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Research article

Effect of Uncertainty During the Lunge in Fencing

Marcos Gutiérrez-Dávila, Carlos Zingsem, Carmen Gutiérrez-Cruz, F. Javier Giles, F. Javier Rojas [Author Information](#)[Publish Date](#)[How to Cite](#)[Email link to this article](#)

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ABSTRACT

The aim of this study is to determine the effect that uncertainty, in relation to the probability of error, exerts on the reaction response and speed during the lunge in fencing. The participants were 18 regional-level fencers with over five years' experience. Force platforms under the feet recorded the horizontal components of the reaction forces, from which the kinematic parameters of the center of mass were calculated. An electronic system to present stimuli, controlled by a programmable clock, projected a target onto a screen that represented a plastron. In situations without uncertainty, the fencers had to lunge as swiftly as possible when a circle (the target) appeared in the center of the plastron, trying to touch the center of the circle with the tip of the sword. In situations with uncertainty, the fencers had the same target as in the previous situation but they received the information that they had to change the lunge into a defensive move if the target disappeared from the plastron during the action. The results indicate that the reaction time and the movement time increased with uncertainty. Although there were no differences for the horizontal velocity of the center of mass at the end of the acceleration phase, the mean horizontal velocity of the lunge was reduced by the effect of the uncertainty. Prior knowledge of the opponent's possible action implies a reduction in uncertainty, reducing movement time as well as meaning faster execution, thereby increasing the success of the lunge in fencing.

Key words: Motor control, biomechanics, neuropsychology, fencing,

reaction response, uncertainty

Key Points

- Reaction time (RT) and the movement time (MT) increase when doubts arise about being able to reach the target as planned during the lunge.
- The horizontal velocity of the lunge decreases by the effect of uncertainty due to the possibility that the events might not occur as planned.
- These results highlight the importance that tactical intent has in fencing for successfully predicting the defensive movements of the opponent during the attack.

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