

News in focus



BERNARD DUPONT (CC BY-SA 2.0)

A study on the social spider *Stegodyphus dumicola* was the first to be retracted.

'AVALANCHE' OF RETRACTIONS SHAKES BEHAVIOURAL-ECOLOGY COMMUNITY

Allegations of fabricated data in papers on spider behaviour have prompted a university investigation and some soul-searching.

By Giuliana Viglione

A complex web is unravelling in the field of spider research. On 5 February, McMaster University in Hamilton, Canada, confirmed that it was investigating allegations that behavioural ecologist Jonathan Pruitt had fabricated data in at least 17 papers that he had co-authored.

Since concerns about his work became public in late January, scientists have rushed to uncover the extent of questionable data in Pruitt's studies. Publishers are now trying to keep up with requests for retractions and investigations. So far, seven papers have

been retracted or are in the process of being retracted; five further retractions have been requested by Pruitt's co-authors; and researchers have flagged at least five more studies as containing possible data anomalies.

A tangled web

Pruitt, who is reportedly doing field research in Australia and the South Pacific, told *Science* last week that he had not fabricated or manipulated data in any way. He did not respond to multiple requests from *Nature* for comment on the mounting list of retractions, or the accusation that he had fabricated data.

His research looks at how different

personalities form in communities of social spider species that live in groups, and it has implications for emerging ideas on how animal behaviours evolve in the context of their environment.

The retractions started in mid-January, when authors of a paper in *The American Naturalist*¹ pulled it, citing "irregularities in the raw data". These were data that Pruitt had provided, showing how long it takes social spiders to resume typical behaviours after a disturbance, such as a simulated attack from a predator.

After a second retraction², Kate Laskowski, a behavioural ecologist at the University of

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California, Davis, who had co-authored both studies with Pruitt, wrote a blogpost about those irregularities (see go.nature.com/39m535t). She had found multiple stretches of data that had been copied and pasted to represent findings for multiple spiders. When Pruitt's explanations failed to account for the anomalies, she requested that the journals retract the papers, reportedly with Pruitt's consent.

"Then, hell broke loose," says Niels Dingemans, a behavioural ecologist at Ludwig Maximilian University in Munich, Germany, who has helped to uncover the data issues.

More than 20 scientists – co-authors, peers and other interested observers in the field – mobilized to pore through the data in almost 150 papers on which Pruitt is a co-author, looking for evidence of manipulated or fabricated numbers. They found similar signs of copy-and-paste duplications. In at least one instance, researchers identified formulae that had been inserted into a published Excel file, designed to add or subtract from a pasted value and create new data points.

Several have stated that they consider this clear evidence of fraud. Dingemans says that his mind was made up by the "avalanche of retractions" in progress, as well as the mounting piles of irregular data. "It is hard to believe these data are not fabricated," he says.

The 17 papers that include questionable data have been cited more than 900 times, and it will take scientists a while to sort out which ideas have been supported elsewhere in the literature and which will need to be retested. "My guess is the impact will probably be pretty big," Laskowski says.

Pruitt had written "a lot of really impressive papers" and was regarded by many as a "rising star", says María Rebolledo-Gómez, a microbial ecologist at Yale University in New Haven, Connecticut.

A spokesperson for McMaster University confirmed that the institution was investigating, but would provide no further comment on issues of research integrity. The University of California, Santa Barbara, where Pruitt did most of the work in question, declined to comment on the specific case but said that it "would cooperate with any other institution conducting an investigation".

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Laskowski says that although the wave of retractions deals a blow to behavioural ecology, she is heartened by how quickly the community has acted to set the scientific record straight. Researchers have lessons to learn about making data publicly available – by one estimate, more than 60% of Pruitt's data-containing papers are in journals with no data-sharing requirements – and about checking data that they receive from colleagues. But she and others are optimistic that these lessons will ultimately strengthen the field.

1. Laskowski, K. L., Montiglio, P.-O. & Pruitt, J. N. *Am. Nat.* **187**, 776–785 (2016); retraction **195**, 393 (2020).
2. Laskowski, K. L. & Pruitt J. N. *Proc. R. Soc. B* **281**, 20133166 (2014); retraction **287**, 20200077 (2020).

suggested that they change the titles of their papers to mention an algorithm he had developed.

"The magnitude of his self-citation requests are shocking," says Jonathan Wren, an associate editor for *Bioinformatics*, a journal that last year barred Chou from reviewing its papers, although it did not name him at the time. "But what blows my mind is that suspicious citation patterns to him go back decades and authors comply with an apparently amazing frequency."

Chou retired from a career in the pharmaceutical industry in 2003. He then founded the Gordon Life Science Institute, which he calls an institute with "no physical boundaries", of which anyone can become a member. Before 2003, Chou had published 168 papers – mostly in the field of computational biology – which were cited around 2,000 times. But he now has 602 papers with more than 58,000 citations, according to Elsevier's Scopus citations database. He is one of the world's most highly cited researchers.

The *JTB* editorial says that Chou also handled papers written by close colleagues at his own institute – some of whom the journal later couldn't trace, which the editorial says calls into question their veracity. It adds that Chou sometimes reviewed papers under a pseudonym, or chose reviewers from his institution. And in many cases, Chou was added to papers as a co-author during the final stage of review.

"Regrettably, this process was repeated for dozens of papers," the editorial says. It adds that the journal wants to "apologize for missing this blatant misuse of the editorial system".

Chou told *Nature* that mentions of his algorithms in papers were "not from 'reviewer coercion', but from their very high efficacy and widely recognized by many users". But he declined to answer questions about the citation practices for which he was banned, and instead referred *Nature* to his website.

Wren flagged the suspicious citation patterns to the *JTB* after an investigation at his own journal. That probe revealed that in every review, Chou had requested that manuscript authors add citations – an average of 35 of them, 90% to papers he had co-authored. *Bioinformatics* announced that it had barred a referee in January 2019.

Wren, a bioinformatician at the Oklahoma Medical Research Foundation in Oklahoma City, says investigations into Chou's citations are under way at at least three other journals to which he has pointed out suspicious patterns. Wren is currently writing an algorithm to flag unusual citation patterns in papers automatically.

The case comes amid efforts by Elsevier to crack down on the practice of 'coercive citation'. Last year, the Amsterdam-based publisher said it was investigating hundreds of researchers whom it suspected of

JOURNAL BANS HIGHLY CITED RESEARCHER FOR CITATION ABUSE

Probe finds that Kuo-Chen Chou repeatedly suggested dozens of citations be added to papers.

By Richard Van Noorden

A US-based biophysicist who is one of the world's most highly cited researchers has been removed from the editorial board of one journal and barred as a reviewer for another, after repeatedly manipulating the peer-review process to amass citations to his own work.

On 29 January, three editors at the *Journal of Theoretical Biology (JTB)* announced in an editorial that the journal had investigated and

barred an unnamed editor from the board for "scientific misconduct of the highest order" (M. Chaplain *et al. J. Theoret. Biol.* **488**, 110171; 2020).

The journal's publisher, Elsevier, confirmed to *Nature* that the barred editor is Kuo-Chen Chou, who founded and runs an organization that he calls the Gordon Life Science Institute, in Boston, Massachusetts. According to the editorial, Chou asked authors of dozens of papers he was editing to cite a long list of his publications – sometimes more than 50 – and