NEWS

Women researchers in autism face glass ceiling

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29 AUGUST 2011

Leo Kanner and Hans Asperger may have **'discovered' autism**, but it was women scientists who did much of the important early work in the field.

Lorna Wing and **Uta Frith** in the U.K. and **Isabelle Rapin** in the U.S., among others, contributed key concepts that inform scientific understanding of the disorder.

Today, a cadre of prominent women researchers continues to publish important papers, train a second (and, in some cases, third) generation of scientists, tweak diagnostic criteria and seek more effective treatments.

So it's discouraging to hear from these senior researchers that the field is not immune from the type of **gender bias** catalogued in a study published this summer. That study focused on sex differences in National Institutes of Health (NIH) grants awarded, showing that women are less likely to hold multiple grants at the same time, perhaps because they have less success with getting their grants renewed.

This is but one aspect of a broader pattern, these female scientists say, which includes lower salaries at the same level of appointment as their male colleagues, more teaching responsibilities in their institutions, smaller likelihood of heading up big, multi-center grants, and having to talk their way into the kind of big-science collaborations that bring scarce funding dollars into labs these days.

"I estimate that I've been making approximately 60 percent of the salary of male colleagues at the same level, some of whom have even fewer years of experience," says **Valerie Hu**, professor of biochemistry and molecular biology at George Washington University in Washington, D.C. "There is no formal mechanism for female faculty as a whole to address these inequities," she says.

Age effect:

The new study, published in Academic Medicine in June, reports that though funding rates for first-time NIH grant applicants are comparable for men and women, men continue to capture more **RO1 awards** — the NIH's five-year grant for independent investigators — than women at every stage of their careers[1].

On average, women ask for and receive larger R01 awards than men do: In 2008, for example, women requested an average of $422,191 in direct costs and received $372,536, compared with the men's $393,323 requested and $344,449 received.

But as women gain experience, their share of the NIH pie gets ever smaller: 30 percent of investigators with one R01 award are female, but only 13 percent of investigators holding four or more R01 grants are female, according to the study.

"The gender differences in the number of concurrent grants is striking," says **Hazel Sive**, a developmental biologist and expert in zebrafish genetics.

The data also testify to women's success in the early stages of their scientific careers, and their difficulties sustaining those gains in later years, researchers say.

"Women are increasingly successful in science and medicine at entering the fields at the level of graduate or medical school, postdocs and even initial NIH grants," says **Wendy Chung**, director of the clinical genetics program at Columbia University. "However, the higher up the ladder you go, the less successful women are at competing."

Chung points out that although there are many women in science and academic medicine, few are appointed to the most senior positions, such as directors, department chairs or deans of medical schools.

Even in autism research, with its many high-profile women investigators, they are less likely to head up center grants, says **Catherine Lord**, director of the University of Michigan Autism & Communication Disorders Center and creator of the **gold standard diagnostic tests** for autism. "There are disproportionately more males in positions of power than there probably should be," Lord says.

More female autism researchers work on cognitive studies and in the social sciences than in basic sciences such as genetics, Lord notes. "Social sciences are often looked down upon by basic scientists, so when you combine that with often unintended gender biases, we're doubly handicapped."

Competing priorities:

In general, younger researchers tend to have a more positive view of the outlook for women in science and autism research. "I would bet that the quality of the individual scientist and his or her work will triumph every time," says **Young-Shin Kim**, associate professor in the Child Study Center at the Yale School of Medicine.

Kim, co-investigator on a ground-breaking study of **autism prevalence in South Korea**, notes that all professional women, and not just scientists, generally have to work harder to balance child-rearing and family responsibilities.

According to a study published in PLoS ONE in August, however, nearly half of all women scientists say their careers have prevented them from having as many children as they would have liked[2].

The study is based on a survey of more than 2,500 scientists at 30 research institutions in the U.S. The researchers found that 29 percent of women graduate students, but only 7 percent of men, worry that being a scientist will keep them from having a family.

"Many women have the constant struggle of balancing their commitments to family and spend more time caring for their families than male counterparts," says Chung. "For women with young children, this can be especially challenging and can derail them from successfully competing for funding and devoting sufficient time and energy to their research."

Once they're thrown off course, it can also be difficult for women scientists to get back on track, she says. In addition to their family responsibilities, female researchers also tend to assume a disproportionate share of teaching responsibilities in their institutions, Chung points out.

"I often see women play a larger role in education or training than men, and I believe this is to the detriment of their research careers, although this is a vital role within the scientific community," Chung says.

Excellence in teaching and mentoring, traditional female strengths, do not lead to career advancement in the same way that publications and grants do. Women researchers also tend to have excellent reputations as collaborators, but here again, they have to work harder than men to be included in multi-principal-investigator collaborative proposals, says Sive. "They may have to initiate collaborations to do so, rather than being invited to join."

Although this may be more the result of an oversight than intentional bias, it still leads to lopsided gender ratios on large studies. Still, there is at least one example of a multi-center research program in which the balance tipped in favor of women scientists.

The principal investigators of nearly all of the original ten **Collaborative Programs of Excellence in Autism**, a $60 million National Institutes of Health initiative, were women, recalls Lord. "I think the women have done a better job in general of working together," she says.

References:

1. Pohlhaus J. R. *et al. Acad. Med.* **86**, 759-767 (2011) **PubMed**
2. Ecklund E.H. and A.E. Lincoln *PLoS One* **6**, e22590 (2011) **PubMed**