Effects of Psychological Interventions on Regulating Pre-Competition Mood States in Malaysian Volleyball Players
心理調節對馬來西亞排球運動員的賽前情緒狀態調節之成效

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Abstract

The purpose of this study was to investigate the effectiveness of three psychological intervention strategies in regulating the pre-competition mood states among volleyball players with matching hypothesis. The Brunel Mood Scale (BRUMS) was employed to examine the pre-competition mood states patterning of its six sub-scales during the time leading up to competition. Participants were the youth state volleyball players (N=96; boys = 48, girls = 48; Age: M=16.35 yr., SD = .89 yr.) competing in the Under 18 National School Sport Council of Malaysia Volleyball Tournament 2008. The Competitive Sport Anxiety Inventory-2 Revised (CSAI-2R) was employed to collect the baseline data two months prior to the official competition during the first meeting. The group with the highest group mean scores in cognitive anxiety component was assigned to a cognitive intervention group (n = 24) in which participants underwent breathing technique & autogenic relaxation with music lasting for 30 minutes per session; the group with the highest group mean scores in somatic anxiety component (n=24) completed the somatic intervention with progressive muscular relaxation lasting for 30 minutes; the self-confidence intervention group which rated the lowest mean group scores in self-confidence component carried out the intervention with positive self-talk and goal setting exercises lasting 30 minutes; and a control group (n = 24). Results of this study revealed that the cognitive intervention was the most effective intervention followed by the somatic intervention in regulating the bad mood states and facilitating the good mood states prior to competition. Similarly, the self-confidence intervention was able to facilitate the vigour sub-scale prior to competition.

Keywords: Psychological Interventions; Matching Hypothesis; Pre-Competition Mood States

摘 要

本研究的目的是探討三項心理調節策略的成效，對排球運動員賽前情緒狀態調節之間的匹配假說。在即將面對激烈的競賽期間採用布魯內爾情緒量表(BRUMS)，以觀察賽前情緒狀態模式的六個因素。參與者是參加18歲以下全國學校體育委員會2008年馬來西亞排球錦標賽的各州少年排球運動員(N = 96；男生 = 48，女生= 48；年齡：M = 16.35歲，SD = .89歲。)。在正式比賽前兩個月的第一次會議中，採用競賽狀態焦慮量表第二修訂版(CSAI-2R)收集了基線資料。在認知焦慮部分獲平均得分最高的組別， 其參與者被分配到認知調節組 (n = 24)，在每節30分鐘的音樂播放下經歷呼吸技巧和自生放鬆；在軀體焦慮部分獲平均得分最高的組別 (n = 24) 以持續30分鐘的漸進性肌肉放鬆完成了軀體調節；在自信心部分平均數排名最低的自信心調節組，則開展了持續30分鐘以積極的自我對話和目標設置練習作調節; 對照組 (n = 24)。本研究結果顯示，認知調節能於比賽前最有效地介入調節不良情緒狀態和促進良好的情緒狀態，其次是軀體調節。同樣，自信心調節能夠在比賽前促進活力因素。

關鍵字: 心理調節；匹配假說；賽前心境狀態

Introduction

Pre-competition mood and sport performance has been supported both anecdotally and empirically (Beedie, Terry, & Lane, 2000; Terry, 2004). It is advantageous for athletes to be able to implement strategies to manage their pre-competition moods. Cox, Qiu, and Liu (1993) report that autogenic relaxation, a technique that combines progressive relaxation, breathing, focus on warmth and heaviness of limbs, and self-talk, is also effective in reducing anxiety and tension. Hewston, Lane, Karageorghis, and Nevill (2005) showed music to be effective at generating pre-competition mood states associated with successful performance and effective coping, and they emphasised the individualised nature of affective responses to music. Sport psychology interventions often help participants learn relaxation techniques as well as cognitive strategies (Hays & Smith, 1996). Relaxation skills increase athletes' awareness of their physiological arousal level and give them tools to regulate that level in order to achieve optimal arousal for best performance. Progressive muscle relaxation (Jacobson, 1938) is an empirically validated method for reducing anxiety and decreasing affective distress (Antoni, Baggett, & Ironson, 1991).

Failure to get in the right mood seems to be a common attribution for poor performance by athletes, while mood enhancement appears to be an important motive for participation among exercisers (Terry & Karageorghis, 2006). Lane & Terry (2000) defined mood as a set of feelings, ephemeral in nature, varying in intensity and duration, and usually involving more than one emotion. Mood state refers to a situation specific, somewhat transient, psychological response to an environmental stimulus (Cox, 2002). Cohen, Kessler, & Gordon (1997) described mood states as illustrations of a process in which an individual attempts to adapt to environmental demands. Murray (1998) defined a mood state as a temporary emotional state that fluctuates depending upon circumstances.

Moods are proposed to predominantly impact the cognitions of the individual (Lane & Terry, 2000; Siemer, 2005; Vallerand & Blanchard, 2000). The different facets of emotions and moods also imply that separate strategies might be effective in order to regulate them optimally; for instance, coping with the source of an emotion but adopting cognitive oriented regulation strategies to alter a mood state (Beedie, Terry, & Lane, 2005; Jones, 2003). One proposal associated with Morgan, immortalised in a 1980 article Test of Champions: The Iceberg Profile, in which he espoused the importance of a mood profile characterised by low anger, confusion, depression, fatigue and tension, and high vigour, has been the subject of much critical debate in the sport psychology literature (Lane & Terry, 2000). In discussing the use of self-talk as a means of changing moods, Zinsser, Bunker, & Williams (2001) suggested that self-talk can be used in the management of both anger and anxiety in sport. They suggested that competitors initially monitor their thoughts, and then apply a range of strategies to help manage these thoughts. Most mood-regulating strategies focus on increasing or maintaining the intensity or positive mood states and decreasing or eliminating negative moods (Ben-Ze'ev, 2000).

The CSAI-2R (Cox, Martens, & Russell, 2003) is a 17-item scale that measures cognitive state anxiety (5 items), somatic state anxiety (7 items) and self-confidence (5 items) in a competitive setting. Respondents rate their feelings before competition (e.g. I feel jittery, I am concerned about losing) on a scale anchored by 1 = not at all and 4 = very much so. Subscale scores are calculated by summing items in each subscale, dividing by the number of items, and multiplying by 10. Score range is 10 – 40 for each subscale. The factorial validity of the CSAI-2R was previously established by Cox et al. (2003) using confirmatory factor analysis (CFA) on data from 331 athletes, which showed a good fit of the hypothesised measurement model to the data (CFI = .95, NNFI = .94, RMSEA = .054).

The purpose of the present study therefore was to investigate the effectiveness of psychological interventions (cognitive intervention; somatic intervention; & self-confidence intervention) on regulating the four temporal mood states prior to competition in Malaysian volleyball players.

Method

Participants

Participants of this study were the youth state volleyball players (N=96; boys = 48, girls = 48; Age: M=16.35 yr., SD = .89 yr.) competing in the Under 18 National School Sport Council of Malaysia Volleyball Tournament 2008. They were the players selected to represent four states in Malaysia (i.e., Negeri Sembilan,

Melacca, Perak and Selangor) in that tournament. Participation was voluntary and informed consent was obtained from team coaches and team managers prior to data collection. Participants were assured confidentiality regarding the data collected and their personal identity.

Measures

Brunel Mood Scale (BRUMS: Terry, Lane, Lane, & Keohane, 1999; Terry, Lane, & Fogarty, 2003) was employed to examine the pre-competition mood states patterning of its six sub-scales during the time leading up (one month before, two weeks before, one week before and one day before) after each psychological intervention session. BRUMS data were converted to standard T-score format using tables of normative data from Terry et al. (2003) on young athletes.

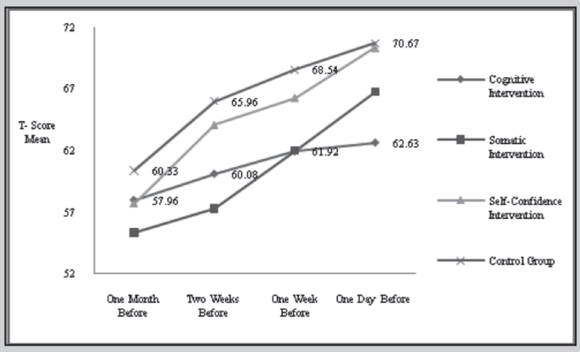
Procedures

The participants first completed the CSAI-2R two months prior to the official competition using standardized instructions recommended by Martens, Burton, Vealey, Bump, & Smith (1990). Based on the results of the first data collected, participants were assigned to one of three interventions and a control group using the matching hypothesis proposed by Gould, Petlichkoff, & Weinberg (1984).

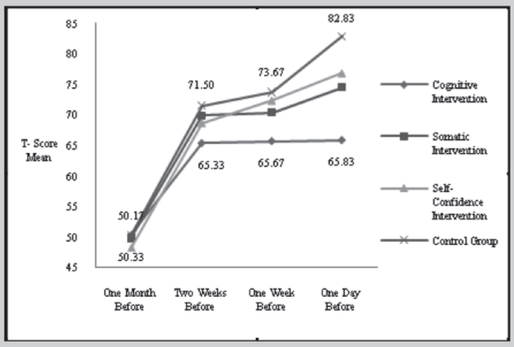
The group with the highest mean scores in the cognitive anxiety component was assigned to the cognitive intervention (n = 24, 12 male & 12 female). This group went through the breathing technique & autogenic relaxation (Maynard, & Cotton, 1993) with music (Nilson, Unosson & Rawal, 2005) lasting 30 minute per session, four times prior to competition. The group with the highest group mean scores in the somatic anxiety component was assigned to the somatic intervention (n = 24, 12 male & 12 female). They completed the progressive muscular relaxation (Jacobson, 1938) with music (Nilson, Unosson & Rawal, 2005) lasting 30 minutes per session, four times prior to competition. The group with the lowest group mean scores in the self-confidence scales went through the self-confidence intervention (n = 24, 12 male & 12 female) with the positive self-talk (Hamilton, Scott & MacDougall, 2007) and goal setting (Weinberg & Butt, 2005) lasting 30 minutes per session for 4 sessions prior to competition. The control group (n = 24, 12 male & 12 female) met up with the researcher for discussion and game sessions. Data were collected four times (i.e., one month before; two weeks before; one week before; and one day before competition) after each psychological intervention session by the researcher.

Results

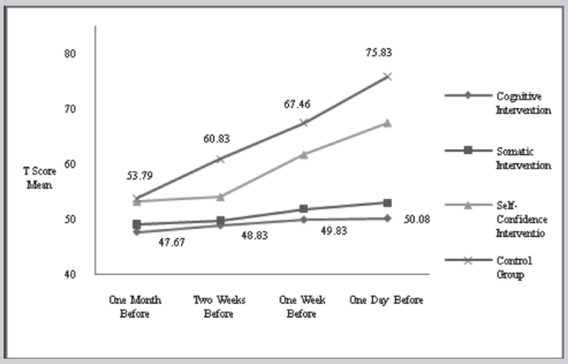
Graph 1. Comparison of the Anger Level between the Four Groups with Time-to-Event



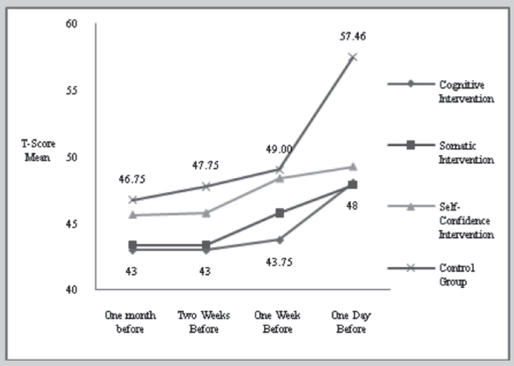
Graph 2. Comparison of the Confusion Level between the Four Groups with Time-to-Event



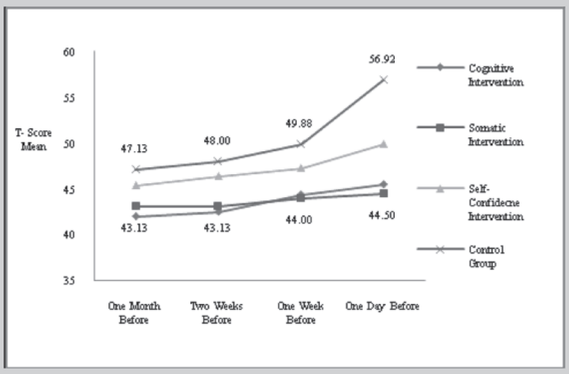
Graph 3. Comparison of the Depression Level between the Four Groups with Time-to-Event



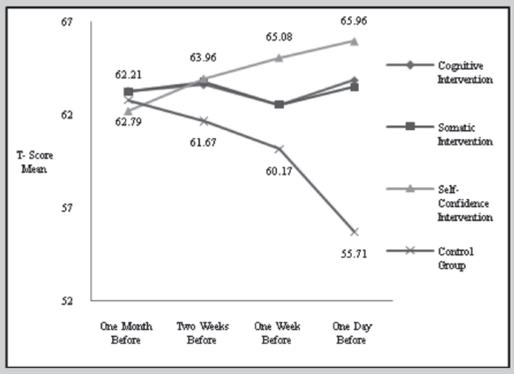
Graph 4. Comparison of the Fatigue Level between the Four Groups with Time-to-Event



Graph 5. Comparison of the Tension Level between the Four Groups with Time-to-Event



Graph 6. Comparison of the Vigour Level between the Four Groups with Time-To-Event



A one-way ANOVA was used to test the T-score of the anger level between the intervention groups and the control group one day before competition. The T-score of the anger level differed significantly across the four groups [F(3, 92)=6.75, p=.001]. Tukey Post-Hoc comparisons of the four groups indicate that the T-score of the anger level of the cognitive intervention group (M=62.62, SD=8.70) gave significantly lower than the self-confidence intervention group (M=70.29, SD=6.18), and the control group (M=70.67, SD=6.03).

Results of this study revealed that the temporal moods one day before competition for the T-score of the confusion level differed significantly across the four groups [F(3, 92)=25.15, p=.001]. Tukey Post-Hoc comparisons of the four groups indicate that the T-score of the confusion level of the cognitive intervention group (M=65.83, SD=5.59) were significantly lower than the somatic intervention group (M=74.50, SD=8.11), self-confidence intervention group (M=76.83, SD=7.36), and the control group (M=82.83, SD=6.18). The T-score of the confusion level of the somatic intervention group (M=74.50, SD=8.11) and the self-confidence group (M=76.83, SD=7.36) also yielded significantly lower than the control group (M=82.83, SD=6.18) at p<.05

The T-score of the depression level differed significantly across the four groups [F(3, 92)=90.19, p=.001] one day before competition. Tukey Post-Hoc comparisons of the four groups indicate that the T-score of the depression level of the cognitive intervention group (M=50.08, SD=1.44) were significantly lower than the self-confidence Intervention group (M=67.40, SD=8.45) and the control group (M=85.83, SD=8.16). The T-score of the depression level of the somatic intervention group (M=52.92, SD=4.22) and the self-confidence group (M=67.46, SD=8.45) also yielded significantly lower than the control group (M=85.83, SD=8.16) at p<.05.

The T-score of the fatigue level also differed significantly across the four groups [F(3, 92)=69.76, p=.001]. Tukey Post-Hoc comparisons of the four groups indicate that the T-score of the fatigue level of the cognitive intervention group (M=48.00, SD=2.28), somatic intervention group (M=47.88, SD=1.94) and the self-confidence intervention group (M=49.25, SD=2.33) were significantly lower than the control group (M=57.46, SD=3.81) one day before competition at p<.05.

Similar results indicated that the T-score of the tension level differed significantly across the four groups [F(3, 92)=80.43, p=.001]. Tukey Post-Hoc comparisons of the four groups indicate that the T-score of the tension level of the cognitive intervention group (M=45.50, SD=1.69), somatic intervention group (M=44.50, SD=2.11) and the self-confidence intervention group (M=49.88, SD=1.73) were significantly lower than the control group (M=56.92, SD=5.27) one day before competition at p<.05.

Also, the T-score of the vigour level also differed significantly across the four groups [F(3, 92)=94.10, p=.001]. Tukey Post-Hoc comparisons of the four groups indicate that the T-score of the vigour level of the cognitive intervention group (M=63.88, SD=2.29), somatic intervention group (M=63.50, SD=2.64) and the self-confidence intervention group (M=66.00, SD=1.18) were significantly higher than the control group (M=55.71, SD=2.68) one day before competition at p<.05.

Discussion

The purpose of the present study was to investigate the effectiveness of psychological interventions (cognitive intervention; somatic intervention; & self-confidence intervention) on regulating the four temporal mood states (one month; two weeks; one week; & one day) prior to competition in Malaysian volleyball players. Mood states were shown to fluctuate at each assessment temporal demonstrating its transient nature. All mean effects were in the direction associated with an iceberg profile (Morgan, 1980, & 1985). Levene's test for homogeneity showed that the assumption of equality of variance among the four groups one month before competition was not violated. The analysis results can therefore be considered valid.

The BRUMS scores for anger, confusion, depression, fatigue and tension of the control group increased over time and it demonstrated significant difference if compared to the intervention groups one day before competition. On the other hand, the vigour level of the control group decreased significantly when compared to the intervention groups one day before competition. The results of the current study suggest that these interventions were able to regulate mood states prior to competition and it supported that the most mood regulating strategies focus on increasing or maintaining the intensity of positive mood states and decreasing or eliminating negative moods (Ben-Ze'ev, 2000).

The present study showed that anger level of the intervention groups and the control group increased over time from one month before competition to one day before competition. The one-way ANOVA analysis showed statistically differences [F(3, 92)=6.75, p=.001], follow-up tests revealed that the cognitive intervention group, somatic intervention group and self-confidence group were significantly lower than the control group one day before competition. It means all the interventions were

able to regulate the anger level when competition was near. Speilberger (1991) proposed that anger can either be suppressed inwardly or expressed towards the self, or directed externally toward other individuals or objects.

Findings of the present study showed that the cognitive intervention was the most effective strategy in regulating the confusion, depression, & fatigue prior to competition if compared to the other intervention groups and the control group. The confusion, depression, & fatigue level of the cognitive intervention were significantly lower than the control one day before competition. The confusion, depression, & fatigue level of the control group increased notably from one month before competition to one day before competition. The present study showed that anger and fatigue increased over time. Findings for fatigue should be not be surprising given athletes reported low scores at the start of the investigation, and it is reasonable to expect fatigue to increase in response to strenuous exercise. Lane & Terry (2000) argued that some individuals could learn to regulate anger to optimum levels, and use anger to enhance determination.

Scores on tension showed that relatively low for all the groups one month before competition and increased over time. Results of this study revealed that the tension level of the control group was significantly higher than all the intervention groups one day before competition. The results indicated that somatic intervention was the most effective intervention in regulating tension if compared to other intervention groups. As highlighted by Thayer (1996) that exercise is proposed to increase energy (by increasing arousal and activation), and reduce tension (by reducing skeletal-muscular tension). It is consistent with the somatic intervention which employed the Progressive Muscular Relaxation (PMR) involved of tensing and relaxing of the skeletal-muscular. Tension, in this respect, has been found in some studies to facilitate performance (Cockerill, Nevill, & Lyons, 1991), particularly in the absence of depression (Lane, Terry, Beedie & Stevens, 2004), and could be an indicator of anticipation and readiness for the upcoming competition. Further, the high perceived effectiveness of relaxation techniques to reduce tension suggests they may have a special place in an athlete's coping repertoire.

On the other hand, the BRUMS score for vigour initially moderately high for all the groups. The vigour level of the control group decreased notably from one month before competition to one day before competition. It showed significantly lower than all the intervention groups one day before competition. Findings of this study indicated that the self-confidence intervention group was the most effective strategy in regulating vigour prior to competition. The findings of this study supported Zinsser et al. (2001) advocated that self-talk can boost one's self-confidence, focus one on goals achievement; enhance and maintain motivation; sustain a positive mindset; interrupt debilitating thoughts and restructure them; help the athletes focus and refocus or shift attentional focus; as well as mentally prepare for the upcoming performance.

The mechanisms by which mood states are controlled by different interventions are open for further research. However, it could be assumed that the interventions involving relaxation might have created a physiological status conducive for positive moods. Similarly, cognitive intervention group may be thought of producing a cognitive status supporting the positive moods.

In conclusion, findings of the present study supported that psychological interventions (cognitive intervention, somatic intervention, & self-confidence intervention) were able to regulate the mood states prior to competition. It means all these interventions were not only suitable to maintain the multidimensional state anxiety prior to competition but also provided very effective strategies in regulating the mood states prior to competition.

In the future, therefore, researchers should investigate the independent effects of different mood states to establish their possible facilitative or debilitative effects on performance (Beedie et al., 2000). In particular, field experiments to evaluate the efficacy of specific mood regulation strategies might provide benefits from both theoretical and applied perspectives. As noted by Martin, Vause, & Schwartzman (2005), there is also a general need in sport psychology for well-designed intervention studies that actually compare the effectiveness of various suggested interventions.

References

Antoni, M., Baggett, L., & Ironson, G. (1991). Cognitive behavioral stress management intervention buffers distress responses and elevates immunologic markers following notification of HIV-1 seropositivity. *Journal of Consulting and Clinical Psychology, 59,* 906-915.

Beedie, C.J., Terry, P.C., & Lane, A.M. (2005). Distinctions between emotion and mood. *Cogniton and Emotion,* 19. 847-878.

Beedie, C. J., Terry, P. C., & Lane, A. M. (2000). The Profile of Mood States and Athletic Performance: Two meta-analyses. *Journal of Applied Sport Psychology, 12,* 49-68.

Ben-Ze'ev, A. (2000). *The subtlety of emotions*. Cambridge, MA:MIT Press.

Cockerill, I. M., Nevill, A. M., & Lyons, N. (1991). Modelling mood states in athletic performance. *Journal of Sports Sciences, 9,* 205-212.

Cohen, S., Kessler, R.C., & Gordon, L.U. (1997). Strategies for measuring stress in studies of psychiatric and physical disorders. In Cohen, Kessler, & Gordon (Eds.), *Measuring stress: A guide for health and social scientists* (pp.2.28). New York: Oxford University Press.

Cox, R. H., Qiu, Y., & Liu, Z. (1993). Overview of sport psychology. In R. L. Singer, M. Murphey, & L. K. Tennant (Eds.), *Handbook of research on sport psychology* (pp. 3-31). New York: Macmillan Publishing Company.

Cox, R.H. (2002). *Sport psychology: Concepts and application*. 5th ed. Missouri, Columbia: McGraw Hill.

Cox, R. H., Martens, M. P., & Russell, W. D. (2003). Measuring anxiety in athletics: The Revised Competitive State Anxiety Inventory-2. *Journal of Sport and Exercise Psychology, 25,* 519-533.

Gould, G., Petlichkoff, L., & Weinberg, R. S. (1984). Antecedents of temporal changes in and relationships between CSAI2 components. *Journal of Sport Psychology, 6,* 289-304.

Hamilton, R.A., Scott, D., & MacDougall, M.P. (2007). Assessing the effectiveness of self-talk interventions on endurance performance. *Journal of Applied Sport Psychology, 19,* 226–239.

Hays, K. F., & Smith, R. J. (1996). *Incorporating sport and exercise psychology into clinical practice*. In J. L., Brewer, B. (Eds) Exploring sport and exercise psychology Washington D. C. pp. 413-429.

Hewston, R., Lane, A. M., Karageorghis, C. I., & Nevill, A. M. (2005). The relationship between music, mood-regulation and coping style. *Journal of Sports Sciences, 22,* 175-176.

Jacobson, E. (1938). *Progressive Relaxation*. Chicago, IL: University of Chicago Press.

Jones, M.V. (2003). Controlling emotions in sport. *The Sport Psychologist, 17,* 471-486.

Lane, A.M., & Terry, P.C. (2000). The nature of mood: Development of a conceptual model with a focus on depression. *Journal of Applied Sport Psychology, 12,* 16-33.

Lane, A.M., Terry, P.C., Stevens, M.J., Barney, S., & Dinsdale, S.L. (2004) Mood responses to athletic performance in extreme environments. *Journal of Sports Sciences 22,* 886-897.

Martens, R., Burton, D., Vealey, R.S., Bump, L., & Smith, D.E. (1990). Development and validation of the Competitive State Anxiety Inventory-2 (CSAI-2). In R. Martens, R.S. Vealey, & D. Burton (Eds.), *Competitive anxiety in sport* (pp. 117-213). Champaign, IL: Human Kinetics.

Martin, G.L., Vause, T., & Schwartzman, L. (2005). Experimental studies of psychological interventions with athletes in competition. Why so few? *Behavioral Modification, 29,* 616-641.

Maynard, I. W., & Cotton, P. C. J. (1993). An investigation of two stress management techniques in field settings. *Sport Psychologist, 7,* 375-387.

Morgan, W. P. (1980). Test of champions: The iceberg profile. *Psychology Today, 14,* 92-108.

Morgan, W. P. (1985). Selected psychological factors limiting performance: A mental health model. In D. H. Clarke and H. M. Eckert (Eds.), *Limits of Human Performance* (pp. 70-80). Champaign, IL: Human Kinetics.

Murray, J.F. (1998). *Mental equipment. Smart tennis: How to play and win the mental game* (pp.127-159). San Francisco, California: Jossey-Bass Publishers.

Nilsson, U., Unosson, M., & Rawal, N. (2005). Stress reduction and analgesia in patients exposed to calming music postoperatively: A randomized controlled trial. *European Journal of Anesthesiology, 22* (96-102).

Siemer, M. (2005). Moods as multiple-object directed and as objectless affective states: An examination of the disposition theory of moods. *Cognition and Emotion, 19, 815*-845.

Spielberger, C. D. (1991). *Manual for the State-trait anger expression inventory*. Odessa, FL: Psychological Assessment Resources.

Terry, P.C. (2004). Mood and emotions in sport. In Morris, T., & Summers, J. (Eds.) *Sport psychology: Theory, applications and issues* (2nd ed.) (pp. 48-73). Brisbane: Wiley.

Terry, P.C., Lane, A.M., & Fogarty, G. (2003) Construct validity of the Profile of Mood States-A for use with adults. *Psychology of Sport and Exercise* 4, 125-139.

Terry, P.C., Lane, A.M., Lane, H.J., & Keohane, L. (1999). Development and validation of a mood measure for adolescents. J*ournal of Sports Sciences, 17,* 861-872.

Terry, P. C., & Karageorghis, C. I. (2006). Psychophysical effects of music in sport and exercise: An update on theory, research and application. In M. Katsikitis (Ed.), *Psychology bridging the Tasman: Science, culture and practice – Proceedings of the 2006 Joint Conference of the Australian Psychological Society and the New Zealand Psychological Society* (pp.415-419). Melbourne, VIC: Australian Psychological Society.

Thayer, R. E. (1996). The origin of everyday moods: *Managing energy tension, and stress*. Oxford: Oxford University Press.

Vallerand R.J., & Blanchard, C.M. (2000). The study of emotion in sport and exercise. Historical, definitional, and conceptual perspectives. In Y.L. Hanin (Ed), *Emotions in sport* (pp.3-37). New York: Human Kinetics.

Weinberg, R. S., & Butt, J. (2005). Goal setting in sport and exercise domains: The theory and practice of effective goal setting, In D. Hackfort, J. Duda & R. Lidor (Eds.), *Handbook of research in applied sport and exercise psychology: International perspectives* (pp.129-144), Morgantown, WV: Fitness Information Technology.

Zinsser, N., Bunker, L., & Williams, J. M. (2001). Cognitive techniques for building confidence and enhancing performance. In J. M. Williams, (Ed.), *Applied sport psychology: Personal growth to peak performance* (4th ed.; pp. 284–311). Mountain View, CA: Mayfield.

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