Men and women show surprising differences in seeing motion

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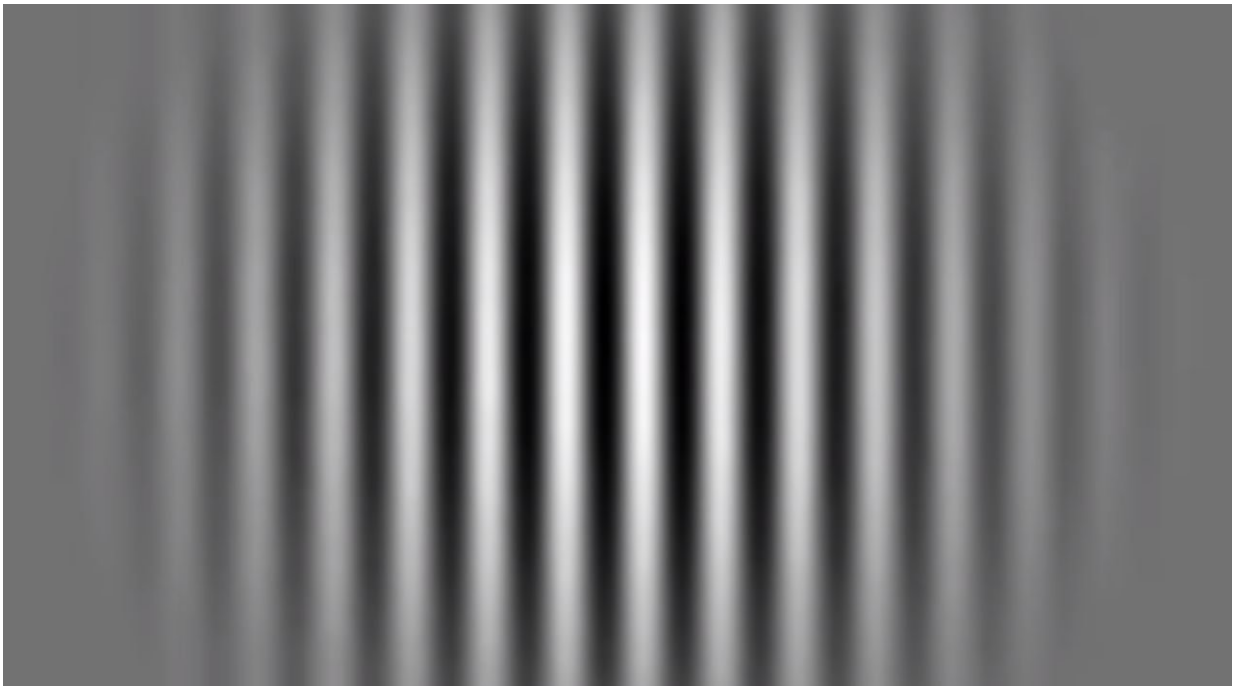

Researchers reporting in the journal *Current Biology* on August 16 have found an unexpected difference between men and women. On average, their studies show, men pick up on visual motion significantly faster than women do.

Individuals representing both sexes are good at reporting whether black

and white bars on a screen are moving to the left or to the right—requiring only a tenth of a second and often much less to make the right call, the researchers found. But, in comparison to men, women regularly took about 25 to 75 percent longer.

The researchers say that the faster perception of motion by males may not necessarily reflect better visual processing. They note that similar performance enhancements in this same task have been observed in individuals diagnosed with autism spectrum disorder (ASD) or depression and in older individuals. The authors speculate that processes in the brain that down-regulate neural activity are disrupted in these conditions and may also be weaker in males.

"We were very surprised," says Scott Murray at the University of Washington, Seattle. "There is very little evidence for sex differences in low-level visual processing, especially differences as large as those we found in our study."

Murray and co-author Duje Tadin, University of Rochester, say that the finding was "entirely serendipitous." They were using the visual motion task to study processing differences in individuals with ASD. ASD shows a large sex bias, with boys being about four times more likely to be diagnosed with the condition than girls. As a result, the researchers included sex as a factor in their analysis of control individuals in the study who didn't have ASD. The sex difference in visual perception of motion became immediately apparent.

To confirm the findings, the researchers asked other investigators who had used the same task in their own experiments for additional data representing larger numbers of study participants. And those independent data showed the same pattern of sex difference.

Murray, Tadin, and colleagues report that the observed sex difference in

visual perception can't be explained by general differences in the speed of visual processing, overall visual discrimination abilities, or potential motor-related differences. The differences aren't apparent in functional MRI images of the brain either.

Overall, they write, the results show how sex differences can manifest unexpectedly. They also highlight the importance of including sex as a factor in the design and analysis of perceptual and cognitive studies.

The researchers say that the findings come as evidence that visual processing differs in males and females in ways that hadn't been recognized. They also provide a new window into differences in neural mechanisms that process visual information, Tadin says.

In further studies, the researchers hope to discover the underlying differences in the brain that may explain the discrepancy between men and women. So far, brain images of the key motion-processing areas haven't offered up any clues, suggesting that the difference may originate in other portions of the brain or may be difficult to measure using current techniques. Ultimately, they say, this path of study might even yield new clues for understanding a vexing question: why ASD is more common in males.

More information: *Current Biology*, Murray et al.: "Sex Differences in Visual Motion Processing" www.cell.com/current-biology/f … 0960-9822(18)30776-0 , DOI: 10.1016/j.cub.2018.06.014

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