Teaching Current Directions in Psychological Science

September 28, 2018

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.*

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How Psychological Science can Influence Climate-Change Attitudes and Actions

Individual Differences in Navigating

How Psychological Science Can Influence Climate-Change Attitudes and Actions

By David G. Myers

Van Lange, P. A. M., Joireman, J., & Milinski, M. (2018). Climate change: What psychology can offer in terms of insights and solutions. Current Directions in Psychological Science, 27, 269–274.

Climate change has arrived. In 2017, atmospheric greenhouse gases, global temperatures, and sea levels all reached record or near-record highs, while winter Arctic sea ice hit a record low (Blunden, Arndt, & Hartfield, 2018).

This global phenomenon is a weapon of mass destruction. Weird weather — scorching heat, hurricanes, floods — has always occurred, but extreme weather happenings are now "beyond the bounds of natural variability" (AMS, 2017; NAS, 2016a). Worldwide, such events have contributed to increasing

insurance losses from natural catastrophes, with 2017 setting a record in the number of more-than-billion-dollar weather-related US disasters (III, 2017; NCDC, 2017). Global warming also makes heat waves,

droughts, wildfires, hurricanes, and floods more intense (NAS, 2016b). To deny climate change is to deny reality.

Climate change also portends psychological consequences:

- *Displacement and trauma.* If this century's predicted 2° to 4° Celsius increase occurs, we can expect drastic change that will force massive resettlement (de Sherbinin et al., 2011). Nathaniel Rich (2018) offers the prognosis:

If by some miracle we are able to limit warming to two degrees, we will only have to negotiate the extinction of the world's tropical reefs, sea-level rise of several meters and the abandonment of the Persian Gulf … Three-degree warming is a prescription for short-term disaster: forests in the Arctic and the loss of most coastal cities … Four degrees: Europe in permanent drought; vast areas of China, India, and Bangladesh claimed by desert; Polynesia swallowed by the sea; the Colorado River thinned to a trickle; the American Southwest largely uninhabitable.

When floods, drought, or wildfires force people to leave their homes and work, the common result is increased poverty and hunger, loss of cultural identity, and earlier death. For psychological health, climate matters in the following (and other) ways:

- *Conflict*. Much human misery — from financial recessions to wars — has arisen from climate fluctuations (Zhang et al., 2011). When climate changes, agriculture suffers and famine and epidemics increase, leading to increased domestic violence, ethnic aggression, land invasions, and civil conflicts (Hsiang, Burke, & Miguel, 2013). For social stability, climate matters.
- *Aggression*. In laboratory and field studies, heat amplifies short-term aggressive behavior. Hot days predict increased neighborhood violence and baseball batters hit by pitchers. Hot seasons, years, and cities experience greater violence than their cooler counterparts (Anderson & Delisi, 2011; Van Lange, Rinderu, & Bushman, 2017). For relationships, climate matters.

Given that climate change arises from human behavior, Paul Van Lange, Jeff Joireman, and Manfred Milinski ask:

What can psychological science (and our teaching) offer?

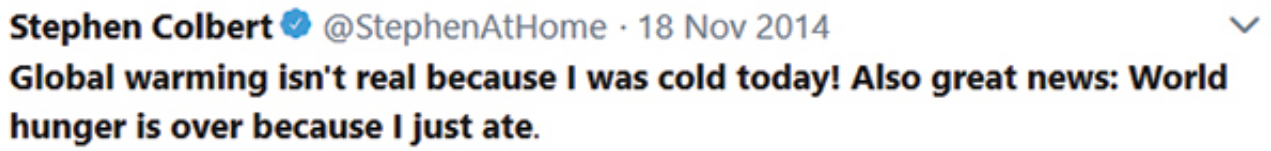
Climate change, they note, pits

- *self-interests against collective interests* (a social conflict between the personal benefits and communal costs of, for example, one's gas-slurping SUV), and
- *short-term versus future interests* (a temporal conflict between the immediate benefits of consumption and its consequences for future generations).

To respond to these social dilemmas, the authors ask, how can psychological science promote belief in climate change as well as an intergroup and longer-term perspective on the issue?

Reversing climate skepticism. How can we close the troubling gap between scientific and public acceptance of human-caused climate change — with 99.9% of 24,210 climate-science articles, but only

62% of the US public, acknowledging climate change (Powell, 2015; Saad, 2017)? One biasing influence on public understanding is people's recent, local weather experiences. A winter blizzard, being cognitively available, dampens belief in global warming, which rises again with the advent of a blistering heat wave. To help students appreciate the distinction between local weather variations and global climate, a Stephen Colbert tweet might help:



Van Lange et al. also recommend persuading people with factual, concrete, locally relevant climate implications. Talk flooding risks to those in flood-prone and coastal areas and heat and agricultural risks to those in hotter climates. And we might add to persuade people by connecting with their values — discuss climate-change effects on the poor to Democrats and on national security to Republicans.

Promoting intergroup cooperation. Nations vary in their population density, wealth, and pollution. And nations (especially their competing representatives) often distrust one another. In addition to suggesting the seeking of superordinate, cooperative goals, Van Lange et al. encourage a competitive altruism, whereby cities or nations compete for prosocial reputations. Public rankings and "cleanest city" awards can harness intergroup competition for positive purposes.

During its recent water crisis, Cape Town, South Africa, put this reputational principle to work at an individual level with an online "City Water Map" that revealed (with a colored dot) whether individual households' water usage was within the water-restriction limit. The effort aimed not to "name and shame," but rather "to publicize households that are saving water and to motivate others to do the same" (Myers, 2018; Olivier, 2018).

Transcending borders of time. To promote long-term thinking, Van Lange et al. recommend focusing on the children who will live in the future climate (kinship fosters cooperation). Intergenerational fairness norms and the benefits of delayed gratification also can be invoked.

For class discussion. To prepare for discussion, students might be given a survey (ideally with anonymous Yes/No clicker responses) asking them what they understand about climate change. Is it happening? If so, are humans responsible?

Given the seriousness of climate change, students might then be asked to discuss, in small groups assigned aspects of the Van Lange article or as a class:

- Why does public opinion lag behind scientific understanding?
- How can people be helped to discount temporary, local weather — the cold day — when assessing global climate trends? Might there be useful metaphors or analogies (we judge a softball or baseball batter by batting average, not the last swing of the bat)?
- In addition to a "cleanest city award," might there be other similar ways mayors or corporate CEOs could be persuaded by reputational concerns?

- How might we frame climate advocacy effectively — by describing the greenhouse effect as a "heat-trapping blanket" and a carbon tax as "carbon offsets"?
- How can we most effectively focus people's concerns on their children's and grandchildren's future on the spaceship Earth? (Can such future concern be engaged for those without children?)

Individual Differences in Navigating

By Gil Einstein and Cindi May

Weisberg, S. M., & Newcombe, N. S. (2018). Cognitive maps: Some people make them, some people struggle. Current Directions in Psychological Science, 27, 220–226.

Efficient navigation through our environments is critical for survival. Animals rely on navigational skills for obtaining food and water, avoiding predators, and finding shelter. For humans, taking the long route wastes time and getting lost can lead to dangerous outcomes.

How do we navigate our environments? Ever since Tolman's (1948) classic research, many have argued that humans (and other animals) find their way by using cognitive maps. Cognitive maps are mental representations of environments that capture the spatial relations among locations. Thus, with a cognitive map, a person can find an efficient path between locations that have not been experienced directly. Others have argued that we do not form map-like representations of our environments and instead rely on less flexible, response-based strategies (e.g., to get from my house to the grocery store, I take the first right and then make a left at the coffee shop).

Which of these views is correct? According to Steven Weisberg and Nora Newcombe (2018), both. Specifically, they present strong evidence that some people form cognitive maps and others do not, and that those who do so are more successful at navigating their worlds.

Earlier methods of studying navigation skills involved driving people through unfamiliar neighborhoods and then testing their senses of direction. Weisberg and Newcombe describe a recent and more convenient technique that involves having participants learn locations and routes in a virtual town (e.g., Schinazi, Nardi, Newcombe, Shipley, & Epstein, 2013). Participants first travel along the roads of one part of the town and learn the names and locations of four buildings along that path. They then travel through a different part of the town, learning the names and locations of four different buildings. Next, participants travel two routes that connect the two parts of town. The interest in this research is the extent to which participants can (1) form a good spatial representation of each part of town and (2) spatially integrate the representations from each part of town into a holistic cognitive map. At test, participants are placed in front of one of the buildings and asked to point in the direction of a target building, which is sometimes located in that part of town and sometimes in a different part of town. Researchers gauge the quality of participants' cognitive maps by the discrepancy between the pointed direction and the actual direction in which the building is located.

Across a number of studies, Weisberg and Newcombe (2016) found substantial individual differences in the quality of participants' representations. Some participants were *integrators* who formed good cognitive maps that accurately represented the entire town. Others were *nonintegrators* who had good

spatial judgments within each part of town but not between the different parts of town. Still others were *imprecise navigators* who had poor spatial judgments even within each section of town. In other words, some people seem to form high-quality cognitive maps, whereas others have great difficulty spatially representing the routes and locations within their environments.

Performance on this virtual-world task seems to capture real-world navigation skills. Poor performance on this task is strongly correlated with high ratings on items from the Santa Barbara Sense-of-Direction Scale (Hegarty, Richardson, Montello, Lovelace, & Subbash, 2002), such as “I very easily get lost in a new city” and “I have trouble understanding directions” (Weisberg, Schinazi, Newcombe, Shipley, & Epstein, 2014).

To help students appreciate individual differences in the ability to form cognitive maps, try the following demonstration. Prepare by getting a map of your campus and identifying a few buildings that students are likely to travel to directly from your classroom as well as a few more remote buildings from different parts of campus. In class, ask students to close their eyes, then give them the name of a building and ask them to point in its direction. Then have students open their eyes and compare their pointed direction with those of their classmates and to the actual direction on a map that you project to the class. Try this with all of the buildings. This demonstration should reveal substantial individual differences. Whereas integrators should have good spatial representation for all locations, nonintegrators should have difficulty with the more remote locations, and imprecise navigators should struggle with all locations. You might ask students to indicate whether they would identify themselves as integrators, nonintegrators, or imprecise navigators. You might also ask them to report whether they relied on a cognitive map or some other strategy for their judgments.

For discussion, you can ask students to consider variables that are correlated with navigation abilities. Navigation skills are not highly related to general intelligence, but integrators outperform imprecise navigators on perspective taking (the ability to imagine different orientations in a scene from different perspectives; Hegarty & Waller, 2004), mental rotation (the ability to mentally rotate three-dimensional objects), and verbal and spatial working memory (the ability to hold items or locations in mind in the face of distraction). These basic processes may underlie the ability to form accurate cognitive maps of complex environments.

Professors might also ask students to think about whether the widespread use of GPS systems such as Google Maps affects our ability or willingness to form cognitive maps (Ishikawa, Fujiwara, Imai, & Okabe, 2008). You could also query your students to determine whether there are individual differences in how they use navigation apps. Imprecise navigators may simply rely on step-by-step directions, whereas integrators may first zoom out in an effort to form a cognitive map of their path. In a few years, driverless cars will take us to our destinations. In the future, will we all be imprecise navigators?

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