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Effect of instructions on attack efficiency in beginners and experienced fencers

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INTRODUCTION:
The success in any combat sport depends remarkably on attack efficiency. In order to be efficient, an attack should be performed not only as accurately as possible, but also with the minimum reaction time and maximum movement speed. On the other hand, an internal or external attentional focus during the action proved to be the relevant factor when movement efficiency has to be considered. Specifically, the experienced individuals benefit from an external focus of attention, whereas the beginners benefit from an internal focus of attention [1]. Therefore, we designed the study aimed to investigate the effects of different instructions on attack efficiency in fencers of different level of expertise. It was hypothesized that the beginners and experienced fencers will benefit mostly from the internal and external focusing instructions, respectively.
METHODS:
Ten beginners and 10 experienced fencers participated in the study. A video-based method [2] was used to present two typical fencing movement techniques (i.e. "stimulus") after which the participants had to perform an offensive (high or low attack) action (i.e. "response"). Three different instructions were used in order to direct the attentional focus: (1) to react as fast as possible; (2) to perform the attacking movement as fast as possible; (3) to be accurate as much as possible. The index of attack efficiency has been calculated based on the results of reaction time, movement speed and absolute error relevant to the previously designated target.
RESULTS:
The different effects of instructions on movement performance have been shown in both groups of subjects, specifically, when the level of movement accuracy was compared to either reaction time or movement speed ($p < 0.05$). Moreover, the movement performance as assessed through any of three selected parameters (i.e., reaction time, movement speed and movement accuracy) was significantly better in experienced fencers than in beginners ($p < 0.05$). Finally, the index of attack efficiency was significantly higher in experienced fencers as well as beginners when the subjects were instructed to react as fast as possible ($p < 0.01$). The instruction to be accurate as much as possible provided the lowest index of attack efficiency in beginners ($p < 0.01$).
CONCLUSION:
The instruction to be accurate as much as possible directs the attentional focus to external stimuli that proved to be detrimental for beginners. This effect was not as prominent in experienced fencers which could be in line with the proposed hypothesis. Anyway, the instruction to react as fast as possible seems to provide the most efficient attack in fencing despite the level of expertise. One could speculate that this instruction is partly based on both internal and external attentional focuses suggesting that the complex situations in combat sports requires partly divided attentional focus rather than strictly directed.

1) Schmidt & Lee, Motor Control and Learning, 2019
2) Mudric et al., Int J Perform Anal Sport, 2015

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