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Gender pay gap among STEM graduates

In several science, technology, engineering, and math (STEM) fields, women earn less than men. Using a three-wave survey, Adina Sterling et al. (pp. 30303–30308) queried 559 engineering and computer science students—195 female and 364 male—who had graduated from 27 institutions in the United States between 2015 and 2017 to uncover potential explanations for the gender pay gap. The authors suggest that self-efficacy, defined as self-confidence in following a course of action to achieve a goal, is a crucial factor that may explain the pay gap, in contrast to hypotheses that women are socialized to expect less pay or that women will accept less pay for a workplace culture that they perceive as favorable. The survey revealed that women in entry-level engineering and computer science jobs, on average, are paid less than their male counterparts and display relatively lower levels of self-efficacy, which may not only influence pay but also their rate of entry into some STEM fields. The authors suggest that cultural beliefs about the appropriateness of men and women for certain STEM professions may influence beliefs about self-efficacy. According to the authors, efforts to strengthen students' self-assessment before they enter the engineering and computer science workforce could help address the gender pay gap. — H.J.



Word cloud representing the role of self-confidence in the gender pay gap.

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How digital text format affects reading performance

The small display sizes of mobile devices, such as cellphones and smart watches, pose a challenge for individuals with low vision. This challenge may become more daunting as populations age. Nilsu Atilgan et al. (pp. 30276–30284) examined factors that affect the readability of text on laptops, tablets, and cellphones. Thirty participants with normal vision and 10 individuals with low vision read 48 Grimms' Fairy Tales stories, which appeared in eight possible text sizes. To achieve 80% of the maximum reading speed on any display format, normally sighted participants required 13 characters per line, and low-vision participants required eight characters per line. The findings suggest that the character count per line, as determined by text size, is an important factor affecting the reading speed of individuals with both normal and low vision. The results underscore the importance of customizing the text format on digital displays to optimize reading performance. According to the authors, the study carries implications for the design of small text displays for people with normal

vision and the prescription of appropriate reading aids for people with low vision. — J.W.

Imaging macrophages in the human eye

Macrophage cells in the retina have typically been examined using labeling techniques and animal models. As a result, little is known about the density, distribution, and movements of these immune cells in the eyes of living humans of various ages, in both healthy and diseased states. Daniel Hammer et al. (pp. 30661–30669) used a high-resolution, label-free imaging technique called adaptive optics–optical coherence tomography in 15 healthy individuals and four patients with glaucoma, a group of eye diseases that can cause blindness. Cell density decreased with age in healthy participants, by approximately 2% per year between the ages of 20 and 70 years. In patients, cell density was higher on the defective side of the retina, compared with the normal side. Moreover, cell processes moved more quickly and covered a smaller area of the retina in patients compared with

healthy participants. The findings suggest that macrophages play a role in the progression of glaucoma, possibly migrating to active areas of disease during early stages. According to the authors, the findings provide a label-free technique to examine retinal macrophages in live human eyes and point to potential biomarkers that could facilitate the development of treatments for glaucoma and other age-related ocular and neurological diseases. — J.W.

Parent–offspring conflict in songbird fledging

Young birds that prolong their stay in the nest increase their chances of survival. However, continuing care may impose an overall cost on parents by decreasing the fitness of the entire brood. The influence of this kind of parent–offspring conflict on the age at which songbirds fledge, or leave the nest, is unclear. Todd Jones et al. (pp. 30539–30546) analyzed data from eight studies of 18 songbird species across the United States. Twelve of the species showed evidence of postfledging bottlenecks; in these species, the mortality rates of fledglings were higher than those of nestlings. Postfledging bottlenecks led to a 14% increase in the probability that at least one offspring in the brood would survive until independence. Moreover, parental benefits associated with early fledging could explain variation in fledging age across species. Taken together, the findings suggest that songbird parents enhance their own fitness by manipulating offspring into fledging early—at the cost of the fledglings' survival.

According to the authors, parent–offspring conflict may similarly affect the age of offspring during key transitions in life for other animals that provide parental care. — J.W.

Environmental impacts of seafood mislabeling

Reports of seafood mislabeling have increased over the past decade, but evidence of its environmental impacts has been limited and largely anecdotal. Kailin Kroetz et al. (pp. 30318–30323) analyzed trade, production, and mislabeling data to systematically characterize various effects of seafood mislabeling in the United States. An estimated 190,000–250,000 tons of mislabeled seafood products are sold in the United States each year, representing approximately 3.4–4.3% of consumed seafood. Compared with the expected products listed on the label, the corresponding substitute products were 28% more likely to be imported from other countries, which may have weaker environmental laws than the United States. Approximately 58% of mislabeled seafood consumed were exclusively wild-caught products, whereas the remaining 42% were potentially farmed. Compared with the expected products listed on the label, the corresponding substitute products scored worse on measures of fishery management effectiveness and marine population health, which covered factors such as abundance, bycatch, and discards. According to the authors, holistic and collaborative approaches are needed to reduce seafood mislabeling and its wide-ranging negative impacts. — J.W.