Teaching Current Directions in Psychological Science

Cindi May, Gil Einstein, and David G. Myers

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.*

Conservatives, Liberals, and the Distrust of Science

by David G. Myers

Lewandowsky, S., & Oberauer, K. (2016). Motivated rejection of science. *Current Directions in Psychological Science, 25*, 217–222.

On many issues, a gulf exists between what the public believes and what scientists have concluded. Is it safe to eat genetically modified (GM) foods? *Yes*, say 37% of US adults and 88% of 3,447 American Association for the Advancement of Science (AAAS) members (both surveyed by the Pew Research Center; Funk & Rainie, 2015).

Is climate change "mostly due to human activity"? *Yes*, say 50% of US adults and 87% of AAAS members, not to mention 97% of climate experts (Cook et al., 2016).

The public-opinion-versus-science divergence continues: Have humans evolved over time? Are childhood vaccines such as the measles, mumps, and rubella (MMR) vaccine safe? Is it safe to eat food grown with pesticides? (*Yes*, *yes*, and *yes*, say most scientists, but *no*, *no*, and *no*, says much of the public.)

What gives? What drives the widespread rejection of scientific findings?

In some instances, note Stephan Lewandowsky and Klaus Oberauer (2016), the public is simply misinformed. A fraudulent but widely publicized report of a link between the MMR vaccine and autism led to a drop in MMR vaccinations and an increase in measles and mumps (Poland & Jacobson, 2011). People may doubt climate change based on the weather they are currently experiencing plus a lack of education about greenhouse gases, rising global temperatures, retreating glaciers, increasing extreme weather, and rising seas — albeit all with imperceptible gradualness. (Some misinformation, Lewandowsky and Oberauer remind us, is funded by corporate interests, as when the tobacco industry worked to counter smoking research.)

In many other instances, contend Lewandowsky and Oberauer, "scientific findings are rejected … because the science is in conflict with people's worldviews, or political or religious opinions" (p. 217). A libertarian who prizes the unregulated free market will be motivated to discount evidence that government regulations serve the common good — that gun control saves lives, that livable minimum wages and social security support human flourishing, that future generations need climate-protecting regulations. A liberal may be similarly motivated to discount science pertaining to the toxicity of teen pornography exposure, the benefits of marriage versus personal freedom, or the innovations incentivized by the free market. Partisans on both sides may, thanks to the ever-present confirmation bias, selectively attend to data and voices that confirm their preexisting views.

Voices from the right and left both may dismiss scientific expertise, but on different issues:

- From some on the right: "Global warming is an expensive hoax!" (Donald Trump, 2014).
- From some on the left: GM foods "should not be released into the environment" (Greenpeace International, n.d.).

To explore this association of political views with acceptance of scientific conclusions, instructors can (a) mine survey data and (b) conduct a simple class experiment.

The National Opinion Research Center at the University of Chicago makes data from its periodic General Social Survey of adult Americans easily available. Visit this site and note that a click on the "search" box at the top will enable you or your students to search for variables of interest (as I did by entering the words "climate," "gun," "nuclear," and "genetically modified"). Then, as a class demonstration or out-of-class exercise, you can investigate the following:

1. **Political views and climate-change concerns.** Enter "tempgen1" in the row box. Enter "polviews" in the column box. Click "run table" and you will see that "temperature rise from climate change" is a big concern for liberals, but not for conservatives. (To see the complete question text, click on "output options" before running the table.)
2. **Political views and gun safety.** Repeat the exercise, this time with "gunlaw" or "gunsales" in the row box.
3. **Political views and nuclear energy as dangerous.** Enter "nukegen" in the row box.
4. **Political views and GM foods.** Enter "eatGM" in the row box — and note that, unlike in the three previous analyses, there is actually, in this sample, little association between political views and attitudes toward GM foods.

Lewandowsky and Oberauer also report on an experiment by Dan M. Kahan, APS Fellow Ellen M. Peters, Erica C. Dawson, and APS Fellow Paul Slovic (2013) that lends itself to a class replication. Show half the students the data on the left side of Figure 1 (see next page), from a hypothetical study of the outcomes in various cities of banning or not banning concealed handguns.

Ask each student: What result does the study support? Compared with cities without handgun bans, did cities that enacted a concealed handgun ban fare (a) better or (b) worse?

Then ask students whether they would describe themselves as tending to be generally more conservative or liberal.

Note that in the data on the left, the ban yielded a 3-to-1 increase versus decrease in crime, compared with a 5-to-1 increase without the ban (thus the ban was effective). Shown these data, most liberals recognized the result … but failed to draw the parallel conclusion (e.g., that the ban

was *in*effective) if shown the mirror-image data on the right. Conservative interpretations were reversed. Are your students', too?

	Results		Results	
	Increase in crime	Decrease in crime	Decrease in crime	Increase in crime
Cities that banned guns	223	75	223	75
Cities that did *not* ban guns	107	21	107	21

Fig. 1. Synthetic data used as stimuli in an experiment by Kahan, Peters, Dawson, and Slovic (2013). See text for details.

Given that people's personal biases filter the science they accept, how can we increase critical thinking, science literacy, and acceptance of evidence? In the case of climate change, we might

- relate the evidence to people's preexisting values (e.g., clean energy boosts national security by reducing dependence on foreign oil);
- connect the topic with local concerns (e.g., the threat of drought matters to Texans, Californians, and Australians; the risk of flooding affects Floridians and the Dutch);
- frame the issues positively (e.g., "carbon offsets" are more palatable than "carbon taxes"; reducing carbon emissions is healthy, regardless of how a person feels about climate change); and
- make communications credible and memorable (e.g., use credible communicators, including conservative messengers to conservatives; underscore the broad-based scientific consensus; show climate-change doubters pictures of rising seas and extreme weather).

Distrust of science runs high among some who are religiously conservative (Pew, 2007). To increase enthusiasm for science among such students, I remind students of religion's support for the founding of science, which was rooted in a spirit of humility that recognizes human fallibility. In that spirit, I suggest, let us welcome whatever insights science has to offer. As St. Paul advised, "Test everything; hold fast to what is good."

References

Andrews, J. J., & Rapp, D. N. (2014). Partner characteristics and social contagion: Does group composition matter? *Applied Cognitive Psychology, 28*, 505–517.

Appel, M., & Richter, T. (2007). Persuasive effects of fictional narratives increase over time. *Media Psychology, 10*, 113–134.

Benjamin, A. S., Bjork, R. A., & Schwartz, B. L. (1998). The mismeasure of memory: When retrieval fluency is misleading as a metamnemonic index. *Journal of Experimental Psychology: General, 127*, 55–68.

Cook, J., Oreskes, N., Doran, P., Anderegg, W., Verheggen, B., Maibach, E., … Rice, K. (2016). Consensus on consensus: A synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters, 11*, 048002.

Eslick, A. N., Fazio, L. K., & Marsh, E. J. (2011). Ironic effects of drawing attention to story errors. *Memory, 19*, 184–191.

Fazio, L. K., Barber, S. J., Rajaram, S., Ornstein, P. A., & Marsh, E. J. (2013). Creating illusions of knowledge: Learning errors that contradict prior knowledge. *Journal of Experimental Psychology: General, 142*, 1–5.

Fazio, L. K., & Marsh, E. J. (2008). Slowing presentation speed increases illusions of knowledge. *Psychonomic Bulletin & Review, 15*, 180–185.

Funk, C., & Rainie, L. (2015). *Chapter 3: Attitudes and beliefs on science and technology topics*. In "Public and Scientists' Views on Science and Society," Pew Research Center. Retrieved from http://www.pewinternet.org/2015/01/29/chapter-3-attitudes-and-beliefs-on-science-and-technology-topics/

Greenpeace International. (n.d.). Genetic engineering. Retrieved from http://www.greenpeace.org/international/en/campaigns/agriculture/problem/genetic-engineering/

Hinze, S. R., Slaten, D. G., Horton, W. S., Jenkins, R., & Rapp, D. N. (2014). Pilgrims sailing the Titanic: Plausibility effects on memory for facts and errors. *Memory & Cognition, 42*, 305–324.

Jacovina, M. E., Hinze, S. R., & Rapp, D. N. (2014). Fool me twice: The consequences of reading (and rereading) inaccurate information. *Applied Cognitive Psychology, 28*, 558–568.

Kahan, D. M., Peters, E., Dawson, E. C., & Slovic, P. (2013). Motivated numeracy and enlightened self-government (Tech. Rep. No. 307). Yale Law School, Public Law Working Paper No. 307.

Marsh, E. J., Meade, M. L., & Roediger, H. L. (2003). Learning facts from fiction. *Journal of Memory and Language, 49*, 519–536.

Pew Research Center (2007, December 18). Science in America: Religious belief and public attitudes. Retrieved from www.pewforum.org/2007/12/18/science-in-america-religious-belief-and-public-attitudes

Poland, G. A., & Jacobson, R. M. (2011). The age-old struggle against the antivaccinationists. *New England Journal of Medicine, 364*, 97–99.

Rapp, D. N. (2008). How do readers handle incorrect information during reading? *Memory & Cognition, 36*, 688–701.

Rapp, D. N., & Braasch, J. L. G. (Eds.). (2014). *Processing inaccurate information: Theoretical and applied perspectives from cognitive science and the educational sciences*. Cambridge, MA: MIT Press.

Rapp, D. N., Hinze, S. R., Kohlhepp, K., & Ryskin, R. A. (2014). Reducing reliance on inaccurate information. *Memory & Cognition, 42*, 11–26.

Rapp, D. N., Hinze, S. R., Slaten, D. G., & Horton, W. S. (2014). Amazing stories: Acquiring and avoiding inaccurate information from fiction. *Discourse Processes, 1–2*, 50–74.

Singer, M. (2013). Validation in reading comprehension. *Current Directions in Psychological Science, 22*, 361–366.

Sparks, J. R., & Rapp, D. N. (2011). Readers' reliance on source credibility in the service of interference generation. *Journal of Experimental Psychology: Learning, Memory, & Cognition, 37*, 230–247.

Trump, D. J. [realDonaldTrump]. (2014, Jan. 28). Snowing in Texas and Louisiana, record setting freezing temperatures throughout the country and beyond. Global warming is an expensive hoax! [Tweet]. Retrieved from https://twitter.com/realDonaldTrump/status/428414113463955457

October 31, 2016