

Sports practice accounts for just one percent of elite athletes' performance differences

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Brooke Macnamara, assistant professor of psychological sciences at Case Western Reserve University. Credit: CWRU

Among elite athletes, practice accounts for a scant 1 percent of the difference in their performances—and starting sports at an early age does not necessarily provide athletes an upper hand—according to new research.

"While practice is necessary for [elite athletes](#) to reach a high level of competition, after a certain point, the amount of practice essentially stops differentiating who makes it far and who makes it to the very top," said Brooke Macnamara, assistant professor of [psychological sciences](#) at Case Western Reserve University and lead author of the study.

"Human performance is incredibly complex," she said. "Multiple factors need to be considered, only one of which is practice."

The study was published in *Perspectives on Psychological Science*, with researchers analyzing 52 data sets on the relationship between practice and performance.

Athletes, parents, recruiters and coaches can use the findings to weigh the importance of practice time and investment, researchers suggest.

Overall, practice explains about 18 percent of why some athletes perform better or worse than others—with 82 percent of this difference attributed to factors other than practice.

The findings counter the notion that anyone can become an expert or elite athlete with 10,000 hours of practice, a theory inspired by research from Florida State University professor Anders Ericsson in the early 1990s and popularized in the mainstream since.

"The concept of 10,000 hours taps into the American ideal of hard work and dedication leading naturally to excellence," said Macnamara. "But it does not account for the inherent differences across people and across

sports."

Starting age holds little to no advantage

While some research has suggested a younger starting age provides an athlete more time to build skills critical to attaining high performance levels, Macnamara's findings offer contradictory evidence.

Higher-skill athletes start at about the same age as less-skilled athletes—or even began a little later—according to Macnamara's research. In fact, [athletes](#) may benefit from waiting to specialize in one sport: A more physically mature athlete can accomplish the fundamentals of an activity more easily, with a lower risk of injury from overuse.

"People and parents who buy into the 10,000-hour rule can push early specialization in a sport, leading to physical or mental burnout before it's clear that a child even has a penchant for that sport," Macnamara said.

Factors other than practice believed to influence athletic performance include genetic attributes, such as fast-twitch muscles and maximum blood oxygenation level; cognitive and psychological traits and behaviors—including confidence, performance anxiety, intelligence and working memory capacity—play roles as well, though researchers don't yet know the significance of each.

"As we look at multiple factors, I don't think we'll ever be able to—with 100 percent certainty—predict someone's performance in any activity, not just sports," Macnamara said. "But we can do better than we're doing now."

More information: B. N. Macnamara et al, The Relationship Between Deliberate Practice and Performance in Sports: A Meta-Analysis,

Perspectives on Psychological Science (2016). DOI: [10.1177/1745691616635591](https://doi.org/10.1177/1745691616635591)

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