

## Study: Rough match can sideline tennis players' perceptions

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Purdue researchers, from left, Jessica K. Witt, an assistant professor of psychological sciences who studies perception in sports, and Mila Sugovic, a third-year doctoral student in cognitive psychology, found that when people are playing tennis well they perceive the ball as moving slower and the net as lower to the ground. (Purdue University photo/Andrew Hancock)

Tennis players who "ace" a match are more likely to see the ball as moving slowly and view the net as lower to the ground, according to new research from Purdue University.

"It is not unusual for tennis players who played well or poorly to comment on their [perception](#) of the ball's speed," said Jessica K. Witt, an assistant professor of [psychological sciences](#) who studies perception in sports. "If they played well, they often say the game seemed to move in [slow motion](#). And we found that, yes, when a person is playing well, they

are likely to perceive the [ball](#) as moving slower."

Witt and Mila Sugovic (pronounced MEE-la SHU-go-vich), a third-year doctoral student in [cognitive psychology](#), published their findings in the current issue of *Perception*. They also found that those who performed well perceived the net to be lower.

"In other studies, when the person performs better, like at softball, they perceive the ball to be bigger," Sugovic said. "This is the first finding where we are showing that something looks smaller or lower, and it matters in this case because the net is something the person is trying to avoid. Viewing it as smaller or lower turned out to be a good thing."

The findings are based on the performance of 36 tennis players who were students in beginner, intermediate and advanced classes. They hit tennis balls at various spins and speeds, from 50-80 mph, from a ball machine. After each hit, they estimated the ball's approaching speed using a computer tool. The players, across all skill levels, judged the ball to be moving slower when they successfully returned the ball compared to when they hit it out-of-bounds. The players who played well also reported the net's height as appearing lower.

This was reinforced by additional experiments in which 26 people played virtual tennis in the lab. By manipulating the size of the racket, the researchers observed that when people played with a larger one, which was easier to control in this game, they perceived the ball as moving slower. When people played with a smaller racket, which was more difficult to control, they perceived the ball as moving faster.

The findings are similar to Witt's previous work in softball, golf and football. For example, in football, she found that people who kick field goals perceive the goal as smaller when unsuccessful and the goal posts as farther apart and the crossbar lower to the ground after a good kick.

The findings challenge traditional views of perception, Witt said.

"Most people consider perception just to be about optical information in the eye, so the same optical information should look the same. What we are finding instead is that what you see relates to your abilities," she said. "This explains moment-to-moment performance. It is not just about your overall skill but how you are able to wield those skills, so to speak. If you are on a hot streak, then you are going to see the world accordingly, and if you are in a slump and struggling, then you are going to see the world according to your performance at that time and not your overall skill."

Witt's research team also will look at the role that streaks and slumps play in an athlete's long-term performance as related to perception, as well as the influence of factors such as fear, pressure or motivation. Other experiments will focus on the perception of fans or onlookers as they watch someone who is playing and how that perception changes if the athlete is playing well or poorly.

**More information:** Performance and Ease Influence Perceived Speed, by Jessica K. Witt and Mila Sugovic, *Perception*.

Provided by Purdue University

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