

experience and match outcome, the participant perceived that meeting personal standards, such as performance-related goals, was more crucial for the intensity of flow than overall winning or losing. Imagery use also had a positive influence on competition performance in regard to playing winners. Beyond this, the participant's national junior ranking improved from 214 up to 69 as the study concluded. The participant also reported a strong increase of confidence throughout the post-intervention phase. Based on previous research findings, the imagery script particularly emphasised images of successful performance, and being confident and in control.¹¹ Confidence appears to be one of the main variables underlying flow and performance in competition.^{15,16}

The results of the intervention study were especially valuable, because of the administration of a targeted intervention, which was based on our previous findings with junior tennis players in tennis competition. The efficacy of the imagery program supported the value of including flow in the development of the imagery intervention. Future studies would benefit from examining and pinpointing key flow antecedents in the particular sport before commencing an intervention to increase flow.

This study aimed to examine the efficacy of an imagery intervention to increase both flow and performance. It is possible that changes in flow and performance were connected. With reference to the interrelatedness between flow and performance, future research needs to elucidate four possible aspects of the flow-performance relationship, a) whether flow is a concomitant or by-product of performance, b) whether flow and performance are connected by a reciprocal relationship,

c) if flow and performance are connected by a causal relationship, or d) if flow is a mediator between mental variables, such as imagery use, and performance. In addition, future studies need to take into account personal preconditions, such as imagery use, imagery ability, age, skill level, and environmental factors, to successfully employ imagery interventions. Especially young athletes with low imagery use and ability should be assisted in reinforcing their mental skills of imagery use before commencing an imagery intervention.

Conclusion

The results of this study provide evidence that the imagery intervention enhanced flow and performance within junior tennis competitions. The conclusion can be drawn that imagery use had a positive effect on flow state and performance over time. As a by-product of this intervention, the athlete experienced a higher level of confidence throughout the post-intervention phase. We need more sport psychological interventions that positively influence mental processes and antecedents of flow to enhance flow and performance in training and competition.

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Thermal Stress and Strain in Elite and Community Level Tennis Players

SARAH M. MORANTE, JOHN R. BROTHERHOOD AND JACQUI RAYMOND

ABOUT THE AUTHOR

Sarah Morante completed a Bachelor of Applied Science (Exercise and Sport Science) at the University of Sydney in 2002. Currently, she is completing a Doctor of Philosophy at the University of Sydney. The title of the research is "Thermal stress and strain in elite and community level tennis players" and is supported by an ITF Sport Science Research Grant, the New South Wales Institute of Sport and Tennis NSW.

for play. Currently, no objective information about players' physiological responses exists on which to formulate guidelines. Therefore the aim of this study is to develop evidence-based recommendations for tennis participation to minimize the potential for heat illness and the impact on

performance. In the field, over the course of twelve months (four seasons), the thermal environment, players' physiological and subjective responses, and activity level and performance will be measured during singles tennis match play. The results will be used to develop equations for the rational analysis of heat stress and strain in competition tennis for a wide range of environmental conditions.

The data will be used to develop models that will predict environmental conditions that are potentially hazardous to player health and safety or impact on performance. In addition, evidence-based advice will be developed for women regarding tennis play in early pregnancy when the foetus is most vulnerable to high body temperature.

Tennis is played throughout the world, often in hot conditions, by players with wide ranging physiological characteristics. There is widespread community concern in Australia about the risk of heat stress in sport.

Anecdotal evidence suggests that dizziness, nausea, vomiting and exhaustion occur during tennis play in hot, humid weather; however the actual incidence and the environmental conditions that cause these symptoms of heat stress are unknown. In the future, heat stress is likely to be an increasing problem for sport due to climate change and global warming. Therefore it is important to establish objective, evidence-based guidelines which determine conditions that are unsuitable