentucky*

[Hofer, M., Chen, F., & Schaller, M. \(2021\). What your nose knows: Affective, behavioral, and behavioral responses to the scent of another person. \*Current Directions in Psychological Science\*, 29\(6\), 617–623. <https://doi.org/10.1177/0963721420964175>](#)

## Do People Have to Pass Your “Smell Test”?

Our sense of smell evolved millennia ago, but Marlise Hofer, Frances Chen, and Mark Schaller show how olfactory cues influence today’s thinking, feeling, and acting. As teachers of psychology, we often need to show students the importance of using the scientific method. Sometimes seeking the truth means that we question our intuition. As in a quote often attributed to Mark Twain, “It ain’t what you don’t know that gets you into trouble. It’s what you know for sure that just ain’t so.”

Hofer uses the following demonstration to show how often people use their sense of smell to foster interpersonal closeness. First, she has students respond to the question below on a scale of 0 (never) to 7 (frequently):

### Student Activity: Does Your Nose Know Anything?

Ask students to imagine two humans living 200,000 years ago: Lucy and Loretta. In most respects, Lucy and Loretta are similar. But they differ in one crucial way: Lucy’s sense of smell is sophisticated; Loretta’s is simple. For example, Lucy can smell when other members of her tribe are fearful, which alerts her to threats. She can also smell when her group members are sick, signaling that she should keep her distance lest she catch their illness. Finally, Lucy is quick to recognize the scent of her romantic partner, which gives her a jolt of happiness.

Loretta’s nose works, but it doesn’t give her any sense of when others are fearful. Hence, Loretta is often the last person in her tribe to realize that a threat is near. Loretta also can’t use her sense of smell to know whether her companions are sick, which leads her to fall ill frequently. Loretta is also smell-blind to her romantic partner, which reduces her chances of reaping the same emotional boost Lucy experiences when she catches a whiff of her partner.

With a partner in person or in a virtual breakout room, ask students to discuss the following questions:

- Compared with Loretta, how might Lucy’s sense of smell help her survive? Try to list at least five ways that Lucy has a survival edge over Loretta. Be as specific as possible.
- Compared with Loretta, how might Lucy’s sense of smell help her successfully reproduce? Think broadly about finding a romantic partner, maintaining that relationship, and parenting children. Again, try to list five specific ways that Lucy has a reproductive edge over Loretta.

- How often have you intentionally smelled another person’s clothing to feel closer to him or her?  
Ask students to predict how a college student sample responded to the question.

- How often have you intentionally smelled another person’s clothing to feel closer to him or her?

With a partner in person or in a virtual breakout room, have students discuss their predictions. Finally, Hofer suggests showing students the actual results from one of her representative studies. Her graphs,

available with this article online, show the percentage of women and men who selected each option.

Overall, more than 9 in 10 students reported having used their sense of smell to feel closer to others. Instructors can discuss how the actual results differed from students' predictions. What do these results tell us about the importance of our sense of smell for fulfilling our need for positive and lasting relationships?

People pay attention to their appearance. They wash their hair, brush their teeth, and wear clothing that doesn't detract from their natural beauty. But, according to Hofer and colleagues, most people forget an aspect of their identity that affects how they relate to others and others relate to them: their smell.

All humans have a unique odor. Just as height and weight depend on the interaction of nature and nurture, odor reflects a complex interaction of our age, emotions, and genome (de Groot et al., 2007; Natsch & Emter, 2020). Our sense of smell helped our ancestors solve problems related to survival and reproduction.

When we are fearful, for example, our bodies emit an odor that lets others know we're frightened (de Groot & Smeets, 2017). Sniffing a scared person's shirt also causes others to feel anxious and less trusting (Quintana et al., 2019). Our sense of smell can alert us to a potential threat.

Our sense of smell also aids us in meeting the need to belong. Humans find comfort in the scent of their loved ones (McBurney et al., 2006). One study showed that women who smelled their romantic partner's shirt, compared with a stranger's shirt, were buffered from stressful reactions to giving a public speech (Hofer et al., 2018). Likewise, women experienced better sleep when their romantic partner's shirt was on their pillow (Hofer & Chen, 2020). These findings suggest that the sense of smell is intertwined with the need to belong, enabling people to reap the rewards of lowered stress and higher-quality sleep.

See "Secrets of the Senses" for more on the surprising ways sensory processes shape our reality.

So, the next time you find yourself wondering whether you should trust your nose, remember that it knows more than you might realize.

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## Attending to Attentional Control

By David G. Myers, Hope College

[Burgoyne, A. P., & Engle, R. W. \(2020\). Attention control: A cornerstone of higher-order cognition. \*Current Directions in Psychological Science\*, 29\(6\), 624–630. <https://doi.org/10.1177/0963721420969371>](#)

Ninety-nine hundredths or, possibly, nine hundred and ninety-nine thousandths of our activity is purely automatic and habitual,” surmised William James (1899, p. 65). As later research has confirmed, such is “the automaticity of everyday life” (Bargh, 1997). Yet, as Alexander Burgoyne and Randall Engle explain, the remaining 1 percent forms the foundation of our human cognitive abilities: our working memory, our fluid intelligence, and our capacity to break free of habit.

### Student Activity: Measuring Attention Control

To enable students to experience an attention-control test, Burgoyne and Engle have created an [online version of their antisaccade task](#). The stimuli are preceded by a simple instruction:

“You will see a flashing ‘=’ sign and a letter will appear on OPPOSITE sides of the screen. When you see the ‘=’ start to flash, you should look AWAY so that you can see the letter. You will then see a B, P, and R button. Your job is to click the button of the letter you saw.”

To further engage students, instructors might ask their students to think/pair/share about their own attention control. Possible questions include:

- Focus. Are you able to focus your attention for stretches of time, with minimal distraction, to enable creativity and achievement? Are there some contexts, such as playing sports or games, where you focus best? Why is that?

- **Distractions.** What distractions divert your attention? (Phones? Music with lyrics? What else?) Why do these distractions capture your attention?
- **Situational control.** What steps could help free you from attention stealing attractions, allowing you to focus your attention with less effort? Could you customize your environment to reduce unwanted distractions?
- **Vocations.** Do some professions require more attention control? What jobs demand the ability to maintain focus while ignoring distractions?
- **Downsides to attention focus.** Are there downsides to having strong attention control? Are there scenarios where distractions are adaptive? When might being lost in thought and oblivious to the environment cause problems?

The focusing power of our attention is familiar to psychology instructors. In demonstrations of “inattention blindness,” people whose attention is focused on a task have failed to notice a woman with an umbrella, a person in a gorilla suit, or a clown on a unicycle meandering through the scene in front of their eyes. Less well-known are other demonstrations of selective attention—and inattention:

- *Inattention deafness:* When people have a novel tune fed into one ear while they focus on repeating words fed into their other ear, they later are unable to identify what tune they heard—though they do tend to *like* the unperceived tune better than other, comparable novel tunes (Wilson, 1979).
- *Inattention numbness:* As pickpockets know, drawing people’s attention by bumping into them makes them less attentive to a hand slipped into their pocket. The phenomenon has been demonstrated in the laboratory, where people distracted by counting vibrations applied to one hand fail to notice an otherwise easily felt vibration applied to their other hand (Murphy & Dalton, 2018).
- *Inattention anosmia:* When people focus their attention on a cognitively demanding task, they become less likely to notice the scent of coffee beans (Forster & Spence, 2018).

Such inattention is a byproduct of attention control—also called “cognitive control,” “executive control,” or “executive attention”—which empowers us to pursue goals with minimal distraction. Attention control, note Burgoyne and Engle, enables us to keep information accessible in our working memory as well as to disengage from other, irrelevant information—a key component of fluid intelligence, the ability to solve novel problems and adapt to new situations. Small wonder, the researchers add, that working memory so strongly correlates with fluid intelligence: “They both require attention control.”

But how do psychologists measure a person’s capacity for attention control and assess its correlation with working memory capacity? One measure is the simple but “devilishly difficult” antisaccade task. Participants “must inhibit a reflexive response—don’t look at the bold, flickering asterisk—and instead, look in the opposite direction.” Evolution has primed us to look at things that move, which sometimes are things that are good to eat or that might eat us. So, it’s a challenge to voluntarily shift one’s eyes

and attention away from movement. But those who can do so tend to exhibit greater working memory, which predicts greater fluid intelligence. Fluidly solving problems requires not just engaging relevant information but also ignoring irrelevant diversions.

Burgoyne and Engle foresee a practical use for new attention-control measures. If these “can improve the prediction of real-world performance, they can increase job fit and training retention rates, capitalizing on individuals’ strengths.” Moreover, they could potentially do so without gender, cultural, or racial bias. For example, the researchers are currently studying whether attention control tests taken by pilots and air traffic controllers in training can predict individual differences in skill learning. So, stay tuned for answers to important questions: How reliable are today’s attention-control measures? How predictive are they for specific jobs? Even if they reduce gender and racial biases, might they privilege younger people?

*Feedback on this article? Email [apsobserver@psychologicalscience.org](mailto:apsobserver@psychologicalscience.org) or scroll down to comment.*

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