



Professor of Psychology Benjamin Le's new course "Open Science and Inclusive Psychology" is one of the nation's only undergraduate courses of its kind.

Free for All

Open Science endorses accessibility, inclusion, and a healthy dose of skepticism.

Social psychologist Amy Cuddy's 2012 presentation about "power posing" is the second most popular TED Talk of all time, with more than 52 million views to date. Citing research she published in 2010, Cuddy outlines in the talk how assuming an expansive posture—legs apart and hands on hips, for instance—can prime a person for success by optimizing hormone levels to increase confidence and reduce anxiety.

Cuddy's groundbreaking findings made her a media sensation, but not for long. The problem? Subsequent experiments failed to reproduce her results.

Power posing's downfall typifies the scientific replication crisis, an ongoing phenomenon in which vigorous retesting has debunked many classic and influential research findings, primarily in the social sciences. Psychology Professor Benjamin Le uses the trend to illustrate the need for fieldwide reform

in his "Open Science and Inclusive Psychology" course. Introduced in the spring semester, it's one of the nation's only undergraduate courses of its kind.

The open science movement promotes transparency throughout the scientific process, from a study's conception to conclusion. This involves researchers sharing their predictions, methods, materials, data, and statistical analyses in real time and publishes making literature free for anyone to

read—rarities in any branch of science.

“When science is done in isolation and put behind a paywall, it’s hard to see the decisions researchers made along the way that could have impacted their outcomes,” says Le, who came to Haverford on a “pre-doc” fellowship in 2001, two years before completing his Ph.D. in social psychology at Purdue University.

“It seems that in the past, if people ran 20 studies and 19 didn’t work, they were only publishing the one that did, often when they advertently or inadvertently did things that tipped them toward significant findings. Unfortunately, these false positives are the findings we’ve been relying on for decades,” he says.

An expert on commitment in close relationships, Le co-edited the 2011 book *The Science of Relationships: Answers to Your Questions About Dating, Marriage, and Family*, joining a dozen other contributors to tackle 40 common questions such as “What’s the best way to meet someone?” and “Why do people cheat?” The book inspired a website, scienceofrelationships.com, where he and his peers analyzed research findings—in a way applying open science themselves by writing about studies in a form the general public could understand. (Last year, Le and his colleagues transferred ownership of the site to another group, which renamed it *luvze.com*.)

Le recently put his relationship research on hold to focus on his “love of science in general and efforts to increase the robustness of science in all areas.” Describing his new course as “what I learned on Twitter during my sabbatical,” he notes that the open science community materialized on that social networking platform. He devoted time away from campus during the 2017-18 academic year to doing a deep dive into the open science movement, writing a comprehen-

sive open science manual for students and deciding that the topic needed to be part of his department’s curriculum—although the course’s relevance spans many fields, and the 16 students enrolled in its first iteration ranged from first-years to seniors representing many different majors.

Le kicked things off by having students examine various psychological tenets that have lost clout for not replicating, like power posing and “ego depletion,” the idea that people have

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a finite amount of willpower that gets exhausted over time. He also exposed the widespread p-hacking (manipulation of data to produce a desired probability value) that has long plagued psychology.

“Basically, my goal early in the semester was to get students frustrated by how many rewards there are for gaming the system,” Le says.

And he succeeded. **Maria Padron ’19** says Le’s course drastically changed the way she looks at science.

“I always assumed if something was in a textbook, it was right,” she says. “If you love psychology, it’s pretty upsetting to learn that you have to rethink everything you’ve been taught. But the skepticism

is healthy—now that we realize there’s a problem, we can work on fixing it.”

That’s what the second half of the course entailed: devising solutions, many of which involve open-science practices that improve transparency and reproducibility. One of those is pre-registration, or posting explicit details about a planned study—including hypotheses—in a time-stamped file in an online repository before beginning to collect data. This curbs selective reporting later on.

Another solution involves changing the academic publishing incentive system, as psychology major Caroline Aronowitz ’20 explains.

“We talked about how much pressure researchers are under to publish, and how they know that will only happen if their findings are significant—which can influence how they do their research and lead to bad science,” Aronowitz says. “When researchers don’t get a significant result, they stick it in a file drawer and forget about it, even though their work still affects science overall.”

Le also pulled “inclusive psychology” into the course, addressing long-standing biases that limit diversity in the sciences. For example, in the field of psychology women fall far behind their male counterparts in holding tenured university faculty positions and departmental leadership roles—discrepancies that are magnified when it comes to ethnic and racial minorities.

“Open science is not just about having methods and data and publications open to everyone, but also considering who participates in science,” Le says. “We’re interested in opening the doors of science to everybody, because more diverse perspectives among scientists produce more creative and impactful research ideas and findings.”

—Karen Brooks