Teaching Current Directions in Psychological Science

October 30, 2015

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Aimed at integrating cutting-edge psychological science into the classroom, Teaching Current Directions in Psychological Science offers advice and how-to guidance about teaching a particular area of research or topic in psychological science that has been the focus of an article in the APS journal Current Directions in Psychological Science. Current Directions *is a peer-reviewed bimonthly journal featuring reviews by leading experts covering all of scientific psychology and its applications and allowing readers to stay apprised of important developments across subfields beyond their areas of expertise. Its articles are written to be accessible to nonexperts, making them ideally suited for use in the classroom.*

Visit the column for supplementary components, including classroom activities and demonstrations.

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Sniffing Out Information: How Odor Shapes Our World

By C. Nathan DeWall

Pazzaglia, M. (2015). Body and odors: Not just molecules, after all. *Current Directions in Psychological Science, 24*, 329–333.

It's easy to snub our sense of smell. Sometimes a foul odor steals our attention. But most of the time, life hums along without our paying attention to what we smell. In some ways, smell is the Cinderella of our senses. It never gets the attention it deserves. When we eat, we prioritize taste over smell in what we eat. Just ask people who eat stinky cheese or the Asian durian fruit — what is commonly called "garbage fruit" because of its stench. When we are on the prowl for a romantic partner, good looks trump good smells.

Yet according to Mariella Pazzaglia (2015), odor plays a major role in helping us navigate our environment. Imagine walking into a shop, ordering some food, and waiting for its delivery while you fix your attention on your smartphone. A specific odor wafts through the air. Your downward gaze does not budge, but the smell causes a chemical reaction. In the space of only a few milliseconds, your brain automatically alerts you that one of your younger female relatives is nearby (Mitro, Gordon, Olsson, &

Lundström, 2012). The major histocompatible gene, which helps us distinguish odors between kin and nonkin, makes this possible (Lundström, Boyle, Zatorre, & Jones-Gotman, 2008). The odor also lets you know that she feels sick (Olsson, Lundström, Kimball, Gordon, et al., 2014). All of this information is under your nose before you lay eyes on your sick niece.

Our sense of smell also influences how we approach potential partners. Because we can sniff out whether someone is our kin, we automatically seek out partners who are genetically dissimilar (Lundström, Boyle, Zatorre, & Jones-Gotman, 2009). Exposure to certain scents can shift the hormonal responses and judgments we use to find a mate. For example, men who smelled T-shirts worn by women at the peak of their fertility experienced a boost in their testosterone levels, which can spur courtship behavior (Miller & Maner, 2010). Likewise, exposure to certain smells — grapefruit, floral, and spice notes — can cause people to judge women as younger and thinner (Hirsch & Ye, 2008; Hirsch, Hoogeveen, Bussee, & Allen, 2007).

To bring this cutting-edge research into the classroom, instructors may use the following three short activities. Each activity is meant to motivate students to appreciate the power of smell in shaping our interactions.

Activity #1

On a PowerPoint slide, show students a list of the five basic senses:

- Sound
- Sight
- Touch
- Smell
- Taste

On a second PowerPoint slide, show students the senses and some possible processes or behaviors that certain senses may influence.

Senses

- Sound
- Sight
- Touch
- Smell
- Taste

Senses

- Sound
- Sight
- Touch
- Smell

- Taste

On a third PowerPoint slide, delete all senses except smell. Next, ask students to list which of the processes or behaviors are affected by the sense of smell.

Sense

- Smell

What Does It Influence?

- Detecting kin versus nonkin
- Knowing whether someone is sick
- Male testosterone levels
- Judgment of female age and weight
- Perceptions of fear and anger

Our sense of smell influences all of the listed outcomes. Ask students to discuss their choices. Did they initially focus on senses other than smell? Why? How did this activity change their perception of smell in their everyday lives?

Activity #2

Most students probably agree that each sense is important. But this activity encourages students to focus on which senses they believe outrank others, and why. On a PowerPoint slide or dry-erase board, list the five senses. Then, ask students to rank the importance of each sense in their daily lives (#1 through #5). Ask students to discuss with a partner why they made their decisions.

According to Pazzaglia (2015), few students will rank smell as their most important sense; vision should reign supreme. If so, ask students why smell was not ranked higher on their list. Remind students about the many processes that smell affects. Ask students if they would like to change their rankings. How did their rankings change, if at all? Why?

Activity #3

We often don’t know how much we need something until it is gone. In this activity, list the five senses and ask students to imagine a day in their lives without each sense. What are three ways in which the loss of a sense will affect our lives negatively? How might the loss of a sense improve our lives?

Instructors then can ask students to use their laptops or smartphones to research conditions in which people lose a certain sense either from birth or in response to an acute event. For example, people without a sense of smell have a condition known as *anosmia*. Do people with anosmia experience similar emotional, cognitive, or behavioral consequences as people whose other senses are impaired, and if so, how?

It is easy to denigrate smell as a second-class sense. We might say that something smells fishy, that an opponent stinks, or that loved ones would enjoy a better life if they stopped and smelled the roses. But we fail to grasp how our sense of smell helps organize and integrate information. This might happen because our nose incorporates sensory input so quickly. We might always prize sight and sound over smell, but at least now we will know that our noses do more work than we realize.

Rise to the Challenge: How to Enhance Your Concentration

By Cindi May and Gil Einstein

Sörqvist, P., & Marsh, J. E. (2015). How concentration shields against distraction. *Current Directions in Psychological Science, 24,* 267–272.

Air traffic controllers must maintain constant vigilance as they manage the flow of aircraft in and out of their sector, safeguarding against collisions and minimizing flight delays. These controllers cannot afford to be distracted. They must effectively block out external disturbances, like noises in the tower or text messages on their cell phones, as well as internal diversions, like daydreams or ruminations, in order to maintain aircraft safety.

How can we maximize concentration for air traffic controllers or other individuals who rely on sustained attention to execute critical work with precision (e.g., surgeons, construction workers, pharmacists, college professors)? Similarly, how can students in a college classroom maintain their focus on the lecture and ignore distractions from the hallway or thoughts about an upcoming date? Are there specific environmental conditions that promote concentration? Do some individuals naturally demonstrate greater powers of concentration than others?

As you consider these questions with your students, try this activity:

Take a passage from your psychology textbook and use it to create two PowerPoint slides. On one slide, show the passage in a clear, large, easy-to-read font. On the other slide, present the passage in a distorted, small, difficult-to-read font. Show your students the two versions and tell them that they will be assigned one of the two fonts. Their job will entail reading and remembering the text while ignoring distracting beeps that will sound at random (Google “censor beep sound effect” if you want a tone you can play repeatedly). Before starting, ask students which font will lead to better text comprehension and less distraction from the beeps: the easy-to-read font or the difficult-to-read font?

Odds are that students will predict better performance in the easy-to-read condition. In this case, they will be wrong. Studies by Sörqvist and colleagues demonstrate that external factors such as time pressure and task difficulty indeed affect concentration, but (perhaps surprisingly) greater challenge yields *better* concentration. For example, in studies using tasks like the reading demonstration above, people are less likely to process distracting information (e.g., respond to the beeps; Halin et al., 2014a, 2014b; Sörqvist, Stenfelt, & Rönnberg, 2012) and more likely to maintain performance on the task at hand (e.g., higher text comprehension; Halin et al., 2014a; Hughes et al., 2013) when the task is difficult or engaging than when the task is easy or dull. Sörqvist and colleagues argue that high task difficulty forces people to concentrate harder, thus allowing them to inhibit irrelevant information and succeed at

the central goal.

Next, ask students to consider whether there are individual differences in the ability to concentrate. Are some people naturally better at concentrating than others? If so, how would strong versus weak concentrators be affected by the easy versus difficult reading tasks? Ask students to predict on which task the strong concentrators would show the biggest advantage.

Students likely will predict the biggest advantage for strong concentrators on the most difficult task. Once again, however, they will be wrong. Studies show that there are in fact individual differences in concentration and that individuals who have a large working memory capacity, which is typically measured by a span task, tend to have heightened natural levels of concentration. Span tasks require people to store and simultaneously manipulate information — for example, remembering target words while solving math problems at the same time. People who score higher on the span task are less vulnerable to distraction — and more likely to maintain their desired level of performance — on a concentration test than their peers who score lower on the span task, but only if the concentration test is easy. Thus, on the easy font task, strong concentrators will outperform weak concentrators. However, more challenging test conditions seem to elicit better concentration among all individuals, thus raising low span performers to the level of high span performers (Halin et al., 2014b).

The findings from Sörqvist and colleagues raise some intriguing possibilities for application that can spark discussion with students: Should people be screened for their concentration abilities as part of the application process for jobs like air traffic controller? Can we use environmental adjustments to optimize concentration in flight towers, operating rooms, and factories? Could we create software that automatically alters task demands to reduce mind wandering and increase concentration for schoolchildren, truck drivers, or accountants? Do college lectures that use complex ideas and difficult concepts to challenge students produce better concentration and learning than do lectures that are entertaining and straightforward?

Students also might benefit from considering the limitations of the current research. Related studies show that when people try to read and remember text, or when they engage in other office-related tasks, the addition of background noise generally *impairs* performance relative to silence if the office tasks are easy (e.g., Bell, Buchner, & Mund, 2008; Sörqvist, Nöstl, & Halin, 2012). Thus, simply increasing the *overall difficulty* of a cognitive setting may not improve concentration; rather, Sörqvist and colleagues demonstrate that elevating the difficulty of the *target task* improves concentration and reduces distraction from background noise.

There also may be limits, however, to the benefits of increasing the difficulty of a target task. In the studies by Sörqvist, the target task was visual. Other studies have found that people tend to remember speech from clear recordings well but remember speech from unclear recordings poorly (e.g., Rabbitt, 1968). Similarly, people with hearing loss show poor memory for auditory information, even when they can accurately perceive the information (McCoy et al., 2005). McCoy and colleagues argued that when auditory tasks are extremely challenging, people devote extra resources to perceive the material, and that extra attention sacrificed to perception compromises rehearsal and memory of the information. It is not clear whether the differences in outcomes across the Sörqvist and McCoy studies are due to changes in modality (visual vs. auditory) or degree of difficulty. Students might design an experiment to answer that question.

Finally, it may be worthwhile to highlight for students the counterintuitive nature of some of the data from the concentration literature — specifically the fact that more difficult tasks tend to improve concentration and at the same time level the playing field for strong versus weak concentrators. These findings serve as an important reminder of the need for a reliance on empirical data, not intuition, when conducting psychological science. œ

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