

By Jim Austin

# Reviewing the reviewers

**A**nna Kaatz was working on a Ph.D. in comparative literature, studying old medical texts and public health codes, when her major professor was jailed and fired for sending sexually explicit material to a detective posing as a minor. Forced to abandon the project, Kaatz found her way to the then-new school of public health at the University of Wisconsin (UW), Madison, and to Molly Carnes, who, in addition to working as a geriatrician, holds faculty appointments in three UW Madison departments and heads UW's Center for Women's Health Research.

On the very day Kaatz arrived at her door, wielding expertise in comparative literature and linguistics, Carnes had decided to analyze the language in critiques of grant proposals from the National Institutes of Health (NIH). It was the kind of serendipitous moment that can make a career.

For her new Ph.D. project, Kaatz and collaborators subjected 454 critiques of 158 R01 grant proposals, all from UW Madison faculty, to quantitative linguistic scrutiny. Using a text-analysis program called LIWC, short for "Linguistic Inquiry and Word Count," they counted words from particular linguistic classes: "ability" words, "achievement" words, "agentive" words, "standout" words, and positive and negative evaluation words. They made comparisons across categories of proposals and proposers: successful and unsuccessful, men and women, established and new.

On 19 August, the results of the study were posted as an ahead-of-print paper at the website of the journal *Academic Medicine*. Some of the findings are what you would expect: Successful proposals had better linguistic scores than unsuccessful proposals. New-investigator proposals attracted fewer positive words and more negative words than proposals from experienced investigators.

The comparisons of female and male applicants were much more interesting. In head-to-head linguistic comparisons, women consistently outscored men, and some of the differences were large.

"This is intriguing," Monica Biernat, associate chair of psychology at the University of Kansas, Lawrence, who has done research on subtle gender bias, commented to *Science*. "But how to interpret the pattern is less clear." It could be viewed as evidence of bias in funding decisions, but the authors don't make that claim. Rather, "[w]e think it is more likely



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that the same level of performance was interpreted in gender-stereotypic ways, leading to more positive commentary about women's applications," they write. One expert we talked to points to an alternative interpretation: Maybe UW women simply write better grant proposals than UW men do.

On that day when Kaatz walked into her office, Carnes had just read a bruising critique of one of her own grants. She recalls thinking, "I can't believe a reviewer would ever say that to a male investigator." Their eventual conclusion, then—that critiques of women's proposals use nicer words—is not without irony. Reviewer responses to the submitted article didn't lessen the irony: It was rejected three times, and some of the critiques would surely have earned poor LIWC scores.

By the time they submitted their article to *Academic Medicine*, the authors "were getting pretty gun shy on emphasizing the potential implications of our study," Carnes writes. So they downplayed the study's controversial gender aspects and stressed the method's utility and potential for further studies. In 2013, Carnes and two collaborators were awarded an NIH Director's Transformative Research Award to build on the work, signaling that whatever the results might mean, NIH agrees that the method has potential.

Kaatz has moved on, but not far: She's now in a position UW calls, simply, "scientist." It's a staff role that allows her to write grants, and it positions her well to pursue her main career goal: drawing more women and minorities into biomedicine in a long-term effort to improve women's and minority health. ■

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