Postdoc Publications Linked to Subsequent Academic Success

A huge bibliographical study has uncovered a strong correlation between researchers' productivity as postdocs and their productivity as faculty members.

By **Charles Day**

For many researchers, the postdoctoral fellowship is a way station between graduate school and a permanent job. Now Bedoor AlShebli of New York University, Petter Holme of Aalto University in Finland, and their collaborators have revealed that, despite the position's transience, the quantity and quality of a researcher's postdoc publications are a strong predictor of whether the researcher stays in academia and, if they do, how productive the researcher will be as a faculty member [**1**]. The findings have implications for faculty hiring and postdoc welfare, say AlShebli and Holme.

AlShebli, Holme, and their collaborators drew their findings from an analysis of a publication database called the Microsoft Academic Graph (MAG), which includes worldwide information about the careers of 45,572 researchers from all academic disciplines between 1996 and 2021. The team was able to use the data in MAG to make inferences from them to follow individuals' publications, citations, career level, and workplace over a 25-year span.

The quantity and quality of a researcher's postdoc publications are a strong predictor of whether the researcher will stay in academia. **Credit: momius/stock.adobe.com**

Of the postdocs in MAG, 41% left academia by the time MAG stopped acquiring data in 2021. A postdocs' tendency to remain turned out to correlate with their publication record. In particular, the higher the number of papers a researcher published as a postdoc versus as a graduate student, the greater the likelihood of their staying in academia. The quality of postdoc papers also mattered for retention. Researchers who had a hit paper—a publication that's in the top 5% of its field's year-end citation list—as a postdoc but not as a graduate student had a retention rate of 63%. Researchers who had a hit paper as a graduate student but not as a postdoc had a retention rate of 58%.

To assess whether a researcher's productivity as a postdoc was related to their productivity as a faculty member, AlShebli, Holme, and their collaborators introduced the "η-index." Like the h-index, the parameter measures the productivity and impact of a researchers work. An h-index and a η-index of 10 both mean that a researcher has published at least 10 papers that have each been cited at least 10 times. However, the η-index differs in that it includes only papers published during a researcher's third and fourth years on a department's tenure track faculty. AlShebli, Holme, and their collaborators found that researchers who had hit papers as postdocs had the highest η-indexes of 4.6. Researchers who had hit papers only as graduate students had η-indexes of 3.3.

AlShebli, Holme, and their collaborators say that one implication of their findings is that postdoc publications could serve as an indicator of academic success. That finding could give departmental search committees pause, given the documented preponderance of Ivy League graduates among the US professoriat (see **Research News: Steep Hierarchies of Prestige in Academic Hiring**) [**2**]. Condensed-matter theorist Allan MacDonald of the University of Texas at Austin has mentored numerous postdocs. He, for one, regards postdoc performance as important in hiring decisions. "It reduces the impact of the simple branding benefit of an elite degree—not to zero, but it does reduce it," he says. "This is a good thing."

Emmy Noether published her theorem linking conservation laws to symmetries as a postdoc at the University of Göttingen, Germany. It's not difficult to find other examples of postdoc brilliance in physics. Nor is it surprising: By various measures our brains peak in young adulthood. In 2020 a team of researchers analyzed individual moves made by chess players in 24,000 games over a 125-year span [**3**]. By comparing the players' moves with the optimum move as calculated by a chess computer, the researchers determined that chess players' prowess rose through adolescence until it peaked at the age of 20. It remained at that peak until the age of 35 and then waned.

Despite the postdoc period coinciding with peak cognitive power, institutions could do more for their postdocs, Holme says. "Most universities have established routines for student and faculty affairs. But since postdocs fall outside of these categories, they could miss out on many forms of support and benefits for purely administrative reasons."

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