

# 卓球におけるワールドクラス選手のサービスの回転数

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(The rotation speed of the service ball delivered by world-class table tennis players)

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### Abstract

The rotation speed of the ball spin has been considered a key factor in winning table tennis matches. This study quantified the rotation speed (rotations per second: rps) of service balls delivered by quarter-finalists in the 2009 World Table Tennis Championships. Ball services were recorded during the quarter-finals of both the men's and women's singles, involving 4 matches and 8 players per gender, using a high-speed video camera (1000 fps) for calculation of the rotation speed, and a standard video camera (30 fps) for distinguishing players and aces (including those touched by the receiver). Eventually, the rotation speeds of 329 services were calculated, and these ranged from 13.7 to 62.5 rps. For men, 50 - 60 rps was the most frequent (40.0%) range of the rotation speeds, while for women, the corresponding range was 40 - 50 rps (43.8%); the average ( $\pm$  SD) rotation speed was significantly greater for men than for women ( $46.0 \pm 9.0$  vs.  $39.2 \pm 9.3$  rps,  $p < 0.001$ ). The fastest rotation speed was 62.5 rps for both genders. Chinese men produced a slower rotation speed than did other men ( $43.5 \pm 8.9$  vs.  $51.0 \pm 6.8$  rps,  $p < 0.001$ ). For women, however, the rotation speed was similar between Chinese players and the others ( $39.9 \pm 10.2$  vs.  $38.5 \pm 8.2$  rps). The rotation speeds of aces were scattered over a wide range of 37.0 - 58.8 rps for men and 27.8 - 62.5 rps for women, implying a weak association between aces and fast rotation. These pioneering data may help clarify some of the technical and tactical aspects of table tennis, and can be used to develop training and game strategies for successful performance.