Medical Xpress

Are we truly 'inattentionally blind'? New study revisits 'invisible gorilla' experiment for new insights

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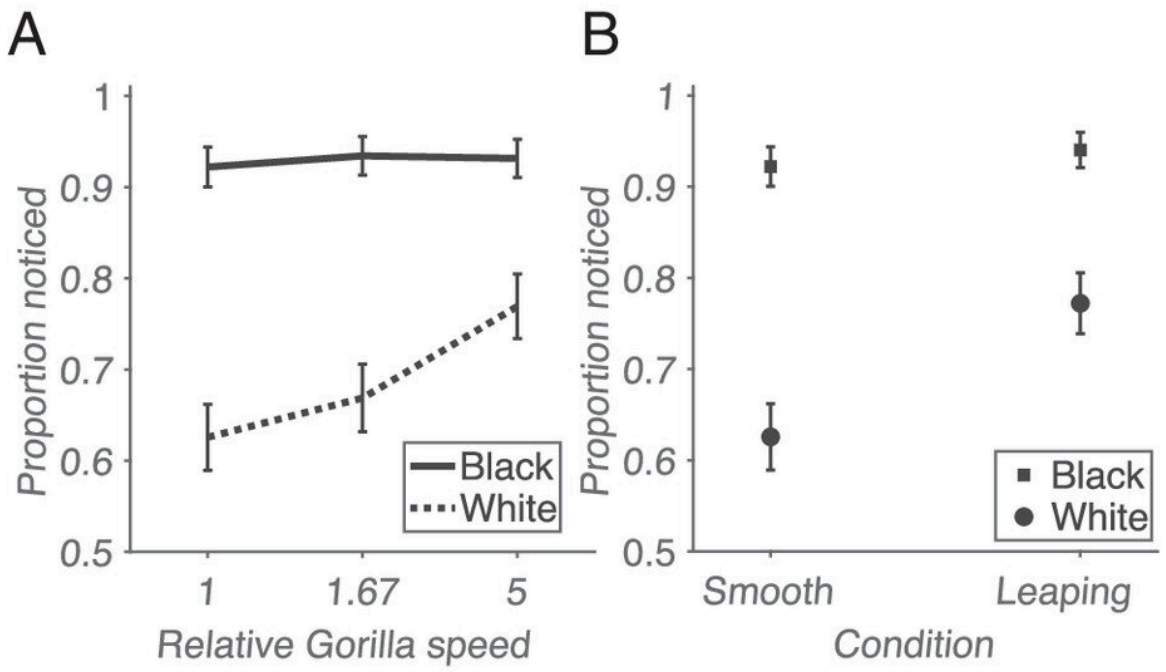

Proportion of participants reporting a relevant unexpected event. (A) x-Axis: Relative Gorilla speed in traversing the screen, relative to the longest duration. y-Axis: Proportion reported. Solid line: Participants reporting passes by the Black team. Dashed line: Participants reporting passes by the White team. Error bars indicate SEM. (B) As in (A), but comparing the performance of participants in the smoothly walking vs. leaping gorilla (otherwise time matched—spending 10 s on the screen) condition. Credit: *Proceedings of the National Academy of Sciences* (2023). DOI: 10.1073/pnas.2214930120

We are quite good at spotting unexpected objects while focused on another activity if they are moving fast, reveals a new study by a team of New York University researchers. Their findings cast doubt on a long-standing view that our ability to see the unexpected is necessarily impaired when our attention is already directed elsewhere.

"For decades, it's been thought that when we're intently focused on something relevant, like driving or playing a game, we fail to spot something that unexpectedly enters our field of vision, even if it is clearly visible and moving," says Pascal Wallisch, a clinical associate professor at New York University's Center for Data Science and Department of Psychology and lead author of the paper, which appears in the *Proceedings of the National Academy of Sciences*. "Our study questions the generality of this view because it shows that people, while focusing on a task, are quite capable of noticing unexpected objects that are moving quickly. However, our research confirms that we are indeed less adept at noticing these same objects when they are moving slowly."

The research team, who also included Wayne Mackey, Michael Karlovich, and David Heeger, centered its study on "inattentional blindness"—the inability to notice unexpected objects if attention is focused on a task. This phenomenon was evident in the widely cited 1990s "invisible gorilla experiment." In that study, the participants—watching a video of students passing basketballs—did not notice an unexpectedly appearing person in a gorilla costume because they were already tasked with, and engaged in, counting the number of passes between players wearing white shirts.

This and similar studies characterized one of the most striking phenomena in cognitive psychology—inattentional blindness—as an inevitable flip side of task focusing, and essentially a deficit.

In the *PNAS* study, the NYU research team sought to better understand

the nature of inattentional blindness through a series of experiments—and, specifically, whether our cognitive processing was indeed as limited as this previous work suggested.

They replicated the invisible gorilla experiment using more than 1,500 of research participants—but including several new conditions. In the original 1999 experiment, the gorilla moved slowly as well as upright—like a human (which it was!).

In the new *PNAS* research, research participants saw the gorilla (yes, also a human dressed in a gorilla costume) in additional ways. Specifically, the "NYU gorilla" moved at various speeds—in some conditions, just a little faster than the "original gorilla" and, in others, substantially faster than the original gorilla. During these experiments—just like in the original experiment—research participants were tasked with counting the number of basketball passes made by players wearing black or white shirts.

A video of the experiment may be viewed below:

Overall, the results showed that participants, while engaged in the pass-counting task, were more likely to spot the NYU gorilla if it was moving substantially faster than in the original 1999 experiment *or* if it was leaping instead of walking.

To ensure these findings generalize beyond spotting gorillas, the researchers then conducted a series of experiments, using approximately 3,000 other participants, that replicated the principles of the invisible gorilla study. In these, research participants were asked to count how many randomly moving dots of a given color were crossing a central line while an unexpected moving object (UMO) —a triangle— was traversing the screen at various speeds.

As with the gorilla study, the participants were more likely to spot the triangle the faster it was moving. Importantly, the authors note, the same was not observed for triangles that were moving slower than the dots, which is remarkable given that the slower moving triangles are on the screen substantially longer. This finding also rules out the following: that the noticeability of the fast moving UMOs is simply due to physical dissimilarity to the task-relevant dots. As the authors write in the paper:

"(O)ur findings…contribute to the ongoing debate on the impact of physical salience on inattentional blindness, suggesting that it is fast speeds specifically, not the physical salience of a feature more generally, that captures attention."

The findings also might also have evolutionary implications. The classical view of inattentional blindness would leave a task-focused organism vulnerable to unexpected threats. These new *PNAS* findings, by contrast, suggest that organisms possess a "sentinel" system that constantly monitors the environment. This system alerts organisms to potential threats—specifically, fast-moving attacking predators.

"Fast-moving, unexpected objects seem to override the task focus of an organism," says Wallisch. "This will allow it to notice and react to the new potential threat, improving chances of survival."

More information: Pascal Wallisch et al, The visible gorilla: Unexpected fast—not physically salient—Objects are noticeable, *Proceedings of the National Academy of Sciences* (2023). DOI: 10.1073/pnas.2214930120

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