Teaching Current Directions in Psychological Science

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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.*

Simulating Cultural Evolution

by David G. Myers

Caldwell, C. A., Atkinson, M., & Renner, E. (2016). Experimental approaches to studying cumulative cultural evolution. *Current Directions in Psychological Science, 25*, 191–195.

Imagine yourself as Rip Van Winkle, falling asleep in the year of Chaucer's death (1400) and awakening today, 20 generations later. You and those around you would, in many ways, be leaves of one tree. Thanks to your similar brains, you would similarly experience the world, sense thirst, prefer sweet to sour, learn and remember, require sleep, read smiles, and need to belong.

But how you would differ. You would have great difficulty understanding your neighbors' language, and your mind would be boggled by their motorized transportation, climate-controlled housing, year-round fruits and veggies, smartphones, Internet dating, online shopping, and Post-it notes.

Across time and place, we humans are all kin beneath the skin. Yet with remarkable speed, our cultures evolve and diverge. As APS William James Fellow Roy F. Baumeister (2005, p. 29) explained in *The Cultural Animal: Human Nature, Meaning, and Social Life*, "Evolution made us for culture."

Animals display the basics of cultural evolution. Chimpanzees have developed and transmitted local customs of tool use, grooming, and courtship — one group breaking nuts with a stone hammer, another with a wood hammer. In the laboratory, if Chimpanzee B observes and learns Chimpanzee A's solution for obtaining food, that technique will then be picked up by Chimpanzee C observing B, and so on (Horner, Whiten, Flynn, & de Waal, 2006). Nonetheless, chimp life today — even in chimp cultures with new and improved feeding techniques — is pretty much what chimp life was in Chaucer's time. Earth is not the Planet of the Apes.

Humans, by contrast, exhibit "cumulative cultural evolution," note Christine A. Caldwell, Mark Atkinson, and Elizabeth Renner (2016). Thanks to a "ratchet effect," useful innovations get

preserved and built upon across successive generations with little backward slippage. The wheel becomes the spoked wheel, which leads to the pulley. Humans uniquely harness this power of culture, which gives us rich language, money for commerce, indoor plumbing, antibiotics, air travel, and Google. Culture — the shared behaviors, ideas, and traditions that humans transmit across generations — is what's special about our species.

Bottling Cumulative Cultural Evolution in the Laboratory — and the Classroom

Much as a wind tunnel creates a small-world environment for exploring real-world aerodynamics, so Caldwell and her colleagues have created laboratory-based cumulative microcultures. Individuals engage in novel tasks and are observed by other individuals who, in turn, are observed by others. The task might involve making a paper airplane and then measuring its flight distance, or constructing a tower out of raw spaghetti and a small amount of modeling clay. The result is typically the ratchet effect, with later generations of learners tending to outperform their microsociety ancestors. To take the two examples above:

Making planes: To replicate a cumulative culture experiment, instructors could (if an at-least-10-meter-long room is available) ask students to take turns making a paper airplane, with their goal being to maximize flight distance (as measured with tape on the floor). Create groups of six or more students, randomly assigning each group member to a position in the maker–observer chain. The first and second student in each chain become, respectively, maker and observer. The plane maker receives a single sheet of standard paper and is seated at a work station and given up to 5 minutes to fold a plane while the observer watches. When finished, the makers are given three flight tests and then write on their plane its longest traveled distance along with their number in the chain. Next, the observer becomes the plane maker, while the third group member becomes the observer. Each successive observer thus can see the prior planes and distances and observe the new one being created and flown, the question being: Averaging across groups, is there some tendency (as in the Caldwell et al. experiments) for later planes to have longer flights?

Building towers: Given a smaller room, instructors could invite students similarly to take turns making and observing a tower built from a standard (e.g., 500 gram) packet of spaghetti and 200 grams of modeling clay. The challenge is to build the tower as tall as possible, given a time limit (e.g., 5 minutes or less). To simplify the task, a small group could take turns at the tower building as the other group members observe, then take a turn as a group themselves. The question: Are the towers built later taller than the towers built first? The task is harder than it sounds (requiring thicker-than-expected spaghetti bunches at the base), which enables observers to learn from the trials and errors of those before them.

To conclude the discussion of cultural evolution, students also might be invited to write about and then discuss their answers to two macro questions: To what extent does cultural evolution over time lead to a better world? For example, in what ways is the world today a better or worse place than it was 100 years ago?

Students will surely offer examples of both "the good old days" before nuclear weapons, climate change, terrorist bombs, and Internet-fed polarization — the days when small-town and rural communal life was marked by social trust and mutual support, when AIDS was unknown and obesity rare, and when people needn't lock their doors. Even so, how many would rather live in that time — when labor was often harder, travel was slow, information was sparse, comforts were fewer, and life was shorter? Cultural evolution also can amplify social differences. But on balance, concludes Baumeister, culture makes "life progressively better for ourselves, our children, and those who come after" (p. 392). Indeed, as Caldwell and her coworkers illustrate, culture can ratchet us forward over time.

Do your students agree?

APS William James Fellow Steven A. Pinker (2016) does. In the book *Scientists Making a Difference: One Hundred Eminent Behavioral and Brain Scientists Talk About Their Most Important Contributions*, edited by APS James McKeen Cattell Fellow and APS William James Fellow Robert J. Sternberg, Past APS President Susan T. Fiske, and APS Fellow Donald J. Foss, Pinker concludes that "the historical decline of violence is just one part of a quantifiable improvement in the human condition. At the same time that our lives are becoming more peaceful, they are also becoming longer, healthier, richer, and smarter. In an age of dire predictions and gruesome headlines, it is the greatest story seldom told."

References

Baumeister, R. (2005). *The cultural animal: Human nature, meaning, and social life*. New York, NY: Oxford University Press.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100*, 204–232.

Eagly, A. H., Ashmore, R. D., Makhijani, M. G., & Longo, L. C. (1991). What is beautiful is good, but…: A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin, 110*, 109–128.

Eastwick, P. W., & Buck, A. A. (2014). Too much matching: A social relations model enhancement of the pairing game. *Teaching of Psychology, 41*, 246–250.

Eastwick, P. W., Keneski, E., Morgan, T. A., & McDonald, M. A. (2016). *What do short-term and long-term relationships look like? Insights from the Relationship Coordination and Strategic Timing (ReCAST) model*. Unpublished manuscript, The University of Texas at Austin, Austin, Texas.

Ellis, B. J., & Kelley, H. H. (1999). The Pairing Game: A classroom demonstration of the matching phenomenon. *Teaching of Psychology, 26*, 118–121.

Horner, V., Whiten, A., Flynn, E., & de Waal, F. B. M. (2006). Faithful replication of foraging techniques along cultural transmission chains by chimpanzees and children. *Proceedings of the National Academy of Sciences, USA, 103*, 13878–13883.

Pinker, S. (2016). The science of our better angels. In R. J. Sternberg, S. T. Fiske, & D. J. Foss (Eds.), *Scientists making a difference: One hundred eminent behavioral and brain scientists talk about their most important contributions* (pp. 409–412). New York: Cambridge University Press.

Shackelford, T. K., & Buss, D. M. (1997). Marital satisfaction in evolutionary psychological perspective. In R. J. Sternberg & M. Hojjat (Eds.), *Satisfaction in close relationships* (pp. 7–25). New York, NY: Guilford.

Simpson, J. A., Fletcher, G. J. O., & Campbell, L. (2001). The structure and function of ideal standards in close relationships. In G. J. O. Fletcher & M. S. Clark (Eds.), B*lackwell handbook of social psychology: Interpersonal processes* (pp. 86–106). Malden, MA: Blackwell Publishers.

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