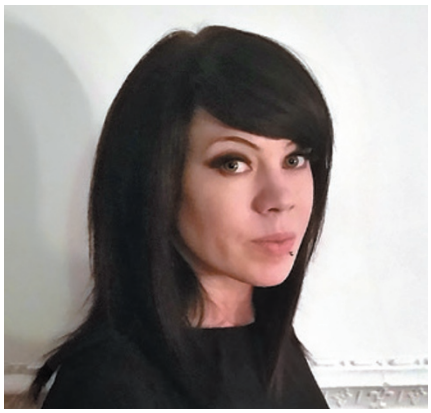
TURNING POINT

Reproducibility pro

Last year, neuroscientist Jen Ware accepted a newly established position as director of experimental design at the CHDI Foundation in New York City, a non-profit organization that seeks treatments for Huntington's disease. She helps CHDI-funded scientists to plan and conduct robust research.



How did CHDI come to create this role?
The low reproducibility of findings in research misdirects effort and wastes a lot of money. My job stems from CHDI's concern for scientific rigour and quality. That concern came to a head last year when the president of the foundation was having a chat with Marcus Munafò, my postdoc adviser at the University of Bristol, UK. He had done a meta-analysis of neuroscience studies that showed how studies with inadequate sample sizes can lead to spurious results — false positives as well as false negatives (K. S. Button *et al. Nature Rev. Neurosci.* **14,** 365–376; 2013).

What do you do in your job?
One duty is to coordinate review of study protocols by an independent committee and to get feedback to scientists before studies are run. It's feedback on whether the methods and the sample size are adequate for the research question. Another duty is statistics and methods training for postdocs in the labs we work with. We hope to set up online courses that postdocs can complete and possibly receive certification for.

Do researchers worry that this will make more work for them?
I'm introducing policies so that protocols will be reviewed. It might be a little more effort at the start of a project, but when it concludes, the research will be easier to assess. I'm trying to make it easier going forward.

Tell me about your background.
It's been a winding career path. I started with a bachelor's degree in psychology at Cardiff University, UK, and then I decided to work as a substance-abuse counsellor. I was on a team that sets up services and reparation for youth, and I had unique insights into drug dependency from working on the front line. So I decided to do a PhD in neuroscience.

What led you to experimental design?
I ran a genome-wide analysis of cotinine levels in smokers for my PhD. Cotinine is the primary metabolite of nicotine, and it's a more precise measure of smoking heaviness than metrics such as self-reporting. We had a sample size of only 4,500, but our results were comparable with studies that have used samples 4 or 5 times that size but with less-precise measures. Later, I spent time at Stanford University in California working on biases in MRI studies with John Ioannidis, who researches scientific rigour. I also heard stories from postdocs who had been told that it was their job to find significant relationships in a data set — to essentially go *P*-value fishing. These factors contributed to my interest in meta-research — research on research — and scientific rigour.

What did you learn about statistical analysis?
I had to learn that *P* values by themselves aren't particularly meaningful. You can get a result with a very low *P* value, but it could be related to an effect that has no clinical or biological relevance. We need to consider whether studies include enough observations to detect a meaningful difference between two groups. Non-significant results of an adequately powered study can be more meaningful than significant results from an underpowered study.

Were you concerned about being the first person in a new position?
I had no trepidation in accepting the offer, but I would be lying if I said that I wasn't a little daunted. It was a move from academia to a non-profit foundation, and a move from the United Kingdom to the United States. It was a lot of change all at once. But I'm already feeling that this is the right move for me. ■

INTERVIEW BY MONYA BAKER

This interview has been edited for length and clarity.

PHYSICS

Post-PhD job stability

More than one-third of new physics PhD graduates in the United States accepted 'potentially permanent' positions across all sectors in 2013 or 2014 — the highest proportion in a decade, according to a survey by the American Institute of Physics in College Park, Maryland, which tracks education and employment trends in physics. In 2010, about 29% of physics PhDs took potentially permanent jobs, and in 2004, only about 25% had accepted such work. Of the PhD graduates in 2014 who specialized in applied physics or optics and photonics, more than half had accepted potentially permanent jobs. Overall, 10% of physics PhDs in 2014 took other temporary jobs, including roles such as visiting professor, lecturer and research scientist. The survey also found that 47% of the graduate cohort had accepted a postdoctoral fellowship, with students of nuclear physics being the most likely to accept such a position. About half of those who had taken a postdoc but were not from the United States said that visa restrictions influenced their decision. The number of physics PhDs who move on to postdoctoral research has been falling since 2010, when nearly two-thirds accepted such a post.

FUNDING

Gender grant disparity

Men apply for and receive more awards than do women in a US grant programme that supports creative thinking in biomedical research, shows an analysis by the science-policy blog Datahound (go.nature.com/sz6iop). The blog examined applicant numbers and success rates by gender for four 'high-risk, high-reward' schemes that are offered by the National Institutes of Health (NIH) in Bethesda, Maryland. In 2015, the blog reported, 9,027 men and 3,422 women applied for awards across all four. Overall, roughly the same ratio of men to women won an award as had applied. But the ratio differed for one scheme in particular — the NIH Director's Early Independence Award, which requires institutions to nominate applicants. About 3 times as many men as women won an award, although 1.5 times as many men had applied. Datahound's author Jeremy Berg, who is a former director of the NIH National Institute of General Medical Sciences, urged the agency to investigate reasons for the disparity in gender ratio between award applicants and recipients.