



# Psychological factors related to choking under pressure

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## ABSTRACT

*Tennis players who focus on their skill execution and self-regulation are likely to improve in training. On the other hand, focusing on performance too much (reinvestment) can result in "paralysis by analysis" and performance decrements. The purpose of this study was to examine the relationships between reinvestment, self-regulation, and perceived choking under pressure among 180 collegiate male and female tennis players from NCAA Division I in the United States (78 players), and from League I in Japan (102 players). Results indicated that a focus on skill execution via self-regulation was positively associated with conscious motor processing and negatively associated with perceived choking. This means that tennis players who consciously control their movement are less likely to perceive themselves as choking under pressure.*

**Key words:** psychology, reinvestment, self-focus, cross-cultural comparison  
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## INTRODUCTION

Competitive tennis requires excellent fitness and mental focus for optimal performance. Research has shown, however, that even skilled performers sometimes choke under pressure (Beilock, 2010). Reinvestment Theory (Masters & Maxwell, 2008) suggests that athletes who focus on the mechanical aspects of motor performance are more likely to experience "paralysis by analysis," or choking under pressure, than are other athletes. Although reinvestment is associated with choking in competition, Self-Regulation Theory (Zimmerman, 2008) suggests that focusing on technical aspects of motor performance is related to skill improvement in training. Thus, there is an apparent paradox. Tennis players who reinvest and focus on their movement during competition are prone to choke, but tennis players who self-regulate and focus on mechanical details during training modify and improve their strokes. Understanding the relationships among reinvestment, self-regulation, and choking of high-level tennis players can help coaches balance the demands of skill development and performance in pressure situations. Therefore, the purpose of this research was to examine the relationships among reinvestment, self-regulation, and perceived choking behavior of competitive tennis players from different countries.

## METHOD

### Participants

Participants were 180 intercollegiate tennis players (98 men and 82 women) from NCAA Division I in the United States (78 players) and from League I in Japan (102 players).

### Procedure

All tennis players gave informed consent and completed paper versions of validated psychological questionnaires regarding awareness of movement (reinvestment) and planning, monitoring, effort, self-efficacy, evaluation, and reflection self-regulation (Hong & O'Neil Jr., 2001; Howard et al., 2000; Masters, Eves, & Maxwell, 2005; Peltier et al., 2006). Participants also answered the question, "What is your tendency to choke under pressure in tennis?"

## RESULTS

The purpose of the present study was to examine relations among reinvestment, self-regulation, and perceived choking under pressure. Cross-cultural comparisons between tennis players from the United States and Japan were also made. Results indicated that for tennis players, paying attention to movements and consciously controlling them (conscious motor processing) was positively correlated with key self-regulation skills and outcomes such as planning, monitoring, effort, self-efficacy, evaluation, and reflection, and was unrelated to choking under pressure. It should be noted, however, that conscious motor processing was not correlated with choking under pressure. Thus, reinvesting by consciously controlling movement may be valuable for competitive tennis players.

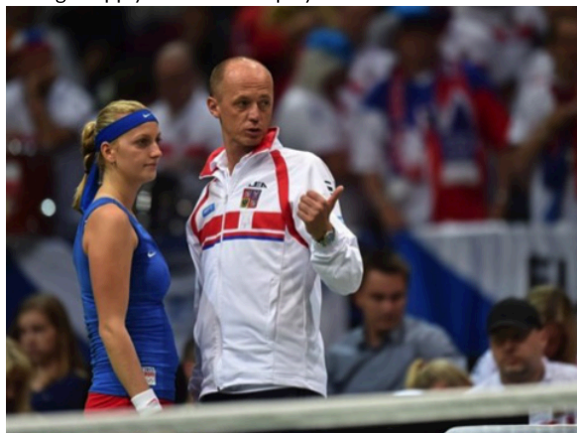


With regard to monitoring style of movement (for example, thinking about how you are going to hit a forehand or thinking about what other people think about you while hitting a shot or moving toward a ball on the court), focusing on style of movement was associated with an increase in the perceived likelihood of choking under pressure. Tennis players who focus on how others evaluate their play are more likely to perceive themselves as choking under pressure.

Four self-regulation skills (planning, monitoring, effort, and self-efficacy) were negatively related to perceived choking. This means that athletes who perceived themselves as better at planning, monitoring, effort, and self-efficacy were less likely to perceive themselves as choking under pressure. For tennis coaches, focusing on these particular skills may be useful, particularly when working with players attempting to address choking-related issues.

Comparisons were made between college players from the United States and from Japan in terms of reinvestment, self-regulation, and perceived choking. Predictions about differences between groups on these variables were not made because it was unclear how the various factors (self, national culture, tennis culture), reinvestment, self-regulation, and perceived choking would be related to each other. Results indicated that there was a significant difference between American and Japanese players. Relative to Japanese tennis players, American players tended to report consciously controlling their movements and engaging in self-regulation, and less likely to choke under pressure. Consequently, tennis coaches should consider national origin and/or cultural background when working with their players.

Limitations of this study should be noted. The correlational design of the research precluded determination of cause and effect. Further experimental research is needed to find out if self-regulation skills cause changes in perceived and actual choking. The study included a cultural comparison from two countries. Additional research can help determine if the current findings apply to tennis players from other countries.



## CONCLUSION

In conclusion, this research explored the relationships among reinvestment, self-regulation, and perceived choking. The research findings indicate a tendency to consciously control movements might be beneficial to tennis players, as such conscious control can lead to improved tennis strokes and is not related to perceived choking under pressure. A tendency to consciously monitor style of movement and consider how others perceive movements, however, was associated with perception of choking under pressure. Helping tennis players to focus on factors other than the opinions of their opponents and spectators may be a valuable approach. In addition, self-regulation skills (e.g., greater self-efficacy) were associated with less perceived choking under pressure. Finally, cultural differences between American and Japanese players were revealed in this study.

### What Coaches or Athletes Should Know/Do

- Improving self-regulation skills, especially self-efficacy, may reduce choking in tennis players

- Consciously working to control movements can be useful in developing stroke mechanics
- Focusing on how others perceive one's mechanics and form (for example how others perceive one's serve) may increase perceived choking in tennis players
- Using an external focus (for example, Where you are going to hit a ball) is a valuable skill (for a review, see Wulf, 2013)

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