A MULTI-METHOD EXAMINATION OF THE PROCESSES AND OUTCOMES OF IZOF INTERVENTIONS IN COMPETITIVE SPORT: IMPLICATIONS FOR PROGRAM DESIGN, DELIVERY, AND EVALUATION

By

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ABSTRACT

Individual Zone of Optimal Functioning (IZOF) model has garnered empirical support to explain states of human functioning and its subsequent impact on sport performance (Hanin, 2000a). Research evidence suggests that athletes' who are able to control or regulate performance states that allow for utilization of resources (e.g., attention, energy) to complete the task in hand are more likely to experience superior performance (Robazza, Pellizzari, & Hanin, 2004). Yet minimal research has been conducted to examine how the IZOF model may inform the design and delivery of intervention programs to ensure athletes' skills in regulation are enhanced.

The present thesis aimed to explore the usefulness of the IZOF model as a guiding framework in real-world applied settings for enhancing athlete regulation of performance states during competition. In study one a practitioner-focused action research study examined the "how" of working within an IZOF framework. In study two, a multiple case study examined the influence of an IZOF program on athletes' pre- and post-intervention thoughts, feelings, regulatory actions, and subsequent performance. A qualitative examination of this program from the athletes' perspective highlighted key program processes and outcomes (study three). An identified outcome of well-being was subsequently examined in relation to athlete use of regulation techniques and skills athletes in study four. Overall, this thesis highlights several implications for program design, delivery, and evaluation for practitioners when adopting the IZOF model in applied practice.

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With a great deal of love,

I would like to dedicate this thesis to mother, Sue, and late father, Tony.

- List of papers, conference presentations, and abstracts
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LIST OF PAPERS

The present thesis is comprised of the following five papers. Study design, data collection, data analysis and writing were conducted by Charlotte Woodcock. Dr Lee-Ann Sharp supported data collection for study one, two, and three in the role of interviewer. Professor Joan Duda and Dr Jennifer Cumming advised on study design, data analysis and manuscript editing.

1. **Woodcock, C.,** Cumming, J., Duda, J. L., & Sharp, L. (under second review). Working within an Individual Zone of Optimal Functioning (IZOF) Framework: Consultant practice and athlete reflections on refining regulation skills, *Psychology of Sport & Exercise.*

2. **Woodcock, C.,** Cumming, J., & Duda, J. L., & Sharp, L. (in preparation). Keep calm and carry on: Optimizing athlete emotion, physiological, and cognitive experiences during tennis and golf competitions

3. **Woodcock, C.,** Duda, J. L., Cumming, J., & Sharp, L. (in preparation). "I've pretty much changed as a tennis player": Athlete evaluation of the processes and outcomes of a 5-Week regulation intervention

4. **Woodcock, C.,** Cumming, J., & Duda, J. L. (in preparation). Psychological skill and technique use and symptoms of athlete engagement and burnout.

During the period of PhD study within the School of Sport & Exercise Sciences at the University of Birmingham, the following manuscripts and conference abstracts have been accepted for publication and/or presentation or are currently in press or under peer review.

Publications

5. Holland, M. J. G., **Woodcock, C.**, Cumming, J., & Duda, J. L. (2010). Mental qualities and employed mental techniques of young elite team sport athletes. *Journal of Clinical Sport Psychology, 4,* 19-32.

In Press

1. **Woodcock, C.,** Duda, J. L., Cumming, J., Sharp, L., & Holland, M. J. G. (in press). Assessing mental skill and technique use in applied interventions: Recognizing and minimizing threats to the psychometric properties of the TOPS, *The Sport Psychologist.*

2. **Woodcock, C.,** Holland, M. J. G., Duda, J. L., & Cumming, J. (in press). Psychological qualities of elite adolescent rugby players: Parents, coaches, and sport administration staff perceptions and supporting roles. *The Sport Psychologist.*

Under Review

3. Holland, M. J. G., Duda, J. L., Cumming, J., **Woodcock, C.**, & Sharp, L. (under review). Assessing the validity and reliability of the Behavioral Regulation in Sport Questionnaire for adolescent age athletes: A multi-method approach.

4. Sharp, L., Holland, M, J. G., **Woodcock, C.**, Duda, J. L., & Cumming, J. (under review). A qualitative evaluation of the effectiveness of a mental skills training program for youth athletes.

5. Sharp, L., **Woodcock, C.**, Holland, M. J. G., Duda, J. L., & Cumming, J. (under review). Validation of the Athlete Burnout Questionnaire with youth athletes.

Conference Presentations

6. Sharp, L. (symposium convener), Holland, M. J. G., **Woodcock, C.,** Cumming, J., & Duda, J. (2010, December). MST with young athletes: Aims, findings, lesson learned, and proposed future directions. Division of Sport & Exercise (DSEP) 2010 biennial conference, London, UK.

    i. Cumming, J., Sharp, L., Holland, M. J. G., **Woodcock**, **C.**, & Duda, J. L. An overview of a MST programme for U16 rugby union players.

ii. **Woodcock, C.,** Sharp, L., Holland, M. J. G., Duda, J. L., & Cumming, J. The process of delivering and evaluating a MST programme: Applying lessons learnt.

iii. Sharp, L., Holland, M. J. G., **Woodcock, C.,** Cumming, J., & Duda, J. L. "It changed my experience of the game": Results from a multi-method evaluation of a MST programme.

iv. Holland, M. J. G., **Woodcock, C.,** Sharp, L., Duda, J. L., & Cumming, J. An action-research approach to MST evaluation: Moving the field forward.

7. **Woodcock, C.,** Sharp, L., Holland, M. J. G., Fisher, B., Duda, J. L. (symposium convener and chair), & Cumming, J. (2010, October). An action research approach to mental skills training: Experience, evaluation, and evolution. Association for Applied Sport Psychology (AASP) annual conference, Providence, Rhode Island.

    i. Fisher, B., Sharp, L., **Woodcock, C.,** Cumming, J., & Duda, J. L. A youth coach perspective of a mental skills training program.

    ii. Holland, M. J. G., Sharp, L., **Woodcock, C.,** Cumming, J., & Duda, J. L. Evaluating MST research procedures: Observations, reflections, and progressions.

    iii. Sharp, L., **Woodcock, C.,** Holland, M. J. G., Duda, J. L., Cumming, J. Youth athletes' responses to a mental skills training program.

    iv. **Woodcock, C.,** Holland, M. J. G., Sharp, L., Duda, J. L., & Cumming, J. Origins and evolution: Coming full circle with mental skills training.

8. Holland, M. J. G., Sharp, L., **Woodcock, C.,** Cumming, J., & Duda, J. L. (2010). Validity and reliability of the Behavioral Regulation in Sport Questionnaire (BRSQ) with youth athletes. *Journal of Sport & Exercise Psychology, 32,* s175-s176. (Published abstract. Paper presented at the North American Society for the Psychology of Sport and Physical Activity (NASPSPA), Tucson, Arizona, June, 2010).

9. Sharp, L., **Woodcock, C.,** Holland, M. J. G., Duda, J. L., & Cumming, J. (2010). Validation of the Athlete Burnout Questionnaire with youth athletes. *Journal of Sport & Exercise Psychology, 32,* s218-s219. (Published abstract. Paper presented at the North American Society for the Psychology of Sport and Physical Activity (NASPSPA), Tucson, Arizona, June, 2010).

10. **Woodcock, C.,** Holland, M. J. G., Sharp, L., Duda, J. L., & Cumming, J. (2010). Psychological skill use in adolescents: Exploring the structural and temporal validity of the TOPS. *Journal of Sport & Exercise Psychology, 32,* s233. (Published abstract.

Paper presented at the North American Society for the Psychology of Sport and Physical Activity (NASPSPA), Tucson, Arizona, June, 2010).

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12. **Woodcock, C.,** Holland, M. J. G., Duda, J. L., & Cumming, J. (2008). Player and coach perspectives of the psychological qualities relevant to elite pathway rugby. *Journal of Sport Sciences, 26(S2),* s42. (Published abstract. Paper presented at the British Association of Sport & Exercise Sciences (BASES) 2008 annual conference, Brunel University, Uxbridge, UK, September, 2008).

13. **Woodcock, C.,** Duda, J. L., Cumming, J., & Holland, M. J. G. (2008, April). Player and coach perspectives of the psychological qualities relevant to elite youth rugby. Paper presented at the British Association of Sport & Exercise Sciences (BASES) 2008 student conference, University of Bedfordshire, Bedford, UK. (Paper awarded coaching research postgraduate prize).

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LIST OF ABBREVIATIONS

A list of abbreviations that are contained within the current thesis is provided (in alphabetical order) below:

AbPS	Absolute Proximity Score
ABQ	Athlete Burnout Questionnaire
ABQr	Athlete Burnout Questionnaire revised
ActPS	Actual Proximity Score
AEQ	Athlete Engagement Questionnaire
CDC	Conservative Dual-Criteria
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMRT	Cognitive-Motivational-Relational Theory
CR-10	Category Ratio Scale
CSA	Composite Sequence Analysis
CZP	Composite Zone Proximity
ERP	Emotion Regulation Program
FiR	Fairways in Regulation
GiR	Greens in Regulation
IZOF	Individual Zone of Optimal Functioning
N+	Unpleasant-helpful
N-	Unpleasant-unhelpful
Nonopt-zone	Non-optimal Zone of Functioning
Opt-zone	Optimal Zone of Functioning

P+	Pleasant-helpful
P-	Pleasant-unhelpful
PBS	Psychobiosocial State
PST	Psychological Skills Training
RDU	Raw Data Unit
SM	Split-Middle
SMART	Specific, Measurable, Adjustable, Realistic, Time-bound
SRMR	Standard Root Mean Square Residual
TOPS	Test of Performance Strategies
TOPS-2	Test of Performance Strategies 2
TOPS-3	Test of Performance Strategies 3
ZOF	Zone of Optimal Functioning

CHAPTER 1

General Introduction

Self-regulation has attracted attention in many sub-disciplines of psychology, particularly in sport psychology (Behncke, 2002). Indeed, Kirschenbaum (1984) espoused the view that sub-optimal performance in sport was due to problems in athlete self-regulation. Such broad interest from numerous domains has led to the proposal of several theoretical approaches and models of self-regulation, and include Kirschenbaum's (1984) conceptualization of self-regulation, Zimmerman's (1998) self-regulation of learning model, and Bandura's (1986) model of self-regulatory processes. A detailed review of these perspectives in the context of sport psychology is beyond the scope of the current thesis, and can be found elsewhere (Duda, Cumming, & Balaguer, 2005). These different models however share operational similarities in defining self-regulation with respect to the processes that enable an individual to successfully engage in goal-directed behaviors. In general, these self-regulatory mechanisms involve an iterative process of goal selection and commitment, identification, initiation, and maintenance of thoughts, feelings, and actions towards a desired goal, and a comparative function to assess goal progress (Karoly, 1993).

The empirical literature in self-regulation has tended to focus on goal-directed behaviors and the process of goal pursuit and attainment (Karoly, 1993). However, emotions also play a crucial role in the self-regulation process. According to Carver (2004), emotions arise as a consequence of the comparative function that assesses goal progress. In sport, an observer may be able to discern an athlete's progress towards his or her performance goal through the emotions he or she expresses. For example, in the 2011 Wimbledon tennis finals, Andy Murray dominated the first set against opponent Rafael Nadal. During this set Murray was described as "exuding tranquility that hinted at a happier outcome" (Brown, 2011). However, after making an unforced error "Murray looked heavy on his feet", "screamed in exasperation", and "berated his choices of angle on the groundstrokes" (Brown, 2011). Although Murray was observed looking towards his coach and mother for support, ultimately when on the competitive stage, he is responsible for his own actions. Commenting on Andy

Murray's performance, previous Wimbledon Champion Boris Becker stated "technically he's got it all" but "emotionally, Murray…doesn't know when to get angry and when to stay calm" (Schink, 2011). Becker holds a view that Murray must become mentally stronger, and learn to control the frustration and anger that seem to interrupt his focus on court and negatively impact performance. Becker's analysis aligns with the self regulation literature (Kirschenbaum, 1984), which suggests that the emotions experienced when performances are not progressing as planned (e.g., losing, making mistakes or errors) can impede further self-regulatory efforts towards a desired goal.

Given the important role emotions play in sport performance (Jones, 2003), a brief history of past work on emotions is presented in introducing the background to the current thesis. It is also put forward that the influential role emotions play form only part of an athlete's performance state (Hanin, 2007). Drawing from Hanin's (2000a) Individual Zone of Optimal Functioning (IZOF) model, a broader state of human functioning is described. The IZOF proposes athletes who are able to control the content and intensity of feeling states, associated with superior performance, increase the probability of effectively and efficiently completing the task in hand. In considering this conceptual stance, a brief review of the IZOF research is offered. Emphasis is given to the impact of IZOF based regulation programs in helping athletes optimize performance experience and outcome. With an eye to further explore the efficacy of the IZOF model as a guiding framework in applied settings, considerations for the current thesis are subsequently presented.

Emotions in Sport: A Brief History

Studies into emotions and their effect on performance have been of primary interest in sport psychology since the 1970s. Arguably the emotion that received the earliest attention from researchers was anxiety. In past work, anxiety has been conceptualized as arousal or level of activation, and the relationship between competitive anxiety and performance was initially explained by the inverted-U hypothesis (Yerkes & Dodson, 1908). Poor performance

was predicted when arousal levels are low or high, whilst optimal performance would be expected when arousal levels are moderate.

Although the inverted-U hypothesis received empirical support (e.g., Martens & Landers, 1970), it also attracted criticism. In particular, it failed to explain individual differences in what was considered an optimal level of anxiety for performance (Jones, Swain, & Hardy, 1993). Reacting to this inadequacy of the hypothesis, Hanin (1978) developed the Zone of Optimal Functioning (ZOF) model. According to ZOF, athletes possess an optimal zone or range of anxiety within which superior performances are more likely to occur. ZOF does not support a nomothetic or group level association between anxiety and performance. Rather, ZOF purports an anxiety-performance relationship that functions at an individual level. This idiographic approach suggests optimal anxiety levels could lie at any point on the low to high arousal continuum (Hanin, 1978).

Theorists, however, questioned the unidimensional conceptualization of anxiety initially embraced by the inverted-U hypothesis and the ZOF model. A multidimensional theory was proposed to better explain anxiety's interactive effects on performance (Martens, Vealey, & Burton, 1990). Martens and colleagues (1990) considered the anxiety response to comprise of two dimensions: (a) cognitive anxiety (e.g., worry), and (b) somatic anxiety (e.g., arousal). This multidimensional theory was later extended to include a directional interpretation of anxiety symptoms. Directional interpretation refers to whether an individual perceives the intensity of anxiety (either cognitive or somatic) to be facilitative or debilitative for performance (Jones & Swain, 1992).

Despite sport psychology's initial interest in competitive anxiety, researchers and practitioners agree that the emotions affecting performance are not limited to the anxiety response (Gould & Udry, 1994; Mellalieu, Hanton, & Jones, 2003; Mellalieu, Hanton, & Fletcher, 2006; Mellalieu, Hanton, & Shearer, 2008). Indeed, anxiety alone explains a limited degree of performance variance when compared to a constellation of emotions (Robazza,

2006). Thus researchers have begun to focus on an interaction of several emotions experienced simultaneously in sport.

To examine the effects concurrent emotions have on performance, Hanin (2000a) extended the ZOF in proposing an Individual Zone of Optimal Functioning (IZOF) model. Underpinning the model, IZOF draws from several theories including Lazarus's (1991; 2000) Cognitive-Motivational-Relational Theory (CMRT) of emotion. CMRT suggests two levels of cognitive appraisals are considered in any person-environment encounter. During a primary appraisal, the relevance (i.e., is anything at stake?), congruence (i.e., will the outcome likely be harmful or beneficial?), and content (i.e., is my identity or moral ideals at risk?) of personal goals are assessed (Lazarus, 1991). Secondary appraisal refers to the availability of individual coping resources and perceptions of control in regard to the stressor. This coping process is viewed as integral to emotion generation and experience. Therefore, CRMT elegantly explains why two individuals in the same situation can experience different emotions based on the appraisal process. For example, during a game of soccer a misplaced pass sends the ball to an opponent's feet. The player who passed the ball is annoyed at giving the ball away. Perceiving the error to result from a lack of ability, the player becomes anxious that she will commit the same mistake again. Not wanting to make subsequent errors in the game, the player avoids gaining possession of the ball and stops going in for tackles. Another player who makes a similar error is also annoyed at giving the ball to the opposing team. In contrast, this player attributes her mistake to losing her footing on the slippery turf. This player believes the error was an unlucky isolated incident and consequently becomes calm and re-focuses on the game in hand.

In the IZOF model, cognitive appraisals are central to person-environment interactions. These interactions are a source of individual experience that encompasses performance history, current expectations, and future success, of which emotions form a conceptual unit (Hanin, 2007). Because performance in sport is repetitive, related emotional

experiences are also repeated, and lead to the development of emotion patterns associated with desirable as well as undesirable performance. These emotion patterns are specific to the individual athlete, task, and setting, and are manifested in five dimensions of form, content, intensity, context, and time.

Form. The form dimension describes how a phenomenon is manifested. Hanin (2010) identified eight interrelated modalities (of which emotions is one component) that describe a performer's psychobiosocial (PBS) state. The remaining seven are: (a) cognitive (e.g., distracted), (b) motivational (e.g., interested), (c) physiological (e.g., sweaty), (d) motor-behavioral (e.g., sluggish), (e) operational (e.g., effortless), (f) communicative (e.g., related), and (g) volitional (e.g., determined).

Content. The content of each form is based on idiographic athlete generated descriptions. These qualitative descriptions attach functional impact to the content as being helpful or harmful for performance. For emotion, athletes identify pleasant and unpleasant descriptors that are associated with good and poor performances. These emotion constellations are specific to the individual, and different athletes may appraise the same emotion to be debilitating or facilitating for performance (Robazza & Bortli, 2003).

The content dimension is conceptualized within two interacting independent affect categories of hedonic tone (pleasant or unpleasant) and functional impact (helpful or unhelpful). Consequently, emotions fall into four different categories of pleasant-helpful (P+), unpleasant-helpful (N+), pleasant-unhelpful (P-), and unpleasant-unhelpful (N-) (Hanin, 2000a). A reversal effect of hedonic tone and functional impact has been consistently found in the literature (e.g., P-, N+) (Hanin & Syrjä, 1995; Robazza & Bortoli, 2003; Robazza, Bortoli, Nocini, Moser, & Arslan, 2000). When identifying content descriptors, it is therefore important for athletes to consider a whole range of pleasant and unpleasant emotions as being beneficial or harmful for performance.

Intensity. The intensity dimension provides a quantitative characteristic of experience. The intensity level of emotions is attached to functional effect for energizing (or de-energizing) effort and organizing (or disorganizing) skill for performance. Thus the same emotion can be interpreted as being helpful or harmful depending on its level of intensity.

Intensity is rated on a modified version of Borg's Category Ratio scale (CR-10; Hanin, 2000a). Borg's (1998) scale is based on the range principle that assumes individuals' range of experience is the same. Perceived intensity is determined by its position from zero to a maximal point. Verbal anchors are placed at selected positions on the scale so it acquires ratio qualities from 0 to the possible maximum. Specific anchors on the revised CR-10 scale occur at 0 = *nothing at all,* 0.5 = *very, very little,* 1 = *very little*, 2 = *little*, 3 = *somewhat*, 4 = *moderately*, 5 = *much,* 7 = *very much,* 10 = *very, very much*, and 11 or # = *maximal possible.* Using these anchors the scale allows for subjective PBS intensity experiences within and between individuals to be compared (Hanin & Syrjä, 1995).

Context. The context dimension relates to an environmental characteristic and includes situational (practice or competition), interpersonal, intra-group, and organizational factors (Hanin, 2000a). These factors influence the content and intensity of a PBS state. For example, athletes experience different emotional states in competition compared to practice. To date, the majority of IZOF work has been conducted in the competitive sport context.

Time. The time dimension encompasses the temporal dynamics of performance related experiences. The few studies that have examined pre-, mid-, and post-performance emotional experiences indicate how the content and intensity of optimal states vary across time (Hanin & Stambulova, 2002; Ruiz & Hanin, 2011). Furthermore, Mellalieu and colleagues (2003) examined the perceived impact of emotions over time. Collegiate athletes listed emotions experienced pre and during competition. Athletes indicated whether they perceived these feelings to be facilitative or debilitative for performance. Thirty-three percent of 229 respondents considered feeling nervous before competition to be beneficial, whereas

only 23% held this view once an event had begun. Similarly, feeling apprehensive was regarded to be unhelpful when experienced prior to an event by all respondents, yet during the performance this debilitative impact was only considered to be the case by 50% of athletes.

It is interesting to note therefore that IZOF research has mostly focused on emotion states immediately preceding short duration events (e.g., archery; Robazza, Bortoli, & Nougier 2000). However given the dynamic nature of emotions over time, this pre-event focus may not be appropriate for long duration sports.

Identification of Optimal and Non-optimal Zone Profiles

Based on the five dimensions of form, content, intensity, context, and time, emotion patterns can be identified following Hanin's (2000c) stepwise profiling process for zone identification. For the profiling process, it is assumed that athletes are aware of and able to report affect related performance experiences (Hanin, 2000b). Athletes first reflect on good and poor performances and identify salient emotion descriptor words that best reflect these sporting experiences (e.g., calm). To facilitate this process, Hanin (2000c) developed a Positive and Negative Affect Schedule that lists 96 different emotion terms for describing affect-related states (see Appendix A). Athletes are recommended to select between three and five positive and a further three to five negative words that describe their best and worst affect-related performance states. During this process, athletes are also encouraged to generate their own terms that may better reflect individual experiences.

The intensity with which these subjective emotions are experienced during optimal and nonoptimal performances is rated on the CR-10 scale using either an empirical or recall method (Hanin, 2000b). The empirical, or direct (cf. Pons, Balaguer, & Garcia-Merita, 2001), method is based on multiple emotion intensity assessments carried out prior to a number of successful and unsuccessful competitive events. An optimal zone of functioning (or an opt-zone) is determined by calculating the mean of intensity ratings from successful events. Half a standard deviation is added to and subtracted from the mean to ascertain an opt-zone

bandwidth or range. Similarly, a nonoptimal zone of functioning (or a nonopt-zone) is identified by following the same procedure for intensity ratings associated with unsuccessful competitive events.

Requiring a number of data points over time, the empirical method has been criticized for being intrusive, costly, and impractical (Hanin, 2000b). Moreover, the method does not take an athlete's previous performance history into account. Hence, the majority of research conducted has employed the second method of recall. Using this method, athletes rate optimal and nonoptimal intensities for good and poor performances retrospectively. An arbitrary range of plus and minus two is given to ratings to form a zone bandwith. Although this method may be open to memory biases when recalling past events, its validity in accurately capturing athlete performance states has received considerable support (e.g., Hanin, 2000b; Hanin & Syrjä, 1996; Robazza, Bortoli, & Nougier, 2000). When used in conjunction with one another, the empirical and recall methods yield similar results and offer further content validity for the latter method (Robazza, Bortoli, & Hanin, 2004).

Once functional and dysfunctional intensity ratings have been identified, a visual representation of opt-zone and nonopt-zone profiles is considered a useful means to enhance athletes awareness of the interaction effects of emotion patterns (Hanin, 2000c). The IZOF opt-zone profile is usually bell-shaped, whereas a nonopt-zone takes an inverse form (see Figure 1.1).

It is worthwhile to note that the profiling process described above is one of several PBS state idiographic assessment methods. Hanin and Stambulova (2002) highlight a metaphor generation method that allows athletes to account for the meaning of a performance situation. Moreover, self-narrative accounts have also been considered an effective technique for PBS assessment. A recognized line of inquiry, narratives can describe performance situations, highlight associated thoughts and feelings, and even initiate motivation for change (Hanin, 2003; Nieuwenhuys, Hanin, & Bakker, 2008).

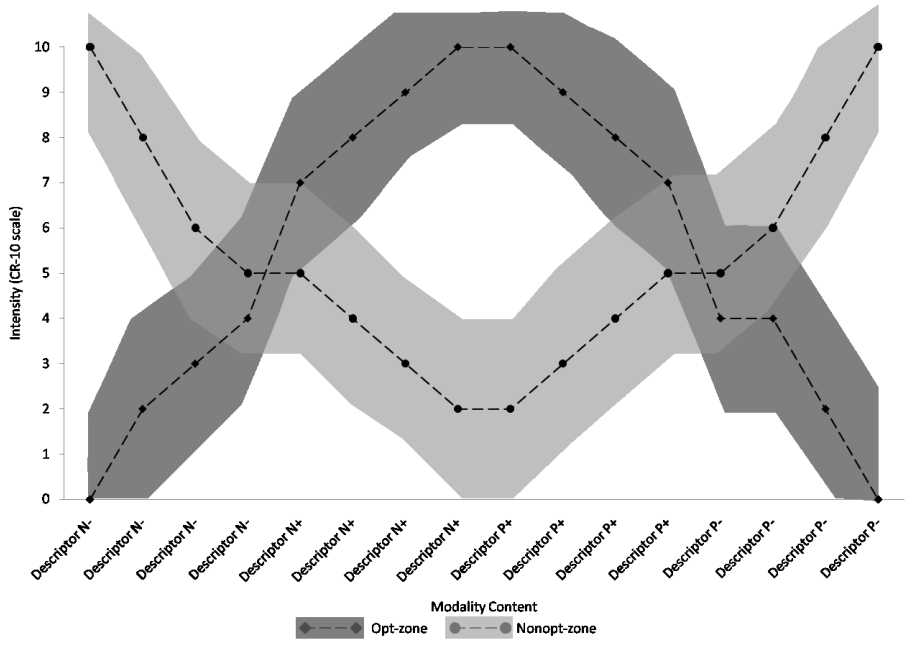


Figure 1.1. Visual representation of a generic opt-zone and nonopt-zone profile.

Emotions and Performance: The In/Out Zone-Performance Principle

The impact of emotion on performance is explained through the utilization and organization of energy. Emotions mobilize or demobilize energy and organize the use or misuse of skill. Depending on the interaction of energizing and organizing effects, the total impact of emotion on performance can be optimal, para-optimal, or nonoptimal (Hanin, 2000b). Based on the utilization and organization of energy and skill, the IZOF model purports an in/out zone-performance principle. The closer an athlete is to an opt-zone and further from a nonopt-zone, the higher the probability for a good performance. Conversely, the nearer an athlete is to a nonopt-zone, yet distal from an opt-zone, the more likely a poor performance will be realized. Para-optimal performance is expected when emotion intensities are inside or outside both zones concurrently (see Table 1.1). Thus, it is assumed that the interaction of functional and dysfunctional emotions best predicts performance (Hanin, 2000a).

Table 1.1

A Description of the In/Out Zone-Performance Principle.

		Performance			
		Optimal	Para-Optimal	Para-Optimal	Nonoptimal
Zone Proximity	Opt-zone	In (proximal)	In (proximal)	Out (distal)	Out (distal)
	Nonopt-zone	Out (distal)	In (proximal)	Out (distal)	In (proximal)

Of all the assessment techniques, the stepwise profiling process has proved useful in providing a quantitative measure to examine the in/out zone principle (Hanin, 2000b). To date, the majority of research on the in/out zone principle has focused on the impact of pre-competitive emotion patterns on performance. Across 10 karate fights, athletes' mean zone proximity prior to good performances was closer to an opt-zone than nonopt-zone. In contrast, athletes reported to be further from their opt-zone and closer to their nonopt-zone before poorer performances (Robazza, Bortoli, & Hanin, 2004). This finding has been replicated for archery (Robazza, Bortoli, & Nougier, 2000), ice-hockey (Hanin & Syrjä, 1995), soccer (Syrjä, Hanin, & Pesonen, 1995), badminton and squash (Syrjä, Hanin, & Tarvonen, 1995), as well as track and field (Robazza, Bortoli, Zadro, & Nougier, 1998).

From Emotions to a Multi-Form Psychobiosocial (PBS) State

Although the majority of IZOF research has focused on emotions, there have been calls to extend the research lens to encompass other forms of the PBS state. Athlete generated descriptors for emotion patterns often hold multiple connotations. Hanin and Stambulova (2002) found athletes identify cognitive, motivational, physiological, motor-behavioral, and communicative components when describing feeling states. Moreover, when Ruiz and Hanin

(2003) asked karate athletes to describe an optimal performance state these five components of the PBS state were referred to in addition to affective and operational forms. Thus an examination of multiple form modalities is likely to offer a more complete description of an athlete's performance state.

In taking a step towards examining a more complete PBS state, Bortoli and Robazza (2002) created a bodily-somatic descriptor list to aid the process of physiological zone profile identification. Following Hanin's (2000c) stepwise process, athletes were able to identify idiographic physiological opt-zone and nonopt-zone profiles (Bortoli & Robazza, 2003). Consistent with the work in emotions, intraindividual comparisons of proximity to pre-competition physiological opt-zone and nonopt-zones yield performance differentiation in line with the in/out zone-performance principle (Robazza, Bortoli, & Hanin, 2004).

Athlete Regulation of Emotions and Physiological Symptoms

The empirical evidence accumulated to date for the IZOF model helps describe (e.g., identification of zone profiles), predict (e.g., in/out zone principle), and explain the emotion-performance and physiological symptom-performance relationships. It is crucial for athletes that they have the ability to regulate these experiences to put themselves in the best place for realizing optimal performance.

In the only (known) study of its kind, Robazza, Pellizzari, and Hanin (2004) developed and delivered an IZOF intervention program with the aim of helping athletes approach individualized emotion and physiological zones of optimal functioning. To consider the contribution of this self-regulation study to the applied sport psychology literature, each intervention phase is considered in turn. These phases include a needs analysis, the identification and enhancement of regulation techniques, and program evaluation.

Needs analysis. Four roller hockey goal tenders and four gymnasts participated in the study. Competing at a National level of competition, these athletes were considered to be elite, and assumed to have the necessary level of awareness to accurately identify zone

profiles. Using the recall method, athletes identified idiographic pre-competitive emotion and physiological zone profiles that enabled optimal and nonoptimal performance experiences to be contrasted. To help further enhance awareness, zones were visually presented, and athletes encouraged to self-monitor performance states during competition and compare this to previously generated opt-zone and nonopt-zone states.

Identifying and enhancing regulation techniques. Three athletes from each sport received an intervention. The remaining participants acted as controls. Based on opt-zone and nonopt-zone profiles, six individualized 10-week emotion regulation programs were developed and delivered. Self-regulation techniques athletes currently used were identified such as precompetition routines, self-talk, imagery, and relaxation. Athletes were provided with suggestions to improve current techniques, and new techniques were also introduced where appropriate (e.g., goal setting). Participants were encouraged to employ the regulation techniques most beneficial for approaching individual opt-zones (for a comprehensive review of emotion regulation techniques, see Jones, 2003).

Program evaluation. The program was evaluated based on the IZOF in/out zone principle. Following the intervention, athletes were better able to recover emotion and physiological opt-zone states for performance, and distance themselves from dysfunctional nonopt-zone experiences. Enhanced pre-performance opt-zone proximity was also accompanied by improvements in performance. A brief social validation interview revealed intervention athletes were interested in the self-regulation program and perceived it to be effective in aiding optimization of pre-competitive mental states. Interestingly, control participants became more distal from opt-zones whilst approaching nonopt-zone states over the same period of time. In conjunction with this unfavorable shift in zone proximity, subjective performance ratings also decreased. It is also worthy to note that when zone proximity was correlated with performance, emotion and physiological symptoms offered a stronger association than either form alone. This finding offers further support for the

consideration of multi-form PBS states that include and extend beyond emotions (Hanin & Stambulova, 2002).

In the application of the IZOF model, Robazza, Pellizzari, and Hanin's (2004) work may be regarded as a landmark study. Their multi-modal intervention offers support for multi-form PBS states and the in/out zone principle of the IZOF model. Support was also garnered for the efficacy of an IZOF intervention program, and the value of IZOF tools such as Hanin's (2000c) profiling process (see Figure 1.2 for an overview). Being the first and only study of its kind, research in this area remains scant (Robazza, 2006). Thus there is a need for further IZOF intervention programs in the competitive sport arena to substantiate previous findings.

With this in mind, the current thesis begins by presenting a series of longitudinal studies that involve the development and delivery of an individualized multi-form IZOF regulation program to athletes participating in competitive sport. These investigations, together with later studies presented in the thesis, aim to contribute to the knowledge base relating to the development, delivery, and evaluation of IZOF intervention programs in real world settings. To meet these aims, some key considerations and limitations emerging from Robazza, Pellizzari, and Hanin's (2004) research are first considered before each study contained within the current thesis is introduced.

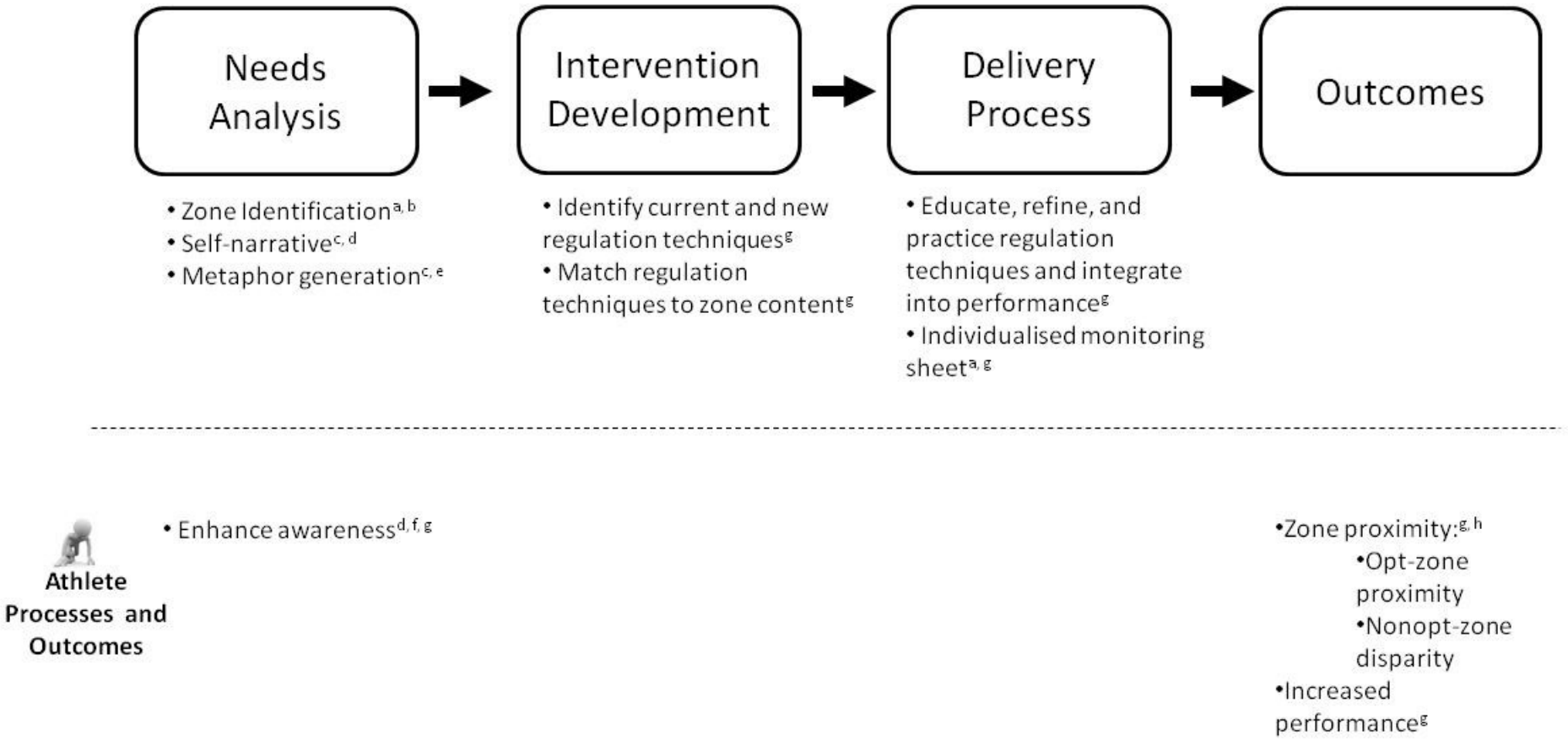


Figure 1.2. Visual representation of applied IZOF processes

Note:
[a]Hanin (2000c). [b]Bortoli & Robazza (2002). [c]Hanin (2003). [d]Nieuwenhuys et al. (2008). [e]Hanin & Stambulova (2002). [f]Harmison (2006). [g]Robazza, Pellizzari, & Hanin (2003). [h]Robazza, Bortoli, & Nougier (2000).

Key Considerations for IZOF Intervention Research

Needs analysis. Robazza , Pellizzari, and Hanin's (2004) needs analysis of athlete performance states focused on emotions and physiological symptoms. These are the only two components of the PBS state for which descriptor lists have been developed to aid zone identification. Previous research has highlighted other form modalities to be salient for describing athletes optimal states of functioning (e.g., cognitions; Hanin & Stambulova, 2002; Ruiz & Hanin, 2003), and should be considered when working in applied settings (Hanin, 2000c; Robazza, Pellizzari, & Hanin, 2004).

Elite client base. The needs analysis Robazza, Pellizzari, and Hanin (2004) conducted was limited to elite athlete participants. It has been assumed that only elite athletes have the necessary level of awareness for zone identification (Hanin, 2000b). However, this reliance on being an elite competitor limits the IZOF to a small select group of athletes. Models of psychological skills training highlight self awareness to be a foundational skill considered essential for change (Ravizza, 2006; Vealey, 1988, 2007). A common aim across applied programs, for athletes competing at all levels of ability, is to develop athlete awareness before education and development of regulation techniques ensue (Murphy & Tammen, 1998).

Self-awareness can be enhanced through multiple sources including consultant-guided and self-reflections, imagery, and reviewing video footage (Gucciardi, Gordon, & Dimmock, 2009; Ravizza, 2006). The use of IZOF tools have also been reported to contribute to developing athlete awareness through the application of idiographic assessment methods (e.g., profiling, self-narrative, metaphor generation) (Hanin, 2003; Robazza, Pellizzari, & Hanin, 2004). Moreover, awareness of functional and dysfunctional performance states is thought to be further enhanced by creating a visual representation of zone profiles (see Figure 1.1; Hanin & Syriä, 1995; Harmison, 2006). Because awareness can be enhanced, then perhaps there is scope (and hope) for extending IZOF studies to a novice or less elite client base.

Meta-experiences. According to Hanin (2007), awareness forms part of athletes' meta-experiences. Meta-experiences are formed from spontaneous and deliberate reflection, by the athlete or others (e.g., coach), on the conditions leading to optimal or nonoptimal performances. For example, an athlete who feels anxious before a competition, and then performs poorly, may develop the belief that anxiety is detrimental for performance. Consequently, if this athlete experiences pre-competitive anxiety again, they are likely to infer a poor performance will ensue. Repeated experiences of this debilitating pattern contribute to the formation of negative attitudes towards feeling anxious immediately prior to competitive events.

Meta-experiences involve three interrelated self-regulation processes of awareness, acceptance, and action (Nieuwenhuys et al., 2008). This "triple-A" framework has been considered useful for examining determinants, as well as the effectiveness, of strategies involved in successful regulation of optimal PBS states (Hanin, 2007). Awareness refers to the belief held regarding situational states. Acceptance relates to the recognition of a state's functional impact on performance. Based on athletes' awareness and beliefs, coping strategies or psychological techniques are employed in the action phase.

In a recent study, Nieuwenhuys and colleagues (2008) examined an elite sailor's good and poor performance experiences using the triple-A framework. In mapping out the connections of awareness, acceptance, and action over the course of a race, the athlete reported gaining new insights into effective and less effective use of regulation techniques. This was not an intervention study per se, but led to the athlete wanting to integrate changes to his training program. Thus, mapping self-regulation processes on the triple-A framework was recognized by the athlete to be beneficial.

Although Robazza, Pellizzari, and Hanin (2004) implied the importance of developing athletes' meta-experiences, these were not defined and examined as a separate dimension. Ruiz and Hanin (2003) suggest that "from an applied perspective, the study of athletes' meta-

experiences is especially important in the regulation of emotions" (p. 241). It is assumed this is the case for all form modalities as meta-experiences pertain to the knowledge, attitudes, and personal significance of experience (Hanin, 2007). Therefore, meta-experiences should be a key consideration when developing and delivering regulation interventions.

Identifying and enhancing regulation techniques. The coping strategies adopted in the action phase of the triple-A framework can encompass the employment of regulation techniques such as goal setting, self-talk, imagery, and relaxation. These techniques formed part of Robazza Pellizzari, and Hanin's (2004) intervention. However, the authors did not offer an in-depth description of how these techniques were identified and developed in order to contribute to athletes' regulation of performance states. One reason for this may be the page limitations often imposed by journal editors. Understandably, prioritization in published papers is frequently given to sections on data analysis and interpretation rather than in-depth procedural details. Consequently, little is known about how the IZOF model (and associated tools for zone identification) inform the education and application of specific regulation techniques to impact zone proximity and the in/out zone-performance principle (Robazza, Pellizzari, & Hanin, 2004).

Program evaluation. Examination of zone proximity and the in/out zone-performance principle have been a primary focus when evaluating IZOF interventions (Robazza, Pellizzari, & Hanin, 2004). However, the contributing factors to observed changes in athlete zone proximity, and how these factors enhance performance in competitive sport contexts, have not been examined. Indeed, Martindale and Collins (2007) emphasize the importance of examining both the processes of change that contribute to intervention outcomes and hold that "outcome information is somewhat empty without sufficient process measures" (p. 466). With the aim of taking account of such processes, it is important to also consider athlete awareness and beliefs surrounding person-environment interactions and employment of regulation techniques when evaluating interventions.

To fully evaluate applied practice however, Anderson, Miles, Mahoney, and Robinson (2002) argue that additional factors to specific variables of interest need to be examined. Anderson and colleagues propose four indicators of effectiveness that are: (a) quality of support, (b) athlete responses to support, (c) psychological skills and well-being, and (d) performance. Although Anderson and colleagues (2002) offer a comprehensive framework, Martindale and Collins (2007) argue that subscribing to a finite "list" of researcher assumed variables may omit critical additional factors that have influenced an athlete. Thus, Martindale and Collins make a case for athletes' subjective views to be bought to the forefront and allow processes and outcomes of an intervention to emerge that may not be reflected in researchers' chosen criteria and measures. Considering the limited application of the IZOF model in the literature, a more exploratory and comprehensive evaluation is warranted to better understand the processes impacting changes in athlete zone proximity and performance. This more inclusive approach allows for additional intervention processes and outcomes to emerge which can inform future hypothesis generation, and delivery of appropriate intervention strategies.

The consultant. Finally, the limited number of IZOF intervention studies means minimal attention has been given to the "how" of implementing the IZOF model in practice. Petitpas, Giges, and Danish (1999) highlight the significance of the consultant-athlete working relationship for initiating change. Thus the consultant should be viewed as a central component of the intervention, and a critical factor in influencing processes and outcomes of a regulation program. Consultant reflections on the process and practice often lead to changes being made to improve intervention components (Cropley, Miles, Hanton, & Niven, 2007; Woodcock, Richards, & Mugford, 2008). It is worthwhile therefore to examine the application of the IZOF model from a consultant's perspective to highlight best practice to optimize intervention processes and outcomes.

The Current Thesis

With these limitations in mind, the current thesis aims to examine the development, delivery, and evaluation of IZOF interventions in real-world settings. The review presented has highlighted several areas for consideration in the implementation and assessment of such interventions, from identifying an appropriate client base to program evaluation. A series of studies are presented within the thesis that touch on one or more of these considerations. In so doing, the over-arching aspiration of the larger work is to provide a comprehensive foundation for the future application and evaluation of IZOF interventions within sport settings. In addition, the current thesis aims to illuminate methodological considerations when working in applied research settings, as well as highlighting conceptual assumptions marking the IZOF model. As a result of the research presented, promising avenues for future research are offered.

Study one. The first study offers a much needed practitioner perspective of working within an IZOF framework. Adopting an action research approach, the process of delivering a 8-week regulation program is highlighted for meeting intervention goals. Specifically, practitioner knowledge and decision making processes are presented to demonstrate how the IZOF framework can provide the structure for an intervention. Focusing on a non-elite athlete in a real world competitive sport setting, the study also illustrates the efficacy of applying the IZOF model with an athlete who is assumed to have low-level of awareness of performance experiences.

Focusing on individual athlete needs, the consultant was challenged in study one to extend the application of the IZOF model beyond its current evidence base. Specifically, work within the IZOF model was broadened to encompass consideration of zone profiles experienced during competitive events in multiple modalities of emotions, physiological symptoms, and cognitions. Although not an extension of the IZOF model per se, a need was

presented in study one to further evaluate the efficacy of specific form modalities of athletes' PBS state experienced over the course of competitive events.

Study two. The aim of study two was therefore to examine the efficacy of the identification of idiographic *during* event zone profiles, with particular attention given to the less considered form modality relating to cognitions. Specifically, a multiple case study is presented with a non-elite tennis player and elite golfer. Based on zone identification of multiple form modalities, a 5-week regulation program was developed and delivered to each athlete. Drawing from information gleaned via both process and outcome focused qualitative and quantitative assessments, program evaluation examined pre- and post-intervention change in athlete meta-experiences, zone proximity, and performance.

Study three. Following recommendations for a comprehensive evaluation of the impact of applied practice (e.g., Anderson et al., 2002; Martindale & Collins, 2007), the aim of the third study was to conduct an evaluation across multiple intervention processes and outcomes from the athletes' perspective. Thus study three extends the evaluation lens to allow for additional influential processes to be identified and beneficial outcomes to emerge. The two athletes from study two, as well as three further recipients of an individualized 5-week intervention program, provided qualitative reports to assess intervention processes and outcomes.

Study four. Studies one to three highlight processes of change (e.g., meta-experiences, technique use, consultant effectiveness), as well as positive outcomes (e.g., opt-zone proximity, maintaining as appropriate focus of attention, perceptions of control) associated with competitive athletes' participation in IZOF interventions. Given the emphasis placed on implications for athlete well-being in models of psychological skills training (Vealey, 2007), well-being was teased out as a pertinent variable worthy of further study in this fourth investigation. Although it is recognized several mediating factors have the potential to influence the relationship between intervention and well-being, the present thesis

focused on athletes' use of psychological techniques and skills. These variables were chosen based on the potential implications for IZOF interventions as well as to other multi-modal psychological skills training programs in general. A cross-sectional study was carried out to examine frequency of regulation technique and psychological skill use with associates of well-being (athlete engagement) and ill-being (athlete burnout). The purpose of study four was to take an initial step towards understanding the associations between how interventions impact positive as well as negative indices of athletes' welfare.

Discussion. The final chapter of the current thesis brings together and summarizes the findings from all five studies presented. Recommendations and future research directions for delivering and evaluating IZOF interventions are offered with specific attention given to the applied implications of the current work. Furthermore, limitations are also discussed before a final conclusion is drawn from the thesis.

Working within an Individual Zone of Optimal Functioning (IZOF) Framework: Consultant Practice and Athlete Reflections on Refining Regulation Skills

This manuscript is under second review in

Psychology for Sport and Exercise.

Introduction

In sport, emotions have been defined as a subjectively experienced psychophysiological reaction to a real or imagined event (Vallerand & Blanchard, 2000). Researchers acknowledge the central role of cognitions in generating such a subjective response (Jones, 2003). Indeed, Lazarus (2000) suggests cognitive appraisals of person-environment interactions and their relative importance to an individual's goals and well-being is key to the process of emotion generation and experience. Drawing from Lazarus (2000), Hanin (2007) considers emotion from a holistic perspective. In his view, emotions are a category of experience that reflects "a person's attitude toward different aspects of the environment and the meaning of the environment for the person" (Hanin, 2007, p. 32). As such, emotions are considered one of eight related components of an individual's psychobiosocial (PBS) state of overall human functioning, and reflect on-going person-environment interactions informed by previous experience, a current situation, and expectations of future success (Hanin, 2010).

Viewed through an Individual Zone of Optimal Functioning (IZOF) lens, the emotion-performance relationship is explained by matching resources to task demands (Hanin, 2007). Specifically, emotions associated with optimal performance ensure efficient recruitment of resources in the mobilization of energy and utilization of skill for favorable task engagement (Hanin, 2000a). Conversely, emotions that are non-optimal reflect a demobilization of energy and miss-use of skill and are dysfunctional for performance (Hanin, 2000b). Given performance experiences are reflected in athletes' emotional states, several researchers have worked with athletes to control and optimize emotions for performance (Prapavessis & Grove, 1991; Robazza, Pellizzari, & Hanin, 2004).

As emotions are subjectively experienced, no one emotion is functionally beneficial for all athletes. Research supports the idiographic nature of how emotions impact performance (Hanin & Syrjä, 1995). Thus there is a need in applied settings to examine emotion-

performance relationships at an individual level. IZOF offers an individualized profiling procedure to identify the content and intensity of emotions for both optimal and non-optimal performances (Hanin, 2000c). These individualized patterns of emotions represent an athlete's optimal zone of functioning (opt-zone) as well as a dysfunctional zone (nonopt-zone).

According to the IZOF model, emotions form only one component of an athlete's PBS state (Hanin, 2000a, 2010). Seven other proposed dimensions are physiological symptom, cognition, motivation, performance, communication, behavior, and volition (Hanin, 2010). Stimulated by multi-dimensional conceptualizations of emotions such as anxiety, physiological symptoms has arguably received the most attention in the literature to date. Following Hanin's (2000c) profiling procedure, support has been garnered for idiographic physiological symptom opt-zone and nonopt-zone patterns in relation to good and poor performances (Robazza & Bortoli, 2003).

For subjective emotions and physiological symptoms, the IZOF model in/out zone-performance principle has received empirical support (Robazza, Bortoli, & Nougier, 2000; Robazza, Pellizzari, & Hanin, 2004). This principle asserts the more proximal an athlete is to experiencing an opt-zone, the more likely superior performance will be achieved. In a similar vein, the probability of a poor performance increases when an athlete is close to a nonopt-zone. This emotion-performance relationship has been demonstrated for both subjective emotion (e.g., happy; Hanin & Syrjä, 1995) and physiological zones (e.g., relaxed; Bortoli & Robazza, 2002). When the experiences of these two forms of athletes' psychobiosocial state are considered together, they offer a stronger prediction for performance in comparison to when emotions or physiological symptoms are independently examined (Robazza, Pellizzari, & Hanin, 2004).

More recently, Hanin (2007) distinguishes between state-like experiences, or emotional states, trait-like experiences, or stable emotional patterns, and meta-experiences. To date the majority of applied interventions has been concerned with athletes' state and trait-like

experiences (Hanin, 2007). Robazza, Pellizzari, and Hanin (2004), for example, developed and delivered a 10-week emotion regulation intervention for roller-hockey goal tenders and gymnasts to help these athletes approach subjective emotion and physiological opt-zone states immediately prior to performance. Following the intervention, athletes were able to approach opt-zone states and reported increases in subjective performance scores.

IZOF research has given less attention to meta-experiences (for exceptions see Nieuwenhuys et al., 2008; Nieuwenhuys, Vos, Pijpstra, & Bakker, 2011). Meta-experiences result from athletes' spontaneous reflection on conditions leading to good and poor performances that consequently contribute to knowledge and beliefs about an experience (Hanin, 2007). Thus meta-experiences influence athletes' choice of regulation techniques; the process and outcome of which is captured within a "triple-A" framework of awareness (of a PBS state), acceptance (of this state's functional impact), and action (employment of effective (or ineffective) coping strategies based on meta-experiences) (Hanin, 2007, 2010).

Triple-A offers a potentially helpful framework for describing the process of change during regulation interventions (Nieuwenhuys et al., 2011). For example, when delivering an IZOF intervention, awareness of opt-zone and nonopt-zone states is considered a necessary prerequisite to emotion regulation (Robazza, Pellizzari, & Hanin, 2004). As a practical tool, Harmison (2006) suggests Hanin's (2000a) profiling process of zone identification enhances levels of awareness, and sets "the stage for…psychological skills and strategies to attain and maintain this mental and emotional state" (p. 240). Moreover, the profiling process allows athletes to identify, reflect, and accept the functional impact zone content has on performance (e.g., helpful or unhelpful). Drawing from the emotion regulation literature, and consistent with the IZOF in/out zone principle, awareness also extends to knowledge about one's current state (Fischer, Manstead, Evers, Timmers, & Valk, 2004; Robazza, Pellizzari, & Hanin, 2004). When a discrepancy exists between this state and one's optimal emotional experience, emotion regulation techniques may be employed to facilitate an opt-zone for performance.

Such optimization of an emotional state may involve reduction (down-regulation), increase (up-regulation), and maintenance of optimal emotion intensity for task completion.

Previous IZOF intervention studies have helped athletes approach an opt-zone for performance (Annesi, 1998; Robazza, Pellizzari, & Hanin, 2004). Although anecdotal reports made by previous consultants have supported working within an IZOF framework (e.g., Harmison, 2006), a systematic reflection of its benefits for a regulation intervention has yet to be considered. Indeed, applied studies in sport psychology tend to centre on intervention outcomes, and the framework guiding the process of intervention delivery is not often examined (Murphy, 2000). Thus the main aim of the present study was to explore the process of working with an athlete to facilitate skills of emotion regulation reflected in the processes of triple-A, current state awareness, and current state-zone discrepancy detection (Hanin, 2010; Fischer et al., 2004).

To examine the process of applying practically based IZOF tools, a single case study methodology with a practitioner research approach was adopted. In so doing, the researcher, who often doubles as applied practitioner, is given a voice. Offering a first person consultant perspective has shown to be an elegant approach when describing the delivery of applied services in sport psychology (Andersen, 2000). Moreover, placing the consultant in the foreground helps answer the call for better documentation of practitioner practice (Simons & Andersen, 1995).

The present investigation offers a single case study of the first author working with a university cross-country runner over a two month period. An action research approach was adopted to examine the "how" of applied practice from the perspective of the consultant and athlete's response to an emotion regulation program. Action research has been proposed as an alternative approach to more traditional paradigms when examining interventions, and allows for close inspection of applied processes (Kellmann & Beckmann, 2003). What distinguishes action research from reflective practice pieces is the involvement of strategic action (Evans,

Fleming, & Hardy, 2000). In sum, the present case study emphasizes procedural decisions and action taken to facilitate a female cross-country runner's skills in emotion regulation.

Method

Participants

First author and consultant. A first-person action research approach was adopted to inquire about my own practice. "I" represents the voice of the first author and consultant. By undertaking this role, I was not an objective researcher looking in from a divorced position outside, but became a participant in the research process. To help contextualize the narrative, Huang (2010) suggests autobiographical information is necessary in anchoring "ownership of expression".

I was a competitive track and field athlete throughout school and university. During my final year of a BSc (Hons) Psychology degree, I was formally introduced to sport psychology. After completing an MSc in Performance Psychology, I began the British Association of Sport and Exercise Sciences (BASES) supervised experience for sport psychology scientific support. I have accumulated four years of supervised applied experiences, providing group and individual support to athletes varying in age, nationality, sport of engagement, and competitive level. At the time of the present study, I was in the second year of a Doctoral Program in Sport Psychology at a UK university.

My theoretical and philosophical approach has been informed by my postgraduate studies, and I view behavior change predominantly through a cognitive behavioral lens. Generally, cognitive behaviorists focus on intervention strategies but also acknowledge the importance of the consultant-athlete working alliance in meeting athletes' individual needs (Petitpas et al., 1999).

Athlete client. A female 19 year old cross-country runner contacted the university for sport psychology support. Anna (an alias) was in her first year of an undergraduate modern languages degree program. Anna was 3 months into her second season as a long-distance

runner. At the point of contact, competitive experiences involved cross-country courses that ranged in distance from approximately 5km to 8km, as well as 1500m, 3000m, 5km, and 10km road races. Personal best times for these specified distances were 5min 08s, 11min 18s, 20min 37s, and 45min 30s, respectively. In her first season racing at a university level, Anna trained 4.5 to 6 hours a week with the university's athletics club, and ran a further 2.5 hours on her own or with fellow athletes each week. Anna reported no previous experience of psychological skills training.

Situating Action Research

Action research encompasses a family of approaches with no single definition or accepted protocol (Evans et al., 2000). This approach lends itself to a constructivist ontology and epistemology where assertions for an objective reality are rejected (Guba & Lincoln, 1994). Instead, subjectively defined realities are constructed by individuals in an effort to impose meaning and order to the world (Krauss, 2005). Individual realities rest in the meaning afforded by cognitive processes rather than external objects or events themselves. In situating the current work within a constructivist paradigm, the present case study reflected a unique coming together of my own previous experiences, Anna's needs as an athlete, and the consultant-athlete relationship that was formed.

Data Collection

Reflective case notes. Evans and colleagues (2000) note that in action research, "the researcher's…reflexivity often features prominently" (p. 301). As such, my own reflections played a central role in understanding the action research cycle and process of applied consultancy when working within an IZOF framework. The structure of my reflections followed Boud's (2001) reflective learning model and involved two levels of reflection: (a) to closely revisit the experience, and (b) re-evaluate the experience from an emotionally removed position. These two stages were prompted by asking and responding to the questions: (a) "What happened?" within 24 hours of completing a consultancy session, and

(b) “So what?” between 1-6 days afterwards. This type of reflection has successfully been used previously to inform applied practice (Woodcock et al., 2008), and allows a balance between my dual role as consultant and action researcher.

Athlete interview. Following the intervention, a semi-structured social validation interview was conducted. Martin and Hrycaiko (1983) recommend an interview guide that addresses athlete’s perceptions of three main areas: (a) intervention goals, (b) procedures applied, and (c) results produced by these procedures. In-depth reflection of Anna’s experience was facilitated by prompts (e.g., “what about the cue words you mentioned?”) and probes (e.g., “why did you find imagery effective?”) relating to each interview topic. Specifically elaboration probes were formed to encourage the athlete to provide an in-depth reflection of intervention experiences. To guard against social desirability and facilitate honest responses, the interview was conducted by a research associate not involved in the applied intervention who had previous experience interviewing athletes about sport psychology. The interview lasted for 38 minutes and was digitally audio-recorded and transcribed verbatim. A copy of the interview guide is available from the first author (see Appendix A).

The interview transcript was subject to deductive content analysis to establish Anna’s response to the emotion regulation program. The analysis process identified phrases that captured Anna’s responses to the three social validation criteria (Martin & Hrycaiko, 1983). Organized by these criteria, phrases that carried a similar meaning were grouped together. To establish trustworthiness of analytical results, Anna reviewed the interview transcript and interpretation of data responses. She made no amendments to the data following this member check (Culver, Gilbert, & Trudel, 2003).

Subjective performance. A self-referenced performance rating was considered appropriate to measure performance outcome because differences between events in course length and terrain make it difficult for an objective measure to be obtained in cross-country

running. Thus, Anna made a self-referenced performance assessment within 45 minutes of completing every cross-country event on an 11 point Likert scale (1 = *worst performance* to 11 = *best performance*). Between the initial meeting and the first intervention session, Anna competed in four races. During the intervention, Anna competed in three races. The self-referenced ratings for each performance were plotted to allow for visual inspection of the case study data.

Action Research Narrative

The structure of the present narrative follows Kellmann and Beckmann's (2003) eight phase action research cycle (i.e., macro-cycle) of: (a) joint problem identification, (b) consultation with a behavioral science expert, (c) data gathering and preliminary diagnosis, (d) supplying feedback to client, (e) joint diagnosis of issue, (f) joint action planning, (g) action, and (h) data gathering after action. At a macro-level, I systematically followed this action research cycle, however micro-cycles of action research also occurred during and between each applied session (see Figure 2.1). These micro-cycles informed strategic action pursued in understanding and developing Anna's skills in emotion regulation.

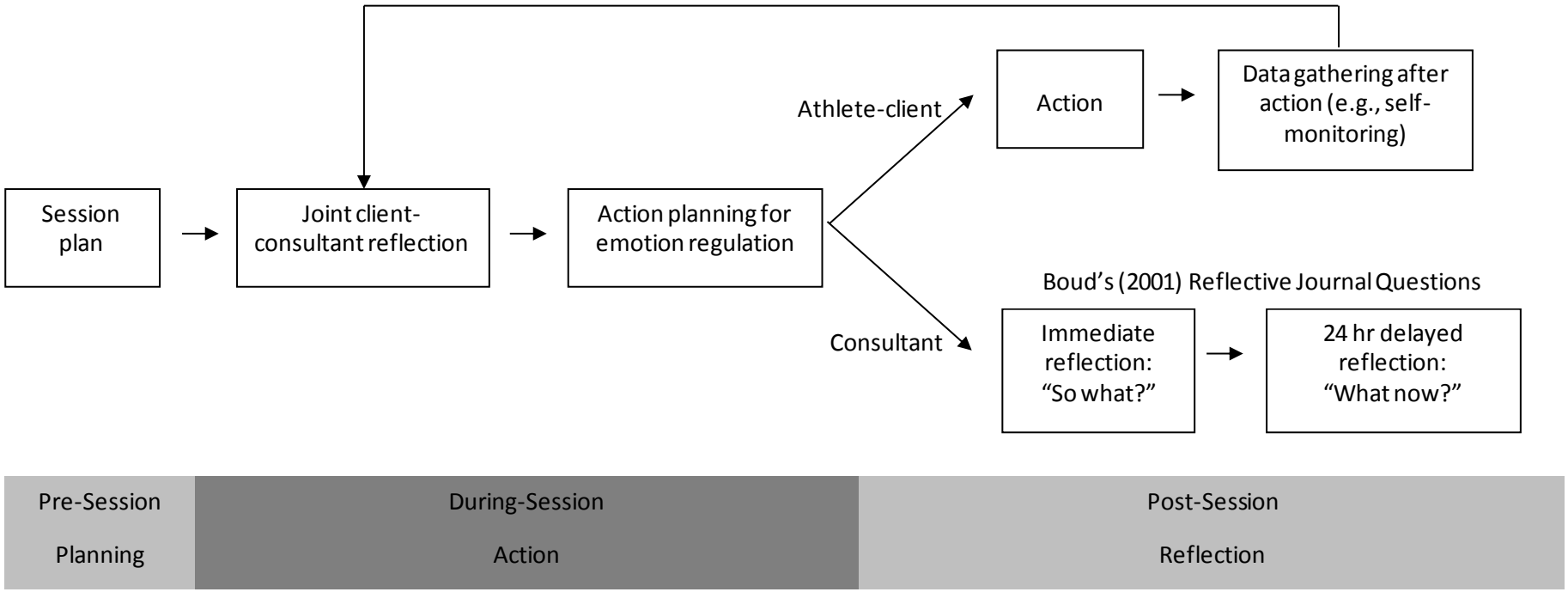


Figure 2.1. Micro-cycle of action research occurring between each intervention session

(a) Joint problem identification (athlete and coach)

Anna was struggling in her second cross-country running season to reproduce good training times in the competitive environment. Anna attributed this setback to weaknesses in the mental side of her performance, and recognized a need to manage debilitative emotions. Following coach recommendations, she contacted the school where the first author is based for psychological support.

(b) Consultation with a behavioral science expert

Following initial email correspondence, I met with Anna to discuss a potential working alliance. In return for psychological support, Anna agreed to take part in applied research that had been granted ethical approval by the school's ethics committee. As a research practitioner, I was aware of my own agenda and interest in exploring the efficacy of working within an IZOF framework. After explaining my research boundaries, Anna agreed to meet once a week for one hour for the remaining two months of her cross-country season (for an overview of the 8-week intervention program see Appendix A).

(c) Data gathering and preliminary diagnosis

The first step, when working within an IZOF framework, is to identify an athlete's opt-zone and nonopt-zone (Hanin, 2000c). This profiling process is supported by several worksheets. The aim of these worksheets is to bring an athlete's subjective experience of past events to the forefront. However, I was concerned an early introduction of paperwork may prove detrimental to developing consultant-client rapport (Beckman & Kellmann, 2003).

Instead, I first invited Anna to talk through her recent experiences as a runner (Andersen, 2000). I gathered data (i.e., listened) and offered preliminary diagnoses (i.e., checking for understanding) by actively listening to Anna's personal account. Allowing Anna to tell her story helped her develop an awareness and acceptance of recent performance experiences. Further, my engagement with her tale demonstrated a desire to understand her needs and thus helped foster an effective working alliance (Andersen, 2000).

Listening to Anna tell her story, I heard a narrative of her performance experiences. An individual's self-narrative provides a framework for understanding life's events and is a process through which humans give meaning to an experience (Hanin, 2003). Within Anna's narrative, I heard clues to awareness ("I get distracted"), acceptance ("if I'm outside my comfort zone I freak out"), and (ineffective regulatory) action ("my thoughts snowball out of control"). Examples of ineffective actions present potential barriers to optimal performance experiences (Giges, 2000), and highlight opportunities for enhancing skills in emotion regulation.

The IZOF model asserts the content of athletes' optimal emotional states depend on time (e.g., pre, during, post) and context (e.g., practice or competition). Accordingly, I was particularly interested *when* in Anna's sport participation ineffective action tended to occur. For Anna, these barriers to optimal performance appeared most prevalent during the beginning of her competitive races. Thus, during competition served as a potential time and context for the development of emotion regulation strategies.

I realized focusing on emotion patterns *during* a competitive event would mean a slight departure from the current IZOF evidence base. To date, IZOF work has focused on, and gathered predictive validity for, *pre*-competitive emotions (Hanin, 2000a; Prapavessis & Grove, 1991). Entering a pre-competitive opt-zone for long duration tasks does not however guarantee on-going opt-zone proximity for a race's duration (Hanin, 2000a). Rather, feelings experienced *during* a long duration event explain a greater degree of performance variance (Jones, Mace, & Williams, 2000).

These findings suggested to me two potential time points. First, focusing on *pre*-competitive zones would direct emotion regulation activities to promote an opt-zone immediately prior to a race (Robazza, Pellizzari, & Hanin, 2004). Alternatively, we could concentrate on *during* event zones and develop regulatory capabilities at a time when performance barriers currently arose. Anna indicated a preference to focus on the latter. Anna

did not perceive pre-race emotions to be an issue. Instead, Anna considered making a positive start by finding a good rhythm over the first kilometer of a race had a greater impact on her overall competitive experience.

Having agreed the time (i.e., during) and context (i.e., competition) on which to ground the emotion regulation program, I guided Anna through Hanin's (2000c) worksheets for the identification of zone content. First, Anna was asked to note down general features of her best and worst performances. A conscientious student, Anna articulated concerns about filling the forms in "correctly" with the "right" information. Listening to Anna's apprehensions, I recognized a potential for bias in Anna's written reflections that may have hindered her development of awareness. To prevent this problem, I suggested that she focus in on the highlights (and lowlights) that form her performance history as she had previously described, and reassured her there were no right or wrong answers.

For her best performance, Anna noted her familiarity with the cross-country course. This knowledge gave her confidence and enabled her to form a race plan. Motivated and determined to execute this plan, Anna described how she was able to concentrate on one kilometer at a time. Anna did not perceive this race to be important, which helped her relax, and utilize her energy for running focused on her goals.

When Anna described her worst performance, a different experience emerged. Anna focused on a specific race in which she had considered her competitors to be better than her. Perceiving a difference in ability level, Anna began to doubt her own performance. She remembered as well an undulating course where it was difficult to find a regular rhythm. Unable to "get into her running" she recalled her muscles feeling tense and tired. Instead of being focused on the race, Anna's thoughts tended to centre on task irrelevant stimuli during this performance.

Anna then identified what subjective emotions she experienced during the first kilometer of her favorable performances. To aid this process, Hanin (2000c) lists 96 emotion

content descriptor words, grouped into positively (e.g., glad, active, calm, excited) and negatively (e.g., angry, afraid, doubtful, helpless) valenced terms. Consistent with zone identification procedures previously adopted (e.g., Robazza, Pellizzari, & Hanin, 2004), I asked Anna to select up to five positive and five negative words that best captured her optimal feeling state. This process was repeated for Anna's poor performances. Anna identified 11 emotion content terms from a possible total of 20 descriptor words.

The next step in the profiling process determined the intensity each subjective emotion was experienced in being helpful or harmful for Anna's performance. Recalling previous performance states, Anna rated intensity levels on a modified version of Borg's CR-10 scale. Borg's (1998) numerical scale has verbal anchors placed at selected positions in such a way that it acquires ratio qualities. A frame of reference (from 0 to maximal possible) is provided that allows for inter- and intra-individual comparisons of intensity levels to be made, as well as guarding against ceiling effects. The CR-10 has thus been considered appropriate for assessing the intensity of emotional experiences (e.g., Hanin, 2000b; Hanin & Syrjä, 1995). Consistent with previous use of the CR-10 scale, the verbal anchors employed in the present study ranged from 0 (*nothing at all*) to 10 (*very, very much*) with a final option of 11 (*maximal possible*) to protect against ceiling effects. These ratings represented zone midpoints, and an arbitrary range of ±2 points was applied to obtain a zone range (Hanin 2000b). A similar process using a physiological descriptor list was followed for identifying the content and intensity of physiological symptoms experienced during good and poor performances. Originally developed in Italian, this list was translated to English following a back translation procedure to achieve linguistic equivalence (Duda & Hayashi, 1998; see Appendix A). It followed that four during competition zones were identified for the beginning of Anna's races (e.g., an opt-zone and nonopt-zone for subjective emotion content and associated physiological symptoms).

(d) Supplying feedback to client

A visual representation of each zone provided feedback to Anna of her subjective emotions (see Figure 2.2) and physiological symptoms (see Figure 2.3) relating to good and poor performances. The figures were constructed using Microsoft Excel and PowerPoint 2007. I guided Anna through each figure and highlighted areas that represented her opt-zone and nonopt-zone. Anna commented how better performances were characterized by positive emotions (e.g., confident, determined, and motivated), and contrasted with poor performances that were associated with negative emotions. A similar pattern of optimal-positive and non-optimal-negative associations were viewed for physiological symptoms. Anna thought the figures helped to identify differences between her opt-zone and nonopt-zone emotion and physiological experiences.

I sensed the profiling process helped formalize Anna's performance experiences and contributed to her awareness and acceptance of emotions and physiological experiences during performance and related action. For example, during her worst performance, Anna vocalized an awareness of focusing on her competitors. She also articulated an acceptance that making such comparisons often led to debilitative thought processes such as thinking her competitors are superior to herself (cf. Nieuwenhuys et al., 2008).

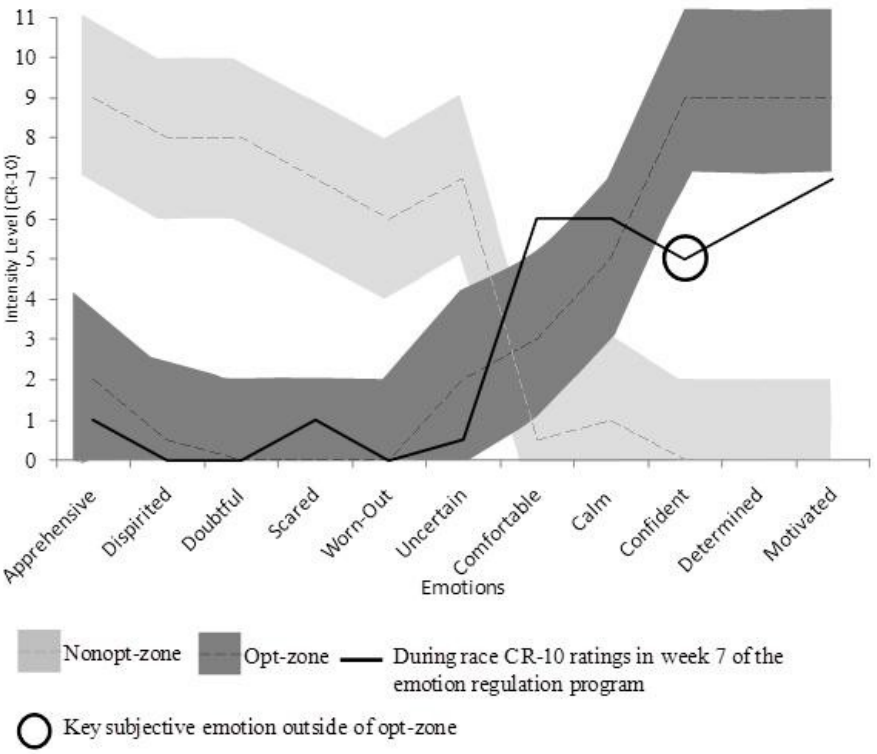


Figure 2.2. Anna's emotion opt-zone and nonopt-zone profile during performance

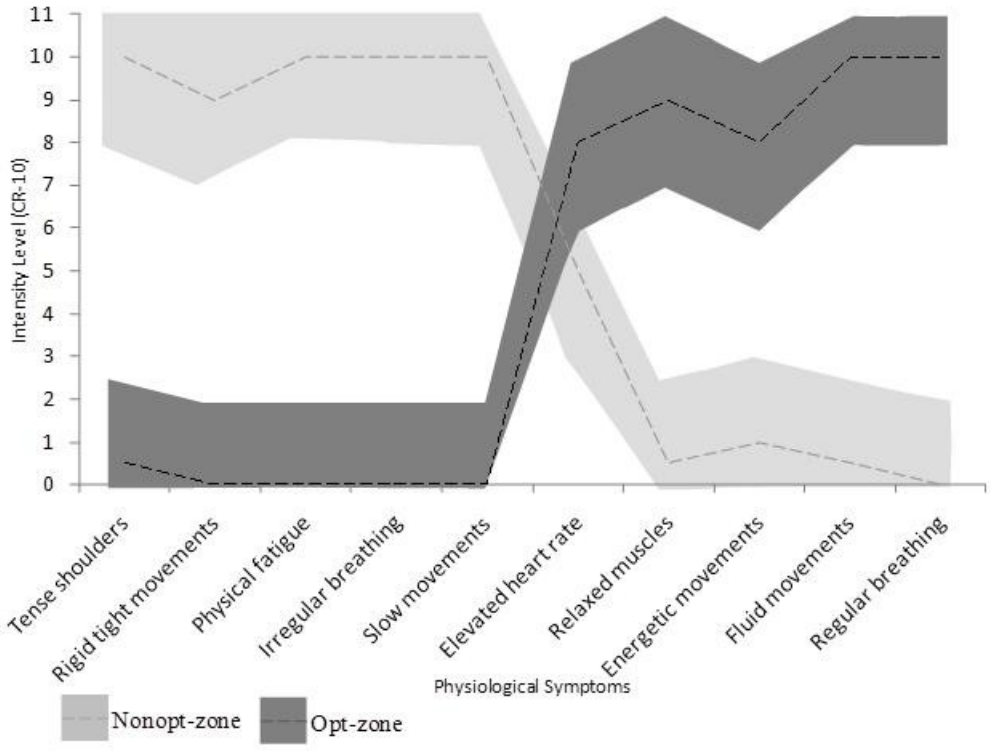


Figure 2.3. Anna's physiological symptom opt-zone and nonopt-zone profile during performance

(e) Joint diagnosis of issue

When regulating emotions, recommendations for the facilitation of desired emotional states have been made in favor of suppressing undesirable feelings (Uphill, McCarthy, & Jones, 2009). Thus, focusing on the facilitation of opt-zone experiences, rather than the suppression of nonopt-zone states, I asked Anna which she considered most important. Anna identified key subjective emotions and physiological symptoms for facilitation by inspecting Figures 2.2 and 2.3 for large discrepancies between opt-zone and nonopt-zone intensity ratings. Specifically, Anna indicated confidence, determination, and motivation coupled with relaxed muscles, fluid, energetic movements and a regular breathing rhythm to be most desirable for performance and these were prioritized for regulation.

Adding a cognitive piece to the puzzle. The role of cognitions is central to emotion generation (e.g., Lazarus, 2000), response (Jones, 2003), and regulation (Gross & Thompson, 2007). Furthermore, cognitions are viewed as a component of Hanin's (2000a) PBS state. Although Anna identified key subjective and physiological responses for performance, I considered these to be tied to underlying cognitive processes that deserved further exploration. I felt increasing Anna's awareness of her thought processes and the impact they had on performance was essential in furthering her (and my) understanding of her overall emotional experiences during competition.

The IZOF profiling procedure has been recommended for the cognitive modality (Hanin, 2000c). Indeed, cognitive descriptors have spontaneously emerged in previous profiling exercises (Hanin & Stambulova, 2002), and omission of this modality has been viewed as a potential weakness in the applied domain (Robazza, Pellizzari, & Hanin, 2004). A review of the literature failed to highlight previous work in affect-related cognitive zones, and a descriptor list for zone identification was not available. As Anna's performance reflections were rich with cognitive references, I nevertheless felt it worthwhile to pursue zone identification for cognitions.

In the absence of a cognition descriptor list, I returned to the narrative method of identifying idiosyncratic content of performance experiences (Hanin, 2003). To aid this process, I posed questions to Anna concerning her affect-related cognitions during previous sport experiences (e.g., "what thoughts passed through your mind when you feel confident during a race?"). Anna initially had difficulty in identifying thoughts associated with better performances. Following further inquiry through guided reflections of previous performances, Anna realized she used self-instructions such as "catch the person in front", and reported an overall feeling of certainty. Otherwise, Anna commented she "didn't really think of anything", suggesting a state of automaticity and a cognitive state reminiscent of the flow experience (Jackson, 2000).

In contrast, cognitions associated with poor performances came easier to Anna. Self-statements, such as "I'm unfit" or "everyone's better than me", tended to build into worrisome rumination during races. After reflecting on these destructive thoughts, Anna expressed a desire for them to stop. Anna accepted the debilitative function of these cognitions and saw no point running when "in this mental state".

To identify her cognitive opt-zone and nonopt-zone, Anna rated the extent to which she experienced these thoughts during the start of a good and poor race on the CR-10 scale. Visual representations of Anna's affect-related cognitive opt-zone and nonopt-zone were created and provided further feedback to facilitate Anna's awareness and acceptance of her thought patterns during her best and worst performances (see Figure 2.4).

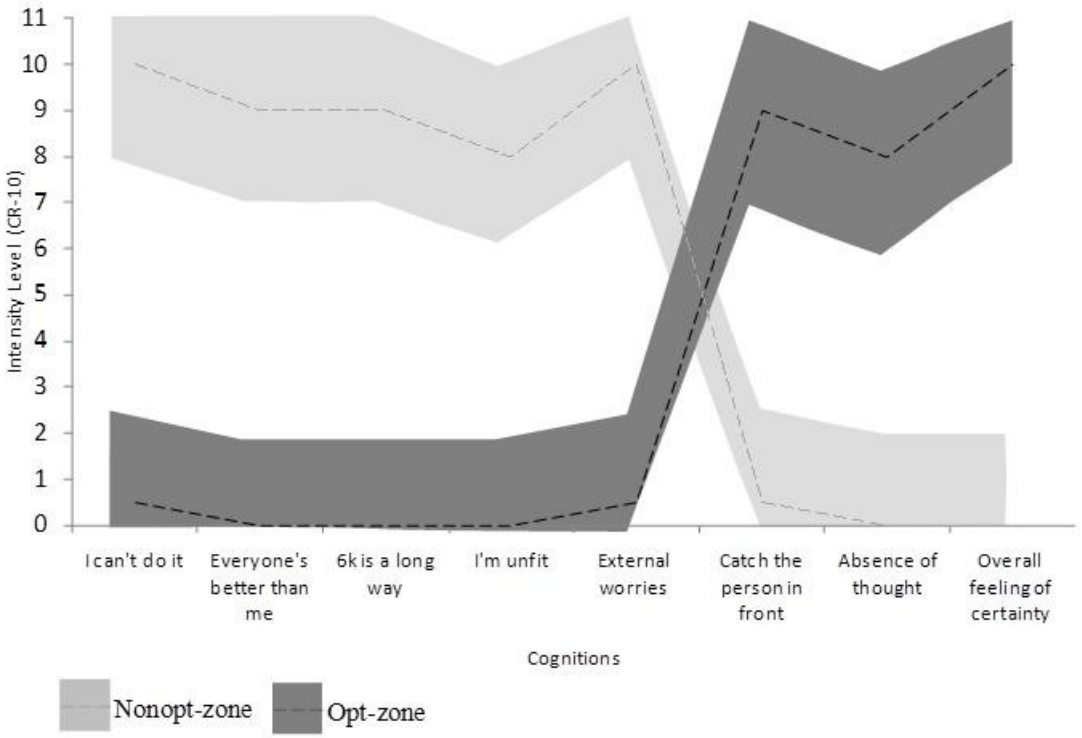


Figure 2.4. Anna's cognitive opt-zone and nonopt-zone profile during performance

(f) Joint action planning

Up to this point, Anna had developed awareness (i.e., what she feels emotionally and physically, and thinks cognitively), acceptance (i.e., the functional impact these feelings and thoughts have on performance), and associated action (i.e., regulatory coping strategies) across three related modalities for performance. When ineffective action is adopted (e.g., de-motivating self-talk), more effective regulatory action is required. For this to occur, Fischer and colleagues (2004) point to the importance of athletes developing a present-moment awareness of current emotion states, and an ability to recognize when discrepancies arise between this and a desired state (i.e., opt-zone).

Subsequent joint consultations were therefore planned to realize these objectives and involved three aims: (1) to build on the IZOF profiling work in maintaining Anna's opt-zone meta-experience across all three modalities, (2) to foster Anna's awareness and acceptance of her current performance state, and (3) to assist effective action in identifying, refining, and

employing regulatory strategies for opt-zone nonopt-zone discrepancy reduction with respect to all three modalities.

(g) Action

Maintaining opt-zone meta-experience. Anna was encouraged to reflect on her IZOF profiles to maintain awareness and acceptance of her subjective emotion, physiological, and cognitive opt-zones. To further facilitate opt-zone awareness, acceptance, and action, I asked Anna if she was willing to try imagery in the fifth week of the intervention. Imagery has been recommended as an effective technique for facilitating awareness (Ravizza, 2006), and would allow Anna to recreate optimal affective experiences in her mind. I first guided Anna through a basic imagery exercise to familiarize her with the technique. These exercises, adapted from Vealey and Greenleaf (2006), introduced Anna to imagery attributes of vividness and controllability through imaging familiar training and competition environments.

Following these exercises, I developed an imagery script that contained characteristics of Anna's ideal performance state. Drawing from Lang's (1979) bio-informational theory of emotional imagery, the script was formed of stimulus, response, and meaning propositions. To ensure the imagery was familiar and meaningful to Anna, these propositions drew from components of her opt-zone profiles. Imagery scripts comprising all three proposition types maximize emotional arousal and imagery vividness (Lang, Kozak, Miller, Levin, & McLean, 1980), and thus were used to facilitate Anna's awareness of her opt-zone.

Anna's script asked her to imagine herself at the start of a race and guided her through the first kilometer. Cognitive meaning propositions included adaptive appraisals of this stimulus event. Associated with these cognitive processes were optimal subjective, physiological, and cognitive responses. Excerpts from Anna's script illustrating this stimulus, response, and meaning propositions include: "confidence grows as you focus on catching the person in front" as well as "your mind is on your race…your breathing is steady". Guided by this script, Anna imaged five times a week for the remaining three weeks of the emotion

regulation program. Further, in a competition week, Anna would image herself running in the up-coming race to reinforce opt-zone thoughts and feeling states in preparation for the event.

Awareness of current performance state. Self-monitoring techniques are recommended to enhance awareness (Ravizza, 2006). Thus, individualized self-monitoring tools were employed to facilitate Anna's awareness of her current performance state during the first kilometer of a race. Three idiographic lists generated from Hanin's (2000c) profiling process were employed. Each list contained Anna's subjective emotions, physiological symptoms, and associated cognitions for performance (see Appendix A). Using the CR-10 scale, Anna rated the intensity she experienced each component during the first part of a race. This self-monitoring was conducted within 45 minutes of race completion to help develop awareness for her current performance state.

Monitoring sheets also informed joint client-consultant reflections. Specifically, intensity ratings were plotted on the same axis as Anna's opt-zone and nonopt-zone to highlight zone proximity and indicated discrepancies between current and desired emotional states (see Figure 2.2 for an example). Joint consideration was given to her specific ratings to further my own as well as Anna's understanding of her emotional experiences. For example, if Anna rated confidence intensity at a five, I would ask why she felt it was at this level. Such questions were designed to help Anna understand discrepancies experienced from her opt-zone and inform consequent regulatory efforts.

Refining current emotion regulation strategies. Experienced athletes often implicitly employ techniques for emotion regulation. Consultants help athletes to recognize and develop these naturally learnt techniques to become systematic regulatory strategies (e.g., Robazza, Pellizzari, & Hanin, 2004). I was thus interested in Anna's current mental techniques implicitly employed for regulating her emotions in forming a foundation for strategy development.

Only in her second cross-country season, Anna was not an experienced runner. However, when reflecting on previous performances, her use of several emotion regulation strategies became apparent. During superior performances, Anna employed goal setting and self-talk strategies. Optimal emotion responses occurred when she had specific performance goals set for competition. These goals appeared to foster an appropriate attentional focus and were coupled with positive thoughts. Conversely, non-optimal emotions transpired when Anna was unfamiliar with a course and was not ready for the undulations and terrain. Feeling ill-prepared, Anna lacked focus and became distracted by task irrelevant thoughts such as worrying about her competitors. Consequently, we focused on developing and refining Anna's current regulatory strategies of effective planning and goal setting for appropriate attention deployment and adaptive appraisal of stimuli through positive self-talk.

The setting of process and performance goals as a technique for attentional deployment has gained support in the literature. Kingston and Hardy (1997) found process goals that focus on an athlete's desired behaviors and actions to facilitate appropriate focus of attention. The setting of performance goals (e.g., to run a specific time) has received support for fostering confidence (Filby, Maynard, & Graydon, 1999), and feelings of motivation and determination (Burton & Weiss, 2008). Thus, we would expect Anna's use of performance and process goals to facilitate appropriate attentional deployment and promote optimal subjective emotion experiences she had identified as key for performance.

Anna's current goal setting strategies involved vague "do your best" goals set by her coach. Drawing from the SMART acronym (Specific, Measurable, Adjustable, Realistic, Time-bound), I discussed the principles of effective goal setting with Anna. Incorporating these principles, Anna identified performance goals that she had ownership over. First, Anna considered specific race times that she perceived challenging yet achievable. For cross-country courses she had previously experienced, performance goals were based on times recorded for the same course and terrain. For unfamiliar cross-country courses, Anna agreed

to consult runners who knew the course to inform the setting of a more flexible performance goal (e.g., a range of potential race times). Reducing the specificity of the performance goal to a time range was considered favorable over Anna returning to her very general and not specific "do your best" goals. Second, Anna identified process goals that were enlightened by her physiological opt-zone. Indeed, for the first kilometer of a race, Anna's process goal or target was to find a good rhythm by focusing on regular breathing. Process goals that reflect rhythm were favored over more specific technical aims, such the mechanics of Anna's running gait, so automaticity of the movement was not interrupted (Kingston & Hardy, 1997).

A second regulatory technique that Anna implicitly used was self-talk. Research supports athletes' internal dialogue as directing focus of attention as well as affecting feelings of confidence and motivation (Zinsser, Bunker, & Williams, 2006). Thus, we worked together to refine Anna's self-talk to facilitate these key characteristics of her opt-zone.

Anna developed awareness of helpful and unhelpful self-talk when identifying her cognitive zone. During this process, Anna identified the content of self-talk statements. For example, phrases associated with her nonopt-zone involved a number of debilitating appraisals (e.g., "6km is a long way"), and self-defeatist reinforcements (e.g., "I'm so unfit"). Whereas self-talk during optimal performances, included motivational instructions such as "just run" and "catch the person in front". Previous research suggests increasing awareness of self-talk is not enough to initiate motivation for change (Hardy, Roberts, & Hardy, 2009). Identifying self-talk statements in relation to good and poor performances however helped Anna to increase her awareness of self-talk use, as well as its functional impact (e.g., helpful or unhelpful). In line with Hanin's (2007) triple-A framework, enhancing awareness and acceptance were currently viewed as a necessary precursor for change and subsequent self regulatory efforts.

Previous research has cautioned against the use of thought suppressing techniques such as thought stoppage (Hardy et al., 2009). Instead of suppressing unhelpful thoughts,

Anna was encouraged to use helpful thoughts. A time for Anna to draw upon helpful cue words was identified to facilitate effective use of these self-talk statements. For example, Anna considered using the cue word "focus" during the first kilometer of her race to help attain her process goal.

Effective regulation towards an opt-zone. Anna practiced goal setting and self-talk to foster opt-zone subjective, physiological, and cognitive experiences for the first kilometer of her race. Inconsistencies between her current and opt-zone states for each modality functioned as a signal for the employment of these strategies. To further develop her ability to recognize and reduce any discrepancy, we extended Anna's original imagery script. Specifically, features of her process goals (e.g., focus on her rhythm) and self-talk (e.g., just run) were incorporated as response propositions to reinforce strategy employment for opt-zone promotion.

(h) Data gathering after action (social validation interview)

The action research cycle has thus far detailed consultant professional practice decisions and action taken to facilitate a female cross-country runner's skills in emotion regulation when working within an IZOF framework. Following the intervention it is however important to gauge what has changed for the athlete. A formal social validation interview was conducted that gathered Anna's responses to intervention goals, the procedures applied, and subsequent results produced (Martin & Hrycaiko, 1983).

Intervention goals. Anna agreed that grounding the intervention on her affective experiences during the first kilometer of a race was the right focus. For Anna, the need to foster mental strength during a race was pivotal to prevent "all the negative thoughts". Anna explained this was "because I'd generally…start feeling positive for three seconds…and then just lose [myself] completely". Thus, it was deemed that having the ability to build on a positive start by employing during race strategies was an important skill for Anna to develop.

Intervention procedures applied. When considering the intervention sessions, Anna noted being able to "talk about [and] reflect on races" was beneficial. Coming from a small running club, Anna felt "a little bit insignificant" in the university running environment. Anna thought "it was nice to have [the consultant]" who she found to be "very approachable". Anna reflected how she "could quite comfortably come in and just be like 'I had an awful race' and not think twice about [disclosing]".

Anna also found the IZOF profiling process helpful. In particular, having a visual representation of affect related performance states facilitated awareness of functionally optimal emotions across events. Anna noted that "feelings associated with…running well, like on the graph, there was a similar pattern…when [she was subsequently] running well".

Reflecting on her emotion regulation strategies, Anna reported practicing imagery the most often and noted "I didn't find it a problem having to sit down and listen to them [scripts] and try and picture them [races]". Anna described imagery as "easy, it was a new idea I'd never done before but it wasn't a strange one". However, imaging new circumstances was a challenge for Anna as she said "I found it harder to image things that hadn't happened before". Consequently, Anna's planning and goal setting were used to develop individualized scripts to help facilitate her ability to image future race performances. Specifically, Anna perceived how "[the consultant] did a script to match my plan which was good because I could sit in my room and pretend I was running the race and how I'd feel".

In contrast, Anna used her self-talk cue words the least often, as this technique was introduced in the penultimate session of the intervention. At the time of the interview, Anna felt she had not fully integrated this regulatory technique into her self-regulation repertoire. This point is illustrated by Anna saying, "I've got a race coming up that I was going to try and use them for". Although Anna had used her cue words during training to help her attentional focus, as she describes, "I tend to not focus…we'd be on the last set of a rep and I'll feel like I

can't do it and then I would be just like 'focus on the person in front if you stay with them you'll get through'".

Although Anna did not find goal setting "a difficult concept to grasp", she reported difficulties when setting targets. She noted how "sometimes [I] found it hard to think of realistic targets…I'd always expect too much of myself". However, over the course of the sessions Anna described how she was able to break her race down into components and use cue words to focus her mind on realistic aims. For example, Anna reflected how she set targets for separate phases of a race: "I'd set my target for the first phase [race time]…and the second phase [find rhythm]…my target phrase was 'just run' so that [kept] me moving forward, and then the third phase was to finish strong".

Results produced. The results produced centre on three main intervention outcomes: (a) Anna's emotional state, associated physiological symptoms, and cognitions, (b) Anna's perceived changes to the performance process, and (c) performance outcome. Before seeking psychological support, Anna found races "awful…I used to find it really hard to just get a grip on the reality of it all. I'd always blow it out of proportion in my head". Following the emotion regulation program, Anna reported being "a lot more in control of where I feel at races". Anna viewed the process of setting goals as having helped her gain perspective and decrease the intensity of nonopt-zone emotions such as feelings of uncertainty. For example, she noted "when I'm a bit unsure of myself or if I think it's a seemingly impossible task I'd be like right let's start with 'stay with your friend' or 'running this time' and then see from there". Anna also reported how imaging upcoming races helped prepare her for the event. She no longer felt like she was stepping into the unknown.

In relation to her physiological symptoms, Anna considered "I have definitely started to relax a bit more at competition and started to enjoy them". Anna's perceptions of competitive races also changed post-intervention. This impact on cognitions is illustrated by Anna as she describes how "I wouldn't freak out completely…I'd start to think more

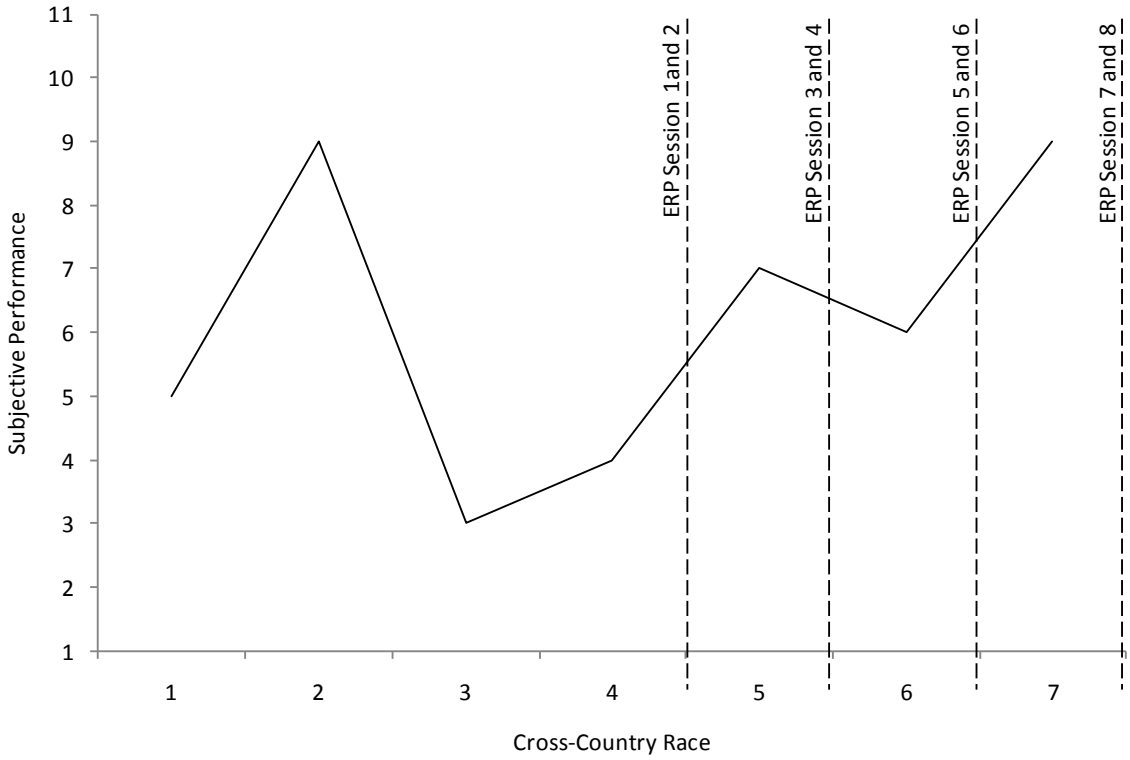
positively at the start of the race…set myself goals and not to worry so much". In sum, Anna felt "just generally more in control of everything…I felt like I was running the race for me and not...just being slung in the deep end and told to run".

When considering the process of performance, Anna perceived the emotion regulation strategies to be effective for fostering desirable opt-zone psychological qualities. During races, when Anna found it difficult to concentrate, she would "try and use the techniques to help my racing at each stage". Specifically, Anna noted how goal setting facilitated opt-zone descriptors of motivation and determination: "[goal setting] definitely helped me focus a lot more, and to push myself a lot more…setting targets is more motivating to achieve them and they're realistic…whereas before they'd be unrealistic and I'd just not try". Anna noted how she also employed self-talk to keep her goals in mind during performance. For example, she said "when I start to lose focus [and] concentration in a race, I just think of the cue word which reminds me of the target I set for that particular stage". Thus, self-talk helped Anna commit to her process goals by maintaining an appropriate focus of attention on task relevant stimuli.

Anna also employed emotion regulation techniques during training runs. In particular, the employment of imagery was described in relation to opt-zone descriptors of motivation and determination: "if I [felt] I couldn't finish the session I'd use to picture myself finishing the session, and that made it easier to do". Furthermore, Anna set goals to help minimize feelings of doubt "before a training session…I was a bit worried about being able to finish the session so I made a point of finishing the session with everyone".

Anna's self-referenced ratings of performance offer further insight into the impact of the emotion regulation program on performance outcome. Visual inspection of Figure 2.5 suggests Anna's perceptions of performance outcome during the intervention had less variability than pre-intervention. For the four races Anna competed in pre-intervention, subjective ratings ranged from 3 to 9 (M = 5.25, SD = 2.63). During the intervention, Anna's

subjective performance ratings decreased in variability. That is, for the three competitive races completed during the intervention, Anna rated her performances between 6 and 9 (M = 7.33, SD = 1.53). Thus, Anna's mean subjective performance score increased from pre to during the intervention.



ERP = Emotion Regulation Program

Figure 2.5. Anna's subjective performance ratings of competitive cross-country races

Final Reflections

The present study adopted an action research approach to help address a recognized need within sport psychology for well documented intervention studies (Kellmann & Beckmann, 2003). The process of working within Hanin's (2000a) IZOF framework to promote a university level cross-country runner's skills in emotion regulation was examined in a single case study. Following Kellmann and Beckman's (2003) action research cycle, procedural decisions and action taken during a two month intervention were highlighted. In developing meta-experiences of awareness and acceptance, the athlete reported use of regulation techniques to enhance the likelihood of experiencing optimal states for performance. Indeed, Hanin's (2000c) individualized profiling process lent itself well to developing pre-requisites to emotion regulation of enhancing athlete awareness of a desired affect-related performance state, as well as having the ability to detect discrepancies with current emotional experiences (Fischer et al., 2004). Moreover, the content and intensity of emotion responses in the athlete's optimal (opt-zone) and non-optimal (nonopt-zone) zones of functioning guided the development of emotion regulation strategies.

The present study was novel in describing an IZOF intervention that focused on *during* event zones of functioning. The majority of previous research has examined components of pre-competitive psychobiosocial states (e.g., Robazza, Pellizzari, & Hanin, 2004). Difficulties in measuring zone proximity during events have been highlighted, and explain why research in this area has received limited attention (Hanin, 2000a). The present study relied on the athlete's immediate reflection on performance experiences following a race. In the current "real world" setting, such a dependence on athlete recall was not viewed as a limitation. Indeed, consultant reflections suggest encouraging athlete systematic self-reflection served to enhance meta-experiences of awareness (i.e., knowledge of performance related states), and acceptance (i.e., functional impact) processes related to action outcomes.

Only focusing on the first kilometer of a cross-country race, the study did not examine the dynamics of emotional experiences for the event's duration. In the social validation interview, it is therefore interesting to note the athlete reported breaking the race down into several phases. Viewing a cross-country event in multiple sub-components is reminiscent of Anna's original reflections on best performance where she reported running one kilometer at a time. This process of task compartmentalization is reflective of Hanin and Hanina's (2009) action-centred profiling. Athletes describe a component chain of subjective experiences of task execution to describe a performance event. This form of profiling can capture the dynamics of long-duration events and thus offers a promising avenue for future research.

In line with previous research, consultant reflections suggest the process of zone identification facilitated athlete awareness and acceptance of desired emotional states (Harmison, 2006). However, these meta-experiences were further developed through the deliberate and systematic practice of imagery. Previously, imagery has also been used to enhance recall of motor tasks as a means of increasing conceptual and physical awareness (Hanin & Hanina, 2009). The athlete participating in this case study was able to re-experience multiple opt-zone characteristics in her mind that reinforced favorable feelings associated with optimal performance.

The enhanced levels of athlete awareness of current and desired emotion states and athlete acceptance of functional impact were further maintained through self-monitoring. Plotting current intensity ratings of emotion descriptors against zone ratings in figure form illustrates current-desired state discrepancies and highlights on-going regulatory needs to inform intervention strategies. Moreover, using monitoring tools for the on-going assessment of zone proximity provides a potential measure of skills in emotion regulation and intervention effectiveness.

Although Hanin's (2000c) profiling process offered pragmatic tools for guiding applied practice, the process of delivery was considered central to intervention effectiveness.

At the start of the program, the consultant recognized the importance of developing rapport with the athlete before zone identification (Petitpas et al., 1999). To help meet this aim, the athlete was encouraged to reflect on performances in her own words (Andersen, 2000). Similarly, previous IZOF research has noted how an athlete "was happy that somebody actually listened to his story for once" (Nieuwenhuys et al., 2008, p. 70). Allowing athletes to form self-narratives also helps give meaning to performance experiences (Hanin, 2003). Taking these previous observations together with present consultant reflections, the delivery of applied programs utilizing Hanin's (2000c) profiling process should emphasize development of client-consultant rapport through the use of active listening skills. Such a positive working alliance can be developed by helping athletes tell their stories, and construct a self-narrative of performance experiences.

Previously, Hanin (2000b) has recommended the profiling process to be used predominantly with experienced athletes who are assumed to have a necessary level of awareness for zone identification. Inexperienced athletes, who do not have an extensive performance history, have difficulties identifying valid zones (Hanin & Syrjä, 1995). However, the present study demonstrated that an inexperienced athlete who was in her second competitive season was able to identify meaningful zones that informed the development and delivery of an effective emotion regulation program. Consultant and athlete reflections suggest Anna's participation in the IZOF-based intervention influenced her meta-experiences associated with emotions, physiological symptoms, and cognitions for performance. Although the validity of zones in the present case was not established, findings suggest that the application of IZOF processes can form a beneficial foundation to interventions with less experienced athletes.

Although the present study suggests the IZOF model is appropriate for enhancing inexperienced athletes' meta-experience of emotional states and their regulation, some caution is warranted. The IZOF model specifies four global categories of emotions based on valence

and functionality (Hanin, 2000a,b). These categories include pleasant-helpful (P+; e.g., determined), unpleasant-helpful (N+; e.g., anxious), pleasant-unhelpful (P-; e.g., self-assured), and unpleasant-unhelpful (N-; e.g., fearful) emotional states. In the current single case study, the athlete's emotion profile only contained two of these categories; namely, P+ and N-. This is in contrast to previous research with more experienced athletes where all four categories are represented (Hanin & Syrjä, 1995; Robazza & Bortoli, 2003). The present finding highlights a potential qualitative and quantitative difference between non-elite and elite athletes' zone profiles.

Research in anxiety may help to explicate why hedonic-function reversal effects were not observed in the present study. Elite athletes tend to report anxiety (cognitive and somatic) to be facilitative (e.g., N+), whereas non-elite athletes perceive this emotion to be debilitative (e.g., N-; Jones, Hanton, & Swain, 1994). Individual differences and perceptions of control are proposed as potential mechanisms mediating interpretation of anxiety direction (Jones, 1995). Further research should examine whether perceived reversals in function in a wide array of pleasant and unpleasant emotions (e.g., P-, N+) can also be explained by similar mechanisms (for a review see Mellalieu et al., 2006).

The present case study described key regulation techniques developed such as imagery, goal setting, and self-talk (e.g., Prapavessis & Grove, 1991; Robazza, Pellizzari, & Hanin, 2004). Individualization of techniques, by incorporating information from athlete zone profiles, has not been considered until now. Opt-zone descriptor words were particularly salient for creating an imagery script that contained stimulus, meaning, and response propositions relevant to the athlete. Individualization of scripts was found important for imaging new experiences, such as desired performance states for upcoming races. Furthermore, previous research suggests such individualization of techniques promotes overall intervention effectiveness (Bull, 1991).

Consistent with previous work, the potential for identifying cognitive zones within the implementation of emotion regulation interventions has been highlighted in the present work (Hanin & Stambulova, 2002). A novel feature of this case study was the extension of Hanin's (2000c) profiling process to identify a cognitive zone. An athlete-generated idiographic representation of affect-related thought processes offers insight into the individual meaning given to person-environment interactions and associated emotions (Lazarus, 2000). This strategic action facilitated athlete awareness of attention, appraisal processes, and cognitive responses, and developed an individualized self-monitoring tool for affect related cognitions for performance.

Further research is warranted to examine the cognitive modality of affect-related performance states. The present athlete's cognitive profile consisted of both self-statements (e.g., "6km is a long way") and broader cognitions (e.g., external worries). Adopting an applied perspective, the former seems to facilitate awareness of appraisal content and the impact of self-talk on emotions. However, viewing cognitions through an IZOF theoretical lens, the latter may prove insightful when examining relationships with subjective and physiologically-based emotional experiences.

The focus of the present study was on the "how" of applied practice. Nevertheless, one of the important principles in the IZOF model is the assumed zone-performance relationship. Compared to pre-intervention ratings, observed subjective performance scores suggested that the athlete was able to perform more consistently during the intervention. This finding was further reflected in the athlete's post-intervention interview in which enhanced perceptions of control, motivation, and appropriate focus of attention were reported. The current results related to subjective performance ratings should, however, be viewed with caution. A relatively small number of performances were obtained, and only three races were completed during the intervention phase. Further, two intervention sessions were delivered after all

performance data had been obtained. Therefore, the obtained subjective performance scores do not reflect the whole 8-week intervention.

A main limitation of the present case study was that the narrative was predominantly informed by consultant reflections. Future research should conduct more comprehensive evaluation on emotion regulation program effectiveness from an athlete's perspective. Alternative methods of data collection such as multiple interviews, or diary studies, would capture processes of change across an IZOF intervention, including early changes that athletes may fail to report in a social validation interview. Future research may also find Nieuwenhuys and colleagues (2008, 2011) effective use of Miles and Huberman's (1994) composite sequence analysis for such in-depth dynamic investigations as useful point of reference. For measuring performance, goal attainment scaling may also offer an alternative quantitative measure to ascertain whether change pre- to post-intervention may be deemed meaningful by the athlete (Kiresuk & Sherman, 1968; Mellalieu, Hanton, & O'Brien, 2006).

To summarize, the present case study offers a first-person account of applied practice working within an IZOF framework for the purpose of enhancing athlete skills in emotion regulation. The in-depth examination detailed the "how" of the IZOF profiling process, and its use to enhance athletes' meta-experiences, as well as the selection and individualization of effective regulatory strategies. It would be interesting for subsequent research to consider the extension of the IZOF model to a cognitive modality in order to develop an evidence base to inform future applied practice. Therefore, the second study of the thesis further examines athlete identification of idiographic *during* event zone profiles, with particular attention given to the form modality of cognitions.

Keep Calm and Carry On:
Optimizing Athlete Emotion, Physiological, and Cognitive Experiences in Tennis and Golf Competitions

Introduction

In golf, Rory McIlroy's collapse in the 2011 US Masters offers one example of the pivotal role emotions play in sport performance (Jones, 2003). The pressure of leading the tournament took its toll after McIlroy miss-hit a tee shot in the last round. Feelings of embarrassment, frustration, and disappointment prevailed and negatively impacted his subsequent performance. Research evidence also provides consistent support for an emotion-performance relationship whereby athletes' experience of emotions correlate with performance outcomes (e.g., Robazza, Bortoli, & Nougier, 2000; Robaaza, Bortoli, & Hanin, 2004; Robazza, Pellizzari, & Hanin, 2004). Thus athletes' ability to control emotions desirable for performance is crucial. However, only a handful of studies have examined theory driven intervention programs for helping athletes develop skills in emotion regulation (e.g., Robazza, Pellizzari, & Hanin, 2004; see study one).

In sport, the few emotion regulation intervention studies conducted have found Hanin's (2000a) Individual Zone of Optimal Functioning (IZOF) model to be a useful conceptual framework to guide practice (e.g., Robazza, Bortoli, & Nougier, 2000; Robazza, Bortoli, & Hanin, 2004; Robazza, Pellizzari, & Hanin, 2004; see study one). The IZOF model holds that emotions are a crucial component of individuals' psychobiosocial (PBS) state (Hanin, 2007). From this holistic view, emotions are viewed as a category of experience that reflects on-going person-environment interactions informed by previous experience, a current situation, and expectations of future success (Hanin, 2010).

The IZOF model posits that the impact of individualized patterns of emotions energize and organize effort and skill for task execution (Hanin, 2000a). This pattern is individual to the person in terms of the content and intensity of the emotions experienced (Hanin & Syrjä, 1996). Empirical studies support the notion that athletes near to an optimal pattern of emotions are more likely to realize a superior performance compared to those who are more distal from this state. Similarly, prospects for a poor performance increase when an athlete's

emotional state approaches an undesirable emotion pattern (Robazza, Pellizzari, & Hanin, 2004). These individualized emotion patterns are considered to represent an athlete's optimal zone (opt-zone) and nonoptimal zone (nonopt-zone) of functioning respectively.

Although most IZOF research has focused on emotions, Hanin (2010) proposes a further seven interrelated modalities that contribute to overall human functioning and an individual's PBS. In addition to emotion, these components are cognitive, motivational, physiological, motor-behavioral, operational, communicative, and volitional. Taken together these eight modalities provide a relatively complete description of a performance state. Further to a subjective emotional experience, research has recently incorporated physiological symptoms when examining athletes' PBS and performance (Robazza, Pellizzari & Hanin, 2004).

When considering which modality of a PBS state to target, Hanin (2000b) recommends modalities most salient to an athlete. In a recent qualitative professional practice study incorporating an 8-week emotion regulation intervention, a consultant working with a non-elite cross-country runner identified during performance subjective emotion and physiological symptom zone profiles (see study one). However, the athlete's description of performance states involved several examples from a cognitive modality, thus Hanin's (2000c) profiling process was extended to this area. Drawing from consultant case reflections, and a social validation interview, this multi-form approach contributed to the athlete's overall PBS performance state of feeling less uncertain (emotion), more relaxed (physiological symptom), and an enhanced ability in maintaining an appropriate focus of attention (cognition).

In their intervention study, Woodcock and colleagues (see study one) also highlighted athletes' meta-experiences. Meta-experiences account for the knowledge, attitudes, beliefs, and preferences athletes have for a specific PBS state (Hanin, 2003). This self-knowledge is developed from feedback relating to successful and unsuccessful performances. For example,

an athlete feeling anxious before competition may have a poor start. Based on this situational experience, that may well be repeated in subsequent events, the athlete is likely to develop knowledge and a belief system that pre-competitive anxiety is harmful for performance.

Meta-experiences are viewed as central to the emotion regulation process. Knowledge and beliefs about one's PBS state for performance contributes to a selection of actions intended for its regulation. Athletes' use of regulatory techniques has been viewed as a process of awareness, acceptance, and action ("triple A"; Hanin, 2006). Awareness relates to the perception and knowledge of a situational state. Acceptance refers to the attitude (acceptance or rejection) of these experiences as being helpful or harmful for performance. Action reflects the effective or ineffective strategies employed by athletes in regulating an optimal state for performance. What action strategies are employed is informed by athletes' meta-experiences shaped from previous experiences of similar situations (Nieuwenhuys et al., 2008).

Intervention studies have shown that athletes' awareness and acceptance of PBS states is an important precursor to enhancing regulation strategies (i.e., action; Robazza, Pellizzarri & Hanin, 2004; see study one). Specifically, idiographic approaches to profiling performance experiences such as Hanin's (2000c) stepwise profiling process (for opt- and nonopt-zone identification), self-narrative accounts (Hanin, 2003), or metaphor generation (Hanin & Stambulova, 2002) have been reported to increase awareness and acceptance (Harmison, 2006; see study one). In a recent study, meta-experiences structured within the triple-A framework gave an international sailor new insights to performance that he wanted to immediately integrate into his training program (Nieuwenhuys et al., 2008). Thus, influencing awareness and acceptance, may initiate spontaneous change in athletes' subsequent action tendencies.

The triple-A framework has been shown to be a useful process for structuring athletes' meta-experiences and subsequent regulatory technique use (Nieuwenhuys et al., 2008, 2011).

It also offers a potential framework for examining regulatory change through athletes' awareness, acceptance, and action processes pre- and post-intervention. Thus the present study aims to examine the change in athletes' meta-experiences following an IZOF based regulation intervention program. To form a comprehensive account of athletes' PBS state during performance, this research will extend Woodcock and colleagues' multi-form program in incorporating subjective emotions, physiological symptoms, and cognitions (see study one). Specific attention is given to the cognitive modality due to the limited attention this form has received in the literature to date.

Given the IZOF model is grounded in the individual experiences of the athlete, a case study design lends itself well to the current investigation (e.g., Cohen, Tenenbaum, & English, 2006; Prapavessis, Grove, McNair, & Cable, 1992; Robazza, Bortoli, & Nougier, 2000). A multiple case study incorporating qualitative and quantitative data sources will examine athletes' experiences of an IZOF intervention. According to Yin (2003), multiple case study designs involving the replication of an intervention are analogous to the process of conducting multiple experiments. Being able to duplicate initial research findings allows for a more compelling case to be presented. The present work offers two separate case studies conducted independently to examine study hypotheses in an ecologically valid setting. To summarize, these hypotheses are: (a) athletes will identify idiographic cognitive zone profiles, (b) an individualized intervention program will increase athletes' awareness and acceptance of performance states and employment of effective action in the form of regulation techniques, (c) and in line with these changes in meta-experiences, improvements in performance will be observed.

Method

Participants

A non-elite (Julia) and an elite (Tony) athlete were purposefully recruited for the present study. An athlete was considered elite if she/he had been competing at a representative

competitive level (e.g., regional, national, international) for more than two years. If an athlete had less than two years of competitive experiences at a given competitive level, or competed at a non-representative level, he/she was considered to be non-elite.

Introducing Julia. Julia was a 14 year old tennis player. She has participated in tennis for two years, and represented her local club competing in under-16 and under-18 tournaments. These events varied in level of ability from club (e.g., grade 5 tournaments) to regional (e.g., grade 3 tournaments). Julia also participated in a Junior Athlete Education program. The charity funded program is designed to support young athletes in balancing sport, academic, and family commitments. Julia indicated she had no previous experience of sport psychology support either formally (e.g., working with a consultant), or informally through books, media, or online material.

Although it was Julia's father who made initial contact with the university to request sport psychology support for his daughter, Julia was keen to participate in the study. Julia perceived the mental side of performance as a weakness, and recognized a need for psychological support to strengthen this area of her tennis game.

Introducing Tony. Tony began playing golf at 15 years of age. Now 22 years old at the time of the study, Tony played off scratch[1] and represented his local golf club, as well as playing in the 1st team for his university, county, and region. Tony dedicated five hours per week to training the technical side of golf, five hours on strength and conditioning, and one hour for mental practice. A second year sport and exercise undergraduate science student, Tony was aware of key themes in sport psychology and expressed familiarity with a number of regulation techniques including goal setting, self talk, imagery, and relaxation. Tony's weekly mental practice was guided by Selk's (2008) mental workout exercises and involved a centering breath, reciting a performance statement, imagining performance highlights,

[1] Scratch is a golf term used to describe a player who has a handicap of zero or lower. In playing terms, a scratch golfer would expect to shoot par or better with par being a pre-determined number of shots required to complete a hole.

affirming an identity statement, and finishing with another centering breath. Prior to the present study, Tony had attended sport psychology workshops organized by his regional and county golf clubs. Tony had not previously received individual sport psychology support.

Tony found out about the present study whilst participating in other studies in the department where the author is based. Tony had recently decided to take his golf more seriously, and work towards becoming a professional. Where Tony used to be carefree and enjoy his golf, he now strived to play every shot faultlessly. When errors in his game occurred, Tony reported becoming "fed up [and] frustrated". Thus, when presented with an opportunity to work on the psychological side of his performance on a one-to-basis, Tony volunteered to participate.

Data Sources

Idiographic scaling. Athletes' opt-zone and nonopt-zones were identified for each modality of subjective emotions, physiological symptoms, and cognitions, following Hanin's (2000b) stepwise profiling procedure (see study one for a detailed procedure).

From the profiling process, three figures were created to provide a visual representation of each zone modality. Descriptor words made up the x-axis, and intensity ratings were plotted on the y-axis. A line connected the data points and illustrated opt-zone and nonopt-zone emotion patterns. Two intensity points were added and subtracted from each point to create a zone band width (Hanin, 2000b; see Appendix B).

The process of zone identification created three individualized self-report forms for each athlete. The forms listed athlete descriptor words for each modality: (a) subjective emotions, (b) physiological symptoms, and (c) cognitions (see Appendix B). For every competition, athletes rated the intensity each descriptor word or phrase was experienced on the CR-10 scale. No more than 45 minutes after an event, athletes responded to the stem "Please indicate to what extent you experienced specific emotions/bodily feelings/thoughts during the tennis match/golf round played". Accuracy of immediate recall post-competition of

feeling states has been supported in previous studies (Hanin & Syrjä, 1996; Robazza, Pellizzari, & Hanin, 2004).

Triple-A process. To examine the triple-A processes of awareness, acceptance, and action, qualitative consultant case notes were collected and an athlete semi-structured interview conducted. The structure of the case notes followed Boud's (2001) reflective learning model. The model involves two stages of reflection. The first involves responding to the question "What happened?" within 24 hours of a session. The second asks "So what?" after a further 1-6 days to allow for an emotionally removed critical reflection of each session. Boud's model has previously been employed to inform professional practice decision making (see study one; Woodcock et al., 2008).

A semi-structured interview was conducted one week after completion of the regulation intervention as a means to evaluate the program from the athletes' perspective. A sub-section of questions were analyzed in line with the aims of the present study. Specifically, the athletes were asked to reflect on performance experiences during the intervention, and the role the intervention had on any perceived changes. Example questions include "What emotions do you tend to experience when you play well?", "Over the course of the sessions, did you notice your feelings or thoughts more or less than you had done previously", "Can you give me an example of how your awareness has changed?", and "Can you give me an example of when you employed a specific technique and how it affected your performance". Probes and prompts were also used to gain further insight into athletes' experience such as "Can you give me an example of how it has changed?" An interview guide is available from the author (see Appendix B).

To ensure integrity of data collection, interviews were conducted by an independent researcher who had not been involved in the present investigation's study design or implementation (Patton, 2002). The interviewer's anonymity from the applied process sought to protect against the possibility of the athletes offering socially desirable responses. The

interviewer had previous experience in interviewing athletes about sport psychology consultancy experiences.

Interviews were conducted in a non-threatening location chosen by the athlete. Questions were asked from the interview guide and appropriate prompts and probes were used to facilitate in-depth athlete reflection. Each interview was digitally audio recorded and lasted between 30 to 50 minutes.

For the triple-A process of action, quantitative data was also collected. The Test of Performance Strategies (TOPS; Thomas et al., 1999) was employed to measure athletes' frequency of regulation technique use pre- and post-intervention. TOPS captures the use of eight salient psychological skills and techniques including goal setting, self-talk, imagery, relaxation, arousal control, emotional control, automaticity, and attentional control[2] in both competition and practice contexts. Athletes responded to 64 items on a 5-point Likert scale of 1 (*never*) to 5 (*always*).

Although participants completed all 64 items, only the subscales consistent with the aims of the study were analyzed. Namely, scores on the goal setting, self-talk, imagery, and relaxation subscales were of interest. These four subscales represent regulation techniques employed in the action phase of the triple-A framework, and are often targeted in interventions (cf. Robazza, Pellizzari, & Hanin, 2004; see study one). The present investigation focused on competition zones, therefore only the competition dimension was included in case study reports. Pre- and post-intervention mean subscale scores were calculated for each of these TOPS subscales.

Performance. Subjective and objective data for performance were collected (Anderson et al., 2002). To aid athletes' self-assessment, the same scale used for PBS intensity was adopted for measuring performance (Robazza, Pellizzari, & Hanin, 2004).Thus

[2] Attentional control in competition is conceptualized as negative thinking.

subjective performance was rated on a CR-10 scale from 0 (*worst performance*) to 10 (*best performance*), with a maximum possible value of 11.

Objective performance data were collected athletes' performance in tennis and golf competitions. In tennis, a player's serve is one of the few performance areas where the influence of external factors, such as the opponent's ability, is minimal. Thus, percentage serve was identified as an appropriate objective measure in the present study. Serves contributing to the percentage serve score included all successful serves in which the served ball lands in the opponent's service box. An observer kept a record of serve frequency for each tennis match, from which an overall percentage serve was calculated.

In golf, game statistics were used as an objective measure of performance. These included the number of fairways in regulation (FiR), number of greens in regulation (GiR), and number of putts the athlete made in an 18-hole golf round. A FiR is achieved if the first shot of a hole (i.e., a tee shot) lands and stays on the fairway. A GiR is attained when a player's ball lands on a putting green in the required number of shots according to par. Allowing for two strokes on the putting green, a ball must reach this area of the course in par minus two strokes. For example, when playing a par 3 hole, the ball must land on the putting green in one stroke to obtain GiR. Finally, the number of putts refers to a frequency count of strokes taken on the putting green to hit the ball in the hole. The golf participant kept a record of his own objective performance scores in terms of each of these statistics.

Case Study Protocol

In case study research, reliability refers to another investigator's ability to follow the same procedures to replicate a study (Smith, 1988). Hence, a detailed case study protocol is outlined that describes the procedures followed in the two present cases (see Figure 3.1).

Baseline (phase 1). The study was granted ethical approval from a university ethics committee. An initial meeting with each athlete and the author was used to explain the study's

procedures in full and gain informed consent from the participant and, if they were under-18 years of age, a parent.

At the time of the initial meeting, the TOPS was completed by participants. Subjective and objective performance measures were also introduced. Athletes completed an example subjective measure to familiarize themselves with the process of making a self-referent performance rating. Subjective and objective performance ratings were recorded for every competition following this meeting until study completion.

Zone identification (phase 2). Following the initial 2 month baseline phase, the author met with each athlete for zone identification. Hanin's (2000b) profiling procedure was followed to identify an opt-zone and nonopt-zone for the three PBS modalities of emotions, physiological symptoms, and cognitions.

5-week regulation program (phase 3). Athletes completed an individualized 5-week regulation program. Sessions were designed to identify, refine, and implement relevant regulation techniques to help facilitate and maintain an optimal state for performance. Each session began with athlete-consultant reflections on recent competitive performances. Athletes' current regulation techniques were identified and refined (Robazza, Pellizzari, & Hanin, 2004). Additional techniques considered appropriate were also introduced and developed. Athletes were encouraged to monitor PBS states during competitions and employ regulation techniques when appropriate. For an overview of each participant's individualized 5-week regulation program see Appendix B.

Supporting materials for the intervention were provided in the form of a journal. This A5 ring-binder contained the three visual representations of each zone profile. Journal pages were also developed that summarized the what, where, when, and how of relevant regulation strategy use.

Post-intervention (phase 4). At the end of the final session, athletes completed the TOPS post-intervention. Finally, athletes participated in a semi-structured interview in the week following program completion.

Data Analysis

Consultant Case Notes and Athlete Interview

Consultant case notes and athlete interview transcripts were subject to composite sequence analysis (CSA; Miles & Huberman, 1994). CSA allows for stories or plots to be extracted from multiple data sources (and cases) without compromising the meaningful sequences they contain. CSA is used to display patterns over time. Thus CSA was deemed appropriate to analyze changes in the processes reflected in the triple-A framework; namely, to capture awareness, acceptance, and action processes pre- and post-intervention (cf. Nieuwenhuys et al., 2008, 2011).

The interviews were transcribed verbatim into 22 pages (Julia's was 13 pages, and Tony's 9 pages). These transcripts and case notes for each athlete were read and re-read several times by the first author. During these readings, performance experiences were divided into pre-intervention and during-intervention categories. Within these time periods, blocks of text or meaningful phrases were isolated that referred to the triple-A process of awareness, acceptance, or action. Each phrase was given a heading that reflected its content. For example, the phrases "she was more powerful than me" and "opponent's string broke, and stopped mid-point to change her racket. This is against the rules!" were labeled "Focus on opponent" under the triple-A process of awareness. Different parts of the triple-A process were connected by directional arrows to demonstrate a sequence of influence during a competition.

Several steps were taken to establish trustworthiness of data analysis. Each athlete reviewed their own interview transcript and interpretation of data responses. No amendments to the data were made by participants following this member check (Culver et al., 2003).

Furthermore, results were presented to research associates to help minimize investigator bias in interpretation (Culver et al., 2003). Any disagreements were discussed between researchers until an agreement was reached by all.

Study Phase		Phase 1		Phase 2		Phase 3		Phase 4
		Baseline		**Zone Identification**		**5 Week Regulation Program**		**Post-Intervention**
Athlete-Consultant Interactions		Initial meeting (60 mins)		Two one-to-one meetings (90 mins each)		Five one-to-one individualized intervention sessions (60 mins each)		
Data Sources		TOPS	Performance (subjective & objective)		Performance (subjective & objective) Zone proximity	Performance (subjective & objective) Zone proximity Consultant case notes		TOPS Semi-structured interview
Competitions	Julia		8 tennis matches		12 tennis matches	15 tennis matches		
	Tony		4 golf rounds		5 golf rounds	7 golf rounds		

Figure 3.1. Summary of the case study protocol followed for each participant.

Zone Proximity

In previous studies, a three step procedure has been followed to calculate opt-zone and nonopt-zone zone proximity separately (Robazza, Bortoli, & Nougier, 2000; Robazza, Pellizzari, & Hanin, 2004). Hanin (2000a) stresses that it is the interaction of helpful and unhelpful PBS experiences that best explain performance. Consequently, zone proximity was determined as a combination of opt-zone and nonopt-zone experiences. Thus a fourth analytical step was included in the present study to create a composite score that reflects the interaction of opt-zone and nonopt-zone feeling states. Following zone identification, this four step process was followed for each of the three form modalities for every competition participants completed.

First an Actual Proximity Score (*ActPS*) was calculated for every competition using the equation, $ActPs = b - c$, and was applied to every descriptor word or phrase in a given zone, whereby b represents the intensity this was experienced, and c equals athletes' original zone rating. For example, an athlete's zone rating for "confident" originally profiled at 9 (represented by *c*), rated "confident" at 4 following an event (represented by *b*), then his or her *ActPS* for "confident" would be 4 - 9 = -5.

Second, an Absolute Proximity Score (*AbPS*) was calculated. As the focus of the investigation is on opt-zone proximity, irrespective of direction (i.e., above or below zone parameters), *ActPS* was converted to an absolute number. Continuing the previous example, a "confident" *AbPs* of -5 as an absolute number would be 5. Third, the mean *AbPS* score for a zone was calculated for a given form and competition.

Finally, a Composite Zone Proximity (CZP) value was obtained for each form modality: CZP = *AbPS* nonopt-zone - *AbPS* opt-zone. CZP scores ranged from -11 (in nonopt-zone, out opt-zone) to 11 (in optzone, out nonopt-zone). Zero represented a para-optimal state when athletes were concurrently in or out both zones.

Intervention Effects

An adapted split-middle (SM) method was adopted to offer a reliable and valid technique to support visual inspection of single case data (Fisher, Kelley, & Lomas, 2003). Namely, the conservative dual-criteria (CDC) method was used to aid visual inspection of zone-proximity and performance data (Fisher et al., 2003). When adopting this method, dual criteria are first identified by (a) calculating a baseline SM trend line (see Kazdin, 1982), (b) extending this trend line into the intervention phase, (c) calculating a baseline mean, and (d) extending the baseline mean line into the intervention phase. These two lines form dual criteria for visual inspection. Reliable change between phases is suggested if a pre-specified number of intervention data points fall above the SM trend line *and* the baseline mean line as determined by a Binomial test. The dual criteria have been viewed as vulnerable to a Type I error. To make a more conservative assessment, each line is raised in height by 0.25 standard deviation of the baseline data. This was deemed an acceptable compromise between Type I and Type II errors (Fisher et al., 2003).

Fisher and colleagues' (2003) CDC was calculated for emotion, physiological symptom, and cognition composite zone proximity and subjective and objective performance over time. Following the intervention, it was expected that composite zone proximity and performance would increase. A one-tailed pre-specified number of data points to fall above the dual criteria lines, and probability value for actual number of data points above the criteria lines, were calculated using the Binomial equation[3]:

$$f(x) = \binom{n}{k} p^n = \left(\frac{n!}{k!\,(n-k)!}\right) p^n$$

[3] Where:

n = number of observations

k = number of data points falling above dual-criteria lines

p = probability of data points appearing above or below dual-criteria lines given the null hypothesis which states 50% of data points will fall above dual criteria lines and 50% below.

Results

The Case of Julia

Cognitive zone profile. Julia identified optimal and nonoptimal emotion, physiological, and cognitive zones of functioning (see Figure 3.2 and Appendix B). When Julia played well, she identified positively phrased thoughts that were both motivational (e.g., keep it up) and instructional (e.g., what the next shot will be). Julia did not identify thoughts or cognitive processes that were particularly pertinent to nonopt-zone feeling states. Her most frequent cognitive activity during poor performances was visualizing what her father would say, however this image was experienced to an equal extent in her opt-zone.

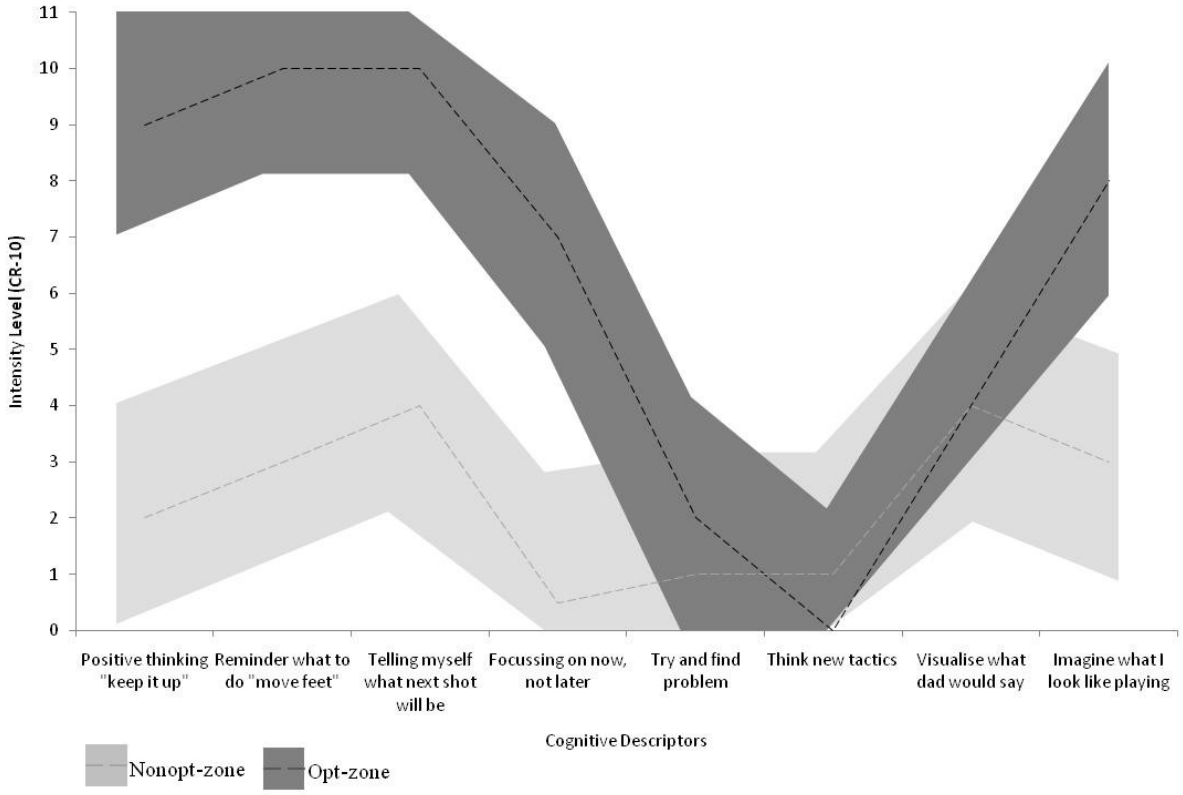


Figure 3.2. Visual representation of Julia's cognitive opt-zone and nonopt-zone.

Triple-A process. When reflecting on pre-intervention performance experiences, Julia indicated an awareness and acceptance of debilitative thoughts and feelings on the tennis court. Julia reported to often lack confidence during tennis matches, and described how small

errors in her game would annoy her. For example, she reflected how "if I hit a bad shot...or two bad shots in a row then that would get on my nerves and I would be throwing my racket around...little things like that would set me off". Following this ineffective regulation strategy, Julia became frustrated and annoyed. Not having the regulation techniques to control or change dysfunctional feelings led to a belief that such feeling states were permanent (see Figure 3.3).

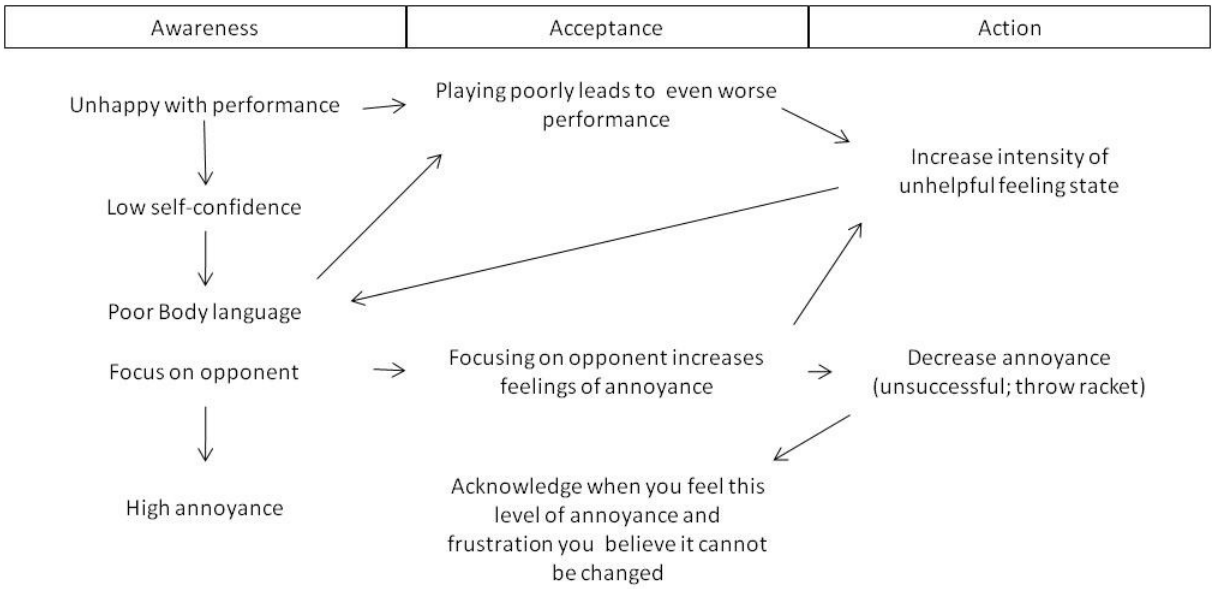


Figure 3.3. Julia's pre-intervention triple-A processes.

In contrast to the action processes depicted in Figure 3.3, baseline responses on the Test of Performance Strategies (TOPS; Thomas et al., 1999) suggested Julia frequently used regulation techniques during competition. Specifically, Julia reported using goal setting and self-talk most often (see Figure 3.4). Unfortunately, the TOPS is a crude measure of reported technique use and does not explain whether a strategy, when employed, is effective (Hardy, Roberts, Thomas, & Murphy, 2010). Although Julia reported a high incidence of goal setting and self-talk, on a par with national and international athletes (cf. Thomas et al., 1999), these techniques do not seem to have helped Julia's levels of confidence, focus, or feelings of annoyance.

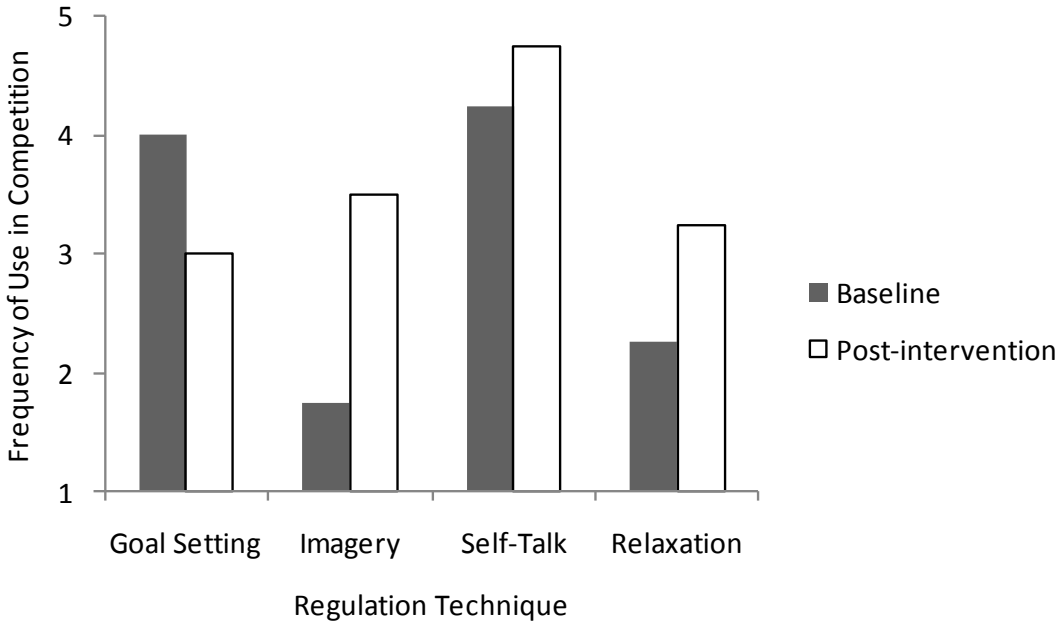


Figure 3.4. Julia's mean TOPS subscale scores at baseline and post-intervention.

Athlete reflections of performance experiences, coupled with consultant case notes, revealed a more complex triple-A process during the intervention (see Figure 3.5). When experiencing annoyance, Julia continued to employ ineffective regulation strategies (e.g., throw racket), but also developed and used more successful techniques of positive self-talk and the employment of a between point routine. For example, the effectiveness of Julia's self-talk was apparent when reflecting on successful implementation of a good coach bad coach metaphor (Zinsser et al., 2006). In one example, an opponent unable to return Julia's serve verbalized her annoyance by saying, "why can't I get these serves back? They're not even that good". Reacting negatively to this statement, Julia felt her confidence falter and began to feel annoyed. Drawing on her good coach, Julia reappraised the situation. She recalled how male senior players found her serve difficult to return. Rather than becoming concerned by her opponent's comments, Julia was able to re-focus for the next point. After losing the first set in this match, Julia proceeded to win the second. This outcome instilled confidence in Julia, as she had never before won a second set after losing the first in a competition.

It is worthy to note that Julia reappraised her pre-intervention acceptance that dysfunctional performance states were fixed states. Reflecting on during-intervention experiences, she acknowledged that feeling states can be altered. This belief seems instrumental to Julia's successful adoption of regulation techniques. This point is illustrated by Julia in her interview:

> Instead of looking at how bad things are and how badly [I'm] playing… I've started to think right, instead of thinking negatively…think about turning it around and thinking how we're going to get back, how we're going to play better, and how you're going to improve your emotions.

In general, post-intervention TOPS subscale scores supported the CSA. Increases in use of relaxation, self-talk, and imagery were reported compared to pre-intervention. Unexpectedly, Julia's goal setting activities decreased following the regulation program (see Figure 3.4).

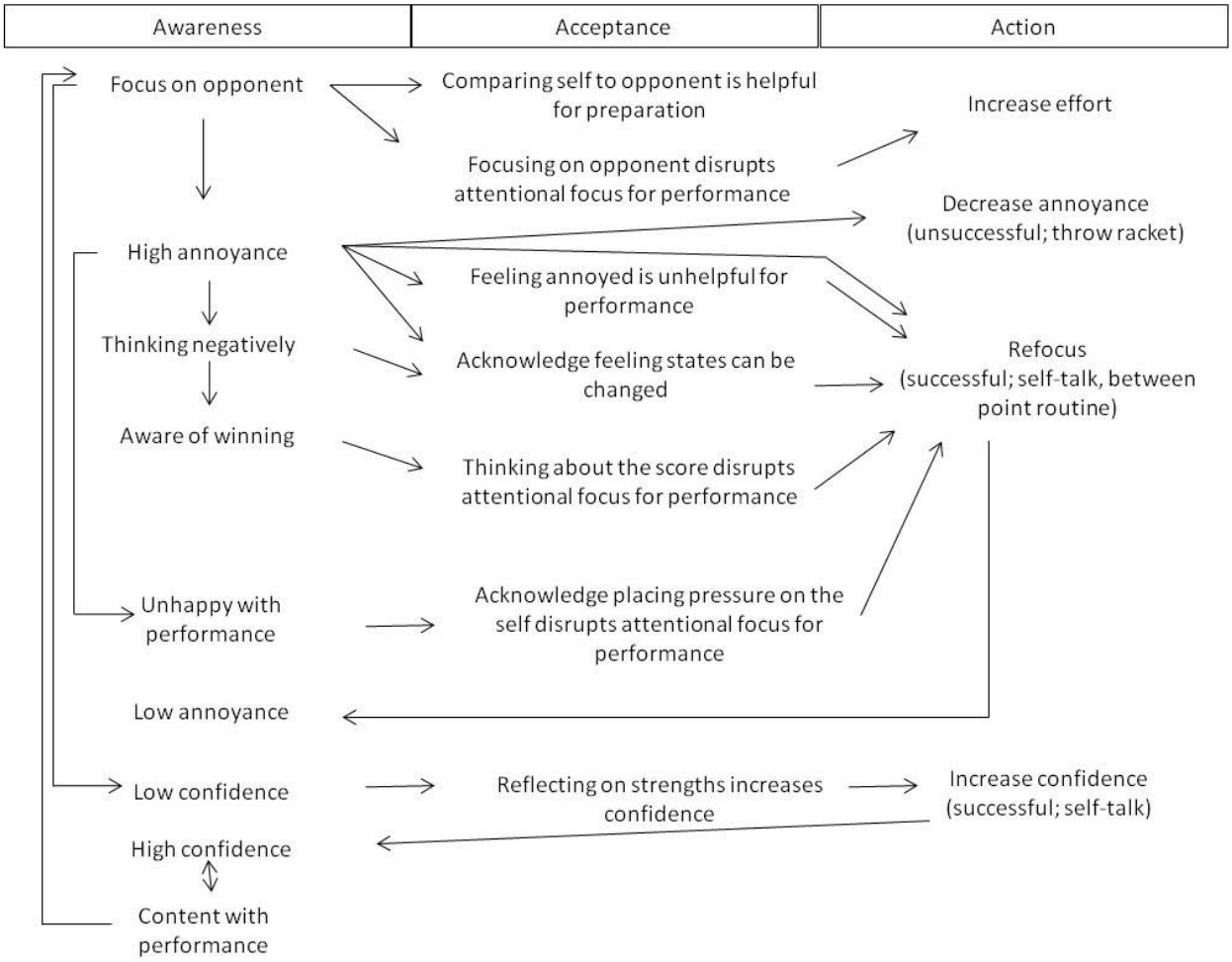


Figure 3.5. Julia's triple-A processes during-intervention.

Zone proximity. Following zone identification, Julia competed in 12 tennis matches before the onset of her regulation program. Data was missing for four of these matches (match numbers 16, 17, 19, and 20), when Julia forgot to take her self-report forms to the tournament. Following the onset of the intervention, Julia competed in a further 15 matches where all data were collected.

The intervention program was designed to help Julia adjust her during performance experiences and approach an optimal state for performance (in opt-zone, out nonopt-zone) and become more distant from a nonoptimal state dysfunctional for performance (out opt-zone, in nonopt-zone). This combined interaction of zone proximity was captured by a composite zone proximity (CZP) score. Descriptive statistics suggest Julia's emotion CZP increased towards

an optimal state, and decreased in variability, from zone identification (M = 1.06, SD = 3.47) to during intervention (M = 2.66, SD = 1.65). The Binomial test indicated a significant increase in proximity to an emotion optimal state for performance (see Figure 3.6). Visual inspection of Figures 3.7 and 3.8 suggest no change was observed for physiological symptoms and cognitions.

Performance. Performance was compared at two points between three study phases: (a) from baseline to zone identification, and (b) from zone identification to during intervention. From baseline to zone identification, subjective performance increased (M = 4.88, SD = 1.96; M = 5.75, SD = 2.76). Similarly at a descriptive level, an increase in percentage serve was observed between these two phases (M = 85.20%, SD = 12.1; M = 90.70%, SD = 4.11). However, CDC assisted visual inspection of subjective and objective performance from baseline to zone identification did not support these descriptive increases (see Figure 3.9 and 3.10). From zone identification to intervention phases, Julia's mean subjective (M = 5.87, SD = 1.73) and objective (M = 90.38%, SD = 5.02) performance ratings did not change at a descriptive level or though CDC inspection (see Figure 3.9 & 3.10).

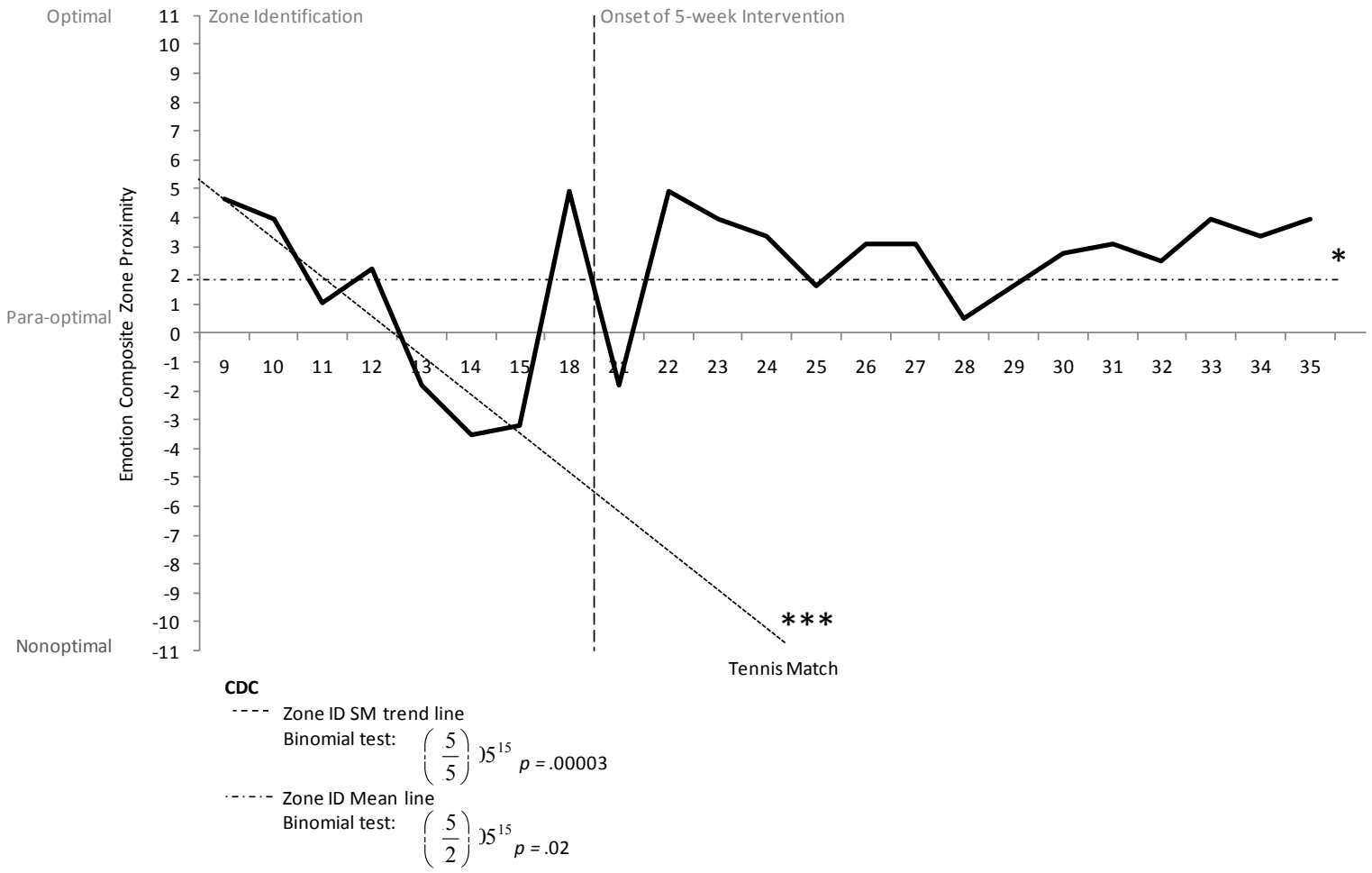


Figure 3.6. Julia's subjective emotion composite zone proximity pre and during a 5-week regulation intervention.
Note. CDC = Conservative Dual-Criteria. 12 data points would need to fall above both CDC lines for a difference to be indicated in composite zone proximity score between zone identification and onset of 5-week intervention phases.
*$p < .05$, ***$p < .001$

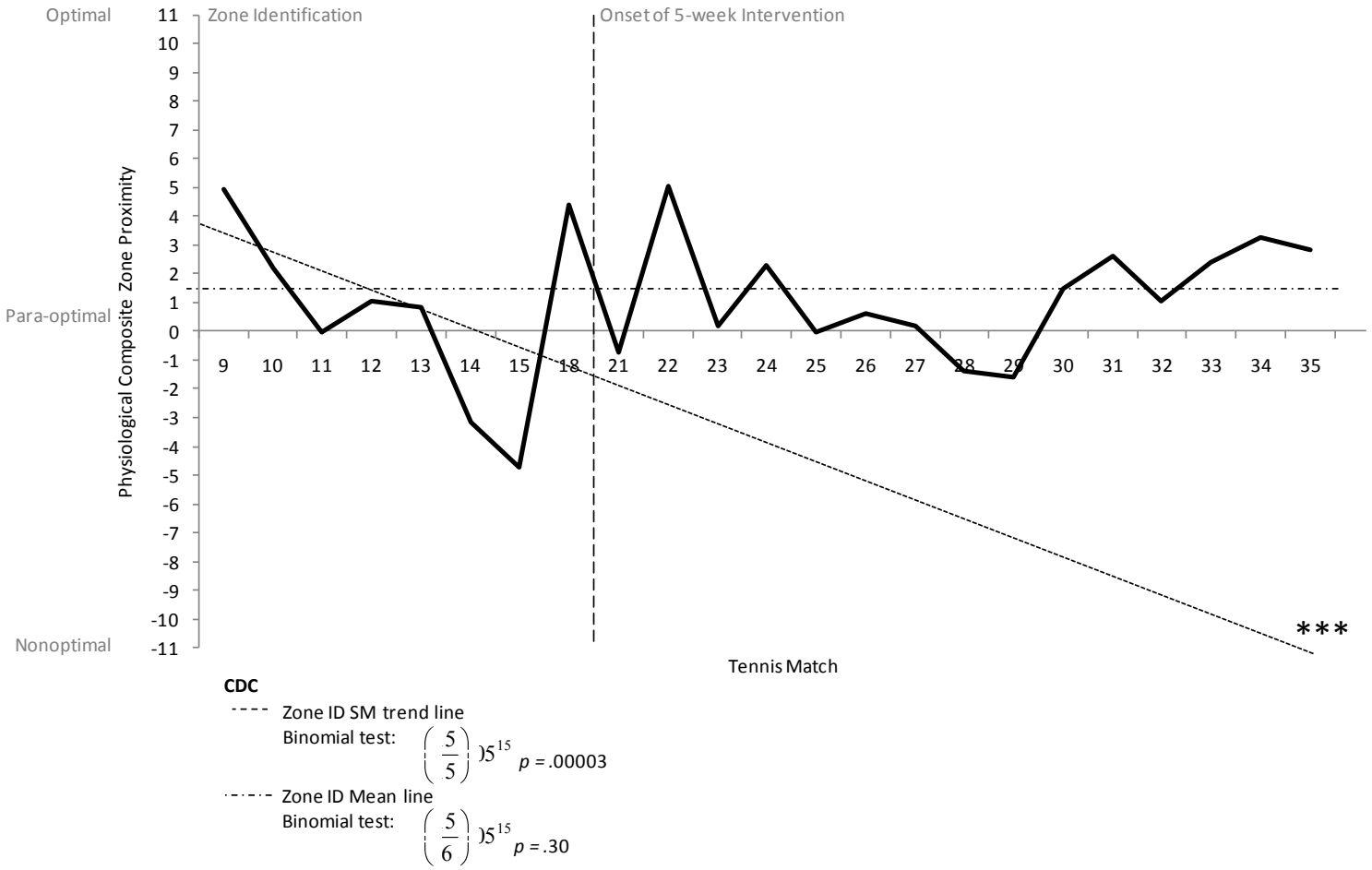


Figure 3.7. Julia's physiological composite zone proximity pre and during a 5-week regulation intervention.

Note. CDC = Conservative Dual-Criteria. 12 data points would need to fall above both CDC lines for a difference to be indicated in composite zone proximity score between zone identification and onset of 5-week intervention phases.

****p < .001*

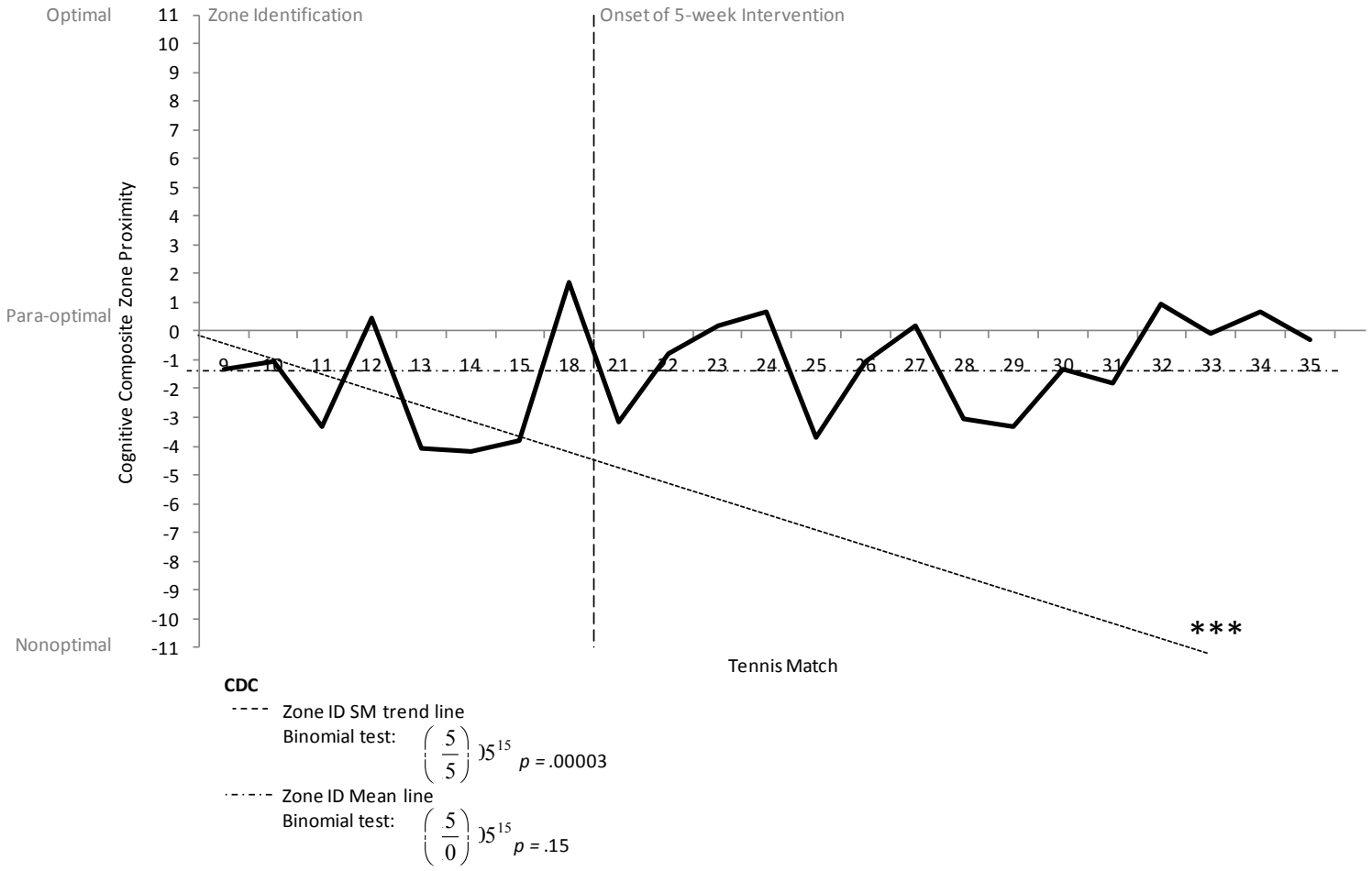


Figure 3.8. Julia's cognitive composite zone proximity pre and during a 5-week regulation intervention.
Note. CDC = Conservative Dual-Criteria. 12 data points would need to fall above both CDC lines for a difference to be indicated in composite zone proximity score between zone identification and onset of 5-week intervention phases.
****p* < .001*

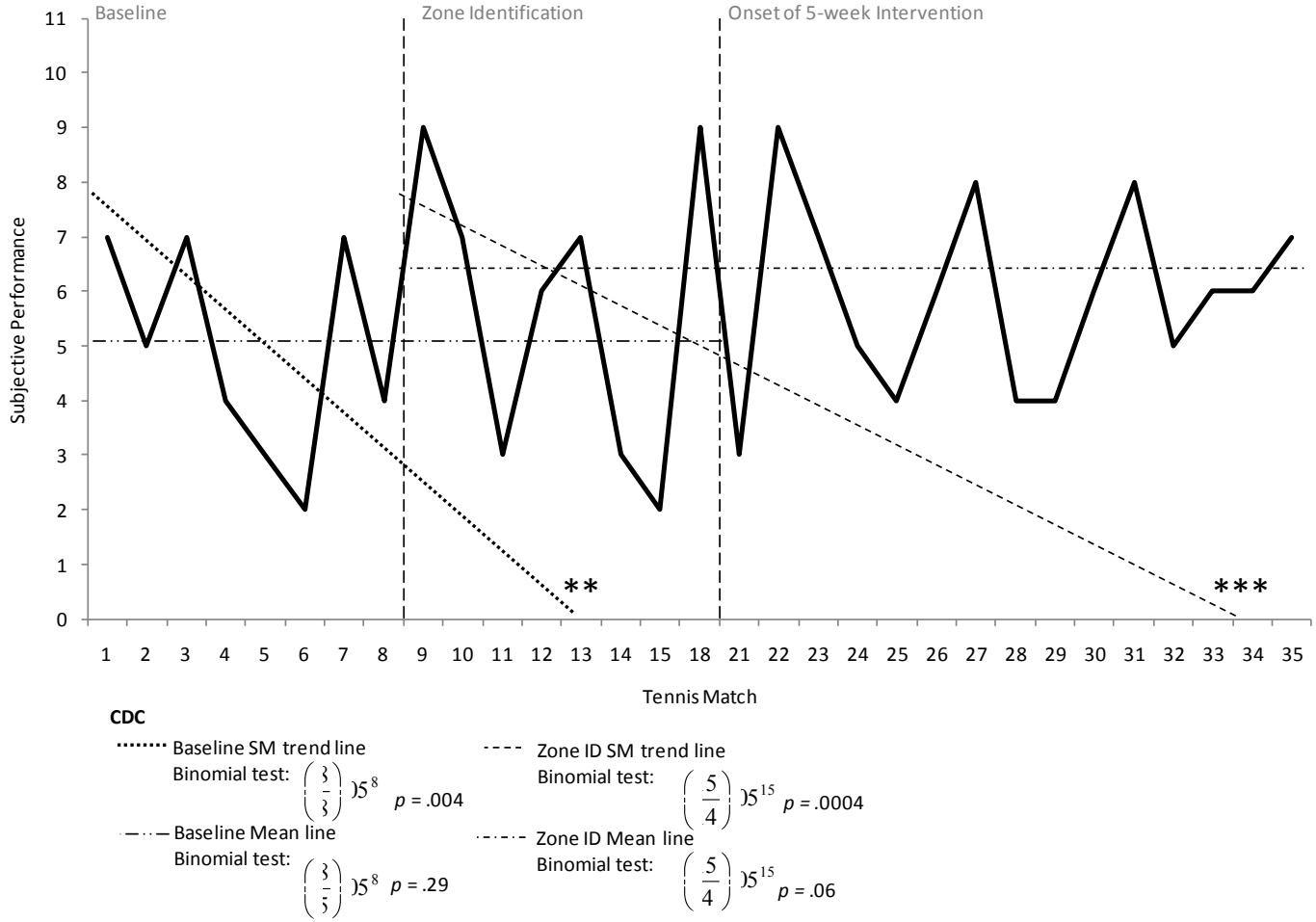


Figure 3.9. Julia's subjective performance scores

Note. CDC = Conservative Dual-Criteria. 8 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between baseline and zone identification phases.12 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between zone identification and onset of 5-week intervention phases.

***p < .01, ***p < .001*

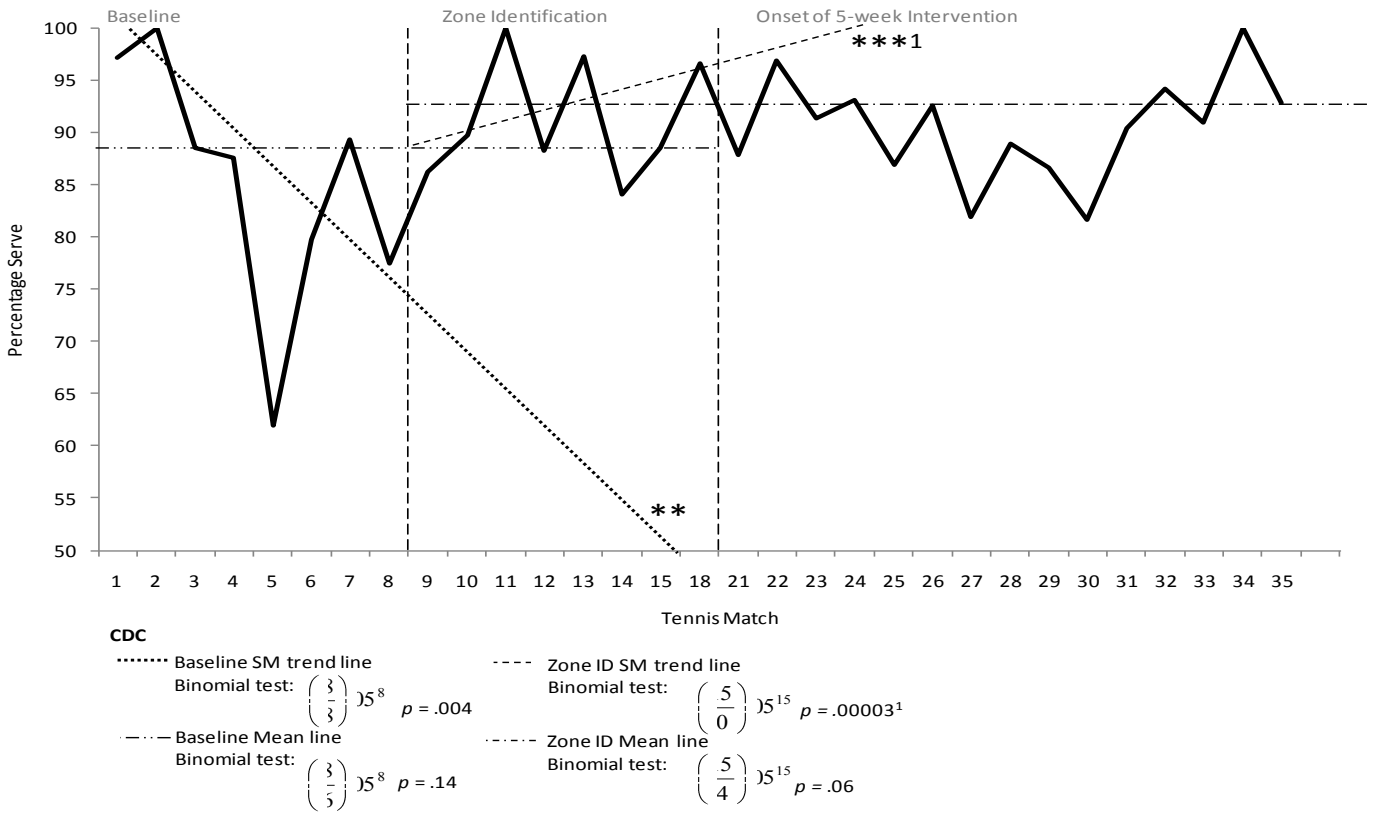


Figure 3.10. Julia's objective performance scores

Note. CDC = Conservative Dual-Criteria. 8 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between baseline and zone identification phases.12 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between zone identification and onset of 5-week intervention phases.

[1]The significant Binomial test indicates the probability of percentage serve scores to be *below* the Zone ID trend line is < .001. For the one-tailed tests it was hypothesized data points would be *above* the line.

***p < .01, ***p < .001*

The Case of Tony

Cognitive zone profile. Tony identified optimal and nonoptimal emotion, physiological, and cognitive zones of functioning. A visual representation of his cognitive opt-zone and nonopt-zone is presented in Figure 3.11. During good performances, Tony's thoughts were dominated by motivational drive self-talk used to maintain high levels of motivation and determination (e.g., "Let's go – win this!" and "Come on - you can do it"). In contrast, during poor performances Tony would consider the negative implications of making a mistake and tell himself, "I can play better than that".

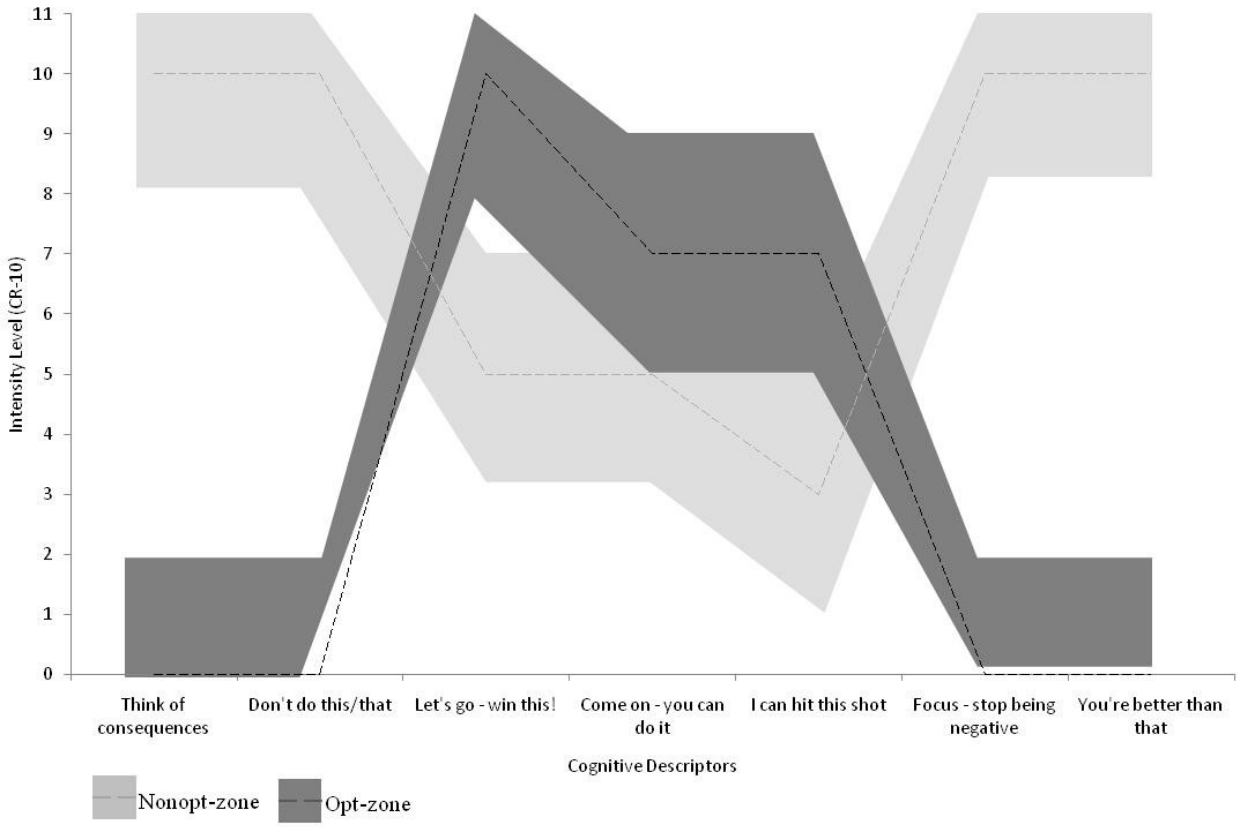


Figure 3.11. Visual representation of Tony's cognitive opt-zone and nonopt-zone.

Triple-A processes. Before the intervention began, Tony reflected on his performance experiences. Tony indicated golf used to be something he looked forward to playing, but he no longer enjoyed competition. Where Tony used to be carefree and find pleasure in playing golf, he now applied pressure to play every shot faultlessly. When errors in his game

occurred, Tony became "fed up [and] frustrated". During golf performance, the consistent psychological strategy Tony employed was a pre-shot routine involving several phases of readying (e.g., walk up to ball, assess shot, select club, check alignment with target), focusing attention on a relevant external cue (e.g., target), and execution (e.g., hitting the shot). Finally, Tony would evaluate the shot. If the ball landed near its intended target, Tony would think "great" and move on to the next shot. When the ball stopped far from a target, Tony often attributed this to a controllable error, and frustration would seep into his game. This unfavourable evaluation would linger in Tony's mind, and negatively impact his mindset for subsequent shots. Awareness of current PBS states, acceptance of its impact on performance, and Tony's use of regulation techniques pre-intervention are reflected in Figure 3.12.

Figure 3.12. Tony's pre-intervention triple-A processes.

Consistent with Tony's commitment to mental practice, TOPS subscale scores suggested frequent use of goal setting, self talk, imagery, and relaxation (see Figure 3.13).

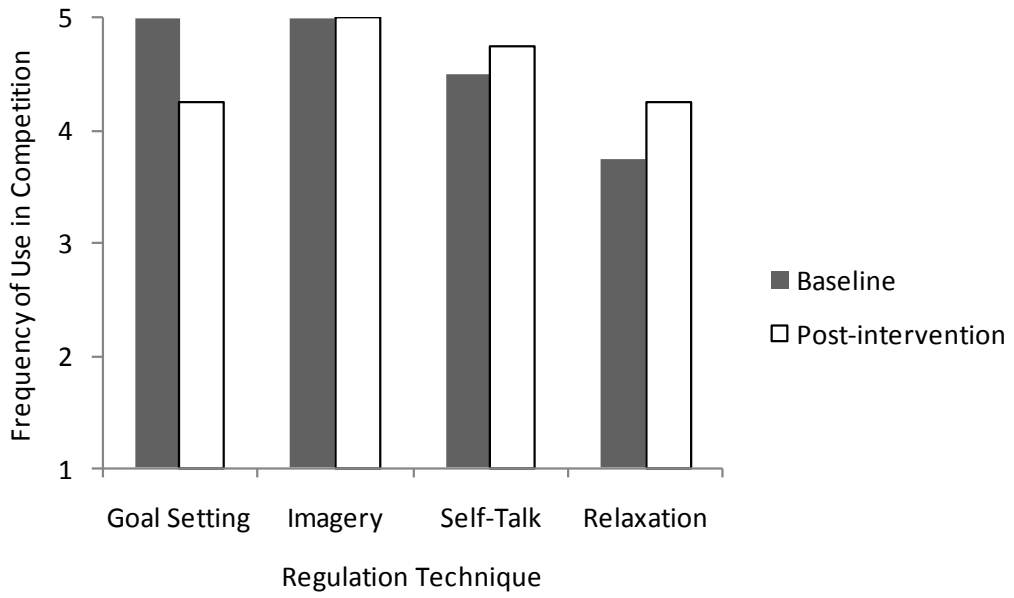


Figure 3.13. Tony's mean TOPS subscale score at baseline and post-intervention.

Reflecting on his involvement in the study, Tony noted the process of zone identification helped enhance awareness. Tony reported "I'd never really sat down and thought about…how I feel mentally, physically during optimal performances and how I…felt during nonoptimal…so I definitely got a greater understanding of myself from just that prior session". From this foundation, Tony shared the regulation work he was doing with his coach between the second and third intervention session. His coach offered his perspective on Tony's tendency to experience concerns over mistakes and explained that all golfers play bad shots, but they still get around the course. Accepting an "imperfect" perspective on performance was reinforced shortly after this exchange, when Tony observed professional players in an international championship. He reported one pro golfer hitting shots that Tony considered to be poor. Tony observed that the pro did not overtly respond to these "bad" shots, but approached the next shot the same way he had approached his previous ones. Watching the professional manage himself on course helped Tony realize how he wanted to change his approach to golf. Tony accepted the detrimental effects frustration had on

performance. Subsequently, Tony resolved to approach every shot as an opportunity to get round the course.

During the intervention, Tony developed a strategy to support his change in approach to golf. Specifically, to help Tony reduce his concern over mistakes after a shot, he would image re-hitting the ball into a "good" or "bad" bucket. The moment this imaged ball landed in a bucket marked the end of his evaluation. Having an end-point to shot evaluation allowed Tony to refocus his mind in the present and on the next shot. For example, he said "[the imaged ball] would be put in there [bucket] and that was it....the last thought I was going to have of that shot". It is interesting to note when Tony was satisfied with performance, he did not use this regulation technique (see Figure 3.14).

Post-intervention TOPS scores suggest a marginal increase in the frequency Tony used self-talk, imagery, and relaxation. In contrast, Tony reported a decrease in how often he employed goal setting following the regulation program (see Figure 3.13).

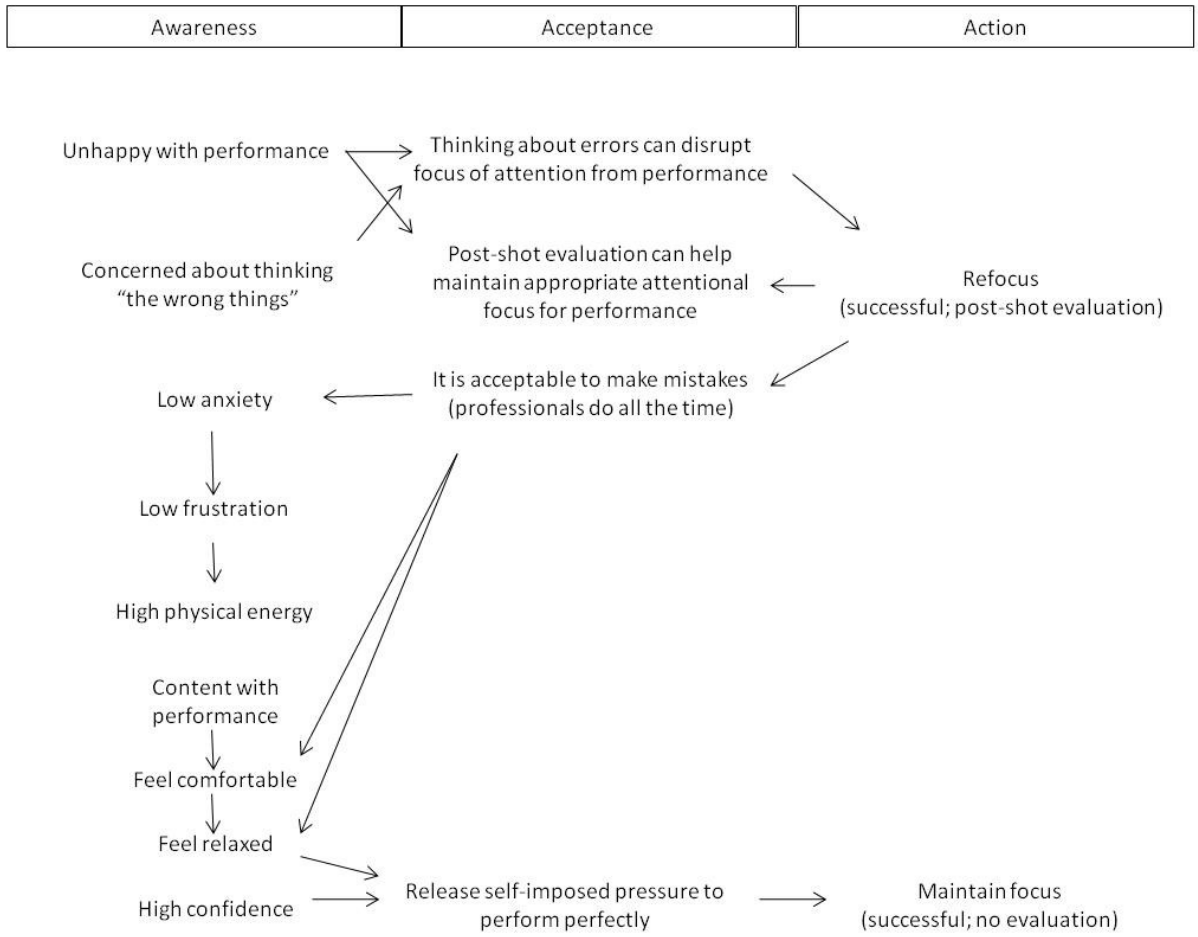


Figure 3.14. Tony's during-intervention triple-A processes.

Zone proximity. During the intervention, Tony indicated two zone profile descriptor words no longer reflected his performance experiences. Specifically, the physiological symptom of "feel/hear heart rate" and the cognition "let's go win this" were deleted from analysis.

During the zone identification phase, Tony competed in five competitive rounds of golf. Data were missing for round seven when Tony reported forgetting to pack his idiographic monitoring sheets in his golf bag. During the 5-week regulation program, Tony competed in a further seven rounds of golf. Following the onset of a 5-week regulation program, Tony competed in 7 further tournaments for which all data were collected.

Descriptive statistics of emotion CZP scores suggest Tony approached an optimal state for performance following the onset of the regulation program (zone identification M = -0.08,

SD = 1.79 and intervention *M* = 2.77, *SD* = 1.52). The Binomial test in conjunction with visual inspection of Figure 3.15, does not indicate a marked difference between phases. Similarly, no differences were found between zone identification and intervention phases for physiological symptoms (zone identification *M* = -0.08, *SD* = 1.79), intervention *M* = 3.04, *SD* = 2.04) and cognitions (zone identification *M* = 0.47, *SD* = 1.81, intervention *M* = 3.96, *SD* = 2.49) (see Figure 3.16 and 3.17).

Performance. Subjective performance decreased from baseline (*M* = 6.50, *SD* = 2.04) to zone identification (*M* = 5.60, *SD* = 1.14) phases. Descriptive statistics for FiR and GiR also indicated a decrease in objective performance between these two phases. Tony recorded reaching fewer fairways (*M* = 10.50, *SD* = 2.08 to *M* = 9.4, *SD* = 1.14) and greens (*M* = 14.50, *SD* = 2.08 to *M* = 11.8, *SD* = 0.45) in the required number of shots according to regulation. In contrast, Tony reported a marginal improvement to his putting game. Specifically, the average number of shots he took to putt per round of golf decreased from baseline (*M* = 34.65, *SD* = 3.59) to zone identification (*M* = 33.60, *SD* = 3.13) phase. CDC assisted visual inspection of Figures 3.18, 3.19, 3.20, and 3.21 do not support any change in subjective or objective performance between baseline and zone identification phases of the present study. Finally, from zone identification to intervention, Tony's mean subjective (*M* = 6.00, *SD* = 1.17) and objective indicators of performance remained constant: FiR (*M* = 10.00, *SD* = 1.53), GiR (*M* = 12.00, *SD* = 0.45), and number of putts (*M* = 33.38, *SD* = 2.44).

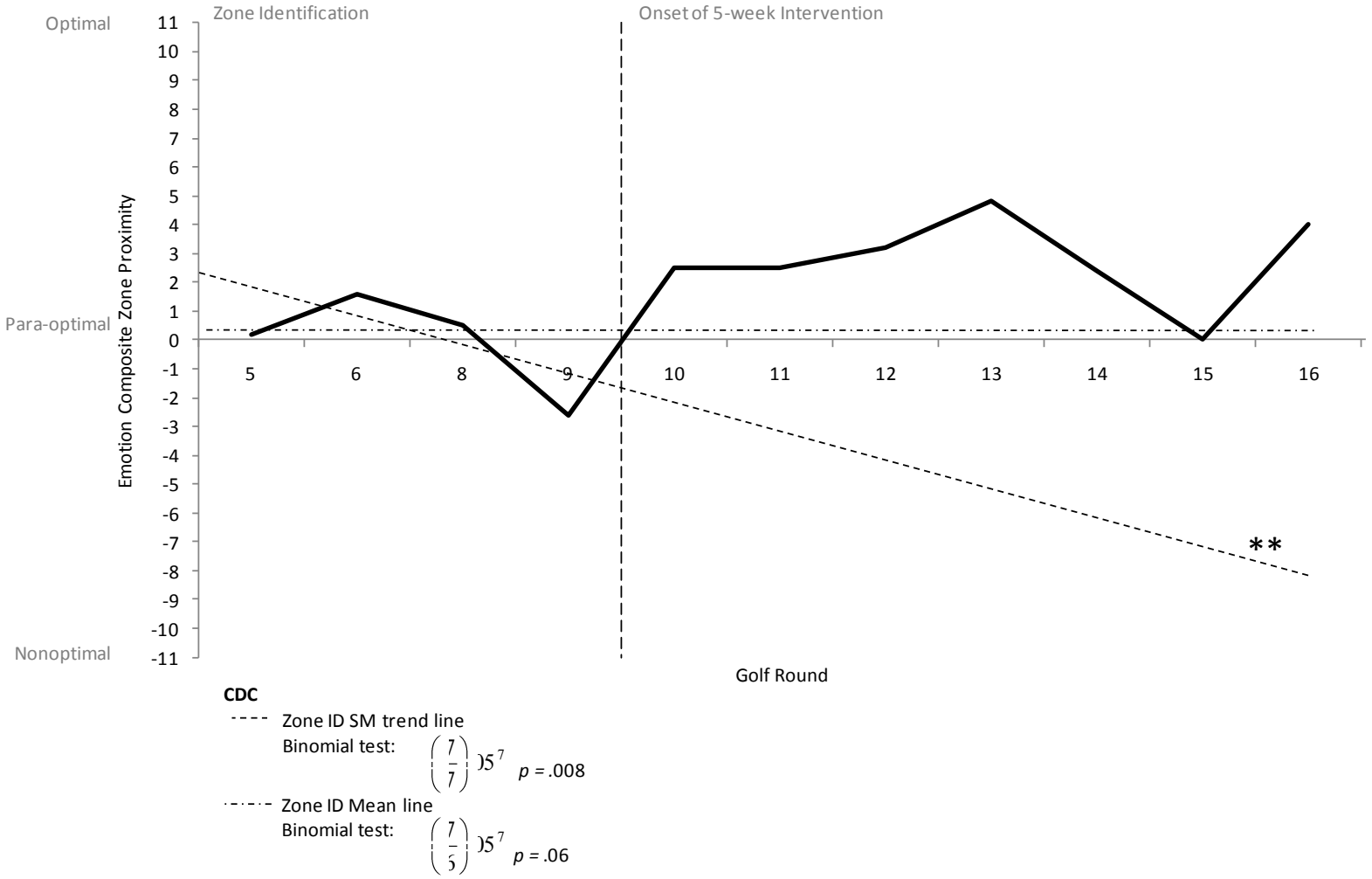


Figure 3.15. Tony's subjective emotion composite zone proximity pre and during a 5-week regulation intervention

Note. CDC = Conservative Dual-Criteria. 7 data points would need to fall above both CDC lines for a difference to be indicated in composite zone proximity score between zone identification and onset of 5-week intervention phases.

$^{**}p < .01$

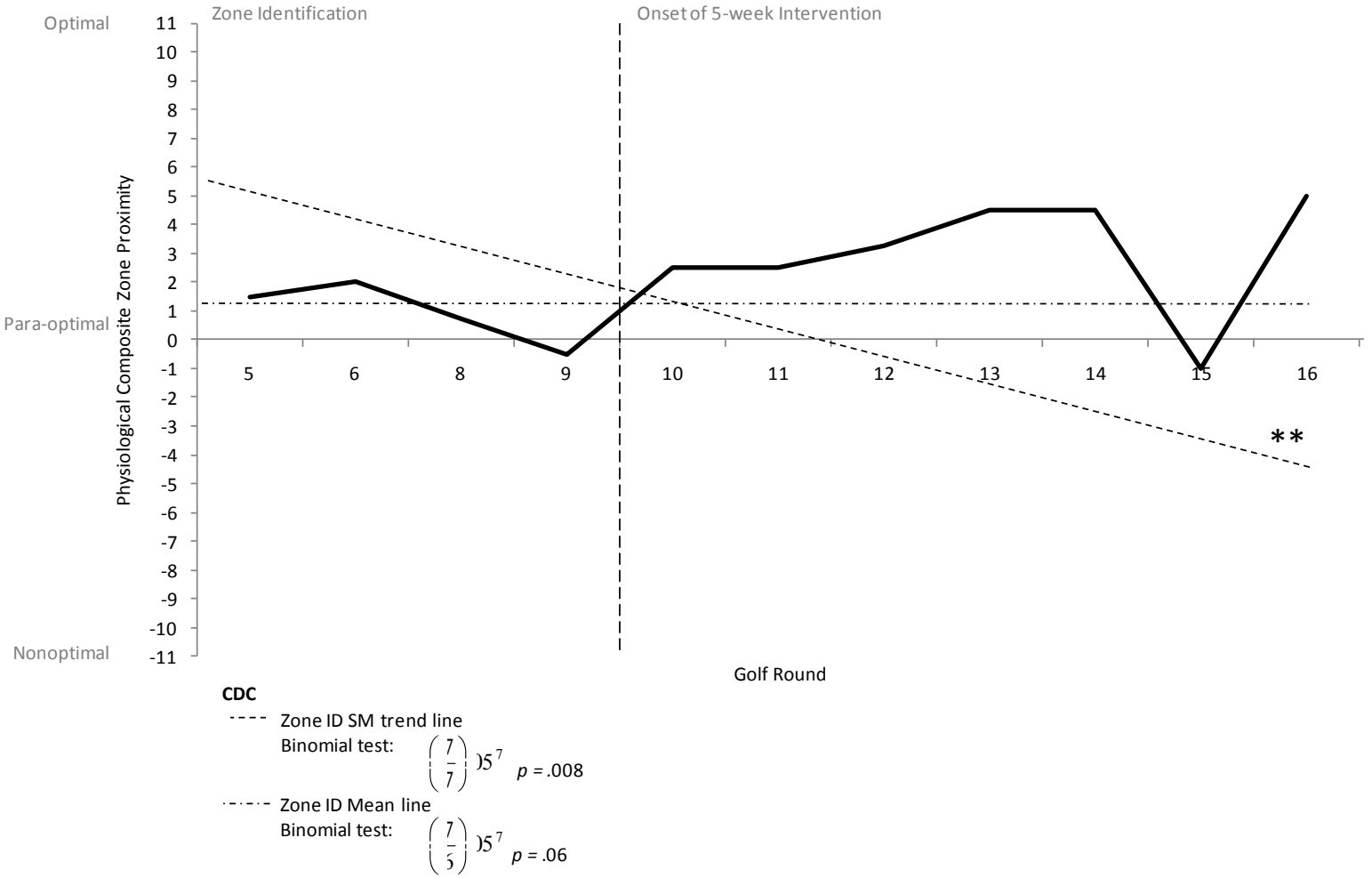


Figure 3.16. Tony's physiological symptom composite zone proximity pre and during a 5-week regulation intervention.

Note. CDC = Conservative Dual-Criteria. 12 data points would need to fall above both CDC lines for a difference to be indicated in composite zone proximity score between zone identification and onset of 5-week intervention phases.

***p < .01*

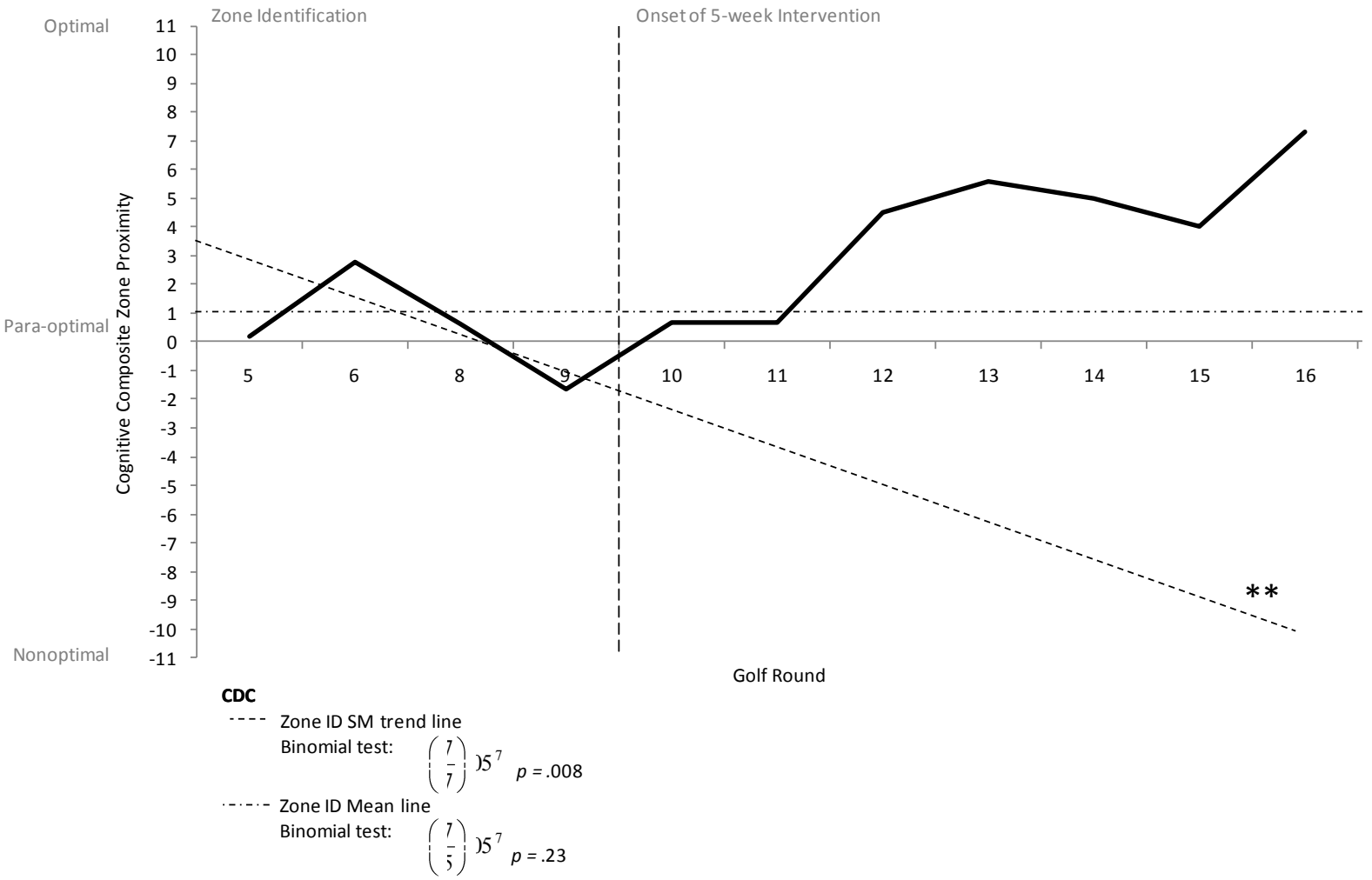


Figure 3.17. Tony's cognitive composite zone proximity pre and during a 5-week regulation intervention.

Note. CDC = Conservative Dual-Criteria. 12 data points would need to fall above both CDC lines for a difference to be indicated in composite zone proximity score between zone identification and onset of 5-week intervention phases.

***p < .01*

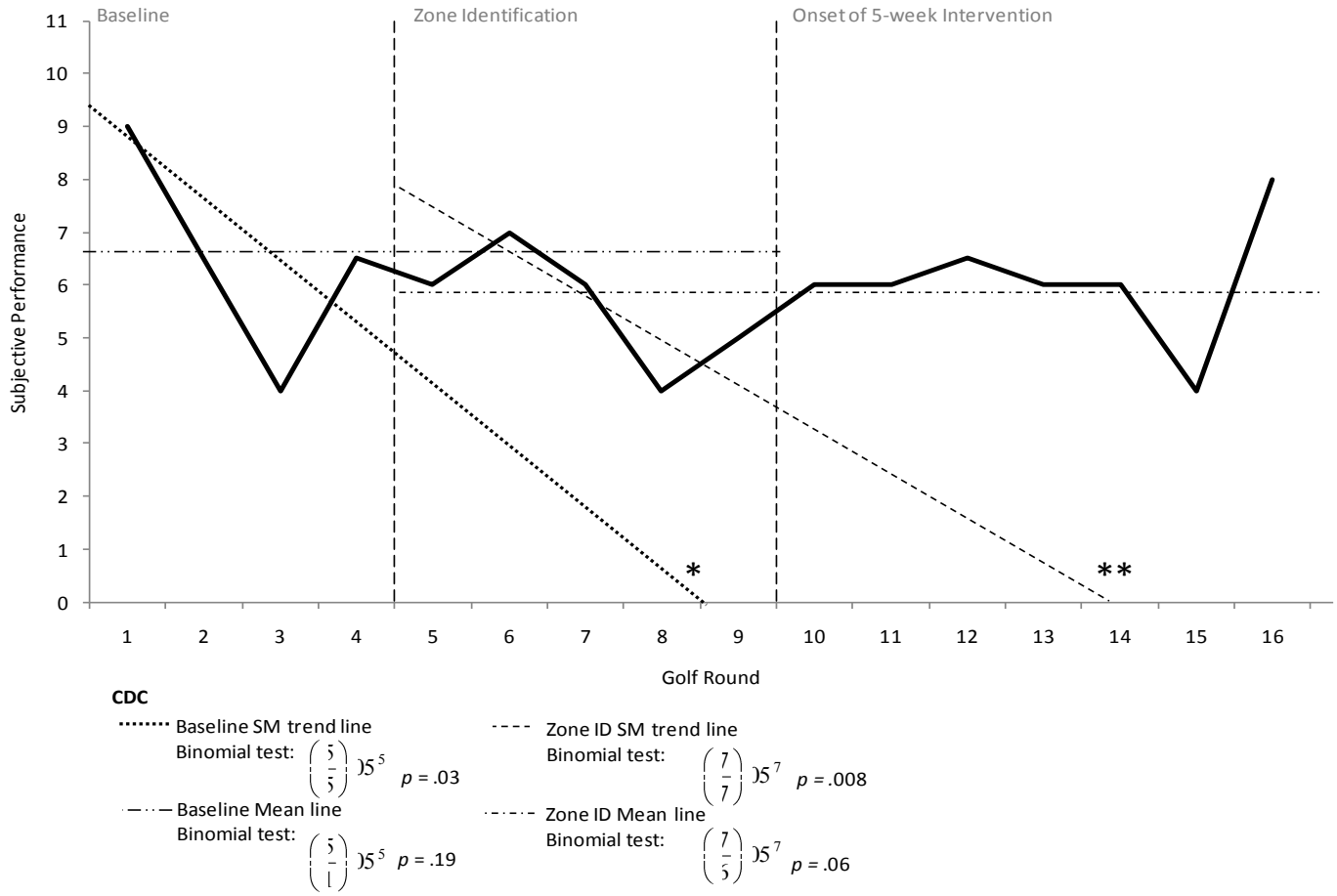


Figure 3.18. Tony's subjective performance of competitive golf rounds.
Note. CDC = Conservative Dual-Criteria. 5 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between baseline and zone identification phases.7 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between zone identification and onset of 5-week intervention phases.
*$p < .05$, **$p < .01$

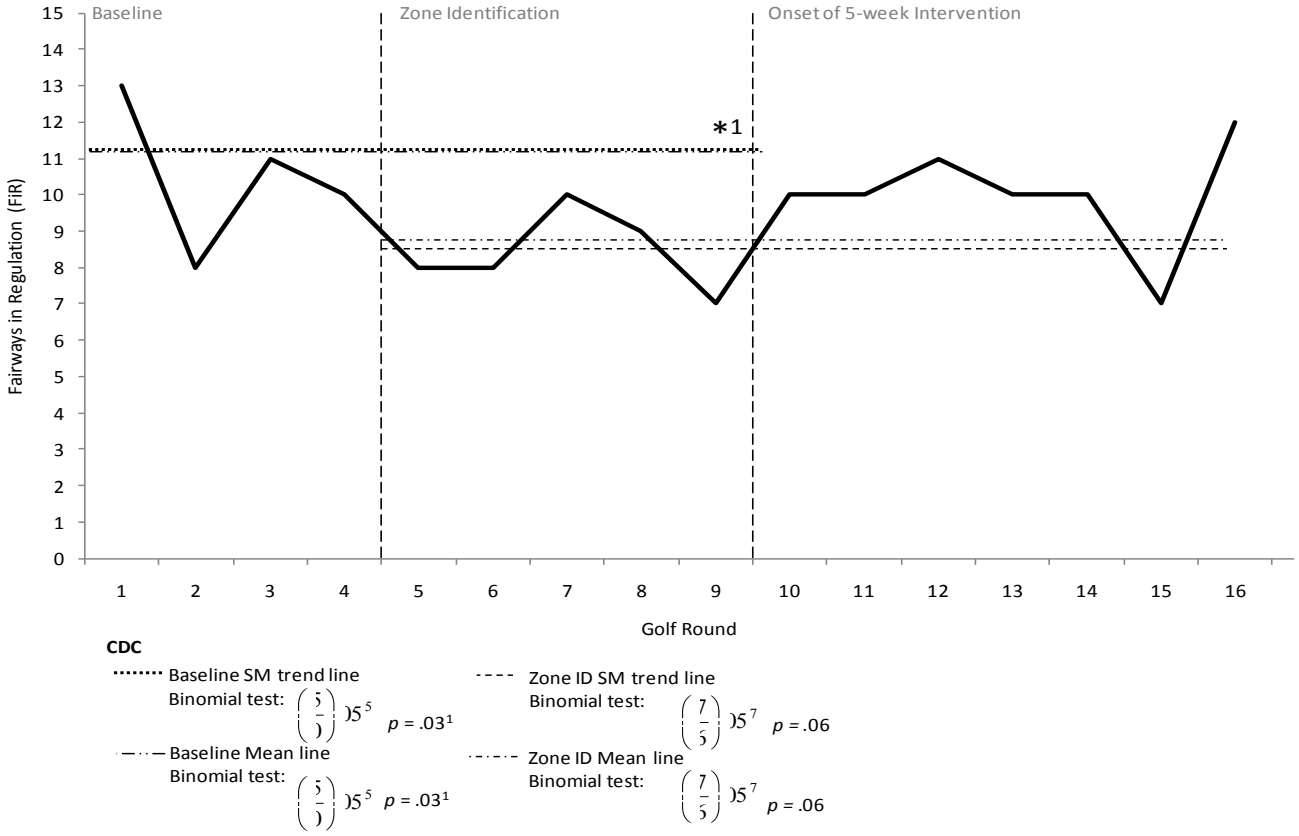


Figure 3.19. The number of fairways in regulation (FiR) Tony recorded in competitive golf rounds.

Note. CDC = Conservative Dual-Criteria. 5 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between baseline and zone identification phases.7 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between zone identification and onset of 5-week intervention phases.

[1]The significant Binomial test indicates the probability of FiR to be *below* the baseline trend line is < .05 by chance. For the one-tailed tests it was hypothesized data points would be above the line.

*$p < .05$, **$p < .01$

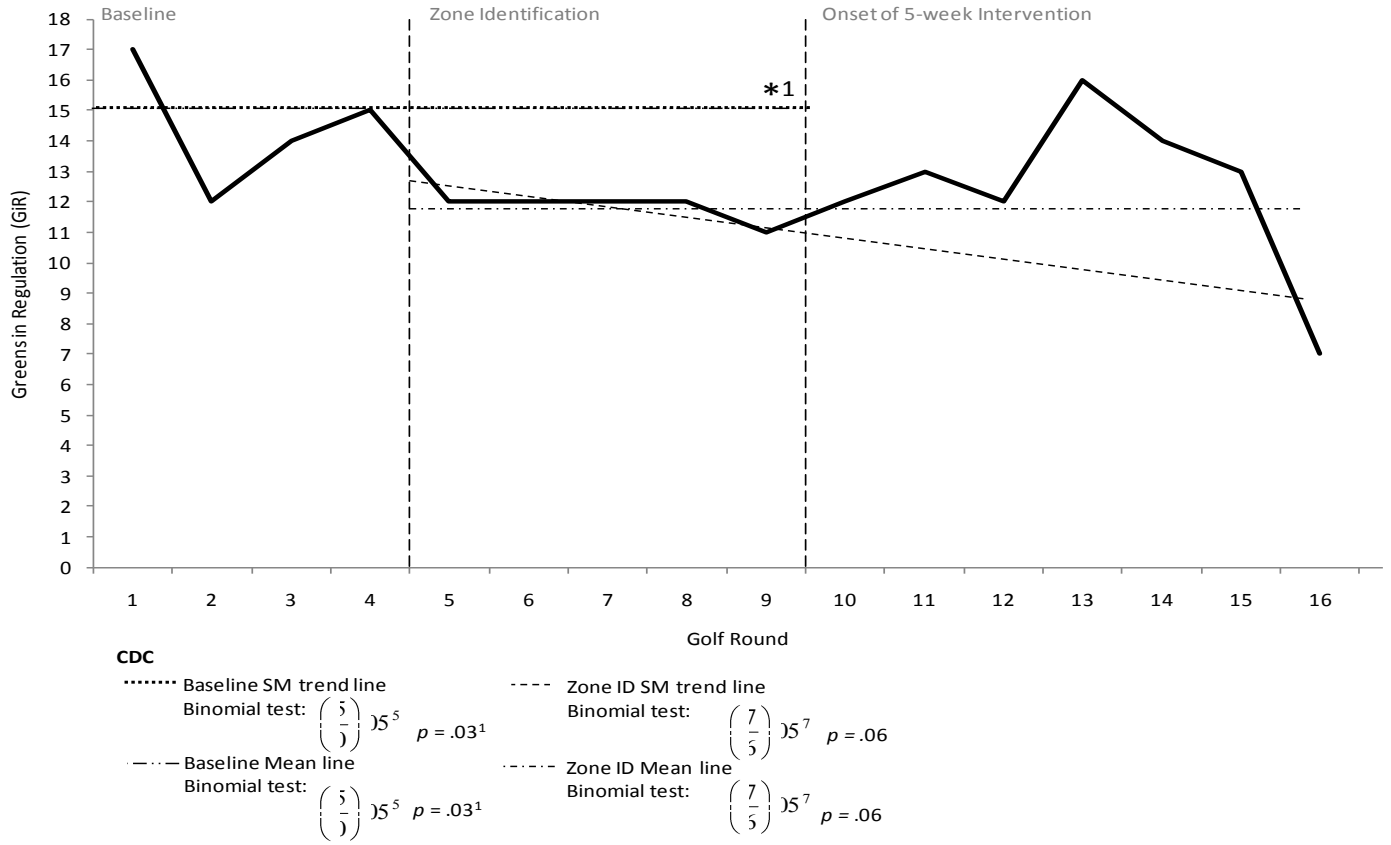


Figure 3.20. The number of greens in regulation (GiR) Tony recorded in competitive golf rounds.

Note. CDC = Conservative Dual-Criteria. 5 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between baseline and zone identification phases.7 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between zone identification and onset of 5-week intervention phases.

[1]The significant Binomial test indicates the probability of GiR to be *below* the baseline trend line is < .05 by chance. For the one-tailed tests it was hypothesized data points would be above the line.

*$p < .05$

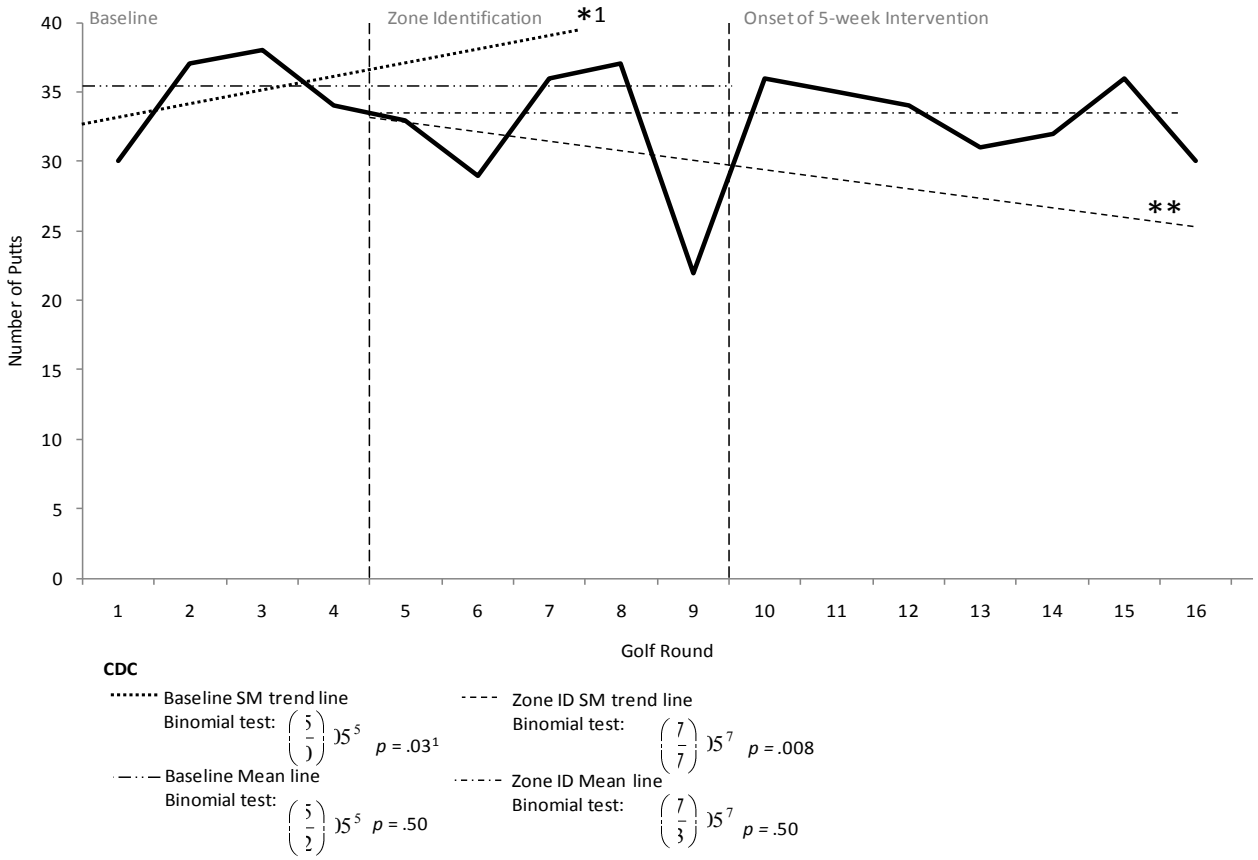


Figure 3.21. The number of putts Tony recorded in competitive golf rounds.

Note. CDC = Conservative Dual-Criteria. 5 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between baseline and zone identification phases.7 data points would need to fall above both CDC lines for a difference to be indicated in subjective performance between zone identification and onset of 5-week intervention phases.

[1]The significant Binomial test indicates the probability of GiR to be *below* the baseline trend line is < .05 by chance. For the one-tailed tests it was hypothesized data points would be above the line

**p< .05, **p < .01*

Discussion

The present investigation examined a multi-form 5-week regulation intervention based on Hanin's (2000a) Individualized Zone of Optimal Functioning (IZOF) model. The aims of the current study were to: (a) provide support for the idiographic assessment of a cognitive zone of functioning, (b) deliver an individualized regulation intervention to enhance athletes' meta-experiences of awareness and acceptance, as well as effective employment of regulation techniques (i.e., action), and (c) improve performance. To achieve these aims, two case studies were presented; the first, a non-elite tennis player, and the second, an elite male golfer.

The athletes in the current study offer partial support for the identification of an idiographic cognitive zone of functioning. Employing Hanin's (2000c) step-wise profiling process athletes recognized optimal and nonoptimal patterns of thinking for performance. In the present study however, the non-elite tennis player reported initial difficulties when identifying cognitions associated with poor performance. These difficulties with accessing self-knowledge supports Hanin's (2000a) concerns that non-elite athletes have not accumulated the necessary performance history to develop an awareness of performance states. When a descriptor list was present to aid the profiling process, difficulties in zone identification (e.g., hesitation, uncertainty) for emotion and physiological symptom profiles was not indicated by either athlete.

Differences in the visual representation of elite and non-elite zone profiles for all three zone form modalities were presently observed. As predicted by the IZOF model, the elite athlete's cognitive opt-zone was represented by a bell-curve, and as expected, a nonopt-zone adopted the inverse shape (Figure 3.9, see Appendix B). In contrast, the non-elite athlete's profiles did not take on this expected form (Figure 3.2, see Appendix B). This finding is consistent with Woodcock and colleagues (study one) where a non-elite cross-country runner's zone profiles did not form the typical IZOF bell-curve. Future research is required to determine whether these consistent differences between elite and non-elite zone profiles

reflects a distinction between the qualitative performance experiences of athletes at varying levels of ability, or disparities in athletes' awareness of performance states as proposed by Hanin (2000a).

Consistent with models of psychological skills training, further development of awareness was a prominent feature of the present regulation programs (Ravizza, 2006; Vealey, 1988). In line with Hanin's (2010) triple-A framework, composite sequence analysis (CSA; Miles & Huberman, 1994) also illustrated change in acceptance processes to be critical for the effective employment of regulation techniques. For example, in the pre-intervention phase, the non-elite tennis player considered poor performance states to be fixed. During the course of the intervention however, a change in attitude was observed. Specifically, when unhelpful thoughts and feelings were noticed, appropriate regulation strategies were repeatedly employed in an attempt to approach an optimal state for performance. Similarly the elite golfer's perspective of making mistakes during competition changed during the intervention. Pre-intervention, the golfer viewed mistakes as a signal of low level of ability, whereas post-intervention he accepted mistakes to be a part of playing golf. The present study thus supports the examination of changes in athletes' perceived performance experiences during interventions.

It is worthy to note that changes to processes represented in the triple-A framework were not exclusively tied to activities endemic to the intervention, but also from additional sources external to the applied program. One case illustrated how awareness developed during a competitive match. This tennis player took an objective view of the quality of her tennis serve through analytical self-talk (Morin, 1993). Whereas the golfer sought further information relating to self-knowledge of his golf game (e.g., being overly concerned with mistakes). For this athlete, observing the reactions professional players had to poor shots became a valuable point of comparison for analyzing how his own (different) reactions and the subsequent impact these had on performance.

Analysis of athletes' meta-experiences indicates changes in use of regulation techniques from pre- to post-intervention. Regulation techniques developed in each intervention program included goal setting, self-talk, imagery, and relaxation. Results from the TOPS suggest marginal increases in use of self-talk, imagery, and relaxation for both athletes. In reviewing emotion regulation, Jones (2003) highlights the value of these techniques for controlling affective states. Surprisingly, both athletes reported a reduction in their use of goal setting during the intervention. This unexpected finding may be related to the type of goal being set. The interventions introduced athletes to the setting and reflecting of process goals rather than outcome goals. It may be the case that athletes set less outcome goals during the intervention phase compared to baseline. Distinctions between goal types are not made in the TOPS (Hardy et al., 2010). Although speculative, this inference however is supported by Tony indicating on outcome focused cognition of "Let's go win this" became less relevant during the course of the intervention, suggesting the outcome of competition became less important.

At baseline, both athletes reported a high incidence of technique use as measured by the TOPS. Consulting this measure's norm values, mean frequency scores in the current study were on a par with national and international athletes (cf. Thomas et al., 1999). At this time, these athletes reported episodes of para-optimal performance and feelings of frustration and annoyance. This unexpected disparity between frequent technique use and poor performance experiences highlights an important distinction that should be made between employing a technique and considering its influence on a performance state. In line with Nieuwenhuys and colleagues (2008), the present study highlighted the incidence of technique use *and* effectiveness in CSA (see Figures 3.3, 3.5, 3.10, & 3.12). Thus, when examining psychological skills and techniques, it is worthwhile for researchers and practitioners to supplement the TOPS with additional measures (Hardy et al., 2010). Furthermore, perhaps

there is scope in measure development for a scale that taps use and perceived effectiveness of techniques during sport performance.

When delivering an IZOF intervention, the main aim for many researchers is to help athletes reach an optimal zone of functioning associated with superior performance (Robazza, Pellizzari, & Hanin, 2004). In the present study, results suggest the tennis player increased her proximity to optimal states of emotion, but not for physiological symptoms or cognitions. No change was observed for any of the three form modalities for the golfer. Although not supported by Binomial testing, visual inspection of the golfer's cognitive composite proximity scores suggest a trend towards an optimal state (see Figure 3.15). The emphasis placed on emotions in tennis (e.g., annoyance) and on cognitions in golf (e.g., concern over mistakes) reflects the most important form perceived by each athlete. Hanin (2000b) recommends practitioners target the most salient form for an athlete of the eight components that describe a PBS state. The present study suggests that when a multi-form approach is taken it is likely that effects will be first seen in this most relevant modality.

A consistent finding in the IZOF literature is the relationship between zone proximity and performance (Hanin, 2000b). In the present study, performance was first examined between baseline and zone identification. Previous research suggests the process of examining performance experiences (such as during zone identification) can initiate motivation for change. For example, Nieuwenhuys and colleagues (2008) found an elite sailor wanting to immediately change his training processes after developing an awareness and acceptance of performance related states. In the present study, the golfer noted gaining awareness and acceptance during the zone identification phase. However no changes in performance suggest this increase in meta-experiences did not impact upon his golf.

Performance was also examined between zone identification and during intervention phases of the study. The IZOF in/out zone-performance principle predicts improvements to performance with enhanced optimal zone proximity. Given limited support was garnered in

the present study for athletes' increased proximity towards optimal states, performance improvements were not observed in terms of subjective or objective results.

The findings from the present multiple case study contrast with Robazza, Pellizzari, and Hanin (2004) study in which athletes were able to approach their opt-zone as well as reported performance improvements. The limited number of competitions that participants completed suggests the current study was under-powered to find change when using Fisher and colleagues' (2003) conservative dual-criteria method. Furthermore, the expectation in applied intervention studies of obtaining immediate performance enhancement should also be questioned. Weinberg and Williams (2006) suggest athletes should engage in psychological skills training for at least three months to allow for the development and integration of new skills in performance. The continued collection of data post-intervention would help to overcome this limitation. In the present study the intervention was only 5-weeks, thus refined current and new psychological techniques may not have fully integrated in performance and limits subsequent impact on performance outcome.

The present study offers several applied implications, however these should be considered in light of study limitations. Namely, generalizations from a case study should not be made beyond the participant in question. However, replication of case study protocol through a multiple case study increases confidence in making applied recommendations. The two cases highlighted the important role of meta-experiences in regulation programs. Consultants should therefore encourage athlete self-reflection of performance experiences, and encourage athlete self-monitoring so athletes become aware not only of what they are feeling (and/or thinking), but also the impact of these states during performance. During consultant-guided reflections, practitioners may identify salient components of an athletes' PBS state to target in an individualized regulation program.

The aim of the present multiple case study was to fill current gaps in the literature relating to multi-form IZOF interventions. The two cases presented offer support for the

identification of cognitive zones of functioning that are meaningful to athletes. Non-elite athletes may lack the necessary awareness to identify a zone that is reliable and valid without additional help from a descriptor list. Development of a list of cognitions relevant to sporting experiences (e.g., focused, distracted) would help develop future identification and comparison of cognitive zone profiles. In particular, cross-sectional work is required to test the in/out zone-performance relationship at a nomothetic level.

CSA offered insights into the role of athletes' meta-experiences pre and during a regulation program. As exemplified by Nieuwenhuys and colleagues (2008, 2011), CSA offers a promising method for examining processes triple-A framework pre, during, and post-intervention. Monitoring of awareness, acceptance, and action over time would provide insights into the impact of intervention sessions (e.g., early sessions focused on developing awareness and acceptance, and later sessions for refining techniques and strategies) often not captured in applied research.

CHAPTER 4

"I've Pretty Much Changed as a Tennis Player":

Athlete Evaluation of the Processes and Outcomes of a 5-Week Regulation Intervention

Introduction

The Individual Zones of Optimal Functioning model (IZOF; Hanin, 2000a) recognizes the idiographic nature of athletes' performance experiences. IZOF views emotion as a critical component of an athlete's psychobiosocial (PBS) state that also comprises cognitive, motivational, physiological, motor-behavioral, operational, communicative and volitional forms (Hanin, 2010; Robazza, 2006). Taken together, these dimensions offer a comprehensive description of human functioning, and recently IZOF research has considered the potential interactive influence several forms (e.g., emotions, physiological symptoms, and cognitions) have on performance (Robazza, Pellizzari, & Hanin, 2004; see study one and two).

Several applied studies in the sport domain provide support for interventions informed by the IZOF model (Annesi, 1998; Robazza, Pellizzari, & Hanin, 2004). However, few have conducted an in-depth evaluation of these intervention programs from the perspective of the athletes involved. Critical reviews pertaining to the evaluation of applied practice have called for athletes' qualitative experience to be brought to the forefront when examining intervention effectiveness (Martindale & Collins, 2007). With this aim in mind, social validation interviews have typically been conducted to determine athletes' responses to the intervention in question (Robazza, Pellizzari, & Hanin, 2004). Martin and Hrycaiko (1983) propose that the process of social validation should seek athlete responses to three questions: (a) are the goals of the intervention important to the athlete? (b) are the procedures applied acceptable to the athlete? and (c) are athletes satisfied with the results produced by those procedures? Social validation interviews that pose all three questions are rarely conducted in applied sport psychology research (Martin, Vause, & Schwartzman, 2005).

More recently, Anderson and colleagues (2002) argued for a more comprehensive assessment of applied practice. Specifically, Anderson and colleagues propose four main indicators of effectiveness, within which social validation forms a single sub-category. These

indicators include quality of support, athletes' response to support, performance outcomes, and enhancement of psychological skills and well-being.

Quality of support comprises of consultant effectiveness and social validation. The impact an intervention has on an athlete depends on the knowledge, delivery style, and characteristics of a consultant (Partington & Orlick, 1987). A consultant's ability to foster an adaptive working alliance with an athlete through the development of rapport is closely related to the success of an applied program (Petitpas et al., 1999). However, previous IZOF intervention studies rarely consider consultant effectiveness when examining a program's influence (Robazza, Pellizzari, & Hanin, 2004).

Athlete response to support involves a change in knowledge of and attitude towards applied sport psychology, as well as the education, practice, and use of psychological techniques (Anderson et al., 2002). Models of applied sport psychology place education at the forefront of intervention delivery (Vealey, 1988). To give confidence when attributing intervention outcomes to program activities, such as educating athletes in the effective employment of psychological techniques, several researchers have monitored variation in athlete knowledge and use of such tools (e.g., goal setting, imagery, self-talk, and relaxation; Brewer & Shillinglaw, 1992). Although important factors to consider, athlete perceptions of delivery, knowledge, and employment of techniques has often been overlooked when evaluating intervention effectiveness.

Of all the indicators of intervention effectiveness, performance has been considered the pier de resistance when determining program success (Anderson et al., 2002). Giving performance an objective or subjective numerical value however fails to indicate the processes involved in driving performance change. As it is the athlete who experiences this change, it appears pertinent to invite his or her personal reflections to gain insight into the processes leading to changes in performance (Martindale & Collins, 2007).

The final indicator of effectiveness relates to changes in athletes' psychological skills and associated well being. The term, psychological skills, has been used to represent different processes in the applied literature. In the current study, Holland, Woodcock, Duda, and Cumming's (2010) definition is adopted. Holland and colleagues extended Vealey's (1988) definition by differentiating between techniques, qualities, and skills. Techniques refer to the psychological tools or methods athletes employ (and captured within athletes response to support). Qualities represent desired outcomes and may include attributes such as a high level of self-confidence, optimal focus of attention, and optimal level of arousal. Psychological skills reflect athlete regulation, control, and maintenance of such desired outcomes. For example, an athlete may learn self-talk phrases (e.g., technique) to realize high levels of confidence (e.g., quality). The process of effectively employing these techniques to maintain high levels of confidence is presently considered a psychological skill.

The second component of this final indicator is athlete well-being. Although considered a key outcome of applied work with athletes (e.g., Vealey, 2007), few sport psychology intervention studies have examined the impact on indices of athlete well-being. Empirical evidence suggests the enhancement or at least maintenance of well-being has significant implications for athlete enjoyment and persistence in sport, as well as protecting athletes from symptoms of burnout (Hodge, Lonsdale, & Jackson, 2009; Quested & Duda, 2011).

Although Anderson and colleagues (2002) provide what seems to be a comprehensive framework of evaluation, limiting assessment to a pre-determined list of outcomes may only paint a partial picture of intervention effectiveness. Thus, when Sharp, Holland, Woodcock, Duda, and Cumming (under review) evaluated the processes and outcomes of a season-long mental skills training program in youth rugby, an inductive analysis of athlete focus group discussions was conducted to allow for intervention benefits to emerge from the qualitative data. Intervention effects were found beyond those indicated by Anderson and colleagues

(2002), such as the successful transference of mental skills to other life domains. However, only adopting an exploratory inductive analytical procedure meant not all of Andersen and colleagues' key indicators were discussed by the athletes.

It seems reasonable to suggest that an in-depth evaluation of an applied sport psychology program would at least examine the four indicators put forward by Anderson and colleagues (2002) yet remain open to additional outcomes and information regarding the processes involved. These latter points are important because the risk of only recognizing the partial effects of psychological support may lead athletes and or coaches to erroneously conclude that the sport psychology consultant was only somewhat helpful. Qualitative methodologies allow for in-depth conversations with athletes to reveal the lived experience of intervention participation (Gucciardi et al., 2009). To better gauge what has changed for an athlete, why it has occurred, and what is helpful or not, support has been garnered for conducting of athlete interviews following a period of applied work (Martindale & Collins, 2007).

Given limitations of recent assessments, an in-depth evaluation on all four of Andersen and colleagues' (2002) indicators is required. It has also been argued that such an assessment should remain open to allow other indicators of effectiveness to emerge in gaining a comprehensive picture of the processes and outcomes involved. This need is particularly marked in applied programs based on the IZOF model where few intervention studies have been carried out. Thus, the main aim of the present investigation was to qualitatively evaluate an IZOF based 5-week multi-form regulation program on four indicators of effectiveness (Anderson et al., 2002). A second aim was to conduct an inductive examination of athletes' intervention responses to allow additional themes to emerge relating to the intervention outcomes and the processes involved.

Method

Participants

Participants had to be competing in their sport at least twice a month, and perceived a need for developing regulation capabilities for performance. The five participants (one female, four male) had a mean age of 18.33 years (*SD* = 3.92) ranging from 13 to 22 years of age, and had participated in their main sport for a mean of 7.2 years (*SD* = 4.15). One female and two male participants competed in tennis, and two male participants played golf at varying levels of competitive ability from club to national representation. All participants signed an informed consent form, and parent consent was obtained for athletes under the age of 18. Ethics approval was granted for the present study from a university ethics committee.

Measures

Semi-structured interview. A semi-structured interview guide was designed to examine all four indicators of intervention effectiveness (Anderson et al., 2002). Further exploratory questions were included to allow athletes to reflect on and report other influential intervention processes and outcomes. Please see Appendix C for an interview guide.

Procedure

All participants completed a 5-week IZOF intervention program aimed to enhance athletes' skills in regulating an optimal emotion, physiological, and cognitive state for performance. The author and consultant met with each athlete on a one-to-one basis. First, athletes were introduced to the study aims and procedures and informed consent obtained. A baseline phase lasted approximately two months where subjective and objective performance data were collected. With the help of the consultant, athletes identified optimal and nonoptimal zone profiles for multiple forms of emotions, physiological symptoms, and cognitions that related to good and poor performances respectively (Hanin, 2000c; see study one). Following zone identification, athletes continued to collect performance data, as well as

zone proximity data for every competition[4], for two months. Informed by multi-form zone profiles and narrative performance reflections, an individualized 5-week intervention was developed and delivered to each athlete.

In total, the program involved five 60 minute one-to-one sessions with the consultant. Session one focused on enhancing athlete awareness of desired feeling states for performance, building a rapport between the athlete and consultant, as well as identifying intervention goals (e.g., to control anger during competition). Session two involved the identification and initial refinement of athletes' current regulatory strategies (e.g., goal setting, self-talk, imagery, relaxation). The final three sessions continued to refine current regulatory strategies, as well as introduce new psychological techniques where appropriate. Throughout the intervention, emphasis was placed on developing athlete awareness of performance states, acceptance of its functional impact on performance (harmful or helpful), and recognizing effective techniques for reducing perceived discrepancies between current and optimal states for performance. Please see Appendix C for individual athlete intervention programs.

Following program completion, participants were invited to take part in a semi-structured interview. The interview was presented as an opportunity for athletes to express his or her experiences of the intervention. All five athletes agreed to participate, and interviews took place 1 to 2 weeks post-intervention. One exception, due to availability of interviewer and athlete, meant the interview occurred 6 weeks after the intervention. It is recognized such a delay may allow for bias of recall, however it was felt that valuable information could still be gained from the athlete's reflections. Indeed, previous research has conducted in-depth social validation interviews up to 4 months following an applied program (Gucciardi et al., 2009).

4 Performance and zone proximity data was collected consistently by two of the five athletes. These results are presented in study two (see study two). Due to the high level of missing quantitative data from the remaining three athletes, performance and zone proximity was not analyzed.

As suggested by Patton (2002) to ensure credibility and integrity of data collection, interviews were conducted by a knowledgeable researcher who had previous experience interviewing athletes' about consultancy experiences. In contrast to previous qualitative evaluations of applied research (Guiccardi et al., 2009), the interviewer had no involvement in the intervention design or delivery. The interviewer's anonymity from the applied process sought to protect against the possibility of athletes offering socially desirable responses.

Athletes were free to identify an interview location where they felt at ease. Two chose to be interviewed at home, whilst three interviews were conducted in a university meeting room. All interviews were audio recorded and lasted between 30 to 70 minutes and transcribed verbatim. Please see Appendix B for an interview guide.

Data Analysis

Transcribed interviews resulted in 60 pages and 31,575 words of single spaced text. Content analysis of the scripts was conducted using a combination of deductive and inductive approaches. Each interview transcript was read and reread to ensure familiarization with athlete experiences. Deductive analysis identified raw data units (RDUs) from participant transcriptions that reflected features of Anderson and colleague's (2002) four indicators of effectiveness. Within each indicator, RDUs with a similar meaning were grouped together to form lower order themes (Côté, Salmela, Baria, & Russell, 1993). Additional intervention processes and outcomes as perceived by athletes were inductively analyzed following recommendations by Côté and colleagues (1993). Specifically, RDUs that had a similar meaning were grouped into categories to form themes that reflected responses beyond those targeted by Anderson and colleagues' four indicators.

As part of the analysis process, several steps were taken to ensure the trustworthiness of the data and its interpretation. First, member checks were conducted to ensure the essence of athletes' experiences had been captured (Lincoln & Guba, 1985). Athletes read the interview transcript to check for accuracy, as well as validating the first author's interpretation

of RDU categorization into broader themes (Culver et al., 2003). Participants indicated that the analysis reflected the interview discussion and intervention experience, and did not make any revisions.

Second, data analysis was checked and discussed with research associates to minimize investigator bias in the analytical process. Research colleagues acted as sounding boards and questioned classification of data themes (Culver et al., 2003). Any disagreements between researchers were discussed until consensus was reached by all.

Results and Discussion

The results and discussion are presented together to avoid repetition (Smith, 1997). The present study aimed to complement and extend previous research examining the effectiveness of a 5-week intervention guided by Hanin's (2000a) Individual Zone of Optimal Functioning (IZOF) framework (see study one and two). Specifically, an extensive evaluation was conducted from the athletes' perspectives to target Anderson and colleagues' (2002) four indicators of effectiveness: (a) quality of support, (b) response to support, (c) performance, and (d) psychological qualities/skills and well-being. Finally, other perceived processes and outcomes that emerged from athlete interviews were identified. In discussing each theme, athlete quotes are used to allow the reader the possibility of subjectively understanding participants' intervention experiences (Culver et al., 2003)

Quality of Support

Quality of support encompassed the qualitative assessment of consultant effectiveness and social validation of the 5-week intervention (see Figure 4.1).

Consultant effectiveness. Consistent with previous accounts of consultant effectiveness, athletes perceived the consultant's interpersonal skills to be pivotal in the provision of applied services. Furthermore, it was important for athletes to perceive the individual to have necessary background knowledge to practice applied sport psychology (Anderson, Miles, Robinson, & Mahoney, 2004; Weigand, Richardson, & Weinberg, 1999).

Consultant interpersonal skills. Athletes perceived three sub-categories that contributed to their impression of the consultant's interpersonal skills in building rapport between athlete and consultant. These sub-categories include being comfortable to talk to, actively listening to athletes' experiences to develop problem solving skills and aid client self-discovery, and having a genuine interest in athletes' sporting experiences.

Athletes considered being able to talk to the consultant in an honest and open way was important to the process of the intervention delivery: "I felt so comfortable…I could reveal things I probably haven't told my dad that have cost me my golf". An athlete described the consultant as having "a friendly approach to working" and as a result was "easy to get on with". This friendly demeanor appeared to help put athletes at ease, as a tennis player said, "I did like the fact it was relaxed" and "made me feel more open to say what I want".

Consistent with previous research, the present findings suggest a friendly and relaxed approach helps to put clients at ease and facilitates development of rapport through the creation of a non-threatening environment (Anderson et al., 2004). Although not featured on formal measures of consultant effectiveness such as the Consultant Evaluation Form (Partington & Orlick, 1987), practitioners should not dismiss this characteristic when forming client-consultant relationships. Getting athletes to talk is viewed as an essential skill (Andersen, 2000), and being able to put clients at ease helps facilitate athlete disclosure, as one golfer described "it's not something I used to be comfortable doing – expressing my thoughts to everyone…it's strange you feel a comfort with the person that you could just talk to them about anything".

The professional practice literature also considers consultant skills in active listening as key when helping athletes tell their stories (Andersen, 2000). Present findings support this position, and highlight how the application of non-directive counseling skills facilitates clients' awareness of performance experiences. One golfer reflected how "different questions she would ask…gave me a greater realization of how I thought [about] myself, and about the

feelings and emotions and thoughts [I have] on the course". By summarizing, paraphrasing, and reflecting information back to a client, athletes were able to explore performance experiences and consider the potential for affective, cognitive, and behavioral change. During intervention sessions, the same golfer noted how the consultant was "good at helping me draw conclusions without realizing I was doing that" and also helped this athlete come "to a realization of what I was trying to evaluate myself".

Finally, the third component athletes noted of consultant interpersonal skills was in taking a genuine interest in athletes' sporting experiences. A golfer reflected how "you can see in her face, she's enjoying talking to you" and "it's always nice telling her about the round and seeing how interested she is". This finding supports Durand-Bush and Bloom (2001) who noted having a genuine interest in clients and their sport facilitates athlete-consultant interactions.

Application and advancement of sport psychology knowledge. Present findings suggest the consultant's ability to apply and advance their own sport psychology knowledge was perceived to be beneficial by athletes. Three sub-categories contributing to this theme include the provision of clear information, learning about clients' sports, and fostering athletes' trust in practitioner's professional abilities.

The sub-category of providing clear information emerged from the present data within consultant effectiveness. An adolescent tennis player noted how sessions were delivered in a manner so he "understood everything". As the provision of sport psychology services often involves an educational component (e.g., Vealey, 1988), the importance of presenting information clearly, especially when consulting with youth athletes, is highlighted. This finding points to a general need in applied practice to develop intervention programs that are appropriate to an individual's age and ability level.

Athletes also valued the interest the consultant showed in wanting to advance their knowledge and understanding of a client's specific sport. A golfer reflected how the

consultant "want[ed] to actually get involved in the sport and see how [the consultant] really could make a difference" and "[the consultant] hasn't been afraid to listen and learn". Whether a consultant should be an expert in a given sport has been a contentious issue in sport psychology (Pain & Harwood, 2004). Recent research suggests consultants who demonstrate a willingness to learn, as highlighted in the present finding, is perceived equally valuable by athletes as those practitioners who already have an established degree of knowledge in a sport (Anderson et al., 2004).

Athletes also trusted in the consultant's professional ability to understand the mental side of performance. Specifically, a golfer expressed an assurance that "because it was the mental side I was having issues with it was the part she could deal with" and perceived the consultant to be someone "who I knew I could trust to understand them [his thoughts]". This level of trust is grounded in athlete perceptions of a practitioner's training and qualifications. Although professionalism in sport psychology has multiple characteristics (Dorfman, 1990), having a depth and breadth in sport psychology competencies help to validate a consultant's position and offers a degree of credibility. Professional organizations such as the British Association of Sport and Exercise Sciences, British Psychological Society, and the Association of Applied Sport Psychology define academic standards and criteria for supervised experiences in service delivery that provide a recognized foundation to a consultant's professional ability.

Social validity. Validation of the intervention encompassed athlete responses to intervention goals, the procedures applied, and the subsequent results produced (Martin & Hrycaiko, 1983).

Intervention goals. Two sub-categories emerged from the data that reflected how important and relevant athletes' perceived intervention goals to be. These sub-categories include collaborative athlete-consultant goal identification and the importance an intervention's goal is perceived to be by an athlete.

Athletes perceived collaborating with the consultant, and having an input when identifying intervention goals to be important. A tennis player thought "it was good because I got to choose…I know probably better than anyone else what I needed to work on". Such collaboration suggests an autonomy supportive environment was perceived by athletes, as another tennis player noted "[the consultant] let me follow my own path". Indeed, athletes' who perceive a sense of ownership over intervention goals, are more likely to foster autonomous motives for goal striving behaviors. These behaviors are typified by commitment and persistence to the set task, and greater internalization of actions (Sheldon & Elliot, 1999).

Being involved in the identification of intervention aims, meant goals were more likely to be personally meaningful and concordant to athletes' current needs and values. Participants varied in being aware of his or her current needs. In particular, one golfer spent time during initial sessions in developing a greater level of awareness of his needs before being able to identify a relevant intervention goal. For example he said, "I'd never really thought about it, it's just that's where all the answers I was giving [were going]". Founding intervention goals on athletes' perceived areas for improvement ensured their relevancy and helped foster commitment and adherence to the change process (Petitpas et al., 1999; Sheldon & Elliot, 1999).

Procedures applied. The intervention procedures and processes applied when delivering the content of the IZOF intervention fell into two sub-categories. Specifically, athletes viewed procedures applied to involve interactive activities and guided reflections.

The three adolescent participants (under 20 years) in the present study indicated how sessions containing interactive activities were particularly enjoyable. Activities were developed to meet individual needs and interests such as visiting zone descriptor word "stations" as a way to enhance awareness of performance states. The youngest participant agreed that "the [sessions] where I got to do different circuits round the room" he found particularly engaging. This finding supports previous research suggesting that athletes

perceive effective sport psychology to be fun (Anderson et al., 2004; Weigand et al., 1999). It should be noted however, where a 13 year old found "[going] round the room doing different things…picking out different words to say what I was doing when I was angry", to be an effective method for learning about the psychological side of his tennis game, this type of activity may not be suitable for all athletes. Indeed, Anderson and colleagues (2004) highlight that the content and delivery of intervention sessions should be individualized to the specific athlete. This individualization was reflected by adult athletes (20 years or over) who regarded consultant-guided reflections to be one of the most beneficial features of intervention sessions. This procedural subcategory involved consultant characteristics of active listening for problem solving and athlete self-discovery.

Results produced. When considering the results produced by the intervention, athletes identified having greater level of self-awareness as well as perceived changes to their general mental approach to sport.

Reflections guided by the consultant led to athletes having a greater level of self-awareness. A golfer found gaining self-knowledge to be a key outcome of the intervention and said, "it was just massive to be able to have such a great [and] better understanding of myself". Perceiving this to be "the main part" of the program, in the view of this athlete, supports previous findings in the applied literature. Indeed, Vealey (1988) purports self-awareness to be a foundation skill for intervention effectiveness, and is considered a necessary pre-requisite when instigating behavior change (Gucciardi et al., 2009; Ravizza, 2006).

Reflecting back on the whole program, athletes recognized changes in how they mentally approached their sport. One athlete stated "well I've pretty much changed as a tennis player". A golfer also noted "I've been a lot better mentally" and another athlete thought "my mind has improved". This change in mental approach was characterized by athletes' reported enhanced ability to prevent distracting thoughts and feelings to develop, as illustrated by a

tennis player who said “I’ve made quite a lot of progress in clearing my mind of any negative thoughts [and] feelings…keeping everything that I do positive”.

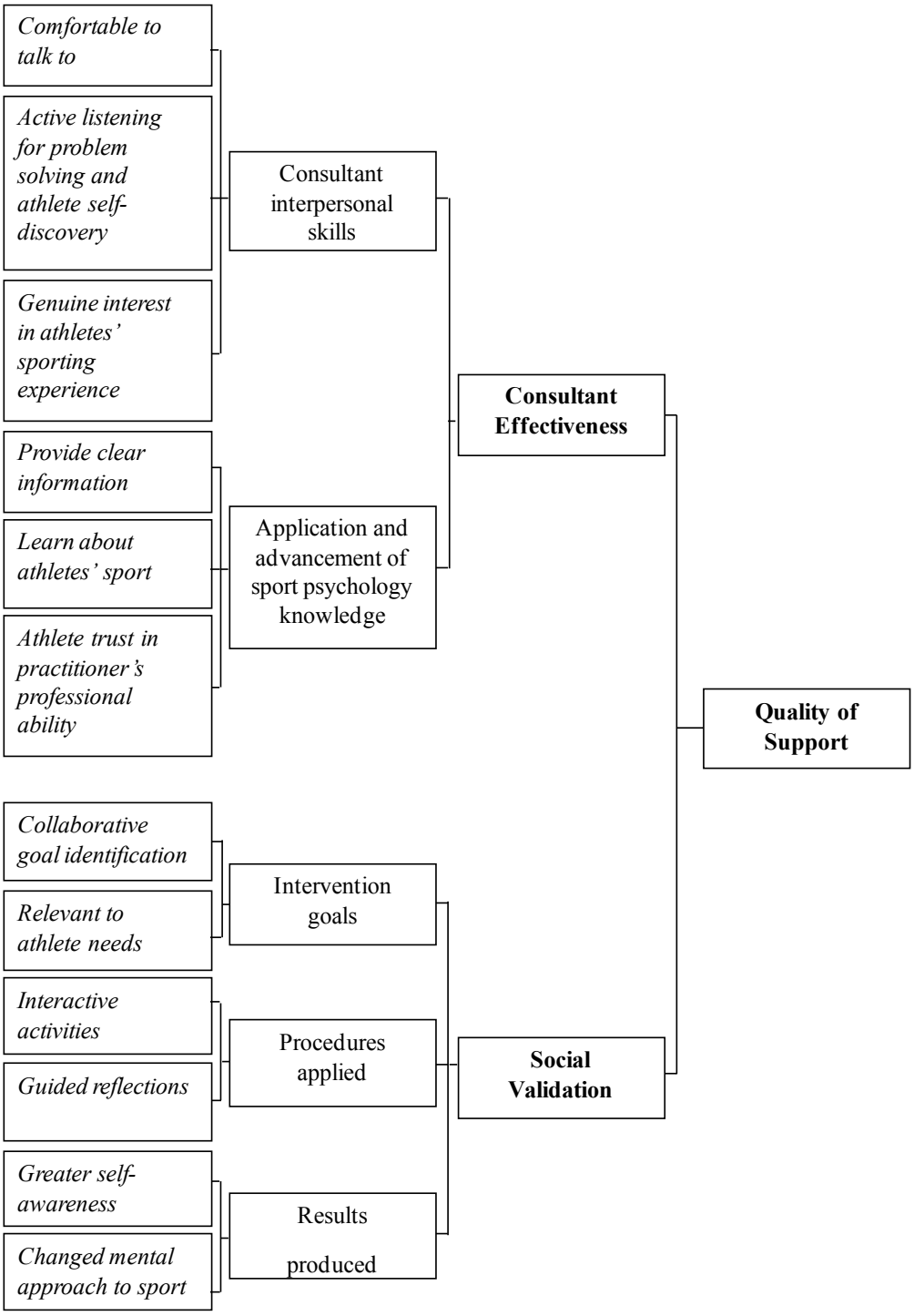


Figure 4.1. Hierarchical structure of 'quality of support'

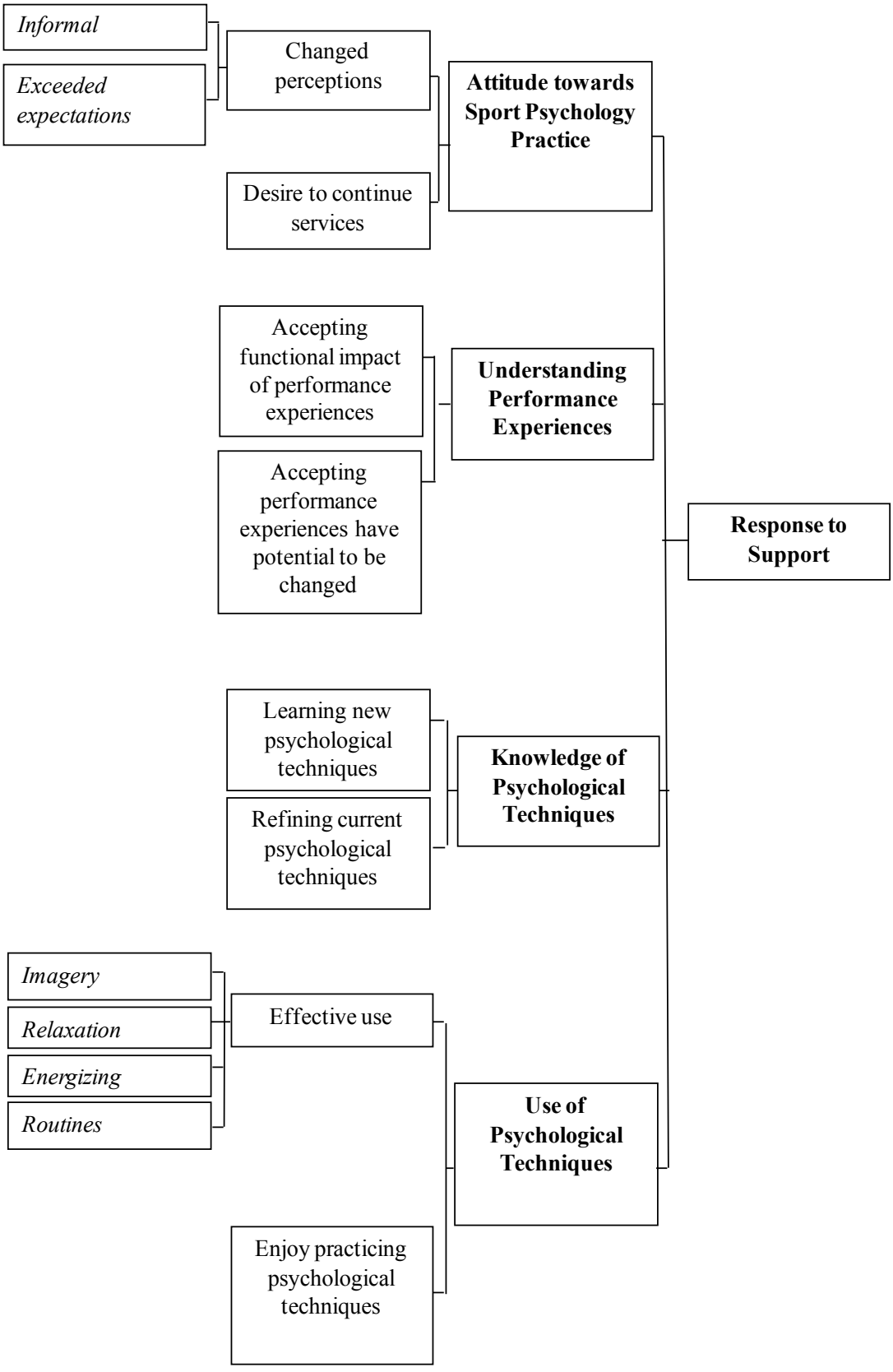


Figure 4.2. Hierarchical structure of athletes' 'response to support'

Athlete Response to Support

Athletes' response to the support provided encompassed several themes including attitude towards sport psychology practice, understanding performance experiences, knowledge of psychological techniques, and use of psychological techniques (see Figure 4.2).

Attitude towards sport psychology practice. Sub-categories that emerged within the theme 'attitude towards sport psychology' included changed perceptions about the field of sport psychology and a desire to continue the intervention program.

Changed perceptions. Reflecting on the support provided, one tennis player who had no previous experience of sport psychology reported a change in attitude towards its applied practice. As a result of having minimal knowledge of applied sport psychology, this athlete felt apprehensive before the program began and said "I was nervous at the beginning because I didn't know what to expect". Although the same athlete did not know what to expect, she indicated a preconception: "I had it in my head that it was going to be really formal". Previous research suggests such a lack of understanding of applied processes in sport psychology can create a naïve fear of the service (Pain & Harwood, 2004). Importantly, the present findings indicate such misperceptions can be changed. Following the intervention the athlete in question altered her perceptions of the intervention process, and described how she found it "was really good because I didn't feel uncomfortable".

Athletes who had previous sport psychology experience either through the provision of one-to-one support or class or workshop-based education, considered their response to the present intervention program had exceeded expectations. For example, one tennis player noted "when we first started I didn't think that it [the intervention] would change that much, but then I noticed quite a big difference". A golfer who felt he had made improvements in remaining calm on the golf course and not becoming frustrated after making a mistake was "shocked at how much" and "I'm probably more pleased than what I expected".

Desire to continue services. Following program completion, three participants communicated a desire to continue the intervention. One golfer reflected that "I wish we had more sessions" and another stated "I want to continue". For the present athletes, this desire to carry on the applied process stemmed from wanting to make further improvements to mental aspects of performance. This reasoning was illustrated by one athlete who said "it's definitely a big improvement, but it's still a work in progress". Such a finding highlights a limitation of structured intervention programs that are tied to a specific timeframe rather than being flexible to athletes' on-going needs. This finding also raises an ethical issue of whether provisions should be put in place for supporting athletes following a formal period of intervention.

Understanding performance experiences. As a result of the intervention, athletes reported a greater understanding of performance experiences specifically relating to thoughts and feeling states. Two sub-themes emerged from the data; namely, accepting functional impact of performance experiences, and accepting performance experiences have potential to be changed.

Accepting functional impact of performance experiences. Athletes gained knowledge of how performance experiences (i.e., content and intensity of thoughts and feelings) can positively and negatively impact performance. This response to the intervention was voiced by several athletes in the present study. For example, one golfer realized how the experience of anxiety interrupted his focus of attention, "I can't concentrate on the golf if I've got to concentrate about being nervous". This finding suggests athlete acceptance of how cognitions and emotions positively and/or negatively influence performance helps to establish the need and importance for intervention work.

Accepting performance experiences have potential to be changed. Further to accepting the functional impact of performance experiences, athletes also articulated an acceptance that performance experiences had the potential to be changed. For example, a

tennis player realized that unhelpful mental processes for performance were not permanent and were worth the investment of time and effort to change: "I've realized that if you just give up then you're not going to get out of that mind set…you're not going to get back to the perfect mind set which means you won't get your game back". Accepting that performance experiences are not stable traits promotes athlete engagement in and commitment to the present regulation program.

Knowledge of psychological techniques. With respect to enhanced knowledge of psychological techniques, two sub-themes emerged from the data; namely, new psychological techniques learnt, and refinements made to current techniques athletes employed.

Learning new psychological techniques. Reports from athletes suggest new psychological techniques were learnt during the intervention. A tennis player reflected, "I've learnt different techniques" and a golfer recognized he had "got some good tools to use". The positive development of intervention techniques provides support for the effectiveness of a program's education phase (Anderson et al., 2002). Offering new techniques to athletes has been considered important as no one tool is optimal for all athletes or effective for any one athlete across different situations (Weinberg & Williams, 2006).

Refining of current psychological techniques. Several studies exploring the development of psychological techniques through natural learning experiences (e.g., environmental influences such as coach and parent behaviors and feedback) suggest athletes are likely to enter formal applied programs with existing strategies in place (Hanton & Jones, 1999a). In the present study, athletes found they were able to refine and develop techniques previously acquired or newly learnt. A golfer regarded the intervention to have "helped develop [current techniques] and then make sure they were stronger". As a consequence of engaging in mental skills training, athletes who refine current psychological techniques exhibit psychological skills akin to athletes competing at a higher level of competition, further

highlighting the importance of considering current techniques when delivering intervention programs (Calmels, d'Arripe-Longueville, Fournier, & Soulard, 2003).

Use of psychological techniques. Engagement in the regulation program led athletes to use psychological techniques learnt during competitive events. One athlete noted "I've been able to use them [the techniques] and they've been working for me". Within this theme, two sub-categories emerged and include the effective use of psychological techniques and enjoyment in practicing these regulation strategies.

Effective use of psychological techniques. Athletes reported using psychological techniques that included imagery, relaxation, energizing, and the employment of routines. Further, athletes found these techniques to be beneficial for optimizing performance experiences. For example, a tennis player observed, "if I did the routine I'd be a lot calmer and a lot more ready for the next point". Other techniques athletes' learnt were self-talk and goal setting. Although athletes did not specifically report using these two techniques, they featured as part of their performance routines. For example, one tennis player's pre-shot routine included instructional self-talk cue words and process goals. During her between point routine, this player would turn her back to the net and focus her mind on the process of how she wanted to play the next point (i.e., set a process goal). Self-talk would be employed to reinforce what she wanted to achieve when she came to play the next point. Although this player talked about her routine in the interview, she did not however mention either self-talk or setting goals in the discussion.

Enjoy practicing psychological skills and techniques. Between each intervention session, athletes considered the practice of psychological techniques to be important. Specifically, one golfer reported to be "working on the things…on a daily basis". Further, athletes considered such systematic practice to be enjoyable, as another golfer suggests, "we actually did the routines and…I really enjoyed that and stuck to them religiously". Previous research suggests the deliberate practice of psychological skills can be enjoyable when

perceived to be a contributing factor towards positive performance experiences (Cumming & Hall, 2002).

Psychological Qualities and Well-Being

Athletes reported several psychological qualities and well-being outcomes of the intervention experienced in the competitive sport context (see Figure 4.3).

Psychological qualities. Reflecting on psychological outcomes stemming from the intervention, athletes considered several qualities such as confidence, appropriate focus of attention, optimal level of arousal, as well as a changed experience of anxiety. For example, one golfer described how he had "definitely got more confidence" as a result of the program. Athletes further commented on improvements in maintaining an appropriate focus of attention. A golfer stated he found "it easier to focus", and a tennis player considered how she now "concentrated on [the] actual game rather than thinking of the fact I'm winning". Moreover, several athletes agreed that the program had helped them to relax.

Finally, the present findings suggested that anxiety responses changed for athletes in two ways. First, athletes reported to be "less anxious" suggesting a decrease in intensity of anxiety experienced. Secondly, for one golfer, the interpretation of anxiety symptoms was also modified. For example, the golfer in question said "I'm still nervous…and I guess scared of what might happen, but it's almost like 'sod it let's wait, let's see what happens'. Whereas before…I'm thinking…'I'm not going to do well today' ". It is interesting to note that this golfer also voiced enhanced levels of confidence. For example:

> I had confidence I was going to hole the putts because we'd [have] the routine…before it. So yes it's a completely different feeling now. Nothing to do with the anxiety. I'll still get that but it almost doesn't affect me.

This athlete's report supports the mediating role confidence plays in the interpretation of anxiety symptoms (Mellalieu, Neil, & Hanton, 2006). The athlete suggests a change in interpretation of anxiety is due to higher levels of self-

confidence that seemed to stem from the employment of a pre-shot routine. This finding is consistent with previous research on multi-modal programs where athletes' interpretation of anxiety symptoms has changed from being debilitative pre-intervention to being more facilitative post-intervention (Hanton & Jones, 1999b). It is interesting to note that previous research has therefore promoted the use of confidence enhancing strategies such as verbal persuasion, positive self-talk (Hardy, Hall, & Alexander, 2001), and imagery (Callow & Hardy, 2001). However, the present study demonstrates that increasing a sense of control over one's performance state through the execution of a pre-shot routine, also helped to facilitate self-confidence in mediating the relationship between worry intensity and directional interpretation.

Well-being. Associates of well-being were indicated by the athletes in the present study and comprised of two sub-categories. Specifically athletes reported increased sense of self-determination and enjoyment when participating in competitive events.

Self-determination. Following the intervention, an athlete noted a change in the way she experienced her tennis participation by saying, "I feel like I want to be here rather than being forced to be here" and "I want to be able to carry on playing rather than 'I don't want to do this'". These reflections suggest an alteration in motivation regulations from being extrinsic and controlling to more intrinsic and autonomous (Deci & Ryan, 1985). Being intrinsically motivated has been considered a prerequisite to several other indicators of well-being including athlete engagement (Hodge et al., 2009) as well as a providing a buffer to symptoms of burnout (Cresswell & Eklund, 2005).

Enjoyment. From a self-determination standpoint, athletes who experience a shift towards intrinsic motivation in their sport participation will also experience an increase in enjoyment (Ryan & Deci, 2000). This tenet has been supported in sport research (Alvarez, Balaguer, Castillo, & Duda, 2009). The present study is consonant with this work. For

example, a golfer suggested his enhanced enjoyment resulted from reassessing the reasons why he played: “it [the intervention] helped me reassess where I was with my golf, and then [I] enjoyed it a bit more”.

Enhanced feelings of enjoyment also stemmed from a decrease in negative affect. One tennis player felt he “enjoy[ed] it a bit more because I’m not so negative all the time”. This statement suggests less negativity during competition allowed for the possibility of greater positive affect, in particular enjoyment.

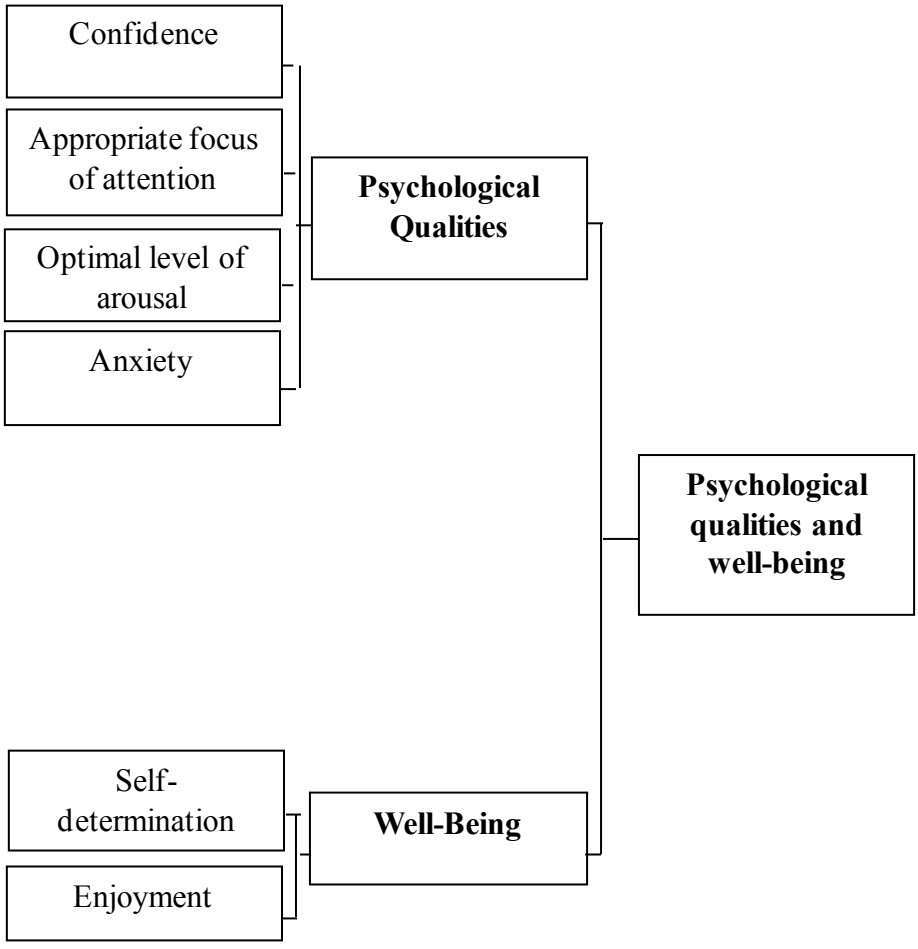


Figure 4.3. Hierarchical structure of ‘psychological qualities and well-being’

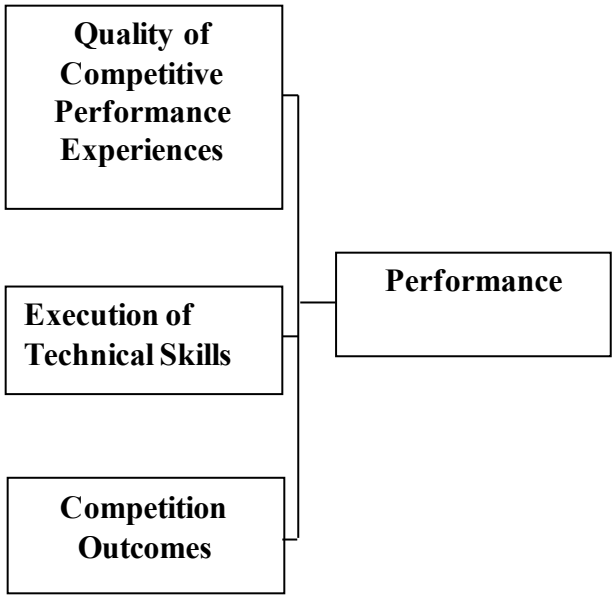


Figure 4.4. Hierarchical structure of 'performance'

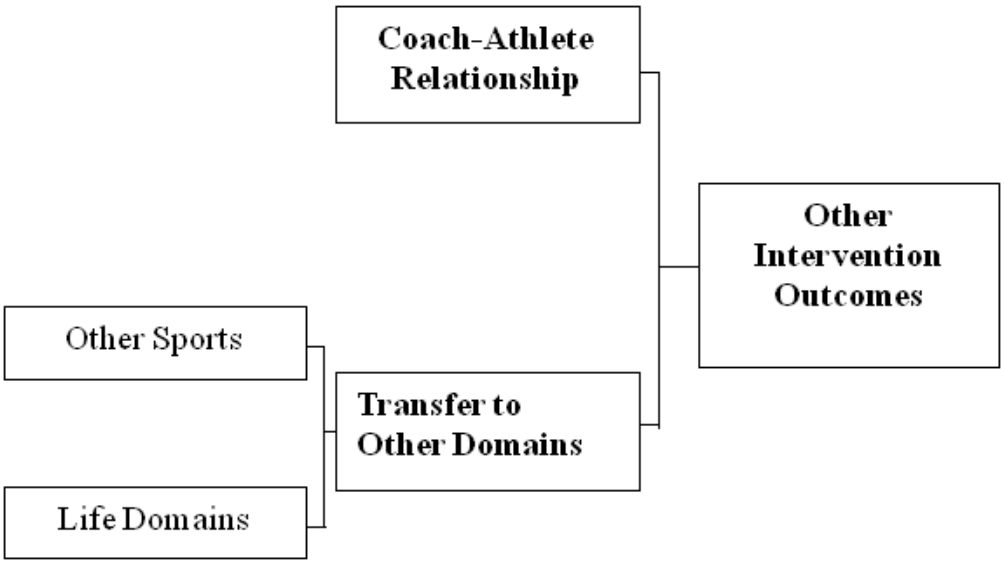


Figure 4.5. Hierarchical structure of 'other intervention outcomes'

Performance

Athlete interviews offered an in-depth qualitative self-assessment of performance. The process of change was subjectively explored and allowed the athletes to identify the origins of any perceived improvements within the context of all the potential factors that may influence performance (Martindale & Collins, 2007). Indeed, the psychological qualities experienced as a result of the intervention (e.g., confidence) were perceived to contribute to performance in different ways, namely the quality of competitive performance experiences, improved execution of technical skills, as well as superior competition outcomes (see Figure 4.4).

Quality of competitive performance experiences. One golfer felt the intervention had a positive impact on the quality of his competitive performance experience. He explained "my scores haven't improved dramatically, but I think they will with time, but I definitely feel more comfortable in whatever the situation on the golf course".

Execution of technical skills. Another golfer observed improvements in terms of the quality of each golf shot. Similarly, a tennis player considered how "I found it affected my performance because I was getting myself ready for the point. Making sure I was there, focusing on [the] next point instead of the last point". For these athletes a period of 'readying' before playing the next shot or point was perceived important for subsequent performance.

Competition outcomes. Only one participant considered performance improvements at an outcome level. The youngest tennis player considered his participation was "helping me win more matches".

Other Outcomes

Further to Anderson and colleagues' (2002) discussion of four indicators of effectiveness, athletes also identified other positive outcomes they attributed to the intervention.

Coach-athlete relationship. One tennis player perceived her involvement in the intervention to have contributed to her coach-athlete relationship. The coach in question expressed an interest in the intervention, and asked for a summary of the main learning outcomes. After seeking permission from the athlete, this information was shared with the coach. Specifically, her between-point routine featured a combination of goal setting, imagery, and self-talk was explained to her coach. As a result, the athlete felt "we've got a better tennis relationship 'cause he [had a]…briefing of what we've been doing he understands the way I feel". This reaction suggests a coach's understanding of the psychological aspect to performance contributes to the coach-athlete dyad. Coach education was not in the original program design thus no other coach received a program summary. This finding is therefore specific to the case in question, making it difficult to generalize across participants.

Transfer to other domains. Benefits of learning psychological techniques in a sport setting can also be realized in other domains (Weinberg & Williams, 2006). Although generalization of regulation techniques was not specifically emphasized as part of the intervention, two athletes reported being able to spontaneously apply these techniques to other sports and life domains.

Other sports. One athlete found he was able to employ regulation techniques learnt for tennis to other sports. Specifically he reported "you can use them in any situation really with any sport" and found "you can use imagery before you [do] the sport and see what you're going to do".

Life domains. Employing psychological techniques learned in the sport context in other life domains has been labeled as 'life skills' in the literature (Weinberg & Williams, 2006). Such life skills were reported by one golfer who said "I take it outside as well, I'm thinking more about things in general life…I'm thinking more confident…I think I will change things in my life [from] how I've done things before because of it". This natural transference has been found in previous applied research (e.g., Gucciardi et al., 2009), however others have argued that deliberate emphasis of technique application to other life pursuits is required for successful generalization (Gould & Carson, 2008).

Summary and Future Research Directions

The present study examined the qualitative experiences of five athletes completing a 5-week IZOF based regulation program. An in-depth evaluation considered multiple intervention processes and outcomes. Organized around Anderson and colleagues' (2002) four indicators of intervention effectiveness, findings supported the general efficacy of a multi-modal individualized program carried out with youth and adult athletes competing in tennis and golf. Athletes reported an enhanced knowledge of sport psychology principles and suggested employment of specific techniques relating to the regulation of emotion, physiological symptoms, and cognitions associated helped facilitate an optimal state during sport competition.

Although the main variable of interest in applied sport psychology programs is often performance outcomes (e.g., Anderson et al., 2002), few athletes in the present study reported objective improvements in this area. Contrary to previous findings (e.g., Robazza, Pellizzari, & Hanin, 2004), the present study suggests performance improvements may not be realized immediately after an IZOF intervention. One explanation for this finding may be the intervention was limited to five one hour sessions. Previous regulation programs have shown performance gains after 12 to 20 hours of applied support (Prapavessis et al., 1992; Robazza, Pellizzari, & Hanin, 2004). Weinberg and Williams (2006) argue how much time spent on

mental training depends on an athlete's needs. Although the present program exceeded the athletes' expectations and as a result suggests initial intervention goals were achieved, a desire to continue service provision was also indicated. Indeed, several participants felt further improvements to the regulation of performance states could be made. Such subsequent advancements in self-regulation might be coupled with performance enhancement.

Athletes in the present study perceived a positive impact on correlates of well-being related to competitive sport participation. Vealey (2007) argues that applied sport psychology services should enhance athletes' psychological and emotional welfare. However, such potential program benefits have rarely been considered in sport psychology intervention research. In the latter cases, performance tends to predominate as the key outcome. Specifically, when compared to pre-intervention, athletes' post-program expressed feeling more self-determined in terms of their sport participation, experienced less negative affect, and found competitive events more enjoyable.

In one of the few intervention studies to monitor changes in motivation regulations, Beauchamp, Halliwell, Fournier, and Koestner (1996) found that after a 14-week self-regulation intervention, golfers reported increased intrinsic motivation. Such a change in reasons for participating in the sport was attributed to increased feelings of competence and personal control over putting after developing pre-shot routines. A similar rationale could be argued for athletes in the present study for increase personal control. A golfer and tennis player reported a pre-shot and between point routine to contribute to a sense of control over his and her performance state.

It should be noted that present findings also suggest that athlete sense of self-determination may have also been influenced by environment factors such as the autonomy supportive approach adopted by the consultant. The potential benefits of promoting greater autonomous motivation regulations in athletes through the provision of autonomy support have been highlighted elsewhere (e.g., Haggar & Chatzirantis, 2007). Although a popular

framework for the delivery of exercise psychology interventions (e.g., Edmunds, Ntoumanis, & Duda, 2007), the theory of self-determination as a guiding framework has not been widely reported in sport psychology programs. This may seem surprising considering Bull (1991) found the strongest determinant of intervention adherence to be motivation.

Overall, athletes perceived participation in the present program to be a positive experience. However the qualitative evaluation precludes causal inferences to be made. Nevertheless, the present examination highlights a number of potential processes and outcomes worthy of future consideration. Although the present study focused on an IZOF intervention, several applied recommendations can be made for practitioners to consider for applied programs in general. In terms of professional practice, consultants are encouraged to consider the process of program delivery. Specifically, offering athlete autonomy in the present study helped develop an adaptive working alliance between client and consultant, as well as promoting athlete commitment to the program. Furthermore, employment of active listening skills by the consultant when reflecting on performance experiences seemed to help athletes gain a greater level of self-awareness. Pulling from the present study, it is also recommended that consultants consider athletes' age, sport, and ability level when developing session content. In the current investigation, younger athletes enjoyed learning about their own sport experiences and psychological techniques through interactive activities, whereas adult athletes noted the important role of consultant-guided reflections.

Finally, this work reinforces the need for in-depth qualitative assessments of applied interventions for research purposes as well as to enhance professional practice. Allowing athletes to reflect on their experience of sport psychology interventions highlights processes of change rather than focusing only on a program's outcomes. Moreover, conducting such a broad evaluation captures more fully the influence a consultant may have for, as well as beyond, targeted areas. In particular, it is interesting to note the beneficial impact an IZOF intervention had on athlete well-being. Given the implications for athlete well-being in

models of psychological skills training (Vealey, 2007), study four examines associates of well-being and ill-being in relation to athletes' use of psychological techniques and skills.

CHAPTER 5

Psychological Skill and Technique Use and Symptoms of Athlete Engagement and Burnout

Introduction

Athletes at the top of their field consistently report the use of mental skills and techniques for performance success (Gould, Dieffenbach, & Moffett, 2002). Stemming from qualitative inquiries, the Test of Performance Strategies (TOPS; Thomas et al., 1999) was developed to capture the frequency with which the most salient psychological skills and techniques are employed by athletes. Techniques include methods or tools such as goal setting, self-talk, imagery, and relaxation. Performance related skills represent an ability to control arousal, emotions, and attention, as well as having a level of automaticity when executing skills. In general, athletes who frequently use these skills and techniques are likely to compete at a higher ability level (Thomas et al., 1999), medal at the Olympics (Taylor, Gould, & Rolo, 2008), and interpret anxiety symptoms as facilitative (Fletcher & Hanton, 2001). As such effective employment of these skills and techniques is often considered as a vehicle for performance enhancement. Multimodal Psychological Skills Training programs (PST) have been designed and implemented to promote the development of techniques and skills in athletes across different sports (Kendall, Hrycaiko, Martin & Kendall, 1990; Thelwell & Greenlees, 2003).

In addition to performance enhancement, Vealey (2007) considers another key aim of PST is to promote athletes' well-being. Athletes who are psychologically and physically healthy are less likely to suffer from injury and more likely to persist in sport (Pelletier, Fortier, Vallerand, & Brière, 2001). Well-being has been conceptualized in different ways encompassing both hedonistic and eudaimonic points of view. Hedonistic well-being refers to experiences of pleasure or happiness and is captured in subjective reports of positive affective states and enjoyment (e.g., Jones, Lane, Bray, Uphill, & Champenoy, 2005). Eudemonia however is concerned with the quality of life experiences, and considers well-being to stem from the pursuit of worthwhile goals on the path towards self-actualization (Waterman, Schwartcz, & Conti, 2008). A number of the models of motivation and optimal functioning

which have received research attention in sport psychology, such as self-determination theory (Deci & Ryan, 1985), flow (Csikzentmihayli, 1990), and mindfulness (Brown & Ryan, 2003), have indices of eudeamonia as key outcomes. All of these approaches place value on individuals engaging in an activity for its own sake; i.e., they are absorbed in and enjoying the process of participating in the task in and of itself (Ryan & Deci, 2000).

A promising construct for operationalizing facets of well-being in sport is athlete engagement (Lonsdale, Hodge, & Raedeke, 2007). Engagement encompasses both hedonic and eudaimonic aspects of well-being, and is defined as "a persistent, positive, cognitive-affective experience in sport" (Lonsdale, Hodge, & Raedeke, 2007, p. 464). Drawing from the perspectives of elite athletes, athlete engagement was first characterized by three eudaimonic related dimensions of confidence, dedication, and vigor. Confidence is defined as a belief in one's ability to perform at a high level as well as achieving desired goals. Dedication is viewed as a desire or hunger to pursue goals perceived to be important. Finally, vigor encompasses liveliness manifested as physical, mental, and emotional energy. A fourth dimension of enthusiasm reflects a more hedonistic view of well-being, and is characterized by feelings of excitement and enjoyment (Lonsdale, Hodge, & Jackson, 2007). Preliminary research supports this multidimensional operationalization of athlete engagement (Lonsdale, Hodge, & Jackson, 2007; Lonsdale, Hodge, & Raedeke, 2007). Reflecting both hedonic and eudaimonic properties, athlete engagement is held to be an appropriate and comprehensive indicator of overall well-being in sport (Hodge et al., 2009).

Whether psychological skill and technique use is associated with athlete engagement has yet to be examined. However, previous research offers some initial support for the link between psychological skills and techniques and one dimension of engagement, namely confidence. Working with amputee soccer players, Lowther, Lane, and Lane (2002) found positive correlations between psychological skill (e.g., arousal control and automaticity) and technique use (e.g., imagery and relaxation) and a task specific form of confidence, namely

self-efficacy (Bandura, 1977). Although Lowther and colleagues failed to detail significance levels or statistical power, the observed moderate correlations (.38 to .57) have been partially replicated in other studies. For example, Fletcher and Hanton (2001) found swimmers who regularly used psychological techniques of relaxation, self-talk, and imagery for competition, reported significantly higher levels of confidence than athletes who adopted these techniques less frequently. Further, reported goal setting, self-talk, and negative thinking in competition, and automaticity, emotional control, relaxation, and self-talk in practice have been found to be significantly and positively correlated with athletes' confidence in their abilities (Crust & Azadi, 2010).

To date, the reported employment of psychological skills and techniques has yet to be examined in relation to the remaining athlete engagement dimensions of determination, vigor, and enthusiasm. Consequently, further examination of multimodal psychological skill and technique use and the multi-dimensional conception of athlete engagement is required.

It is important to note that well-being and ill-being should not be interpreted as conceptual or empirical polar opposites (Deci & Ryan, 2000). That is to say an absence of well-being does not automatically suggest a presence of ill-being, and vice versa. Thus, when examining indices of well-being it is important to also consider determinants of compromised welfare. An indicator of the experience of ill-being and compromised functioning in athletes, burnout has received considerable attention in the literature (Gustafsson, Kenttä, & Hassmén, 2011). Individuals high in athlete engagement have been found to be low in symptoms of burnout (Lonsdale, Hodge, & Jackson, 2007).

According to Raedeke and Smith's (2001), burnout is defined as a psychosocial syndrome encompassing emotional and physical exhaustion, a reduced sense of accomplishment, and sport devaluation. Burnout symptoms have been associated with more controlling motivation regulations in athletes (Lonsdale, Hodge, & Rose, 2009) and higher incidence of reported injury (Cresswell & Eklund, 2006a).

Burnout continues to be a concern within sport contexts, however intervention studies examining ways to manage symptoms of athlete burnout remain scant (Goodger, Lavallee, Gorely, & Harwood, 2006). Advice on how to prevent or reduce burnout symptoms has been gleaned from a handful of exploratory studies that recommend a combination of social support and psychological techniques (Gould, Tuffey, Udry, & Loehr, 1996). With regard to the latter, Raedeke and Smith (2004) found coping behaviors (e.g., time management) to be negatively associated with burnout mediated by stress. These findings support the important role internal resources play for managing burnout symptoms, and could help explain why some athletes are more negatively impacted by the demands of sport participation and likely to burnout in a given context than others. As such, it is worthy to examine the employment of psychological skill and technique use to ascertain whether the frequency of use is associated with experienced levels of burnout.

In sum, research into psychological skill and technique use has predominantly been considered in relation to performance. Few studies have examined Vealey's (2007) second aim of PST, namely the promotion of athletes' well-being in sport participation. Previous research has often investigated one or two skills or techniques and either eudaimonic *or* hedonic well-being in relation to individual techniques and skills. Few have considered the influence the multimodal use of psychological techniques and skills and indicators of eudaimonic *and* hedonic well-being. Thus the present study aimed to determine whether dimensions of athlete engagement varies with frequency of psychological skill and technique use. Secondly, the present study sought to ascertain whether psychological skill and technique use is associated with symptoms of athlete burnout.

In the absence of a composite measure of athlete psychological skill and technique use (Hardy et al., 2010), cluster analysis was employed to form athlete profiles capturing the multimodal adoption of skills and techniques in practice as well as competition. It was predicted that athletes in cluster groups representing more frequent employment of

psychological skills and techniques will report higher levels of engagement and lower levels of burnout in both practice and competitive settings when compared to cluster groups using these skills and techniques less often.

Method

Participants

A total of 248 athletes (138 males, 110 females), M_{age} = 22.69 years (*SD* = 8.10), participated in the present study following receipt of an information letter and completion of a consent form. Average sport participation was 8.53 hours per week (*SD* = 4.47). 46.4% of the athlete sample represented 13 different individual sports, the most prevalent sports were athletics (n = 28) and swimming (n = 10). The remaining 53.6% participated in team sports. Of the 11 team sports represented, the highest proportion of athletes participated in squash (n = 44) and soccer (n = 41). Athletes varied in competitive level across the sample, ranging from recreational participants to international level competitors. The majority of the sample (86.6%) reported being in their sport's mid-season at the time of the study.

Measures

Psychological skill and technique use. A refined version of the Test of Performance Strategies 2 (TOPS-2; Hardy et al., 2010) was used to measure psychological skill and technique use (TOPS-3; www.topsfirst.com). The TOPS-2 was developed to overcome problems with the original TOPS scale. Specifically, in previous work with the original questionnaire, items from the subscales of attentional and emotional control in practice cross-loaded onto a single factor (Thomas et al., 1999). Furthermore, Lane, Harwood, Terry, and Karageorghis (2004) found problems with activation and automaticity in practice and activation, emotional control, and negative thinking in competition. The TOPS-2 aimed to address these issues, but limitations remained (Hardy et al., 2010). For example, a new competition subscale of distractibility had unacceptable low internal reliability (α = .44). Thus, the TOPS-2 was further refined by the test developers to create the TOPS-3 (Thomas,

2009, personal communication). The TOPS-3 omits a distractibility subscale, and introduces an attentional control subscale in competition. Further improvements to previous TOPS-2 items were also made. Specifically, for emotional control in practice the negatively worded "I have trouble controlling emotions when things are not going well at practice" was changed to read "I can control my emotions when things are not going well at practice". It is this most updated version of the TOPS questionnaire which was adopted in the current study.

Frequency of mental skill and technique use on the TOPS-3 is calculated for 17 different subscales, eight for practice and nine for competition, and include goal setting, imagery, relaxation, self-talk, automaticity, arousal control, emotional control, and attentional control as well as negative thinking for competition only. Athletes respond to 68 items on a 5-point Likert scale (*1 = never* to *5 = always*), and mean subscale scores are calculated.

Athlete engagement. The Athlete Engagement Questionnaire (AEQ; Lonsdale, Hodge, & Jackson, 2007) was used to measure the level of engagement athletes experienced towards their sport. Athletes respond to 16 items on a 5-point Likert scale (*1 = almost never* to *5 = almost always*). Example items from each subscale include "I am confident in my abilities" for confidence, "I feel energized when I participate in my sport" for vigor, "I am devoted to my sport" for dedication, and "I enjoy my sport" for enthusiasm. A mean score for each of the four subscales is calculated. Previous research provide support for the measure's factorial and structural validity (Lonsdale, Hodge, & Jackson, 2007; Study 3). Furthermore, adequate internal reliability for the AEQ's subscales has consistently been found in previous studies with Cronbach alpha coefficients ranging from .84 to .89 (Lonsdale, Hodge, & Jackson, 2007; Study 3), and .85 to .89 (Hodge et al., 2009).

Athlete burnout. The Athlete Burnout Questionnaire (ABQ: Raedeke & Smith, 2001) has been the measure of choice for assessing the three proposed burnout symptoms in the case of sport participants. Previously the exhaustion subscale has been criticized for only assessing physical fatigue and not effectively tapping emotional signs of exhaustion (Lonsdale, Hodge,

& Jackson, 2007). Representation of exhaustion as two separate physical and emotional dimensions has been proposed and supported (Quested & Duda, 2011; Sharp, Woodcock, Holland, Duda, & Cumming, 2010). Consequently, the original exhaustion items of the ABQ were reworded to allow for separate assessment of physical and emotional dimensions in the present study.

The original five ABQ items measuring exhaustion were examined and revised to create two independent 4-item subscales to separate physical and emotional exhaustion dimensions. To tap physical exhaustion the word physically was added to the items "I feel so [physically] tired from my training that I have trouble finding energy to do other things" and "I feel [physically] wiped out", and the word "body" was inserted to the item "my [body] feels overly tired from my sport participation". Further, the phrase "mental and" was removed from the item "I am exhausted by the [mental and] physical demands" to make the wording specific to athletes experience of physical fatigue. New items were written specifically for the emotional exhaustion subscale, and included: "I am exhausted by the emotional demands of my sport", "I feel like I have little left in the emotional tank when playing my sport", "I'm feeling emotionally burned out in terms of my sport participation", and "I am emotionally drained from my involvement in my sport". The original item "I feel physically worn out" was omitted from this revised Athlete Burnout Questionnaire (ABQr).

Consistent with the original ABQ, athletes respond to the 18 items of the ABQr on a 5-point Likert scale (*1 = almost never* to *5 = almost always*). Mean subscale scores were calculated for each of the 4 dimensions of burnout.

Procedure

Following ethical approval granted by a UK university ethics committee, participants were informed about the general purpose of the study and informed consent gained. Questionnaire packs containing all three measures and items tapping demographic information were administered. Participants were told no right or wrong answers existed for

questionnaire items. Individuals were encouraged to provide honest responses that reflected their sporting experiences. All questionnaires were completed in the presence of administrators who were available to respond to participant questions.

Results

Preliminary Analyses

Before data were analyzed in line with the main aims of the study, a number of preliminary analyses were conducted. When self-report measures are used, Hagger and Chatzisarantis (2009) recommend researchers conduct confirmatory factor analyses (CFA) when validity has not been established with similar populations in comparable contexts. Given the validity of the AEQ has only been examined with elite level athletes previously (e.g., Lonsdale, Hodge, & Jackson, 2007), and the psychometric properties of the ABQr and TOPS-3 for practice and competition are unknown, CFAs were conducted to inspect the convergent validity of these measurement models. Once the structural validity of the measurement models had been established, descriptive and reliability analyses were performed. A cluster analysis identified practice and competition TOPS-3 cluster groups. Potential confounding variables were identified and controlled for in the main analysis.

Structural validity of measurement models. All models were tested using AMOS 18 data analysis software adopting maximum likelihood estimation. Following this procedure assumptions of normality are demanded. Specifically, evidence for kurtosis at a univariate and multivariate level is a key concern (Byrne, 2010). According to guidelines proposed by West, Finch, and Curran (1995), univariate normality assumptions were met for all items across questionnaires (i.e., skewness < 2; kurtosis < 7). Multivariate non-normality was however evident in the data for all four measurement models. Malhalanobis distance indicated two multivariate outliers that were subsequently removed from the data set. Nevertheless, Mardia's normalized kurtosis coefficient indicated non-normality persisted in the data for all

variables[5] (Byrne, 2010) Therefore, when assessing factor loadings nonparametric bootstrapping was adopted to resample the data for parameter estimation (Kline, 2005).

Convention dictates a non-significant chi-square value indicates adequate model fit (Byrne, 2010). However the chi-square test has been criticized for its sensitivity to sample size and multivariate non-normality of the data (Hu & Bentler, 1999). Supplementary measures of fit are thus recommended in the form of goodness of fit indices. Hu and Bentler (1999) propose a two-index presentation that incorporates indices that demonstrate both absolute and incremental fit. Specifically, the Standard Root Mean Square Residual (SRMR) is recommended as the absolute fit index most sensitive to model misspecification, supplemented by the Comparative Fit Index (CFI) as a gauge of incremental fit for sample sizes ≤ 250. Hu and Bentler specify cut-off criteria to indicate good fit of ≤ .08 for SRMR and > .95 for CFI. In line with previous research (e.g., Quested & Duda, 2011), these cut-offs are viewed as quintessential for model approximation however a less severe cut-off value of .90 for CFI has also been recommended (Kline, 2005), and deemed acceptable in the present study. Results of the structural equation modeling are provided in Table 5.1.

5 Mardia's normalized kurtosis coefficient for athlete engagement = 31.32, burnout = 22.26, psychological skill and technique use in practice = 40.57, and competition = 33.30.

Table 5.1

Fit Indices for AEQ, ABQr, and TOPS-3 Measurement Models

Measurement Model	χ^2 (df)	SRMR	CFI
1. AEQ	275.04** (98)	.05	.92
2. ABQr[a]	433.32** (129)	.08	.86
3. ABQr[b]	375.93** (128)	.08	.89
4. ABQr [c]	328.80** (127)	.06	.91
5. ABQr[d]	253.08** (98)	.06	.92
6. TOPS 3 practice[e]	886.76** (436)	.06	.93
7. TOPS 3 competition[e]	1098.48** (558)	.06	.93

Note. SRMR = Standard Root Mean Square Residual; CFI = Comparative Fit Index.

[a] A four factor first-order ABQr model was tested. The incremental fit index (CFI) indicated that this model could be further improved. Inspection of modification indices (MIs) suggested items 3 and 14 designed to measure sport devaluation cross-loaded onto an alternative factor of emotional exhaustion. To test whether these items measured both sport devaluation and emotional exhaustion, the model 2 was respecified. Because estimation of MIs is based on a univariate approach, it is important to only change one parameter at a time (Byrne, 2010); item 14 in model 3 and item 3 in model 4.

[b] An additional parameter was added to model 2 between item 14 and emotional exhaustion. An increase to the incremental fit index (CFI) suggests an improved fit to the data.

[c] An additional parameter was added to model 3 that allowed item 3 to cross-load onto both sport devaluation and emotional exhaustion. A further reduction in the chi-square statistic and improvements to both goodness-of-fit indices suggest increased model fit, thus confirming the problematic nature of items 14 and 3.

[d] Ideally, items should be a good indicator of only one factor (Pett, Lackey, & Sullivan, 2003), therefore model 5 was specified with these two cross-loading items removed. Fit indices suggest further improvements to the model. For a four-factor ABQr with the present participant group, a revised 3 item sport devaluation subscale was therefore calculated with items 3 and 14 removed from subsequent analyses.

[e] Due to the large number of parameters to be estimated for the TOPS-3 subscales, a further 201 athletes were recruited to assess convergent validity forming a participant group of 422 athletes (256 males, 166 females), M_{age} = 26.34 years (*SD* = 10.48).

**p < .01

Descriptive statistics. Descriptive statistics were calculated for AEQ (model one), ABQr (model five), TOPS-3 practice (model six), and TOPS-3 competition (model seven) (see Table 5.2). In general, mean values for athlete engagement were higher than athlete burnout, suggesting athletes experienced greater levels of engagement in sport than feelings of burnout symptoms. Specifically, athletes exhibited high levels of vigor and enthusiasm, and low levels of emotional exhaustion. The highest mean value observed for the TOPS-3 subscales was 3.56 for automaticity in competition thus suggesting all subscale scores were relatively low (cf. Kee & Wang, 2008). Consistent with previous research employing earlier versions of the TOPS measure, participants reported more frequent use of psychological skills and techniques in competition than in practice settings (Thomas et al., 1999). An exception to this established trend in the current study was the lower levels of reported self-talk in competition when contrasted with practice.

Correlation coefficients were calculated for the TOPS-3 subscales and AEQ and ABQr dimensions (see Table 5.3). A number of significant small to medium correlations (i.e., $r > .10$ to .50) were found. In general positive significant correlations were found between psychological skils and technique use and dimensions of engagements, and negative associations with facets of burnout. Differential ABQr coefficients for emotional and physical exhaustion with the targeted psychological techniques and skills were observed, offering further support for a bi-dimensional measure of reported exhaustion.

Reliability analysis. Cronbach's alpha was calculated to ascertain the internal reliability for each subscale (see Table 5.2). The ABQr dimension of reduced accomplishment ($\alpha = .76$) demonstrated acceptable reliability when adopting a cut-off value of .70. For the remaining subscales that consisted of 4 items or less, Loewenthal (2001) recommends an adjusted criterion value of .60. Consequently, internal reliability was found to be acceptable for the remaining ABQr subscales ($\alpha = .84$ to .86), for all AEQ subscales ($\alpha = .82$ to .88), and 16 of 17 subscales for the TOPS-3 ($\alpha = .62$ to .85). Activation in practice however just missed

the recommended criterion (α = .59). When the reverse scored item "I have difficulty getting into an ideal performance state during training" was deleted this coefficient increased to an acceptable .65. This item was consequently removed from any further analyses.

Table 5.2

Descriptive Statistics of Athlete Engagement, Burnout, and Psychological Skill and Technique Use

Measure	Subscale	α	*M*	*SD*
AEQ	Confidence	.84	3.78	0.65
	Dedication	.86	3.94	0.73
	Vigor	.82	4.18	0.59
	Enthusiasm	.88	4.34	0.65
ABQr	Reduced Accomplishment	.76	2.53	0.66
	Sport Devaluation	.85	2.16	0.82
	Emotional Exhaustion	.84	2.06	0.78
	Physical Exhaustion	.86	2.29	0.81
TOPS 3				
Practice	Goal Setting	.85	3.05	0.86
	Imagery	.73	2.87	0.80
	Relaxation	.84	2.24	0.87
	Self-Talk	.82	3.11	0.80
	Automaticity	.64	3.50	0.61
	Activation	.65[a]	3.29	0.66
	Emotional Control	.64	3.30	0.62
	Attentional Control	.71	3.26	0.66
Competition	Goal Setting	.82	3.23	0.84
	Imagery	.83	3.09	0.85
	Relaxation	.84	2.59	0.87
	Self-Talk	.76	3.09	0.78
	Automaticity	.65	3.56	0.57
	Activation	.73	3.55	0.62
	Emotional Control	.81	3.47	0.79
	Attentional Control	.72	3.54	0.67
	Negative Thinking	.75	2.44	0.74

Note. [a] Following reliability analysis for activation in practice, the item "I have difficulty getting into an ideal performance state during training" was removed to attain acceptable alpha coefficient values (e.g., $\alpha \geq .60$).

Table 5.3

Correlation Coefficients between TOPS-3, AEQ, and ABQr Subscales

		Athlete Engagement				Athlete Burnout			
		Confidence	Dedication	Vigor	Enthusiasm	Sport devaluation[b]	Reduced accomplishment	Emotional exhaustion	Physical exhaustion
Practice	Goal Setting	.29***	.42***	.34***	.22***	-.04	-.11	.01	.08
	Imagery	.33***	.25***	.09	.08	-.10	-.16*	.11	.10
	Relaxation	.16*	.01	-.05	-.16*	.12	-.00	.26***	.19***
	Self-Talk	.20***	.20***	.11	.04	-.10	-.09	.06	.12
	Automaticity	.23***	.23***	.27***	.26***	-.16*	-.15*	-.29***	-.20***
	Activation	.29***	.35***	.32***	.27***	-.17***	-.31***	-.05	-.03
	Emotional Control	.29***	.20***	.27***	.26***	-.23***	-.37***	-.34***	-.26***
	Attentional Control[a]	.31***	.36***	.34***	.30***	-.31***	-.35***	-.29***	-.19***
Competition	Goal Setting	.24***	.31***	.20***	.18***	-.04	-.09	.03	.10
	Imagery	.33***	.29***	.34***	.17***	-.17***	-.23***	-.02	.05
	Relaxation	.19***	.09	.01	-.06	.04	-.12	.16*	.16*
	Self-Talk	.24***	.23***	.14***	.09	-.05	-.10	.11	.08
	Automaticity	.39***	.24***	.35***	.29***	-.15*	-.36***	-.24***	-.15*
	Activation	.40***	.32***	.30***	.30***	-.24***	-.45***	-.18***	-.12
	Emotional Control	.20***	.22***	.19***	.27***	-.26***	-.37***	-.41***	-.31***
	Attentional Control	.38***	.42***	.37***	.41***	-.39***	-.49***	-.37***	-.34***
	Negative Thinking	-.37***	-.33***	-.35***	-.41***	.34***	.48***	.40***	.25***

Note:

[a] Following reliability analysis for activation in practice, the item "I have difficulty getting into an ideal performance state during training" was removed to attain acceptable alpha coefficient values (e.g., $\alpha \geq .60$).

[b] Items 3 and 14 were removed from the ABQr sport devaluation subscale.

* $p < .05$, *** $p < .001$.

Cluster Analysis

Cluster analysis involves the assignment of observations into homogenous groups or clusters based on common characteristics. It is well-suited for the present study for participant groups to establish multimodal profiles of psychological skill and technique use as assessed by the TOPS-3. This analytical procedure has however been criticized for the subjectivity involved when determining the number of clusters in a solution (Hair, Anderson, Tatham, & Black, 1998). Several different analytical methods may be employed and the two main approaches of hierarchical and non-hierarchical tend to yield different results (Hair, et al., 1998). A two-stage method that uses both approaches has thus been recommended (Kee & Wang, 2008). Furthermore examining the stability of the cluster solution across two different data sets allows for the constancy of the cluster solution to be established (Clatworthy, Buick, Hankins, Weinman, & Horne, 2005).

Consequently, steps were taken to reduce the subjective nature of identifying a cluster solution. First, all TOPS-3 subscale scores were transformed into standardized Z scores to ensure equal variance across variables. To validate the cluster solution across two different data sets, the current data were randomly split into two groups (N_{group1} = 121, N_{group2} = 118). Each group was considered representative of the overall sample. Ward's hierarchical agglomerative method using a Euclidean distance measure of similarity was employed for group 1. Agglomerative schedules and dendograms were inspected to determine the number of clusters (Clatworthy et al., 2005). On the agglomerative schedule, an inconsistent increase in cluster coefficients indicated the number of clusters in the solution. A dendogram tree graph was inspected to reinforce the solution from the agglomerative schedule. This procedure was repeated for group 2 to establish the stability of the first group's solution. Each group suggested a two-cluster solution for the TOPS-3 subscales in a practice context. The procedure was repeated for TOPS-3 competition subscales which also supported a two cluster solution.

Achieving a two cluster solution for the hierarchical method, a non-hierarchical approach to cluster analysis was then employed. Specifically, a *k*-means clustering method whereby the number of clusters from the hierarchical approach (e.g., two cluster groups) was declared and the solution refined for each sport context (Kee & Wang, 2008). Centroid values from the hierarchical procedure were used as seed points for the *k*-means analysis. For TOPS-3 practice and competition clusters 91.2% and 84.1 % of the athletes remained in the same cluster when following hierarchical and non-hierarchical methods respectively. This level of consistency achieved across methods is comparable to previous two-stage approaches to cluster analysis (e.g., Harwood, Cumming, & Fletcher, 2004; Kee & Wang, 2008).

Interpretation of cluster solution. To establish whether cluster groups were higher or lower on psychological skill and technique use, a *z* score criteria of ±0.5 was implemented (Hodge & Petlickhoff, 2000). The first cluster for both practice and competition settings exhibited below mean scores for all TOPS-3 subscales. In contrast, subscale scores were above the mean for the second cluster. These findings suggest a lower/higher use of psychological techniques and skills across cluster groups in practice and competition settings. However, emotional control in practice did not exceed the between cluster criterion of ±0.5. Consequently, classification of cluster profiles were: (a) *lower practice use, moderate emotional control*, (b) *higher practice use, moderate emotional control*, (c) *lower competition use*, and (d) *higher competition use*. A MANOVA was calculated to confirm differences in cluster groups on their clustering variable. A significant multivariate effect was found between practice cluster groups[6] (a) and (b), Pillai's Trace = .66, $F(8, 230) = 56.23$, $p < .001$, $\eta_p^2 = .66$, and competition cluster groups[2] (c) and (d), Pillai's Trace = .69, $F(9, 229) = 55.44$, $p < .001$, $\eta_p^2 = .69$. Non-significant findings from univariate analyses confirmed athletes in

6 Homogeneity of variance-covariance matrices was violated (Box's M = 79.29, p < 001), thus rejecting the null hypothesis that the observed covariance matrices of dependent variables were equal across groups. It has been argued that Box's M is overly sensitive to departures of normality. Thus the more conservative Pillai's trace was used when interpreting MANOVA results (Tabachnick & Fidell, 2006).

practice clusters (a) and (b) did not differ in their use of emotional control. This analysis also highlighted these groups did not differ in the skill of automaticity. Cluster groups (a) and (b) were renamed to reflect this finding to (a) *lower practice use, moderate emotional control and automaticity*, (b) *higher practice use, moderate emotional control and automaticity.* All competition univariate analyses revealed significant differences between cluster groups (c) and (d) at the $p < .006$ level. Descriptive statistics of cluster membership are shown in Table 5.4.

It is interesting to note that 198 athletes had the same frequency profile for both practice and competition contexts (i.e., lower practice and lower competition, higher practice and higher competition), and only 41 athletes had different profiles across the two sport settings (i.e., lower practice and higher competition, higher practice and lower competition).

Validation of cluster membership. A variable not involved in the original cluster analysis was identified to validate cluster membership (Hair et al., 1998). Previous research suggests athletes competing at a higher level of ability use psychological skills and techniques more often than individuals at lower levels (Thomas et al, 1999). Thus Chi square tests were performed to see if differences existed between representative (i.e., participated at regional, national, or international level) and recreational (i.e., participated at club or recreational level) athletes in cluster membership. A chi square test supported the expected distribution of athletes across practice cluster groups (χ^2 (1) = 7.97, p = .005). Specifically, 65.6% of recreational athletes were in practice cluster (a), whilst 54.1% of their representative counterparts were members of cluster group (b).

Table 5.4

Cluster Profiles for Psychological Skill and Technique Use in Practice and Competition

	Psychological Skill and Technique Use Clusters											
	Practice						Competition					
	Cluster (a): Lower practice, moderate emotional control and automaticity (n = 140)			Cluster (b): Higher practice, moderate emotional control and automaticity (n = 99)			Cluster (c): Lower competition (n = 125)			Cluster (d): Higher competition (n = 114)		
	M	*SD*	*Z*	*M*	*SD*	*Z*	*M*	*SD*	*Z*	*M*	*SD*	*Z*
Age	23.08	9.06		22.30	6.87		23.28	8.84		22.18	7.46	
Hours of Training (per week)	7.96	4.67		9.48	4.12		8.13	4.52		9.10	4.46	
Goal Setting	2.61	0.75	-0.37	3.67	0.56	0.42	2.79	0.78	-0.52	3.41	0.72	0.58
Imagery	2.47	0.69	-0.50	3.42	0.60	0.54	2.56	0.66	-0.62	3.67	0.64	0.68
Relaxation	1.89	0.66	-0.26	2.72	0.90	0.28	2.24	0.76	-0.40	2.97	0.81	0.43
Self-Talk	2.69	0.66	-0.49	3.70	0.57	0.54	2.61	0.63	-0.63	3.62	0.55	0.68
Automaticity	3.49	0.63	-0.24	3.52	0.58	0.27	3.32	0.56	-0.42	3.84	0.43	0.49
Activation	3.00	0.49	-0.49	3.71	0.45	0.72	3.21	0.59	-0.55	3.93	0.38	0.62
Emotional Control	3.26	0.63	-0.11	3.37	0.60	0.12	3.33	0.84	-0.17	3.64	0.72	0.20
Attentional Control	3.00	0.62	-0.27	3.63	0.54	0.32	3.27	0.65	-0.38	3.84	0.56	0.45
Negative Thinking							2.72	0.72	0.37	2.13	0.63	-0.42

For the two competition clusters, recreational and representative athletes were similarly found to distribute into low and high use groups respectively (χ^2 (1) = 5.87, p = .02). Specifically 58.4% of recreational athletes were members of cluster group (c), and 58.8% of individuals competing at a representative level were in cluster group (d).

Identifying potential confounds in cluster groups. Before exploring differences in engagement and burnout between the cluster groups emerging from scores on the TOPS-3, it was important to establish whether extraneous variables influenced the dependent variables of interest. Previous research suggests that differences in athletes' age, gender, competitive level, and training load impact the level of reported burnout symptoms (Caccese & Mayerberg, 1984; Gustafsson et al., 2011). Having received limited attention in the literature, it seemed prudent to also examine the presence of these potential extraneous determinants on athlete engagement.

Eight MANOVAs were conducted. Although, structural equation modeling procedures suggested multivariate non-normality, MANOVA is considered reasonably robust to such violations when not caused by outliers (Tabachnik & Fidell, 2006). For each MANOVA, age, gender, competitive level of ability (e.g., recreational or representative), or training load (i.e., hours of training per week) served as an independent variable. The ABQr and AEQ subscales served as dependent variables. Box's and Lavene's tests were inspected to check for assumptions of equality of variances and covariances of the dependent variable had been met. A conventional $p < .05$ cut-off criterion was adopted for establishing multivariate statistical significance. Any multivariate significant differences were followed by further univariate analyses. A Bonferroni adjustment was calculated for univariate tests to guard against Type 1 errors when making multiple comparisons. Specifically, the original p value of .05 was divided by the number of comparisons made to give an adjusted p value of $p < .01$. A summary of the multivariate analyses are presented in Table 5.5. Univariate analyses are discussed below.

Table 5.5

Mulitvariate MANOVA results for Demographic Variables and Engagement and Burnout

DV	IV	Pillai's Trace	*df*	*df* error	*F*	*p*	η_p^2
Athlete Engagement	Age[a]	.04	4	168	1.59	.11	
	Gender	.13	4	234	8.43	.000***	.13
	Training load[b]	.15	4	202	9.09	.000***	.15
	Competitive level[c]	.04	4	234	1.69	.15	
Athlete Burnout	Age[a]	.04	4	168	1.83	.18	
	Gender	.04	4	234	2.26	.06	
	Training load[b]	.14	4	202	8.41	.000***	.14
	Competitive level[c]	.02	4	234	8.36	.25	

Note. DV = dependent variable, IV = independent variable, η_p^2 = partial eta squared.

[a] A median-split was used to assess age differences (median = 20 years). The younger group contained 87 athletes (M = 18.64, SD = 0.48), and the older group comprised of 86 individuals (M = 29.03, SD = 11.21). Sixty-six athletes with the median age were omitted from the present analysis.

[b] A median-split was used to assess training load measured by hours per week (median = 8 hours). The group who trained for fewer hours contained 105 athletes (M = 4.89 hrs, SD = 1.61), and the group who trained over 8 hours per week comprised of 102 athletes (M = 12.59 hrs, SD = 3.83). Thirty-two athletes reported training for the median and were omitted from the preliminary analysis.

[c] To assess competitive level, participants were grouped in two categories. The first group included athletes competing at a representative level and comprised of international, national, regional, and county competition (N = 85). The second group included club and recreational athletes (N = 154).

*** $p < .001$

Athlete engagement. Differences for gender and training load emerged for dimensions of athlete engagement. Specifically, males reported significantly higher levels of confidence than females ($F(1,237) = 18.25$, $p < .001$, $\eta_p^2 = .07$). Participants who trained for more than 8 hours per week reported higher levels of confidence ($F(1, 205) = 13.07$, $p < .001$, $\eta_p^2 = .06$) and dedication ($F(1,205) = 9.16$, $p < .001$, $\eta_p^2 = .08$) compared to those who trained for fewer than 8 hours.

Athlete burnout. Differences as a function of training load were also found for athlete burnout. At a univariate level, analysis revealed significant differences between training

groups in sport devaluation ($F(1,205) = 16.12$, $p < .001$, $\eta_p^2 = .07$) and reduced accomplishment ($F(1,205) = 15.84$, $p < .001$, $\eta_p^2 = .07$). Group means indicated that athletes who trained for fewer than 8 hours per week experienced higher levels of these two burnout symptoms than athletes who exceeded 8 hours.

In sum potential confounding variables of gender and training load for engagement were found, as well as training load for burnout. Chi square tests were performed to see if differences existed in these variables between cluster groups.

Practice cluster groups (a) and (b). A significant chi square test indicated gender differences existed in practice settings ($\chi^2(1) = 6.99$, $p = .008$), with 66.7% of cluster group (b) represented by male athletes. A significant chi square was also found for training load between clusters (a) and (b), ($\chi^2(1) = 6.65$, $p = .01$). 68.6% of athletes who trained for less than 8 hours per week were members of cluster (a). However participants whose training exceeded 8 hours per week were evenly distributed between clusters (a) and (b). Nevertheless, 60.7% of cluster (b) was made up of athletes who had this higher load of training.

Competition cluster groups (c) and (d). For competition clusters, no differences in gender ($\chi^2(1) = 0.46$, $p = .50$) or training load ($\chi^2(1) = 2.54$, $p = .11$) were found.

Thus, the results indicate that gender and training load need to be controlled for in the main analyses for practice cluster groups only.

Psychological Skill and Technique Use Differences in Athlete Engagement

To address the main aims of the study, differences in athletes' experiences of engagement and burnout were examined as a function of psychological skill use. TOPS-3 cluster groups served as the independent variable, and athlete engagement and burnout were the dependent variable. Six one-way MANOVAs were conducted to determine if the clusters differed across dimensions of engagement and burnout. A multivariate analysis of covariance (MANCOVA) was employed in place of a MANOVA to control for confounding variables as indicated by preliminary analyses. Tests for assumptions of equality of variances and covariances of the dependent variable were conducted. For multivariate analyses, statistical significance was achieved at the $p < .05$ level. For univariate analyses, a Bonferonni adjustment was adopted of $p < .01$.

Practice. To control for the effects of confounding variables of gender and training load for engagement across the two practice clusters a MANCOVA was employed. A main effect for practice clusters was found, Pillai's Trace = .20, $F(4, 200) = 12.54$, $p < .001$, $\eta_p^2 = .20$. Univariate analyses found significant effects for all engagement dimensions of confidence ($F(1, 203) = 31.10$, $p < .001$, $\eta_p^2 = .13$), vigor ($F(1, 203) = 17.98$, $p < .001$, $\eta_p^2 = .08$), dedication ($F(1, 203) = 32.90$, $p < .001$, $\eta_p^2 = .14$), and enthusiasm ($F(1,203) = 8.46$, $p = .004$, $\eta_p^2 = .04$). Inspection of estimated marginal means, corrected for the potential confounding effects of gender and training load, indicated athletes in the *higher practice use, moderate emotional control and automaticity* group (b) experienced higher levels of engagement on all four scale dimensions than individuals in the *lower practice use, moderate emotional control and automaticity* group (a).

Competition. A MANOVA revealed a significant main effect for cluster group on engagement (Pillai's Trace = .16, $F(4, 234) = 10.87$, $p < .001$, $\eta_p^2 = .16$). Significant results were found for all four engagement dimensions of confidence ($F(1, 237) = 32.59$, $p < .001$, $\eta_p^2 = .12$), vigor ($F(1, 237) = 16.86$, $p < .001$, $\eta_p^2 = .07$), dedication ($F(1, 237) = 31.87$, $p <$

.001, η_p^2 = .12), and enthusiasm (F(1, 237) = 15.33, p < .001, η_p^2 = .06). Inspection of estimated marginal means indicate that athletes in the *higher competition use* cluster experience higher levels of engagement compared to athletes in the *lower competition use* cluster.

Psychological Skill and Technique Use Differences in Athlete Burnout

Practice. A MANCOVA was conducted, with practice cluster groups as the independent variable and dimensions of burnout as the dependent variables, whilst controlling for training hours per week. A main effect for practice clusters was found, Pillai's Trace = .12, F(4, 201) = 7.15, p < .001, η_p^2 = .12, and univariate analyses revealed that the significant difference pertained to reduced accomplishment (F(1, 204) = 19.95, p < .001, η_p^2 = .09). Estimated marginal means signified that athletes in the *lower practice use, moderate emotional control and automaticity* group (a) cluster experienced a greater degree of reduced accomplishment compared to those in the *higher practice use, moderate emotional control and automaticity* group (b).

Competition. A MANOVA revealed a significant main effect for psychological skill and technique use (Pillai's Trace = .10, F(4, 234) = 6.72, p < .001, η_p^2 = .10). When examining burnout dimensions at a univariate level, significant symptoms were apparent in reduced accomplishment (F(1, 237) = 26.50, p < .001, η_p^2 = .10), and sport devaluation (F(1, 237) = 6.84, p = .01, η_p^2 = .02). Specifically, cluster means suggested that athletes in the *lower competition use* group (c) experienced higher levels of reduced accomplishment and sport devaluation than those in the *higher competition use* group (d).

Discussion

The purpose of this study was to examine the relationship between athletes' use of psychological skills and techniques, as formed via scores on the TOPS-3 subscales, and dimensions of athlete engagement and burnout. As athletes will often employ a variety of techniques and skills, multimodal profiles were identified to examine associations with these associates of well-being and ill-being. Cluster analysis supported general "higher" and "lower" frequency groups in practice and competition contexts across all skills and techniques, except for emotional control and automaticity in practice. In the present discussion, the terms higher and lower are used for succinctness when describing skill and technique use between groups. It should be noted however in a practice setting, both higher and lower groups reported manifesting emotional control and automaticity to a similarly moderate degree.

In support of initial hypotheses, athletes who employed psychological skills and techniques more frequently experienced higher levels of engagement in both practice and competition contexts than lower use groups. Specifically, skill and technique use was strongly associated with the eudaimonic related constructs of confidence and dedication, as indicated by higher partial eta squared values compared to vigor and enthusiasm.

Consistent with previous research, correlations suggest techniques and skills were positively associated with confidence (see Table 5.3). A medium correlation coefficient for imagery suggests this technique was associated with confidence to a greater extent than goal setting, relaxation or self-talk in competition and practice settings. This result is consonant with Fletcher and Hanton (2001) who found athletes who employed imagery more often exhibited higher confidence levels compared to those who used this technique on fewer occasions. Imagery has also been considered to be a source of a task specific form of confidence, namely self-efficacy (Bandura, 1997). Imagery, for example, can be employed to re-experience previous performance accomplishments or future goal attainment (Bandura,

1977; Callow & Hardy, 2001). Interestingly, several psychological skills were also positively correlated with confidence including automaticity as well as an ability to control activation, emotions, and attention. Bandura's (1997) theory also helps to partially explain these associations. Being able to control emotions and levels of activation for an optimal state for the task in hand are considered to be a source of self-efficacy.

In the present study, variance in dedication was also explained by frequency of psychological skill and technique use. Although the direction of this association cannot be inferred from the present study, this finding reflects previous research relating to athlete employment of psychological skills and techniques and goal striving efforts in training and competition. Indeed, a medium positive correlation with goal setting and dedication was found. Other techniques and skills may be employed to help athletes pursue goal attainment. This notion is supported by previous research where the use of motivational self-talk has been associated with maintaining or increasing drive and effort (Hardy, Gammage, & Hall, 2001). Furthermore, the use of motivational specific imagery may also facilitate dedication. Imaging goal striving processes, and their subsequent achievement, help foster and maintain effort and dedication towards goal attainment (Callow & Hardy, 2001). This type of imagery has been considered important when athletes have limited opportunities for realizing achievement, such as being injured or during the off-season (Driedgier, Hall, & Callow, 2006; Cumming & Hall, 2002), and could be pivotal for promoting associates of athlete well-being during such challenging times.

As expected, athletes who reported high psychological skill and technique use experienced lower levels of burnout compared to the lower use groups. Contrary to present findings with engagement, associations at a univariate level were only partially supported across the four dimensions of burnout. In particular, it appears that athletes' multimodal use of psychological skills and techniques alone do not provide the necessary coping skills and capacities to buffer against feelings of physical and emotional exhaustion in training and

competition or sport devaluation in practice settings alone. Conversely, hypotheses regarding to an association between relatively high levels of psychological skill and technique use and low levels of reduced accomplishment were supported in both practice and competitive condition, and for sport devaluation only in competition.

The strongest effect was found for reduced accomplishment in both practice and competition settings. Athletes who frequently use psychological skills and techniques appear better protected against such negative perceptions. It may be that athletes low in reduced accomplishment experience feelings of achievement, pride, and indeed, objective accomplishment (Londale, Hodge, & Jackson, 2007). Performance accomplishments are the most powerful source of self-efficacy (Bandura, 1997), and are closely associated with techniques for enhancing confidence previously discussed including self-talk, imagery, and goal setting.

Further to the main aims of the present study, several supplementary findings from the measurement models and preliminary analysis are worthy of note. Confirmatory factor analysis for a four factor model of athlete burnout and adequate internal reliability offers initial support for calls to separate the dimensions of emotional and physical exhaustion (Lonsdale, Hodge, & Jackson, 2009; Quested & Duda, 2011). In the present study, items designed to measure sport devaluation cross-loaded onto emotional exhaustion, thus suggesting further validation and refinement of this four factor measurement model is required.

Preliminary analyses also indicated that athletes who experienced greater training loads, as indicated by average hours of practice per week, reported higher indices of engagement and lower degrees of burnout. Given high physical training demands has emerged as an influential antecedent to burnout in previous work, the opposite trend was anticipated (Gould, Udry, Tuffey, & Loehr, 1996). Interviewing professional rugby players at the end of a season, Cresswell and Eklund (2006) found training load was only associated with symptoms

of burnout during peak training times. Thus, periodization of training and time of season may influence burnout to a greater extent than the number of training hours alone.

Finally of interest was the observed lack of significant differences in reported burnout symptoms between competitive levels in the present study. To date, athlete burnout has been predominantly researched with high level athletes (e.g., Cresswell & Eklund, 2006; Gustafsson, Hassmén, Kenttä, & Johansson, 2008; Lonsdale, Hodge, & Rose, 2009). The high physical and psychological demands placed on athletes participating in the upper echelons of their sport are thought to be at risk of experiencing burnout symptoms. Present findings however run counter to this assertion, and provide a case for examining burnout in other athlete population groups (e.g., Gustafsson, Kenttä, Hassmén, & Lundqvist, 2007).

Given the lack of research pertaining to the use of psychological skills and techniques and associates of well-being (and ill-being), the present findings are important. Results suggest the more athletes' use psychological skills and techniques, the greater the feelings of engagement in sport participation and the lesser individuals' experience symptoms of burnout. Often adopted for purposes of performance enhancement, the present results suggest psychological skills and techniques provide a potential means for enhancing athletes' psychological, emotional and physical well-being (Vealey, 2007). Although the cross-sectional design currently employed precludes inferences of causality, a stage has been set for future research intervention efforts.

Several research questions may be asked stemming from the present investigation. In particular, investigators are encouraged to go beyond the TOPS-3 and examine the type of psychological skills and techniques that influence athlete well-being and ill-being. In its current form the TOPS-3 is a crude measure of skill and technique frequency of use (Hardy et al., 2010). The appropriateness of and effectiveness in how a specific skill and technique is employed and for what function has critical implications for the performance as well as the quality of athletes' sport experiences. When delivering a goal setting program with swimmers,

for example, Burton (1989) found one athlete worked hard to increase goal setting activities. Unable to set realistic targets, however, this individual experienced increased cognitive anxiety, and diminished levels of confidence and effort when her goals were not achieved. Thus, future research should monitor the efficacy of which skills and techniques are employed as well as frequency of their use.

Although athletes' multimodal use of both skills and techniques was investigated, in general correlation coefficients appeared to be stronger between the TOPS-3 assessing skills and the assessed dimensions of engagement and burnout than the observed correlations with techniques. Specifically, subscales relating to the self-regulation of emotions, attention, and activation were positively associated with the indicators of engagement and negatively related to facets of burnout. PST models suggest a clear distinction between techniques and skills (e.g., Vealey, 2007). To further understand how techniques and skills interact, as well as the potential impact of both, researchers need to make conceptually clear distinctions when examining these variables (cf. Holland et al., 2010). For example, one function of the technique imagery is to help foster the skill of attentional control (Calmels, Berthoumieux, & d'Arripe-Longueville, 2004). Such distinctions will enable researchers to evaluate the impact of specific psychological techniques on the development of particular psychological skills.

In sum, it is hoped that the present study has bought Vealey's (2007) second (but equally important) objective of psychological skills training (PST) of enhancing athlete well being into the forefront of researchers' and practitioners' minds. This is important for all who are involved in the delivery and evaluation of PST centred on positive personal development as well as performance enhancement (Sheard & Golby, 2006).

CHAPTER 6

General Discussion

It seems appropriate to begin the final chapter of this thesis by returning to the beginning. The introduction presented Kirschenbaum's (1984) assertion that "performance in sport [is] a problem in self-regulation" (pp. 159 – 160). In particular, sport research on self-regulation has focused on the influential role of emotions as well as athletes' ability to control these feeling states for performance (Hanin, 2000a; Jones, 2003; Robazza, 2006). A case has been made, however, for broadening the regulation research lens to encompass multiple components of individuals' psychobiosocial (PBS) state assumed relevant to task execution (Hanin & Stambulova, 2002). In exploring this wider perspective on athlete regulation, the current thesis has pulled from Hanin's (2000a) Individual Zone of Optimal Functioning (IZOF) model. Although theoretical and empirical advancements of the IZOF model have recently been examined (e.g., Hanin, 2007, 2010), little has been done to investigate the efficacy of the model when applied in real world contexts. It is important for applied sport psychology to demonstrate the effectiveness of its procedures and methods (Strean & Roberts, 1992). Thus the present thesis aimed to explore the usefulness of the IZOF model as a guiding framework in applied settings for enhancing athlete regulation of PBS states for performance. In so doing, a collection of studies that examine the development, delivery, and evaluation of IZOF based regulation programs were presented.

Study one entailed a practitioner-focused action research examination of working within an IZOF framework for the development of an athlete's skills in emotion regulation. The study offered insight into one consultant's approach when adopting the practical tools of the IZOF model, and how these tools can inform applied practice. In examining the forms of subjective emotions in conjunction with athletes' physiological symptoms, this study recommended extending the IZOF profiling process to include the cognitive component of the PBS state. Following these proposals, study two presented a multiple case study of an IZOF based multi-form intervention that encompassed emotion, physiological, and cognitive components of performance experience. Qualitative and quantitative data offer partial support

for intervention effectiveness across cases. Athletes' qualitative performance experiences enhanced from pre to during intervention, however no change was indicated in opt-zone proximity (and nonopt-zone disparity) or performance.

In study three, an in-depth qualitative examination of athletes' experience of IZOF based interventions suggested further salient outcomes in addition to performance are worthy of further investigation when determining intervention impact. Specifically, the relevance of considering indicators of well-being emerged from study three. This finding is consistent with models of applied practice that espouse interventions should not only be concerned with performance enhancement but also contribute to athletes' overall welfare (Vealey, 2007). However, the examination of correlates of athlete well-being and/or ill-being in the applied sport psychology literate remains scant. Study four consequently sought to fill a gap in the literature by examining the most frequently adopted psychological techniques and skills with indicators of well-being and ill-being. Athletes who frequently employed multimodal psychological skills and techniques were found to experience higher levels of athlete engagement and lower athlete burnout than individuals who used these skills and techniques less often.

In light of the present thesis' focus on "real world" applied settings, a fifth study took an important step in deliberating the potential threats to the psychometric properties of self-report measures of psychological skill and technique use when administered in these contexts. Several suggestions have been put forward to protect the reliability and validity of such measures to aid the collection of quality data upon which inferences are made and theories hang on. Furthermore, maintaining the construct validity of questionnaires through careful administration will provide more telling evidence regarding intervention effectiveness; in particular, the processes impacting intervention outcomes (e.g., psychological technique use).

By focusing on the applied process as a whole (from needs analysis to program evaluation), one of the challenges of the current thesis was to do justice to the potential

research avenues that emerged from each study. Across the four studies support has been garnered for applied processes in the design, delivery, and evaluation of an IZOF based intervention (see Figure 6.1). This concluding chapter aims to bring together and extend these applied practice themes. These include consultant considerations for whom adopting the IZOF model would be most appropriate for, as well as suggestions for intervention needs analysis, goals, content, and outcomes. Within each of these areas, conceptual and methodological issues that could not be fully addressed within the scope of the current thesis are highlighted to inform future research endeavours.

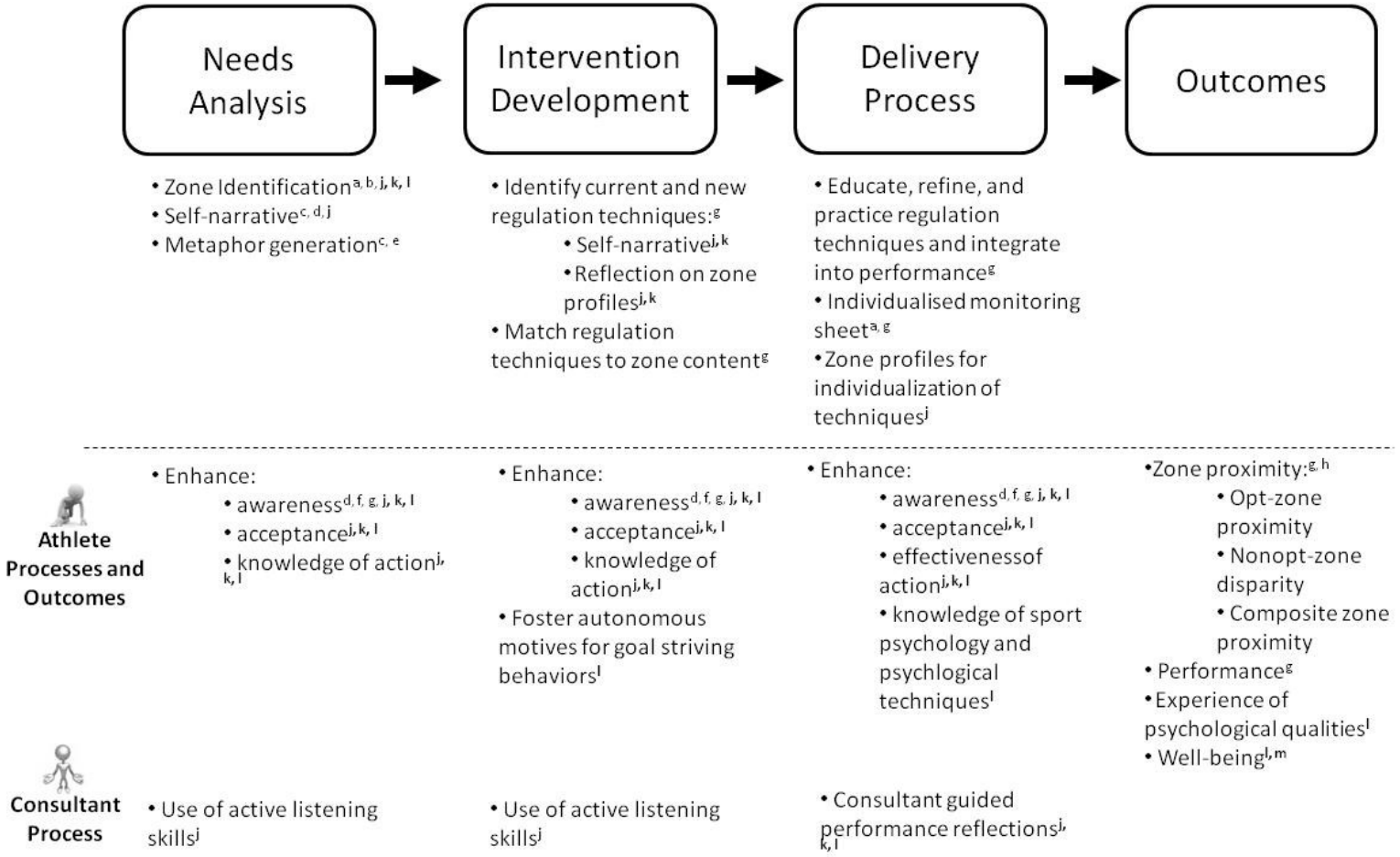


Figure 6.1. Visual representation of applied IZOF processes including findings and recommendations from current thesis

Note: Bold letters highlight studies contained within the current thesis.
[a]Hanin (2000c). [b]Bortoli & Robazza (2002). [c]Hanin (2003). [d]Nieuwenhuys et al. (2008). [e]Hanin & Stambulova (2002). [f]Harmison (2006). [g]Robazza, Pellizzari, & Hanin (2003). [h]Robazza, Bortoli, & Nougier (2000). [i]Grounded in an eclectic cognitive behavioral and humanistic person-centered approach to professional practice. [j]Study one. [k]Study two. [l]Study three. [m]Study four.

Consultants' Professional Philosophy and IZOF Based Interventions

A novel perspective to IZOF interventions within the current thesis is the consideration given to the consultant's role. A consultant's professional philosophy is the foundation of applied practice and influences the content, process, and effectiveness of sport psychology services (Pocwardowski, Sherman, & Ravizza, 2004). Before the applied implications of the current thesis are discussed, it is important to first confirm the philosophy that guided design and delivery of the intervention programs presented in study one, two, and three.

The professional philosophy of the consultant was introduced in study one. Specifically, the consultant adopted an eclectic approach combining cognitive behavioral and person centered theories. These are presented within a hierarchical structure of professional philosophy to illustrate how the present practitioner's core beliefs and values relate to the IZOF model as implemented, intervention goals, and employed techniques (Pocwardowski et al., 2004; see Figure 6.2).

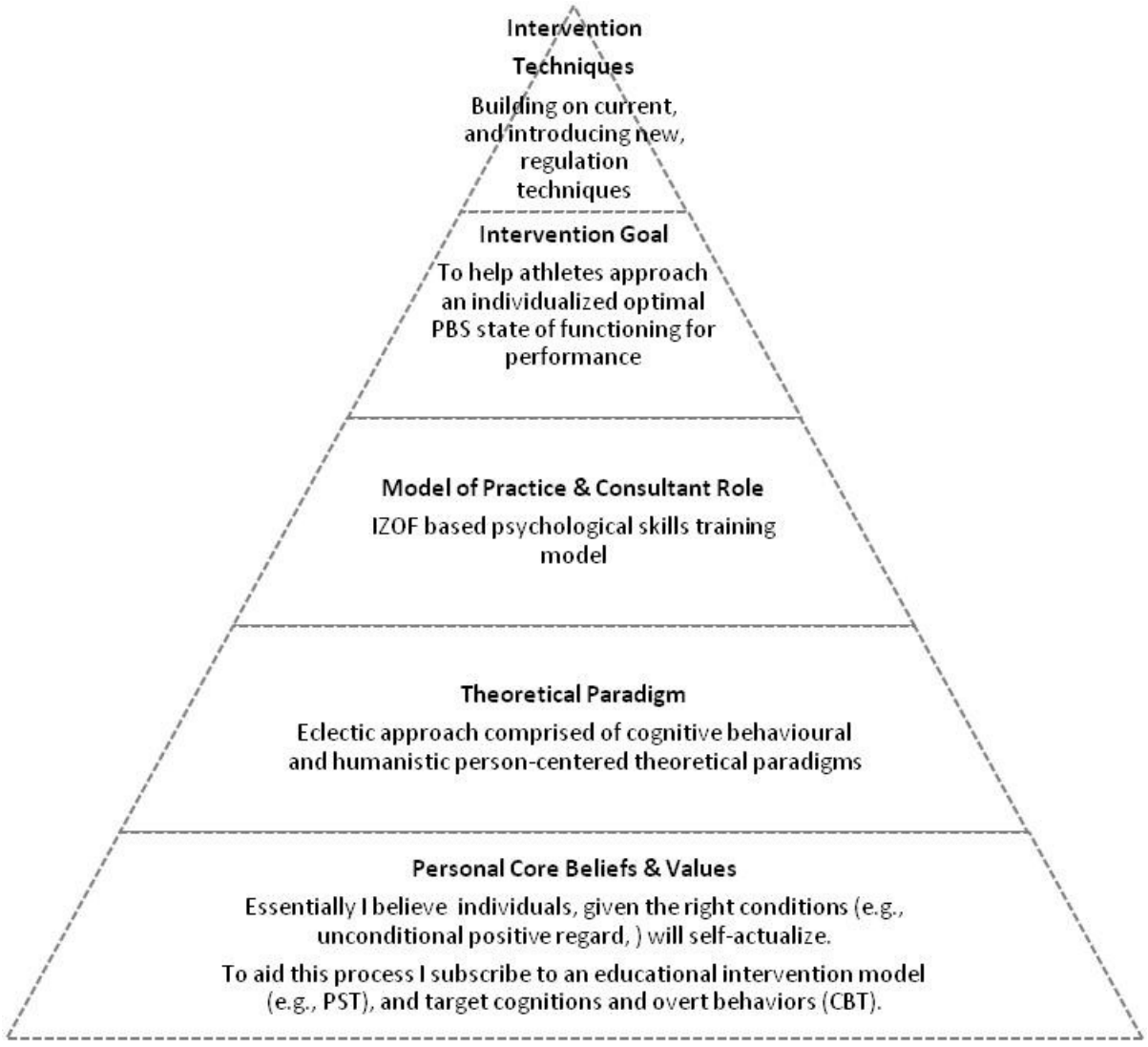


Figure 6.2. Consultant hierarchical structure of professional philosophy adopted for the IZOF intervention programs presented in the current thesis (adapted from Pocwardoski et al., 2004).

IZOF Based Needs Analysis: Understanding Individual Experience

The IZOF model lends itself well to a consultant who subscribes to a person centered approach. Consulting from this perspective, practitioners assume that every athlete is unique and experiences the world in an individual way (Pocwadowski et al., 2004). The IZOF model holds a similar assumption. Specifically, within this model, individual sport experiences are assumed to be subjectively perceived based on previous situations and expectations of future success (Hanin, 2007). Thus it is important for a consultant to gain an understanding of an individual's experience before intervention development and delivery.

This pre-intervention phase is often referred to as a needs analysis. Practitioners have noted the strengths of obtaining athletes' views in performance experiences during this assessment process (Butler & Hardy, 1992). Moreover, this process often involves athlete introspection which, in turn, is thought to contribute to greater self awareness (Morin, 1993); an attribute considered to be fundamental for applied practice (Ravizza, 2006; Vealey, 1988). This type of idiographic assessment is at the heart of the IZOF model (Hanin, 2000a). Consultant reflections and athlete reports offer further support for the validity of these methods in contributing to athlete awareness (see study one).

The development of athlete awareness is assumed pivotal to fostering athlete commitment to change and engagement in applied programs (Ravizza, 2006). Indeed, theories of self-regulation stress the important role awareness has in motivating self-evaluation and subsequent self-regulation towards desired standards or goals (Scheier & Carver, 1988). In contrast to this view, Hardy and colleagues (2009) found enhancing athlete awareness of the frequency and content of negative self-talk had no effect on their desire to change these cognitions. Results from the present thesis may help explain their unexpected finding. Regulation programs in study one, two, and three aimed to not only enhance athlete awareness of the content of performance experiences, but also the functional impact these states have on performance. These studies suggest that helping athletes bring these meta-experiences of awareness *and* acceptance to the forefront of consciousness is pivotal in fostering a commitment to change and subsequent engagement in an applied program. In study two, for example, participants' awareness of experiences and belief of the debilitative impact these states had on performance provided the impetus for these individuals to seek sport psychology support and commit to program participation.

In line with IZOF tenets, the development of athletes' meta-experiences is implicitly encouraged in all the IZOF idiographic assessment procedures (Hanin, 2000c, 2003, 2007; Hanin & Stambulova, 2002; Harmison, 2006; Robazza, Pellizzari, & Hanin, 2004). The

importance of a consultant's delivery style however when adopting a particular assessment method was highlighted in study one. Creating an effective working alliance, athletes' were encouraged to conduct honest self-reflections and be open in his or her disclosure of performance experiences. Specifically, the consultant used active listening skills to help the athlete "tell their story". Katz and Hemmings (2009) state active listening is a key skill practitioners continuously develop for nurturing an effective working alliance between themselves and the athlete client. From a person centered theory, active listening represents several techniques including expressing warmth, empathy, genuineness, and unconditional positive regard. Together these key counseling ingredients allow the athlete to feel safe and able to offer honest reflections of previous performance experiences. Such perceptions of a comfortable and friendly consultation environment were also reflected by athletes in study three. It has been argued that when a non-threatening consulting environment is created, within which athletes are at ease and feel able to be open and honest, individuals are more likely to identify a valid representation of PBS states. Thus development of rapport with a client should be an explicit and central consideration when performing idiographic assessment in applied research.

Are IZOF Interventions Limited to Elite Athletes?

Another consideration when exploring performance experiences is whether the athlete is competing at an elite or non-elite level within his or her sport. The IZOF model assumes that athletes develop patterns of experience over time. Hanin (2000b) suggests only elite athletes have the necessary performance history to be aware of such patterns for zone identification. Based on this assumption, IZOF investigations have been limited to an elite population. The current thesis extended the application of the model to a non-elite cohort. Following Hanin's (2003) profiling process, athletes who had one and two years competitive experience were able to identify personally meaningful individual zones of functioning that were perceived to relate to good and poor performances.

Although these are encouraging findings, further consideration of non-elite athletes' level of awareness of PBS states is warranted before recommendations can be made to extend the application of the IZOF model to this cohort. Study one highlighted the limited representation of global emotion categories in a non-elite athlete's zone profile. Further concerns were raised in study two relating to a non-elite athlete's difficulty when identifying a cognitive zone of functioning. IZOF assumptions would argue these findings reflect non-elite athletes' low levels of awareness for PBS states (Hanin, 2000a). An alternative explanation suggests these non-elite athlete zone profiles are a valid representation, and reflect a qualitative difference between elite and non-elite athletes (see study one).

Previous to the current thesis, only one study has considered elite and non-elite athletes' zone profiles. In contrast to study one, Robazza and Bortoli (2003) found non-elite athletes idiographic assessment revealed emotion and physiological symptom zone profiles to comprise of all four global content categories of P+, P-, N+, and N-. These inconsistent findings are tentatively compared as different definitions of "elite" seemed to have been employed. For example, Robazza and Bortoli's (2003) elite and non-elite groups differed on level of sporting ability (elite = International or National; non-elite = 2nd or 3rd Division). This is in contrast to the present thesis that defined "elite" by years of competitive experience at a representative level (e.g., regional, national, international). An argument may be put forward that Robbazza and Bortoli (2003) groups also differed in competitive experience (elite M = 13.7 years; non-elite M = 9.1 years). However, when elite participant groups from the wider IZOF literature is inspected, having 9.1 years of competitive experience sits within the elite range (see Table 6.1).

The definition of elite adopted by the current thesis is consistent with IZOF principles; if it is the repeated experience at a representative competitive level (e.g., regional, international, international) that contributes to the formation of patterns over time. Thus, it follows that length of participation (e.g., years), in a given context (e.g., competition), at a

given level of ability would form contributing factors to developing a greater awareness of PBS states. Although the current thesis suggests less experienced athletes may benefit from IZOF interventions, there exists within the IZOF literature to clearly define what is meant by the term elite to understand by what factors an athlete is assumed as having the necessary level of awareness for valid zone identification. Clear conceptualization of elite and non-elite athletes will also allow for consistent cross-study comparisons to be made between these two groups of PBS states, meta-experiences, and responses to regulation programs.

Table 6.1

Demographic Description of Elite Participant Groups in Previous IZOF Research

Research	*N*	Sport	Age (*M* years)	Competitive Experience (*M* years)	Highest Reported Competitive Level
Hanin & Syrjä (1995)	46	Ice hockey	16.3	6.9	National
Hanin & Syrjä (1996)	17	Soccer	20.6	13.2	International
Robazza, Bortoli, Nocini, Moser, & Arslan (2000)	63	Soccer	24.3	12.4	Semi-professional
	61	Volleyball	25.6		
Robazza, Bortoli, & Nougier (2000)	1	Archery	22.0	9.0	International
Hanin & Stambulova (2002)	85	Range	20.3	9.4	International, National, Local
Robazza & Bortoli (2003)	184	Range	23.8	13.7	International, National
Ruiz & Hanin (2003)	63	Karate	14.7[c]	8.2[c]	International, National
			17.6[c]	10.2[c]	
			19.7[c]	13.5[c]	
Robazza, Pellizzari, & Hanin (2004)	4	Roller hockey	20-19[a]	9-20[ab]	National
	4	Gymnastics	17-22[a]		
Robazza, Bortoli, & Hanin (2004)	10	Karate	20.9	18.0	International, National
Robazza, Bortoli, & Hanin (2006)	23	Figure skating	20.7	13.7	International, National
	12	Gymnastics			
Nieuwenhuys, Hanin, & Bakker (2008)	1	Sailing	23.0	14.0	International
Robazza, Pellizzari, Bertollo, & Hanin (2008)	56	Swimming Track & Field	21.9	8.0	National
Nieuwenhuys, Vos, Pijpstra, & Bakker (2011)	10	Range	30.6	11.0	International
Pellizzarri, Bertollo, & Robazza (2011)	10	Gymnastics	17.5	7.6	National, Regional
Ruiz & Hanin (2011)	20	Karate	24.95	16.65	International

Note. [a] Only a range of years was reported in the original publication. [b] Range of years for all participants in the study. [c] Participant age and years of competitive experience reported in three groups.

Focusing in on Areas for Regulation: Time and Form of the Psychobiosocial (PBS) State

During an IZOF based needs analysis (whether that be with an elite or non-elite athlete), specific areas for regulation may be identified. Study one highlighted the PBS state dimensions of time (e.g., pre, during, post competition) and form (e.g., emotive, physiological, cognitive). Based on athlete reflections of previous performance experiences, and guided by empirical evidence from relevant literature, study one examined PBS states *during* competitive events. Athlete identification of these individualized experiences across multiple form modalities offers preliminary support for extending the IZOF model to *during event* zones (see study one and two). Essentially an assessment tool that captures a cross-sectional picture, the current thesis emphasizes caution is warranted when using Hanin's (2000c) profiling process to describe these during event experiences.

According to the IZOF model's multi-stage principle, the content and intensity of optimal and nonoptimal PBS states change over time (Hanin, 2000b). By adopting Hanin's (2000c) profiling process to identify during event zones, the present thesis essentially created cross-sectional representations. In study one, for example, zone profiles were considered for the first kilometer of a cross-country race. This athlete's PBS state for the remaining four to seven kilometers was not targeted or measured in the intervention. In study two, athletes reported a more general during performance state, reflecting on the whole tennis match or golf round. Capturing performance experiences using this method means moment-to-moment fluctuations in PBS states experienced across the duration of a competition were not captured in the current thesis.

Zone profiles are thus considered to be limited in representing valid during event experiences. Pragmatically, it is difficult to envisage how the dynamics of experience can be reliably captured through Hanin's (2000c) profiling process. Alternative methods of idiographic assessment will need to be embraced by researchers if the understanding of the temporal dynamics of performance states is to be advanced. In this regard, Strean and Roberts

(1992) note that "applied researchers will not be able to afford the luxury of neatness over knowledge" (p. 62). Nieuwenhuys and colleagues (2008, 2011) present one promising example of how fluctuating performance states may be examined through the application of composite sequence analysis to athletes' recalled experiences. In study one, other potential methods have been recommended (such as diary studies) that could benefit exploration of the temporal dimension of PBS states.

The present thesis also offered initial support for profiling a cognitive modality relating to performance. With the aim of focusing on emotions, previous studies have found other form modalities emerge when assessing performance experiences. These modalities include motivational, cognitive, physiological, and communicative components (Hanin & Stambulova, 2002; Robazza, Pellizzari, & Hanin, 2004; Ruiz & Hanin, 2003). Study one offers further support that multiple forms should be considered as indicators of competitive performance. For example, in this study when providing a self-narrative description of performance states, an athlete highlighted the critical role of cognitions. Idiographic assessment of a cognitive zone of functioning was extended in study two and three. The identification of individualized profiles offers initial support for extending the IZOF model to incorporate this form modality.

Although a tentative first step has been taken in the current thesis, future research needs to be conducted to further understand the interaction of cognitions with other components of athletes' PBS state and the subsequent impact on performance. Before this promising avenue of research can be pursued however, cognitions need to be carefully operationalized for idiographic assessment. Study one and two illustrated athlete generated cognitive descriptors included both regulation techniques such as self-talk (e.g., "6km is a long way") and psychological qualities (e.g., appropriate focus of attention). In line with previous conceptualizing of the cognitive modality, it seems appropriate for future studies to only include the latter facet and include descriptor words such as "focused", "convinced", and

"resolute" (Bortoli, Bertollo, & Robazza, 2009). In this regard, there is much need for the development of a cognitive descriptor list to help guide consultants and athletes during idiographic assessment (see study one and two). Following these improvements in the conceptualization and operationalization of the cognitive component, research may begin in examining zone-performance relationships for this important modality.

Establishing IZOF Intervention Goals

Idiographic IZOF assessment procedures provide a foundation for identifying intervention goals. Study one offered an example of Hanin's (2000c) profiling process and suggested the recall method to be an effective means for identifying key areas to target regulation efforts. Furthermore, study three indicated that this process, accompanied by consultant guided reflections, allowed athletes to "discover" key components of performance experiences and prioritize these for change. This finding is in line with principles of Cognitive Behavioral Therapy that asserts the client-consultant working alliance should be collaborative, where the practitioner helps the athlete identify his or her own solutions (Katz & Hemmings, 2009; Petitpas et al., 1999).

The present thesis suggests the collaborative establishment of intervention goals between client and consultant provides athletes with a sense of autonomy (see study three). Idiographic IZOF assessment allows athletes to describe individual experiences in his or her own words and form the basis from which intervention goals are identified. According to Sheldon and Elliot's (1999) Self-Concordance Model, perceiving ownership over goals set is likely to lead to autonomous motives for goal striving behaviors. These behaviors are typified by sustained effort (e.g., commitment to the regulation program), which in turn is more likely to lead to goal attainment (e.g., desired program outcomes).

Enhancing Regulation Techniques: Athlete Ownership over Technique Use

In the present thesis, all athlete goals stemmed from idiographic assessments of good and poor performances. Thus, all goals related to enhancing optimal zone proximity through

the increase, decrease, and maintenance of PBS state components. Several cognitive-behavioral techniques have been proposed to aid the control of the modalities of emotions, physiological symptoms, and cognitions (e.g., Jones, 2003; Robazza, Pellizzari, & Hanin, 2004; Zinsser et al., 2006). The most cited techniques include goal setting, imagery, relaxation, and self-talk; all of which featured in one or more of the intervention programs in the current thesis.

Consistent with previous IZOF based intervention studies, programs in the present thesis were designed to identify and enhance athletes' current regulation techniques (Robazza, Pellizzari, & Hanin, 2004). Indeed, descriptions of technique use, in the absence of any formal education in psychological skills, suggest athletes develop a certain level of ability for regulating performance states through natural learning experiences (Calmels et al., 2003; Hanton & Jones, 1999a). A consultant who helps athletes identify strengths in these implicitly developed techniques, in turn will likely foster athletes' sense of competence in psychological skills training processes.

Emphasis was also given to athlete self-generated content during the delivery of the IZOF programs. Previous psychological skills training programs have also prioritized athlete involvement when identifying technique content. For example, gymnasium triathletes identified positive self-statements perceived to be helpful for use pre or during competition (Thelwell & Greenlees, 2001). In a mental toughness program with Australian footballers, Gucciardi and colleagues (1999) also emphasized athlete personal cues, phrases, or images for use to enhance motivation, concentration, and emotional intelligence.

Athlete generated content may also contribute to technique effectiveness. Lang's (1979) bio-informational theory of emotional imagery stresses that response and meaning propositions must be relevant to the individual (see study one). Furthermore, Ahsen's (1984) triple code model of imagery holds meaning at its core. That is, assumed within this model, two athletes could image the same scenario but subscribe completely different meanings to

the situation. Hardy (2006) argues a similar theoretical position may be held relating to the functional impact of self-talk. Thus, an imagery script or self-talk phrase generated by a consultant for enhancing confidence may be interpreted differently by an athlete. As a result, this technique is unlikely to have the desired effect.

Study one demonstrated how the content and intensity of descriptors identified during Hanin's (2000c) idiographic zone profiling process can aid the development of individualized and meaningful content for techniques. Opt-zone profiles are based on athletes' best ever performances and highlight the content and intensity of components contributing to optimal performance states. Athletes (and consultants) can draw from zone elements to provide personally meaningful content for self-talk and imagery. Such individualization of techniques was a key feature of all the IZOF programs. Qualitative reports support the efficacy of using IZOF zone descriptors for the development of technique content that is most relevant to individual athletes (see study three).

Evaluating IZOF Intervention Outcomes

Enhancing zone proximity and performance. Corroboration was sought in the present thesis for the effectiveness of IZOF based interventions. Specifically, the efficacy of such an approach for helping athletes adjust multi-form PBS states towards an optimal zone of functioning for performance was determined (Robazza, Pellizzari, & Hanin, 2004). In line with the in/out zone-performance principle, any changes observed in the intended direction should be accompanied by performance improvements.

Participant reports, following a 5-week regulation program, suggest athletes experienced more optimal states for performance post-intervention. Although these qualitative reports offered a compelling case for program effectiveness, these findings were only partially supported by quantitative measures of zone proximity (see study two). These conflicting findings paint an unclear picture for the efficacy of IZOF regulation programs. Although quantitative data can sometimes be viewed as providing stronger evidence for a particular

finding, the qualitative support for intervention effectiveness should not however be discounted. Martindale and Collins (2007) emphasize athletes' subjective reflections provide vital insight into whether improvements have been made (or not) following an intervention, and should be a central feature of program evaluation. The limited quantitative evidence obtained in study two may be in part explained by intervention length. Athletes in study three expressed a desire to continue the program following its completion; suggesting further improvements to zone proximity and performance could have been made – perhaps to a level detectable by quantitative means? It is also worth noting that failure to replicate previous findings in hypothesized changes in enhancing opt-zone proximity and performance may have been due to the employment of Fisher and colleagues (2003) conservative dual criteria (CDC) in study two. Previous IZOF intervention research inferred change by comparing mean values at a descriptive statistic level (Robazza, Pellizzari, & Hanin, 2004). If CDC had been adopted in this previous IZOF intervention study for examining change over time, equally conservative inferences are likely to have ensued.

From technique use to assessing meta-experiences. Changes in athletes increase opt-zone proximity during an intervention designed to enhance such optimal states, is often related to psychological techniques included in an applied program. This is often determined by changes in athlete use of goal setting, self-talk, imagery, and relaxation from pre- to post-intervention (Cohen et al., 2006). However, a number of concerns have been raised when assessing frequency of technique use in applied research settings (see study two and five). The issues raised challenge future applied researchers to carefully consider the process of administrating self-report questionnaires to determine development of psychological techniques.

Athlete reported employment of techniques does not directly translate as an ability to regulate an optimal zone of functioning (see study two). During competition, athletes have been shown to employ techniques during competitions that have resulted in good and poor

performances (Nieuwenhuys et al., 2011). The difference between achieving an optimal state, and realizing related performance benefits, may depend on the effectiveness of technique use rather than its employment alone. For example, Nieuwenhuys and colleagues (2008) illustrated an athlete's use of self-talk was unsuccessful when considered inappropriate for the situational demands a race presented. Thus it is important to assess not only if athletes use regulation techniques, but whether these individuals implement techniques in a way that contributes to approaching an optimal state in the context at hand, and therefore, being potentially beneficial for performance.

Enhancing athlete well-being. It is worthy to note that an interesting investigatory thread emerging from the present thesis pertained to the enhancement of well-being as a result of athlete involvement in IZOF regulation programs (see study three and four). The next challenge for researchers is to determine what factors are driving these observed changes in athletes' self-reported well-being. Study four took an initial step in contributing towards this relatively new area of research. Nevertheless, several possible explanations are briefly discussed below in the hope of stimulating further investigation regarding the implications of IZOF interventions for athletes' psychological and emotional welfare.

As suggested in studies two, three, and four, athletes perceived themselves to be more self-determined in their actions and behaviors during competition following the IZOF intervention. When self-determined, athletes perceive behaviors to be volitional, internally endorsed, and engaged in through choice rather than coercion. These are the hallmarks of intrinsic motivation as explained by self-determination theory (SDT; Deci & Ryan, 1985). This is in contrast to extrinsic motivation where behaviors are externally regulated by consequences such as a monetary prize, endorsement from a significant other or internalized contingencies (Deci & Ryan, 2000). As an indicator of and contributor to optimal functioning, a plethora of research has shown self-determination to be associated with quality of sport experience and ability to function optimally in a given context (Alvarez et al., 2009).

A social cognitive theory, SDT considers the potential influence of the environment and the person on perceptions of motivation regulations (Deci & Ryan, 1985). In the present thesis, it is unclear to what extent these two sources impacted athletes' reasons for engagement. Study one and three highlighted the autonomy supportive role the consultant adopted (e.g., environmental source) in influencing athletes' intrinsic motivation regulations. However, through IZOF intervention processes of enhancing self-awareness, self-monitoring using individualized zone profiles as a point of reference, and effective employment of regulation techniques, athletes are likely to have gained a greater sense of control over performance processes to complete a given task. Such personally controllable and self-referenced approaches to performance also reflect the internally driven hallmarks of intrinsic motivation (Duda et al., 2005). This inference is further supported by findings from study four, in which regulation technique use was found to be positively associated with associates of athlete well-being.

At this juncture these are speculative inferences, and further research is required to understand the motivational processes involved that lead to athletes' enhanced psychological well-being following an IZOF intervention program. In an overview of psychological skills training, motivation, and self-regulation, Duda and colleagues (2005) summarize an integrative model for the examination of these relationships. Future research examining this model will help to explain the processes of change when athletes learn to approach and regulate optimal states for performance.

Limitations of the Current Thesis

A number of limitations have been discussed within each chapter. At this point, however, it is prudent to highlight more general limitations pertaining to the thesis.

Real World Setting of the Present Research

"Non-blind" participants. The longitudinal intervention studies contained in the current thesis were set in ecologically valid settings. Participants in studies one, two, and three, pro-actively sought psychological support in the hope of enhancing performance-related psychological factors. Although reflective of real world settings, this may invite some unwanted bias in a research context.

Intervention length. To enable comparisons between athletes, the IZOF program was kept consistent to a specified length of 5-weeks (see study two and three). Athletes viewed the regulation program to have exceeded expectations (see study three). During the course of the applied experience, athletes seem to have re-assessed their own goals for the intervention, and several participants indicated a desire to continue the applied work (see study three). This finding may be viewed positively, seemingly reflecting a high level of athlete engagement in and enjoyment of the program. Nonetheless this response raises some ethical questions. If athletes perceive a need to continue applied work, is it ethically questionable to withdraw service provision in order to adhere to a study protocol?

Outside of a research setting and given the presence of sufficient time and financial resources, these athlete-consultant collaborations are likely to have continued until the former feels empowered to *self*-regulate in the absence of a consultant's support. Although in the current research context athletes were made aware of the research boundaries from the outset (including length of service provision offered), it presents an ethical dilemma that deserves further consideration when conducting applied research. In such work, it seems appropriate that attention be given to the provision or referral processes for participants to continue to receive applied support if they want to.

Consultant expertise. As is the case with any applied research, intervention effectiveness is moderated by the expertise of and approach taken by the consultant delivering the program. For this reason, the current thesis has made the consultant's level of competence, academic background, and professional philosophy transparent to the reader (see study one and current chapter). Thus the present findings should only be interpreted in light of these consultant attributes. It may be athletes' experiences and outcomes of the same intervention would be different if delivered by a less or more experienced practitioner, or by the same consultant adopting an alternative approach to professional practice.

Validity of Idiographic Assessment

The idiographic approach reflected in the IZOF model has been favored by practitioners over nomothetic approaches that can be misleading when used at an individual level (Hanin & Syrjä, 1995; Hanin, 2000a; Harmison, 2006). Adopting an idiographic approach can involve the development of individualized measures such as zone profiles (see study one and two). Thus it is important that the developed zone profiles offer a valid and reliable reflection of an individual's performance experience. When using the recall method, Hanin (2000b) recommends zones are confirmed over three to five competitions[7]. Repeated assessments of zone content and intensity will help refine profile descriptions and ensure a valid representation of performance experience is identified. Although a formal validation process was not included in the present thesis, all athletes were given the opportunity to alter his or her zone profiles (see study two). Nevertheless, a standardized validation process is recommended in future research. This may be particularly relevant for non-elite athletes whose level of awareness of PBS states is assumed to be lower than that of their elite counterparts.

Constrained to Emotions, Physiological Symptoms, and Cognitions within a PBS State

[7] Validation processes should be done for the specific context a zone was identified for (i.e., competition or practice). Competition is assumed to be the situational context.

In the present thesis, only three of a potential eight PBS form modalities were considered. Although the inclusion of emotions, physiological symptoms, and cognitions mark a novel contribution to the current IZOF literature, Hanin (2000c) encourages consultants to identify and work with the modalities most salient to an individual. An example of this process was highlighted in study one, where consultant reflections suggested cognitions were a salient modality for the athlete in question. In seeking to provide further support to study one, it was pre-determined however that athletes' emotions, physiological symptoms, and cognitions would form the needs analysis and intervention foundation in study two and three. Being constrained to these three forms may have limited the intervention content and/or meant that the areas addressed were not the most important modality for those particular athletes.

Future Research Directions

Throughout the studies contained within the current thesis, future research directions have been put forward including the importance of validating the IZOF model for understanding non-elite athlete experiences, the need to focus on meta-experiences pre, during, and post interventions, and the relevance of adopting alternative methodologies for examining the temporal dynamics of performance experiences. Moreover, the further examination of indicators of well-being (and perhaps also ill-being) as outcome measures of IZOF programs was advocated. Two further and potentially fruitful areas to pursue are considered in this last chapter of the thesis.

PBS State Experiences

Future research should seek to include salient descriptors from all eight PBS state modalities. When multiple forms are considered together, the influence on performance is stronger than a single modality (Robazza, Pellizzarri, & Hanin, 2004). Nevertheless IZOF research has been limited to considering two or three modalities at any one time (see study one and two). Examining a more complete PBS state will shed further light on the PBS state-

performance relationship. Indeed, Hanin and Stambulova (2002) suggest a shift is required "from emotions to performance related states" (p. 411).

Bortoli and Robazza (2007) proposed a 14-item list of descriptors for this purpose (Bortoli, Bertollo, Comani, & Robazza, 2011). Unfortunately limitations of this self-report inventory require consideration before research is progressed in this area. Although items are reported in English language journals, the descriptor list was developed and validated in Italian (Bortoli & Robazza, 2007). Thus cross-cultural validation would be required before administration to English speaking athletes. Furthermore, the researcher-generated measure advocated by Bortoli and Robazza (2007) departs from the idiographic approach of former IZOF research. Previous group-generated scales have been criticized for omitting individually salient descriptors, and the validity of PBS states represented by a nomothetically-derived measure may be questioned (Hanin, 2000b).

PBS Trait-Like Experiences

Consistent with previous IZOF intervention research, the current thesis focused on athletes' situational experiences (Robazza, Pellizzari, & Hanin, 2004). More recently, Hanin (2007) also identified trait-like experiences of relatively stable patterns that reflect the repetitive nature of sport activity. Exploring how often patterns of experience occur offers further insight into an athlete's history, and is an important consideration when describing performance events (Nieuwenhuys et al., 2008). If trait-like experiences tend to be debilitative, then these would present a potential barrier to athletes in approaching optimal zones of functioning (Hanin, 2010). Future research should therefore distinguish between state and trait-like experiences to examine whether athletes high or low in debilitative trait experiences differ in levels of ease in approaching optimal zones.

Thesis Summary and Concluding Remarks

The aim of the present thesis was to make a meaningful contribution to the IZOF literature in applied research settings. In meeting this overarching purpose, a series of longitudinal IZOF based regulation intervention studies have been presented. In general, drawing from consultant professional practice reflections and athlete experiences of the IZOF program, the current thesis offers support for the effectiveness of multi-form IZOF interventions. Emerging from the evaluation of these applied studies, several avenues for future research have been highlighted. A first step was taken down one promising avenue relating to the potential relationship between psychological skills, regulation techniques, and associates of athlete well-being and ill-being. Finally, challenges of conducting research in applied settings have been highlighted with specific consideration given to the administration of group based self-report measures of psychological technique and skill use.

The present discussion pulled together the studies contained within the thesis and offered insights into how the IZOF model can inform multiple areas of intervention development, delivery, and evaluation. However, these applied implications should be considered in the context of the thesis' limitations and constraints. In so doing, the reader is encouraged to remain open to less conventional approaches to data collection and analysis (e.g., composite sequence analysis) as we move forward in understanding idiographic performance experiences (see study two; Strean & Roberts, 1992).

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Appendices[8]

Appendix A

Study 1

[8] A contents table is given for each study to list relevant documents. Bold table entries indicate a new document. Some documents were used in multiple studies. Where duplications occur across studies, the duplicate document is listed in the contents but not in bold.

Three-Step Back Translation of Bortoli and Robazza's (2002) Physiological Symptom Descriptor List from Italian to English (Duda & Hayashi, 1998)

Step 1
(Bilingual)

Italian to English

(i.e., this step needs to be done by a bilingual Italian and English speaker. The person's native tongue ***does not*** have to be Italian or English)

Below is a list of approximately 45 words/phrases that offer a description of how an athlete's body may feel just prior to, or during, competitions.

Please read each word, and type an English word or phrase that has an equivalent ***meaning*** (this may not always be a literal translation)***.***

If you have any questions please do not hesitate to email Charlotte Woodcock <cjw787@bham.ac.uk>

- Thank you –

Risposte Somatiche Associate alle Emozioni

Italian[9]	**English**
Tensione muscolare	Muscular tension
Assenza di sete	A lack of thirst
Bocca asciutta	Dry mouth
Muscolatura delle braccia rilassata	Relaxed arm muscles
Elevata frequenza cardiac	Elevated heart rate
Bisogno di andare in bagno	A need to go to the bathroom
Mani fredde	Cold hands
Movimenti decisi	Decisive movements
Insensibilità al freddo	Insensitivity to the cold
Tensione ai muscoli delle braccia	Tension in the arm muscles
Gambe molli	Weak legs
Tensione ai muscoli dorsali	Tension of the back muscles
Mani contratte	Clenched hands, contracted hands
Astenia	Physical weakness, lack of strength
Muscolatura rilassata	Relaxed muscles
Muscoli del volto contratti	Contracted facial muscles
Tensione ai muscoli delle spalle	Tension in the shoulder muscles
Mancanza di controllo espressione del volto	Lack of facial muscles control

[9] Original Italian bodily symptom descriptor words obtained from Robazza (personal communication; Bortoli & Robazza, 2002)

Italian[9]	English
Movimenti energici	Energetic movements
Percezione battito cardiac	To feel or hear ones own heart rate
Mani sudate	Sweaty hands
Tensione ai muscoli del collo	Tension in the neck
Bruciore agli occhi	Burning sensation of the eyes
Mani sudate e fredde	Sweaty,cold hands
Emicrania	Migraine
Movimenti fluidi	Fluid, loose movements
Sentirsi freschi (non sudati)	Feeling refreshed, but without sweat
Tensione ai muscoli delle gambe	Tension in the leg muscles
Movimenti rigidi	Rigid, tight movements
Sete	Thirst
Stanchezza fisica	Physical fatigue
Ritmo regolare del respiro	A regular breathing rhythm
Piedi freddi	Cold feet
Senso di fame	A feeling of hunger
Ritmo cardiaco irregolare	Irregular heart beat
Sensazione diffusa di freddo	Cold sensation
Sbadigli	Yawning
Ritmo irregolare del respiro	Irregular breathing rhythm
Sudorazione	Sweating
Tensione allo stomaco	Stomach cramps
Tic nervosi	Nervous tick
Ritmo cardiaco regolare	Regular heart beat
Dolore alla schiena	Back pain
Movimenti lenti	Slow movements
Muscolatura del volto rilassata	Relaxed facial muscles

Step 2: English to Italian

(Bilingual)

(i.e., this step needs to be done by a bilingual Italian and English speaker. The person's native tongue ***does not*** have to be Italian or English)

Below is a list of approximately 45 words/phrases that offer a description of how an athlete's body may feel just prior to, or during, competitions.
Please read each word, and type an Italian word or phrase that has an equivalent ***meaning*** (this may not always be a literal translation)**.**
If you have any questions please do not hesitate to email Charlotte Woodcock <cjw787@bham.ac.uk>

- Thank you –

English (from Step 1)	Italian A	Italian B
Somatic responses related to emotions	Risposte Somatiche Associate alle Emozioni	Riposte Somatiche Associate alle Emozioni
Muscular tension	Tensione muscolare	Tensione muscolare
A lack of thirst	Assenza di sete	Mancanza di sete
Dry mouth	Bocca asciutta	Bocca asciutta
Relaxed arm muscles	Muscolatura delle braccia rilassata	Muscoli delle braccia rilassate
Elevated heart rate	Elevata frequenza cardiac	Elevate battiti cardiaci
A need to go to the bathroom	Bisogno di andare in bagno	Bisogno di andare in bagno
Cold hands	Mani fredde	Mani fredde
Decisive movements	Movimenti decisi	Movimenti decisi
Insensitivity to the cold	Insensibilità al freddo	Insensibilita' al freddo
Tension in the arm muscles	Tensione ai muscoli delle braccia	Tensione dei muscoli delle braccia
Weak legs	Gambe molli	Gambe de boli
Tension of the back muscles	Tensione ai muscoli dorsali	Tensione dei muscoli dorsali
Clenched hands, contracted hands	Mani contratte	Mani contratte, mani contratte a pugno
Physical weakness, lack of strength	Astenia	Debolezza fiscia, Mancanza di forza
Relaxed muscles	Muscolatura rilassata	Muscoli rilassati
Contracted facial muscles	Muscoli del volto contratti	Stretto, tensione dei muscoli facciali
Tension in the shoulder muscles	Tensione ai muscoli delle spalle	Tensione dei muscoli delle spalle
Lack of facial muscles control	Mancanza di controllo	Mancanza delle espressioni

English (from Step 1)	Italian A	Italian B
	espressione del volto	facciali
Energetic movements	Movimenti energici	Movimenti energetic
To feel or hear ones own heart rate	Percezione battito cardiac	Sentire il proprio battito cardiaco
Sweaty hands	Mani sudate	Mani sudate
Tension in the neck	Tensione ai muscoli del collo	Tensione dei muscoli del collo
Burning sensation of the eyes	Bruciore agli occhi	Bruciore di occhi
Sweaty, cold hands	Mani sudate e fredde	Mani sudate e fredde
Migraine	Emicrania	Emicrania
Fluid, loose movements	Movimenti fluidi	Movimenti fluidi
Feeling refreshed, but without sweat	Sentirsi freschi (non sudati)	Sentirsi rinfrescate – senza sudore
Tension in the leg muscles	Tensione ai muscoli delle gambe	Tensione muscoli delle gambe
Rigid, tight movements	Movimenti rigidi	Movimenti rigidi
Thirst	Sete	Sete
Physical fatigue	Stanchezza fisica	Fatica fiscia
A regular breathing rhythm	Ritmo regolare del respiro	Regolare ritmo respiratorio
Cold feet	Piedi freddi	Piedi freddi
A feeling of hunger	Senso di fame	Sentirsi affamato
Irregular heart beat	Ritmo cardiaco irregolare	Irregolare battito cardiaco
Cold sensation	Sensazione diffusa di freddo	Sensazione di freddo
Yawning	Sbadigli	Sbadgliare
Irregular breathing rhythm	Ritmo irregolare del respiro	Irregolare rtimo respiratorio
Sweating	Sudorazione	Sudorazione
Stomach cramps	Tensione allo stomaco	Crampi allo stomaco
Nervous tick	Tic nervosi	Tick nervosa
Regular heart beat	Ritmo cardiaco regolare	Ritmo cardiaco regolare
Back pain	Dolore alla schiena	Mal di schiena
Slow movements	Movimenti lenti	Movimenti lenti
Relaxed facial muscles	Muscolatura del volto rilassata	Muscoli facciali rilassati

Step 3

Italian – Italian

Please read through and compare the two lists of words/phrases that describe how an athlete's body may feel prior to performance. Please highlight any words/phrases in list B that carry a different **MEANING** than the equivalent word/phrase in list A. Remember it is equivalence in meaning that is important, not equivalence in the words used. For any words that do carry a different meaning please attach a comment within, or write out in a separate document how the meaning is different.

- Thank you -

	Italian A (from Step 2)	**Italian B (from Step 2)**
	Risposte Somatiche Associate alle Emozioni	Riposte Somatiche Associate alle Emozioni
1	Tensione muscolare	Tensione muscolare
2[10]	Assenza di sete	Mancanza di sete
3	Bocca asciutta	Bocca asciutta
4	Muscolatura delle braccia rilassata	Muscoli delle braccia rilassate
5	Elevata frequenza cardiac	Elevate battiti cardiaci
6	Bisogno di andare in bagno	Bisogno di andare in bagno
7	Mani fredde	Mani fredde
8	Movimenti decisi	Movimenti decisi
9	Insensibilità al freddo	Insensibilita' al freddo
10	Tensione ai muscoli delle braccia	Tensione dei muscoli delle braccia
11	Gambe molli	Gambe deboli
12	Tensione ai muscoli dorsali	Tensione dei muscoli dorsali
13[11]	Mani contratte	Mani contratte, mani contratte a pugno
14	Astenia	Debolezza fiscia, Mancanza di forza
15	Muscolatura rilassata	Muscoli rilassati
16	Muscoli del volto contratti	~~Stretto~~, Tensione dei muscoli facciali
17	Tensione ai muscoli delle spalle	Tensione dei muscoli delle spalle
18	Mancanza di controllo espressione del volto	Mancanza delle espressioni facciali
19	Movimenti energici	Movimenti energetic
20	Percezione battito cardiac	Sentire il ~~proprio~~ battito cardiaco
21	Mani sudate	Mani sudate
22	Tensione ai muscoli del collo	Tensione dei muscoli del collo
23[12]	Bruciore agli occhi	Bruciore di occhi
24	Mani sudate e fredde	Mani sudate e fredde
25	Emicrania	Emicrania

[10] List A means to be without thirst whereas B means to have a lack of thirst. A maybe due to the fact that one has quenched thirst.

[11] List A just says contracted hands, list B suggests hands are clenched as fists.

[12] Mean the same, but depending on context the difference could be that one implies burning sensation in eye due to foreign object where as the other maybe due to tiredness

26	Movimenti fluidi	Movimenti fluidi
27[13]	Sentirsi freschi (non sudati)	Sentirsi rinfrescate – senza sudore
28	Tensione ai muscoli delle gambe	Tensione muscoli delle gambe
29	Movimenti rigidi	Movimenti rigidi
30	Sete	Sete
31	Stanchezza fisica	Fatica fiscia
32[14]	Ritmo regolare del respiro	Regolare ritmo respiratorio
33	Piedi freddi	Piedi freddi
34[15]	Senso di fame	Sentirsi affamato
35	Ritmo cardiaco irregolare	Irregolare battito cardiaco
36[16]	Sensazione diffusa di freddo	Sensazione di freddo
37	Sbadigli	Sbadgliare
38	Ritmo irregolare del respiro	Irregolare rtimo respiratorio
39	Sudorazione	Sudorazione
40[17]	Tensione allo stomaco	Crampi allo stomaco
41	Tic nervosi	Tick nervosa
42	Ritmo cardiaco regolare	Ritmo cardiaco regolare
43[18]	Dolore alla schiena	Mal di schiena
44	Movimenti lenti	Movimenti lenti
45	Muscolatura del volto rilassata	Muscoli facciali rilassati

[13] List A suggests that one feels fresh, without sweating but List B says that one has been refreshed, so maybe one could interrupt that List B has taken shower…
[14] Sentences mean the same but List B could also mean to regulate ones breathing rhythm
[15] List A suggests a FALSE feeling of hunger whereas List B suggests that one has TRUE hunger and requires food
[16] List A suggests an overall feeling of cold whereas List B it is only a sensation of cold
[17] This maybe the same as your example, tight and sore. Cramps can be painful but tight does not necessarily mean pain
[18] List A means pain n the back whereas List B is more of a general back ache/pain

BEST Ever Performance

Date of Birth: e.g., if you were born on 29th March 1993 then enter 29/03/93

D	**D**	**M**	**M**	**Y**	**Y**

Number of Siblings: e.g., if you have one brother then enter 1

Today's Date: 29/01/09

Step 1: Identify BEST EVER performance

Concentrate on your own **BEST** ever Start-Middle performance during a race. Try not to compare yourself with other athletes.

Please indicate the date, place, and results of your **BEST** ever performance:

Date:

D	**D**	**M**	**M**	**Y**	**Y**

Location: _____

Result: _____

e.g., position/time

Recalling your **BEST** ever performance clearly in your mind, *Please indicate how **well you feel you performed** by circling one number on each scale below.*

1 = worst ever performance, 10 = best ever performance, • = absolute best ever performance

	Worst									*Best Ever*	
Start	1	2	3	4	5	6	7	8	9	10	11
Overall Performance	1	2	3	4	5	6	7	8	9	10	11

Please provide any important details about this competition and your performance.

Step 2: Identify HELPFUL-Positive and HELPFUL-Negative Emotions

Please go over the list of HELPFUL-Positive (pleasant) and HELPFUL-Negative (unpleasant) emotions below, select from the list 5 (or less) words that best describe how you felt *during the first 1 km of* your **BEST** ever competition. Each line in the list consists of several synonyms (have a similar meaning); you may select only one word on the same (horizontal) line. Circle the word you select. If you do not find a word describing an emotion that is important to you, you may add your own word (or words) at the end of the list.

HELPFUL-POSITIVE-EMOTIONS (P+)

Active	Dynamic	Energetic	Vigorous	
Relaxed	Comfortable	Easy		
Calm	Peaceful	Unhurried	Quiet	
Cheerful	Merry	Happy		
Confident	Certain	Sure		
Delighted	Overjoyed	Exhilarated		
Determined	Set	Settled	Resolute	
Excited	Thrilled			
Brave	Bold	Daring	Dashing	
Glad	Pleased	Satisfied	Contended	
Inspired	Motivated	Stimulated		
Lighthearted	Carefree			
Nice	Pleasant	Agreeable		
Quick	Rapid	Fast	Alert	
Your own emotion:				
Your own emotion:				
Your own emotion:				

HELPFUL-NEGATIVE-EMOTIONS (N+)

Afraid	Fearful	Scared	Panicky	
Angry	Aggressive	Furious	Violent	
Annoyed	Irritated	Distressed		
Anxious	Apprehensive	Worried		
Concerned	Alarmed	Disturbed	Dissatisfied	
Discouraged	Dispirited	Depressed		
Doubtful	Uncertain	Indecisive	Irresolute	
Helpless	Unsafe	Insecure		
Inactive	Sluggish	Lazy		
Intense	Fierce			
Jittery	Nervous	Uneasy	Restless	
Sorry	Unhappy	Regretful	Sad	Cheerless
Tense	Strained	Tight	Rigid	
Tired	Weary	Exhausted	Worn out	
Your own emotion:				
Your own emotion:				

WORST Ever Performance

Step 3: Identify WORST EVER performance

Please indicate the date, place, and results of your **WORST** ever Start-Middle performance during a race:

Date:							**Location:**	
	D	**D**	**M**	**M**	**Y**	**Y**	**Result:**	

e.g., position/time

Recalling your **WORST** ever performance clearly in your mind, *Please indicate how **well you feel you performed** by circling one number on each scale below.*

1 = worst ever performance, 10 = best ever performance, • = absolute best ever performance

	Worst									*Best Ever*	
Start	1	2	3	4	5	6	7	8	9	10	11
Overall Performance	1	2	3	4	5	6	7	8	9	10	11

Please provide any important details about this competition and your performance of <critical event> during it.

Step 4: Identify UNHELPFUL-Positive and UNHELPFUL-Negative Emotions

Please go over the list of UNHELPFUL-Positive (pleasant) and UNHELPFUL-Negative (unpleasant) emotions below, select from the list 5 (or less) words that best describe how you felt *during the first 1 km of* your **WORST** ever competition. Each line in the list consists of several synonyms (have a similar meaning); you may select only one word on the same (horizontal) line. Circle the word you select. If you do not find a word describing an emotion that is important to you, you may add your own word (or words) at the end of the list.

HELPFUL-POSITIVE-EMOTIONS (P-)

Active	Dynamic	Energetic	Vigorous	
Relaxed	Comfortable	Easy		
Calm	Peaceful	Unhurried	Quiet	
Cheerful	Merry	Happy		
Confident	Certain	Sure		
Delighted	Overjoyed	Exhilarated		
Determined	Set	Settled	Resolute	
Excited	Thrilled			
Brave	Bold	Daring	Dashing	
Glad	Pleased	Satisfied	Contended	
Inspired	Motivated	Stimulated		
Lighthearted	Carefree			
Nice	Pleasant	Agreeable		
Quick	Rapid	Fast	Alert	
Your own emotion:				
Your own emotion:				
Your own emotion:				

HELPFUL-NEGATIVE-EMOTIONS (N-)

Afraid	Fearful	Scared	Panicky	
Angry	Aggressive	Furious	Violent	
Annoyed	Irritated	Distressed		
Anxious	Apprehensive	Worried		
Concerned	Alarmed	Disturbed	Dissatisfied	
Discouraged	Dispirited	Depressed		
Doubtful	Uncertain	Indecisive	Irresolute	
Helpless	Unsafe	Insecure		
Inactive	Sluggish	Lazy		
Intense	Fierce			
Jittery	Nervous	Uneasy	Restless	
Sorry	Unhappy	Regretful	Sad	Cheerless
Tense	Strained	Tight	Rigid	
Tired	Weary	Exhausted	Worn out	
Your own emotion:				
Your own emotion:				

Step 5: Describe emotion intensity in your BEST ever performance

Write below the words you chose and circled in Steps 2 and 3 in the spaces below. HELPFUL-POSITIVE-EMOTIONS are indicated by **P+**, HELPFUL-NEGATIVE-EMOTIONS are indicated by **N+,** UNHELPFUL-NEGATIVE-EMOTIONS are indicated by **N-,** and UNHELPFUL-POSITIVE-EMOTIONS are indicated by **P-**.

Now think about *the intensity of your emotions during the first 1 km of your **BEST** ever competitive performance that you identified* in Step 1. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity. This number should indicate the **MAGNITUDE** of the emotion you felt just *during the first 1 km of* this competition.

Intensity of emotions

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Step 6: Describe emotion intensity in your WORST ever performance

Write below the words you chose and circled in Steps 2 and 3 in the spaces below. HELPFUL-POSITIVE-EMOTIONS are indicated by **P+**, HELPFUL-NEGATIVE-EMOTIONS are indicated by **N+,** UNHELPFUL-NEGATIVE-EMOTIONS are indicated by **N-,** and UNHELPFUL-POSITIVE-EMOTIONS are indicated by **P-**.

Now think about *the intensity of your emotions during the first 1 km of your* ***WORST*** *ever competitive performance that you identified* in Step 1. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity. This number should indicate the **MAGNITUDE** of the emotion you felt *during the first 1 km of* this competition.

Intensity of emotions

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Step 7: Identify HELPFUL-Positive and HELPFUL-Negative Bodily Symptoms

Please go over the list of bodily symptoms below, select from the list 5 (or less) words that best describe how you felt *during the first 1 km of* your **BEST** ever competition. Circle the word you select. If you do not find a word describing a bodily symptom that is important to you, you may add your own word (or words) at the end of the list.

HELPFUL-POSITIVE-BODILY SYMPTOMS (P+)

Lack of thirst (not thirsty)

Relaxed arm muscles

Relaxed muscles

Energetic movements

Fluid, loose movements

Feeling refreshed

Regular breathing rhythm

Regular heart rate

Relaxed facial muscles

Your own bodily symptom: _____

Your own bodily symptom: _____

Your own bodily symptom: _____

HELPFUL-NEGATIVE-BODILY SYMPTOMS (N+)

Muscular tension

Dry mouth

Elevated heart rate

A need to go to the bathroom (toilet)

Cold hands

Insensitivity to the cold (don't feel the cold)

Tense arm muscles

Weak legs

Tense back muscles

Clenched hands

Lack of strength

Tense facial muscles

Tense shoulders

Lack of facial muscular control

Feel/hear heart rate

Sweaty hands

Tense neck

Tired eyes

Sweaty, cold hands

Migraine

Tense legs

Rigid, tight movements

Thirsty

Physical fatigue (physically tired)

Cold feet

Yawning

Hungry

Irregular breathing rhythm

Sweaty

Stomach cramps

Nervous tick

Back pain

Slow movements

Your own bodily symptom: _____

Your own bodily symptom: _____

Step 8: Identify UNHELPFUL-Positive and UNHELPFUL-Negative Bodily Symptoms

Please go over the list of UNHELPFUL-Positive (pleasant) and UNHELPFUL-Negative (unpleasant) bodily symptoms Please go over the list of bodily symptoms below, select from the list 5 (or less) words that best describe how you felt *during the first 1 km of* your **WORST** ever competition. Circle the word you select. If you do not find a word describing a bodily symptom that is important to you, you may add your own word (or words) at the end of the list.

UNHELPFUL-POSITIVE-BODILY SYMPTOMS (P-)

Lack of thirst (not thirsty)

Relaxed arm muscles

Decisive movements

Relaxed muscles

Energetic movements

Fluid, loose movements

Feeling refreshed

Regular breathing rhythm

Regular heart rate

Relaxed facial muscles

Your own bodily symptom: _____

Your own bodily symptom: _____

Your own bodily symptom: _____

UNHELPFUL-NEGATIVE-BODILY SYMPTOMS (N-)

Muscular tension

Dry mouth

Elevated heart rate

A need to go to the bathroom (toilet)

Cold hands

Insensitivity the cold (don't feel the cold)

Tense arm muscles

Weak legs

Tense back muscles

Clenched hands

Lack of strength

Tense facial muscles

Tense shoulders

Lack of facial muscular control

Feel/hear heart rate

Sweaty hands

Tense neck

Tired eyes

Sweaty hands

Migraine

Tense legs

Rigid, tight movements

Thirsty

Physical fatigue (physically tired)

Cold feet

Yawning

Hungry

Irregular breathing rhythm

Sweaty

Stomach cramps

Nervous tick

Back pain

Slow movements

Your own bodily symptom: _____

Your own bodily symptom: _____

Step 9: Describe bodily symptom intensity in your BEST ever performance

Write below the words you chose and circled in Steps 2 and 3 in the spaces below. HELPFUL-POSITIVE-BODILY SYMPTOMS are indicated by **P+**, HELPFUL-NEGATIVE-BODILY SYMPTOMS are indicated by **N+,** UNHELPFUL-NEGATIVE-BODILY SYMPTOMS are indicated by **N-,** and UNHELPFUL-POSITIVE-BODILY SYMPTOMS are indicated by **P-**.

Now think about *the intensity of your bodily symptoms during the first 1 km of your **BEST** ever competitive performance that you identified* in Step 1. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity. This number should indicate the **MAGNITUDE** of the bodily symptom you felt just *during the first 1 km of* this competition.

Intensity of bodily symptoms

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Step 10: Describe bodily symptom intensity in your WORST ever performance

Write below the words you chose and circled in Steps 2 and 3 in the spaces below. HELPFUL-POSITIVE-BODILY SYMPTOMS are indicated by **P+**, HELPFUL-NEGATIVE-BODILY SYMPTOMS are indicated by **N+,** UNHELPFUL-NEGATIVE-BODILY SYMPTOMS are indicated by **N-,** and UNHELPFUL-POSITIVE-BODILY SYMPTOMS are indicated by **P-**.

Now think about *the intensity of your bodily symptoms during the first 1 km of your **WORST** ever competitive performance that you identified* in Step 1. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity. This number should indicate the **MAGNITUDE** of the bodily symptom you felt *during the first 1 km of* this competition.

Intensity of bodily symptoms

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Step 11: Identify HELPFUL-Positive and HELPFUL-Negative Thoughts

Please list below all the thoughts (words, images, or short phrases) that go through your mind *during the first 1 km of* your **BEST** ever competition. Try to think of as many as possible. When you are happy with your list, please identify 5 (or less) positive thoughts that are HELPFUL (P+) and 5 (or less) negative words that are HELPFUL (N+).

Thoughts

Step 12: Identify UNHELPFUL-Positive and UNHELPFUL-Negative Thoughts

Please list below all the thoughts (words, images, or short phrases) that go through *during the first 1 km of* your **WORST** ever competition. Try to think of as many as possible. When you are happy with your list, please identify 5 (or less) positive thoughts that are UNHELPFUL (P-) and 5 (or less) negative words that are UNHELPFUL (N-).

Thoughts

Step 13: Describe thought intensity in your BEST ever performance

Write below the words you chose and circled in Steps 2 and 3 in the spaces below. HELPFUL-POSITIVE-THOUGHTS are indicated by **P+**, HELPFUL-NEGATIVE-THOUGHTS are indicated by **N+,** UNHELPFUL-NEGATIVE-THOUGHTS are indicated by **N-,** and UNHELPFUL-POSITIVE-THOUGHTS are indicated by **P-**.

Now think about *the intensity of your thoughts during the first 1 km of your **BEST** ever competitive performance that you identified* in Step 1. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity. This number should indicate the **MAGNITUDE** of the thoughts you felt *during the first 1 km of* this competition.

Intensity of thoughts

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Step 14: Describe thought intensity in your WORST ever performance

Write below the words you chose and circled in Steps 2 and 3 in the spaces below. HELPFUL-POSITIVE-THOUGHTS are indicated by **P+**, HELPFUL-NEGATIVE-THOUGHTS are indicated by **N+,** UNHELPFUL-NEGATIVE-THOUGHTS are indicated by **N-,** and UNHELPFUL-POSITIVE-THOUGHTS are indicated by **P-**.

Now think about *the intensity of your thoughts during the first 1 km of your* ***WORST*** *ever competitive performance that you identified* in Step 1. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity. This number should indicate the **MAGNITUDE** of the thoughts you felt *during the first 1 km of* this competition.

Intensity of thoughts

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(-)	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Anna's Idiographic Self-Monitoring Form

*Please indicate how **well you feel you performed** in the race by circling one number on each scale below.*

1 = worst ever performance, 10 = best ever performance, 11 = absolute best ever performance

	Worst										***Best Ever***
Overall Performance:	1	2	3	4	5	6	7	8	9	10	11

Performance Emotions

Please think about *the intensity of your emotions* experienced in the first kilometer of your race. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity.

		Intensity of emotions												
		Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	Comfortable	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Calm	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Confident	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Determined	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Motivated	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	Uncertain	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Apprehensive	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Dispirited	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Doubtful	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Scared	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Worn-out	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Performance Bodily Symptoms

Please think about *the intensity of the bodily symptoms you experienced* in the first kilometer of your race. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity.

		Intensity of bodily-symptoms												
		Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	Relaxed muscles	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Energetic movements	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Fluid movements	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Regular breathing	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(+)	Elevated heart rate	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Tense shoulders	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Rigid/tight movements	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Physical fatigue	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Irregular breathing	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Slow movements	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Performance Thoughts

Please think about *the intensity of your thoughts that went through your mind* in the first kilometer of your race. Please circle one number between 0 and 10 on the intensity scale below (0=nothing at all and 10=very, very, much). Circle 11 for maximal possible intensity.

		Intensity of thoughts												
		Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
P(+)	Catch the person in front	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Absence of thought	0	0.5	1	2	3	4	5	6	7	8	9	10	11
P(+)	Overall feeling of certainty	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	I can't do it	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	Everyone's better than me	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	6k is a long way	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	I'm unfit	0	0.5	1	2	3	4	5	6	7	8	9	10	11
N(-)	External worries	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Table 8.1
The themes, content, and purpose of Anna's emotion regulation program sessions.

Session	Theme	Content & Activities	Purpose
1	*Introductory session*	a. Reflect on Anna's best and worst performance experiences.	a. Increase Anna's awareness of her psychobiosocial performance states, with particular emphasis on subjective emotions and physiological symptoms.
2	*Zone identification*	a. Established the time (e.g., during the first 1 km of a race) and context (e.g., competition) of zones to be identified. b. Followed Hanin's (2000c) stepwise profiling process for subjective emotions and physiological symptoms.	a. Identify a salient phase of performance on which to focus the emotion regulation intervention. b. Identify opt-zone and nonopt-zone profiles during the first 1km of a cross-country race and enhance meta-experience of performance related subjective emotions and physiological symptoms.
3	*Zone identification*	a. Followed Hanin's (2000c) profiling process for cognitions.	a. Identify opt-zone and nonopt-zone profiles during the first 1km of a cross-country race and enhance meta-experience of performance related cognitions.
4	*Current emotion regulation techniques*	a. Reflect on Anna's best (i.e., optimal) and worst (i.e., nonoptimal) performance experiences to identify any emotion regulation techniques Anna currently uses. These included: goal setting and self-talk.	a. Identify emotion regulation techniques Anna currently employed, and accept the current effectiveness of these techniques.
5	*Introduction to*	a. Conduct introductory imagery activities	a. Introduce Anna to, and build feelings of

Session	Theme	Content & Activities	Purpose
	imagery	adapted from Vealey and Greenleaf (2006).	competence in, the emotion regulation technique of imagery.
6	*Refining goal setting*	a. Reviewed Anna's imagery practice, and developed a tailored imagery script incorporating opt-zone descriptor words and phrases. b. Created a race plan for competitions (e.g., goal setting).	a. To create a personally meaningful imagery script for Anna to experience and reinforce her opt-zone performance states in her mind. b. Identify performance and process goals for competitive races.
7	*Refining self-talk*	a. Reflected on Anna's practice of a tailored imagery script. b. Review and refine current use of self-talk during races.	a. To open a forum for discussion relating to Anna's imagery experiences (e.g., helpful/unhelpful, clear and vivid). b. To enhance Anna's awareness and acceptance of her cognitive processes during a race. Identify functionally beneficial cue words to aid achievement of process and performance goals.
8	*Review of the emotion regulation program*	a. Reflect on athletes' experiences of the emotion regulation program.	a. Review what Anna found most helpful during the program, and how she intended to continue to develop her skills in emotion regulation following the intervention and cessation of consultant support.

Template for Consultant Case Notes
(based on Boud's (2001) reflective learning model)

Participant number: Session number:

Date of Session: Session Theme:

Notes on Athlete's Performance Reflections Given During Session	Immediate Reflection (within 24 hours of session)	Delayed Reflection (within 1 – 7 days of session)

Semi-Structured Interview Guide

Section 1: Welcome (not recorded)

Welcome and thank you for agreeing to take part in this short discussion that will explore your experiences of the self-regulation program. What you discuss here today will contribute towards a research project and will therefore be audio recorded, however all responses are confidential. Please do not worry about what you think you should say, but what is your honest opinion.

Do you have any questions before we begin?

Section 2: Social Validation Questions (recorded)

(Adapted from recommendations made by Martin, Vause, & Schwartzman, 2005)

1. Could you talk me through what you learnt as a result of the sessions you had with Charlotte?
    a. Do you feel you are able to identify the emotions, bodily symptoms, and thoughts associated with your optimal and non-optimal performance states?
        i. How has your understanding of your performance state changed as a result of the program?

    b. What specific strategies or techniques from your sessions did you find most useful?
        i. How did you find these techniques useful/effective?
        ii. Could you give me an example of when you have employed a specific technique and how did it affect your performance?

    c. Thinking about the whole of your cross-country participation, what have you changed as a result of something learnt from the self-regulation program?

2. How effective did you find the work you conducted with Charlotte?

3. Was a target area, focussing on the first kilometer of your races, the most important area for you to be working on in terms of your cross-country performance?

4. Were the particular procedures used during the program acceptable to you?

5. Are you satisfied with the progress you have made with controlling your emotions, thoughts, and bodily symptoms during the first kilometer of your cross-country races?

6. Did the program contribute to your cross-country participation in any other way?

7. How effective did you find the supporting materials (e.g., print outs of graphs) provided in the program?

8. What would you change about the program?

Section 3: Closing Questions

Interviewer reflects back the answers given by the participant.

9. Is there anything you think we have missed and would like to add?

Thank you very much for you time to take part in this interview.

Appendix B

Study 2

Test of Performance Strategies
(TOPS; Thomas, Murphy, & Hardy, 1999)

Each of the following items describes a specific situation that you may encounter in your training and competition. Please rate how frequently these situations apply to you on the following scale:	Never	Rarely	Sometime	Often	Always
1. I set realistic but challenging goals for practice	1	2	3	4	5
2. I say things to myself to help my practice performance	1	2	3	4	5
3. During practice I visualize successful past performances	1	2	3	4	5
4. My attention wanders while I am training	1	2	3	4	5
5. I practise using relaxation techniques at workouts	1	2	3	4	5
6. I practise a way to relax	1	2	3	4	5
7. During competition I set specific result goals for myself	1	2	3	4	5
8. When pressure is on at competitions, I know how to relax	1	2	3	4	5
9. My self-talk during competition is negative	1	2	3	4	5
10. During practice, I don't think about performing much - I just let it happen	1	2	3	4	5
11. I perform at competitions without consciously thinking about it	1	2	3	4	5
12. I rehearse my performance in my mind before practice	1	2	3	4	5
13. I can raise my energy level at competitions when necessary	1	2	3	4	5
14. During competition I have thoughts of failure	1	2	3	4	5
15. I use practice time to work on my relaxation technique	1	2	3	4	5
16. I manage my self-talk effectively during practice	1	2	3	4	5
17. I am able to relax if I get too nervous at a competition	1	2	3	4	5
18. I visualize my competition going exactly the way I want	1	2	3	4	5
19. I am able to control distracting thoughts when I am training	1	2	3	4	5
20. I get frustrated and emotionally upset when practice does not go well	1	2	3	4	5
21. I have specific cuewords or phrases that I say to myself to help my performance during competition	1	2	3	4	5
22. I evaluate whether I achieve my competition goals	1	2	3	4	5
23. During practice, my movements and skills just seem to flow naturally from one to another	1	2	3	4	5
24. When I make a mistake in competition, I have trouble getting my concentration back on track	1	2	3	4	5
25. When I need to, I can relax myself at competitions to get ready to perform	1	2	3	4	5
26. I set very specific goals for competition	1	2	3	4	5
27. I relax myself at practice to get ready	1	2	3	4	5
28. I psych myself up at competitions to get ready to perform	1	2	3	4	5
29. At practice, I can allow the whole skill or movement to happen naturally without concentrating on each part of the skill	1	2	3	4	5
30. During competition I perform on 'automatic pilot'	1	2	3	4	5
31. When something upsets me during a competition, my performance suffers	1	2	3	4	5
32. I keep my thoughts positive during competitions	1	2	3	4	5
33. I say things to myself to help my competitive performance	1	2	3	4	5

Each of the following items describes a specific situation that you may encounter in your training and competition. Please rate how frequently these situations apply to you on the following scale:	Never	Rarely	Sometime	Often	Always
34. At competitions, I rehearse the feel of my performance in my imagination	1	2	3	4	5
35. I practise a way to energize myself	1	2	3	4	5
36. I manage my self-talk effectively during competition	1	2	3	4	5
37. I set goals to help me use practice time effectively	1	2	3	4	5
38. I have trouble energizing myself if I feel sluggish during practice	1	2	3	4	5
39. When things are going poorly in practice, I stay in control of myself emotionally	1	2	3	4	5
40. I do what needs to be done to get psyched up for competitions	1	2	3	4	5
41. During competition, I don't think about performing much - I just let it happen	1	2	3	4	5
42. At practice, when I visualize my performance, I imagine what it will feel like	1	2	3	4	5
43. I find it difficult to relax when I am too tense at competitions	1	2	3	4	5
44. I have difficulty increasing my energy level during workouts	1	2	3	4	5
45. During practice I focus my attention effectively	1	2	3	4	5
46. I set personal performance goals for a competition	1	2	3	4	5
47. I motivate myself to train through positive self-talk	1	2	3	4	5
48. During practice sessions I just seem to be in a flow	1	2	3	4	5
49. I practise energizing myself during training sessions	1	2	3	4	5
50. I have trouble maintaining my concentration during long practices	1	2	3	4	5
51. I talk positively to myself to get the most out of practice	1	2	3	4	5
52. I can increase my energy to just the right level for competitions	1	2	3	4	5
53. I have very specific goals for practice	1	2	3	4	5
54. During competition, I play/perform instinctively with little conscious effort	1	2	3	4	5
55. I imagine my competitive routine before I do it at a competition	1	2	3	4	5
56. I imagine screwing up during a competition	1	2	3	4	5
57. I talk positively to myself to get the most out of competitions	1	2	3	4	5
58. I don't set goals for practices, I just go out and do it	1	2	3	4	5
59. I rehearse my performance in my mind at competitions	1	2	3	4	5
60. I have trouble controlling my emotions when things are not going well at practice	1	2	3	4	5
61. When I perform poorly in practice I lose my focus	1	2	3	4	5
62. My emotions keep me from performing my best at competitions	1	2	3	4	5
63. My emotions get out of control under the pressure of competition	1	2	3	4	5
64. At practice, when I visualize my performance, I imagine watching myself as if on a video replay	1	2	3	4	5

Julia's Idiographic Self-Monitoring Form

Please indicate to what extent you **experienced** specific emotions, bodily feelings, and thoughts **during** the match played. Please circle one number for each item on the scale below between 0 and 10 (0=nothing at all and 10 = very, very, much). Circle 11 for maximal possible intensity.

Please complete AFTER each match you play *(no more than 45 minutes after competition)*

Intensity of **emotions**

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
Unhurried	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Determined	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Alert	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Anxious	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Fearful	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Apprehensive	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Tense	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Intensity of **bodily feelings**

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
Lack of thirst	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Relaxed muscles	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Fluid, lose movements	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Sweaty hands	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Thirsty	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Clenched hands	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Muscular tension	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Slow movements	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Tense shoulders	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Intensity of **thoughts**

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
Positive thinking	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Reminder of what to do	0	0.5	1	2	3	4	5	6	7	8	9	10	11
What next shot will be	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Focussing on "now"	0	0.5	1	2	3	4	5	6	7	8	9	10	11
What's the problem	0	0.5	1	2	3	4	5	6	7	8	9	10	11
New tactics to get back in control	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Visualise what dad would say	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Imagine what I look like playing and need to do	0	0.5	1	2	3	4	5	6	7	8	9	10	11

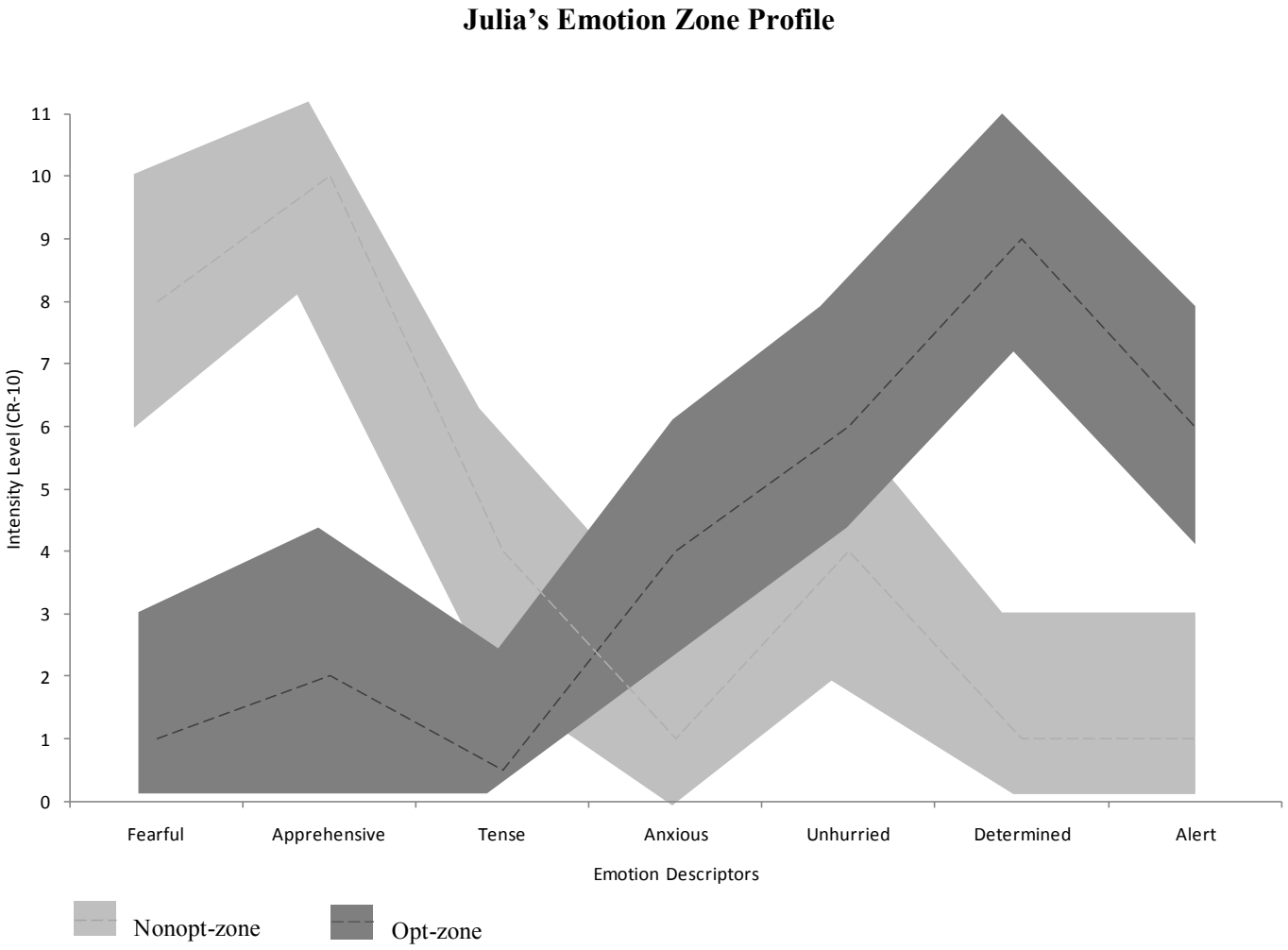

Figure 8.1. Visual representation of Julia's emotion opt-zone and nonopt-zone.

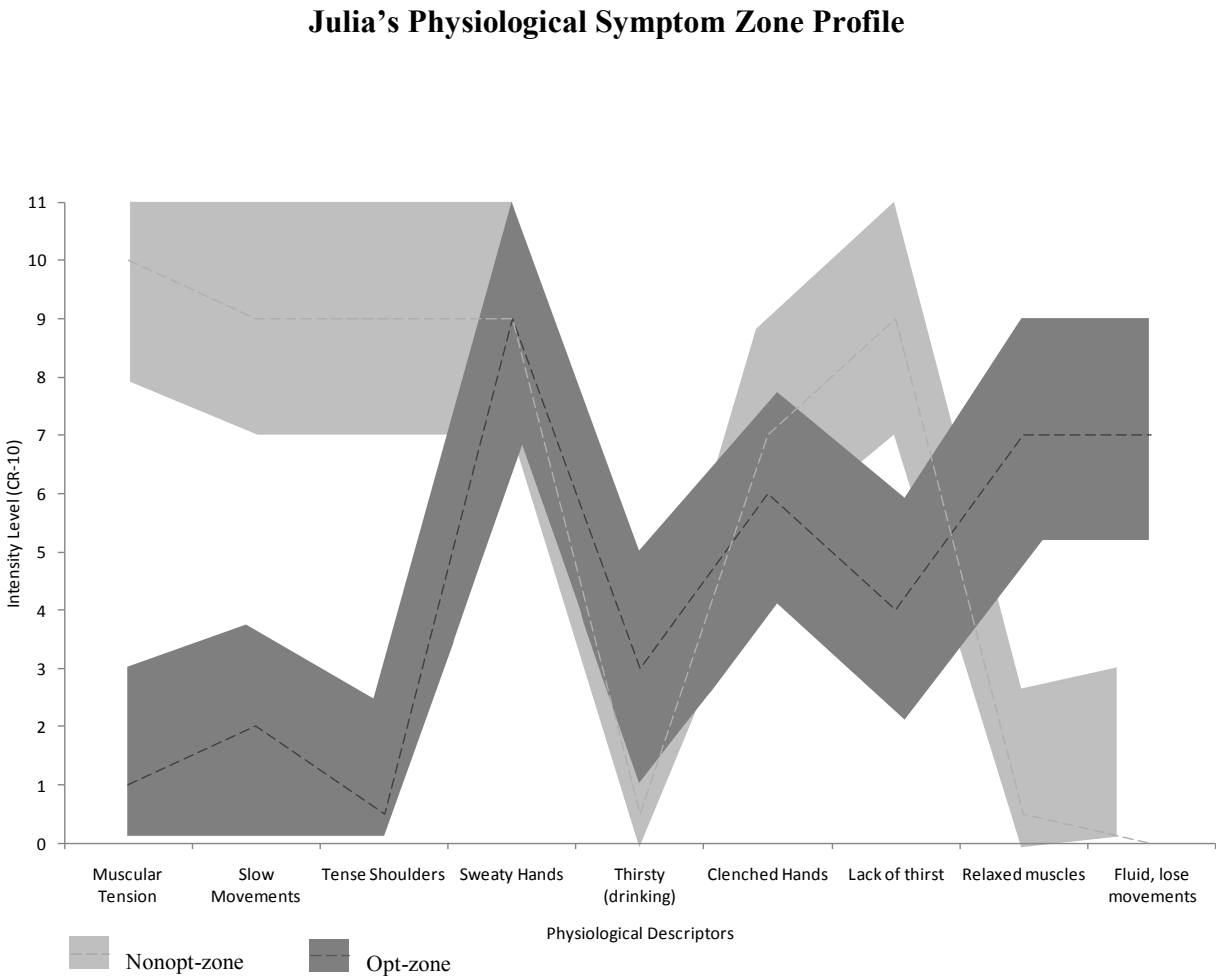

Figure 8.2. Visual representation of Julia's physiological symptom opt-zone and nonopt-zone.

Tony's Idiographic Self-Monitoring Form

Please indicate to what extent you ***experienced*** specific emotions, bodily feelings, and thoughts ***during*** the round ***between shots***. Please circle one number for each item on the scale below between 0 and 10 (0=nothing at all and 10 = very, very, much). Circle 11 for maximal possible intensity.

Please complete AFTER each match you play *(no more than 45 minutes after competition)*

Intensity of **emotions**

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
Unhappy	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Furious/Frustrated	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Discouraged	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Intense	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Jittery	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Determined	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Confident	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Excited	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Energetic (close to breaking pt)	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Concern over errors	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Intensity of **bodily feelings**

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
Physical fatigue	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Energised/activated muscles	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Feel/hear heart rate	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Fluid, loose movements	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Feeling refreshed	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Regular heart beat	0	0.5	1	2	3	4	5	6	7	8	9	10	11

Intensity of **thoughts**

	Nothing at all	*Very, very little*	*Very little*	*Little*	*Moderate*		*Much*		*Very much*			*Very, very much*	*Maximal possible*
Think of consequences	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Don't do this/that	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Let's go - win this!	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Come on - you can do it	0	0.5	1	2	3	4	5	6	7	8	9	10	11
I can hit this shot	0	0.5	1	2	3	4	5	6	7	8	9	10	11
Focus - stop being negative	0	0.5	1	2	3	4	5	6	7	8	9	10	11
You're better than that	0	0.5	1	2	3	4	5	6	7	8	9	10	11

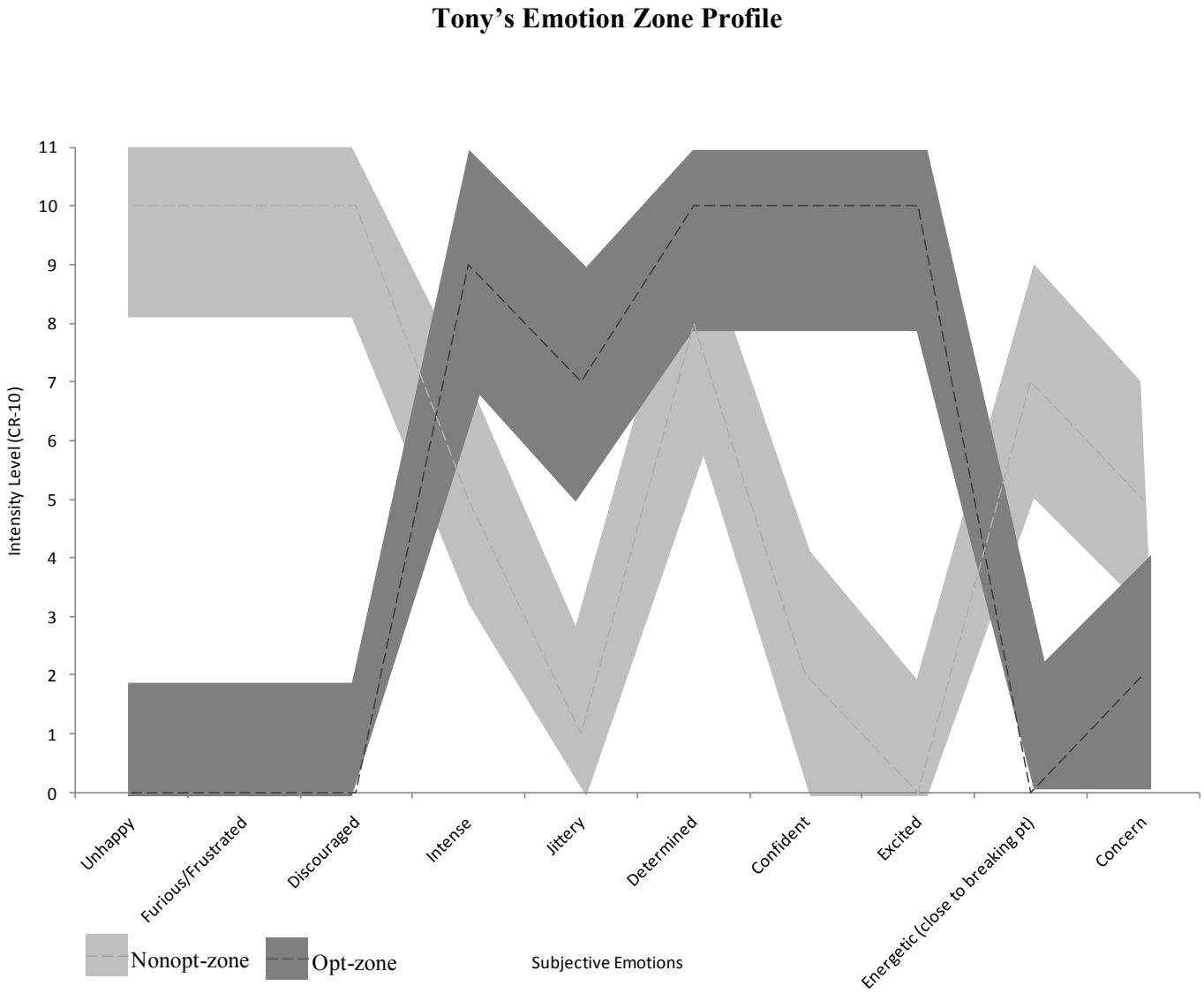

Figure 8.3. Visual representation of Tony's emotion opt-zone and nonopt-zone.

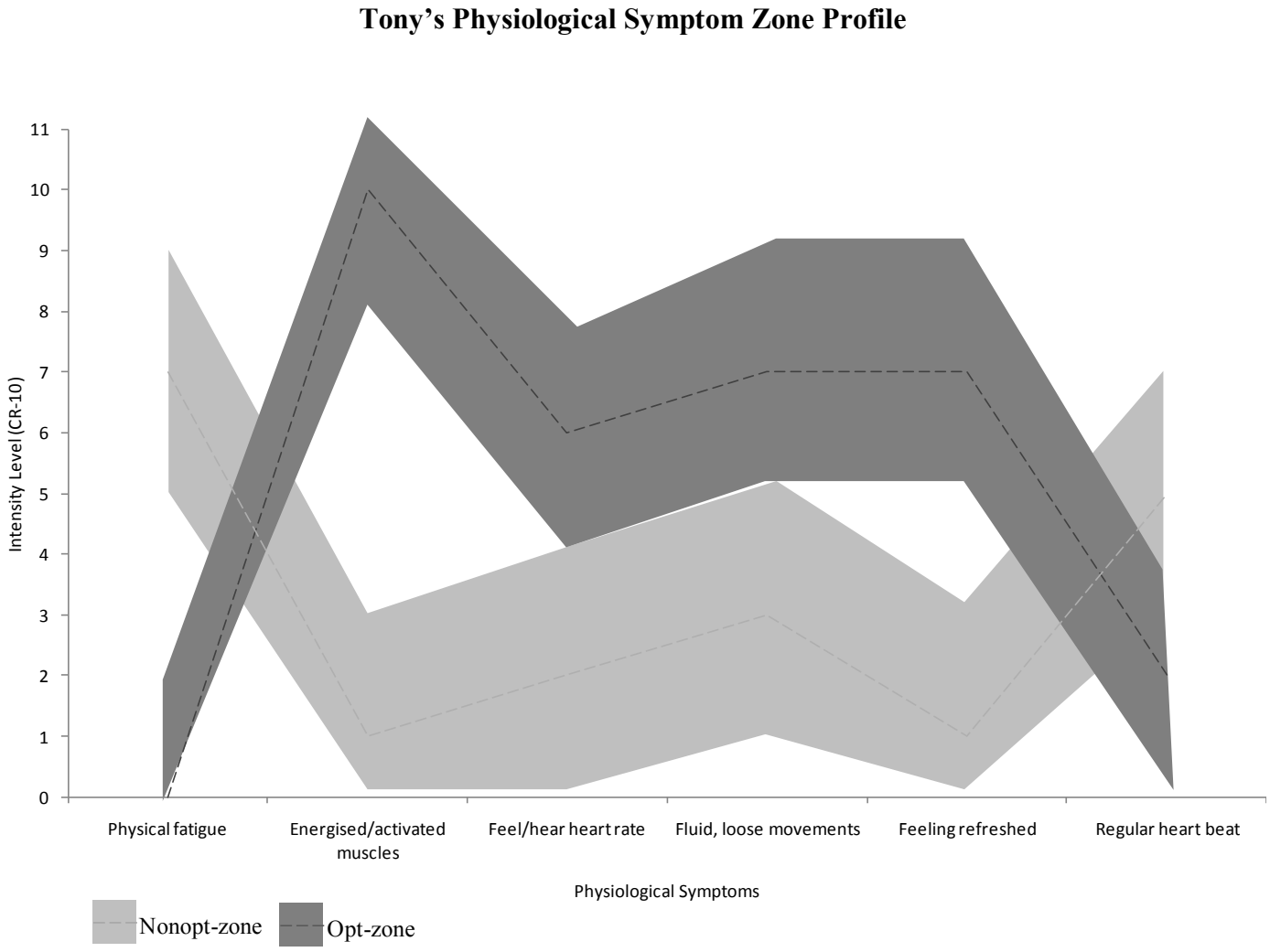

Figure 8.4. Visual representation of Tony's physiological symptom opt-zone and nonopt-zone.

Table 8.2

An Overview of Julia and Tony's Individualized 5-week Regulation Program

Session Theme	Session Activities	Julia, 14 years old, Tennis	Tony, 22 years old, Golf
1. *Regulation techniques I: Current regulation techniques*	**a. Reflect on recent performance experiences.**	a. Consultant guided reflections on recent performance experiences.	a. Consultant guided reflections on recent performance experiences.
	b. Review IZOF emotion, physiological symptom, and cognitive zone profiles.	b. See Figure 3.2 and Appendix B for zone profiles	b. See Figure 3.9 and Appendix B for zone profiles
	b. Identify current regulation techniques	c. Ability to focus of attention when not playing tennis	c. Pre-shot routines, imagery, self-talk
	d. Identify intervention goal	d. "To learn new skills or 'tricks' in areas in need of improvement"	d. "To reduce concern over mistakes"
2. *Regulation techniques II: Building on athletes' current and introducing new techniques*	**a. Reflect on recent performance experiences.**	a. Consultant guided reflections	a. Consultant guided reflections
	b. Build on and refine current regulation techniques	b. Introduce a brief centering exercise to help re-focus mind during competition and decrease intensity of frustration.	b. Reflect on current mental training activities (Selk, 1998).
	c. Introduce new regulation techniques	c. Develop effective employment of self-talk techniques adopting a good/bad coach metaphor (Zinsser, Bunker, & Williams, 2006). Introduce imagery through a familiarization exercise (Vealey & Greenleaf, 2006). Use imagery to re-experience recent performance. Practice using self-talk in image.	c. Introduce an end point to current process of post-shot evaluation. Set process goal for next competitive golf round.

Session Theme	Session Activities	Julia, 14 years old, Tennis	Tony, 22 years old, Golf
		Set process goal for next tennis game.	
3. *Regulation techniques III: Building on athletes' current and new techniques*	**a. Reflect on recent performance experiences, and effectiveness of techniques.**	a. Consultant guided reflections	a. Consultant guided reflections
	b. Build on and refine current and new regulation techniques	b. Practice centering exercise (introduced in session 2). Set process goal for next tennis game.	b. Develop imagery use to reinforce opt-zone thoughts and actions when in challenging situations. Explore self-talk to help decrease tension just before performing a shot (e.g., "smooth"). Set process goal for next tennis game (e.g., incorporate self-talk cue word into pre-shot routine).
4. *Regulation techniques IV: Refine regulation techniques*	**a. Reflect on recent performance experiences, and use and effectiveness of techniques**	a. Consultant guided reflections	a. Consultant guided reflections
	b. Build on and refine current techniques	b. Review and refine current use of self-talk (e.g., good/bad coach), and centering during matches	b. Review effectiveness of self-talk cue word.
5. *Review of the regulation program*	**a. Reflect on recent performance experiences, and use and effectiveness of techniques**	a. Consultant guided reflections	a. Consultant guided reflections
	b. **Review regulation program**	b. Review of the regulation program.	b. Review of the regulation program.

Semi-Structured Interview Guide for 5-Week IZOF Intervention Program

Section 1: Welcome (do not record)

Welcome and thank you for agreeing to take part in this short discussion that will explore your experiences of the golf psychology program. What you discuss here today will contribute towards a research project and will therefore be audio recorded, however all responses are confidential. What you say here today may be used in research publications, but anonymity will upheld through the use of pseudonyms to maintain anonymity.

During our discussion today, please do not worry about what you think you should say, but what is your honest opinion. There are no right or wrong answers; we want to know how you truly feel. You do not have to answer a question if you do not wish to, and you may terminate the interview at any point. If the meaning of any words is unfamiliar please do not hesitate to ask for clarification.

Do you have any questions before we begin?

Section 2: Intervention Evaluation Questions (record)[19]

(Adapted from recommendations made by Martin, Vause, & Schwartzman, 2005 and Anderson, Miles, Mahoney, & Robinson, 2002)

To begin our discussion I am going to ask a series of questions about your experience of the golf psychology sessions.

1. What were your expectations before you began the program?
   Probe: What did you hope to gain from the intervention sessions?

2. Before the sessions began, you identified three profiles relating to the emotions, bodily symptoms, and thoughts associated with good and poor performance.
   a. What emotions/thoughts/bodily feelings do you tend to experience when you play well?
   b. What emotions/thoughts/bodily feelings do you tend to experience when you tend not to play well?

3. Intervention goals were identified from your individual zone profiles. Your goal was: "*individual's goal/aim".* As a result, the sessions focussed mainly on this area.
   a. Was this an important area for you to focus on?
   b. Would you have preferred to have changed the focus of the sessions at any point?

[19] For Julia and Tony answers from questions 2, 4, 7, and 8 were analyzed in study two. The remaining questions were analyzed in study three.

4. Although the process of identifying these profiles was not one of your 5 applied sessions, do you think the identification of these profiles had an impact on you and your performance in any way?

   Prompt: Such as your awareness of how you feel during performance.

   [if any triple-A changes are offered]:

   Probe: How did it impact performance?

5. How do you think the profiles informed the intervention sessions?

   Prompt: Identifying an area to focus the sessions

   Prompt: To monitor progress over the course of the sessions

6. Over the course of the sessions did you notice your feelings or thoughts more or less than you had done previously?

   Probe: Can you give me an example of how it has changed?

7. How do you feel emotions, bodily feelings, and thoughts influence performance?

   Probe: What specific emotions, bodily feelings, and thoughts do you tend to experience when you play well?

   Probe: What specific emotions, bodily feelings, and thoughts do you tend to experience when you are playing not so well?

8. In what way has your experience of specific emotions, bodily feelings, and thoughts changed over the course of the intervention sessions?

9. Giving as much detail as possible, can you describe what progress you have made in being aware of and controlling your emotions, thoughts, and/or bodily feelings during competition?

10. What aspects of the sessions did you enjoy?

11. What aspects of the sessions did you find most useful?
    a. *Probe:* Was there a specific techniques (e.g., post-shot routine) that you found useful?
    b. Why did you find this/these useful/effective?
    c. Which techniques did you find less helpful? Can you explain to me why this was?
    d. Can you give me an example of when you have employed a specific technique and how it affected your performance?

       Probe: What did you do?
    e. If the program was to continue what would you like to develop further and why?

12. During the course of the program you were encouraged to practice techniques (e.g., post-shot routine) outside of the sessions.
    a. Were some techniques easier to practice than others?
    b. What techniques did you find yourself practicing and why?
    c. In what way did you find the handouts for your folder helpful, and why?

d. How often did you find yourself referring to handouts to aid the practice of new techniques?
e. What aspects of the training journal would you continue to use or keep?
f. What elements of the training journal would you change?

13. Thinking about the whole of your golf participation, what have you changed as a result of something learnt from the intervention program?
    Probe: Did the program contribute to your golf in any other way?
    Prompt: Enjoyment of competing/training
    Prompt: Reasons for participation

14. What aspects of the sessions do you feel were most valuable?
    a. What features of the consultant style did you like?
    b. Is there anything you would change in the way the sessions were delivered?

Section 3: Closing Questions

Interviewer reflects back the answers given by the participant.

15. Is there anything you think we have missed and would like to add?

Thank you very much for you time to take part in this interview.

Appendix C

Study 3

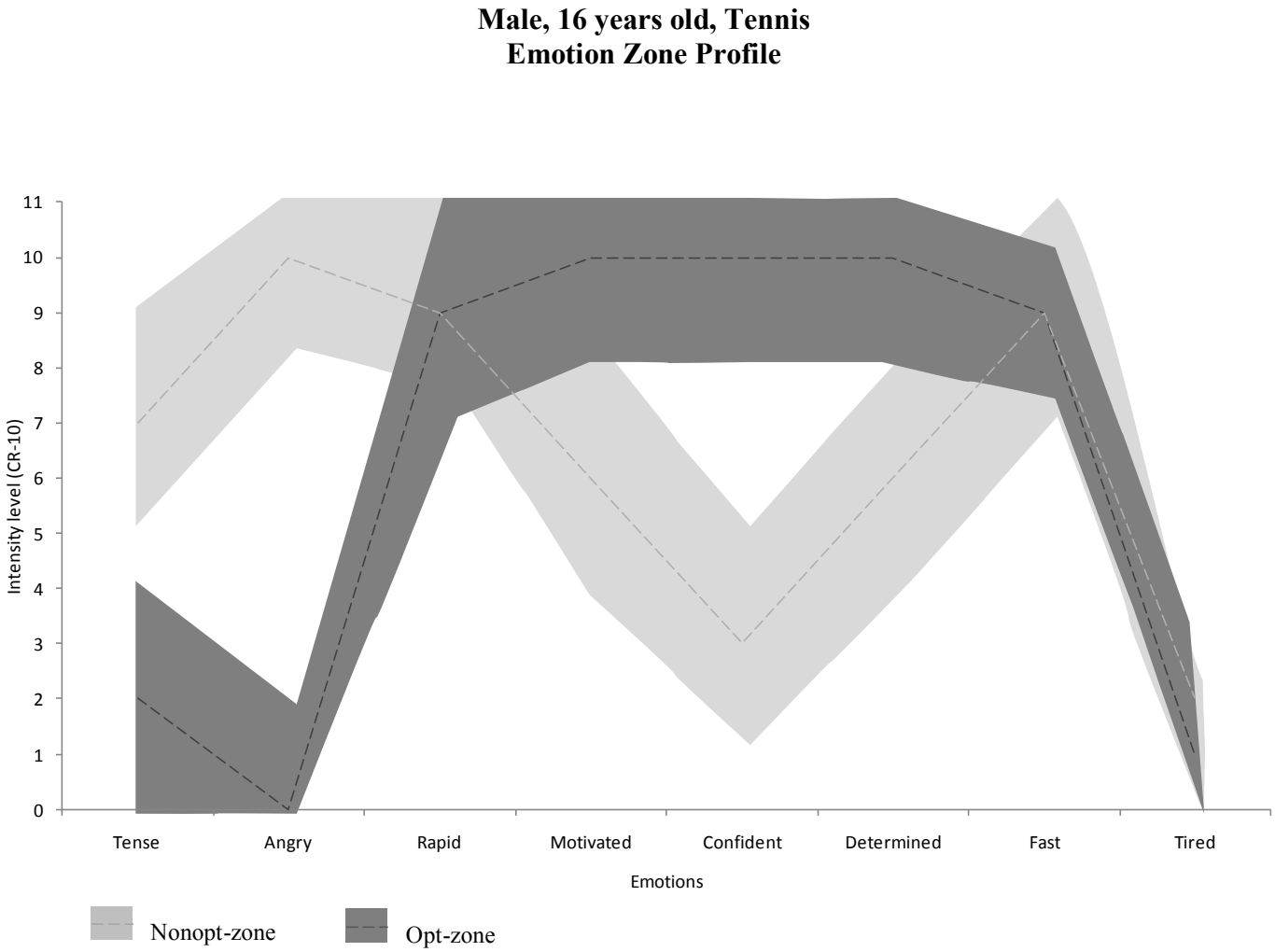

Figure 8.5. Visual representation of a male 16 year old tennis player's emotion opt-zone and nonopt-zone.

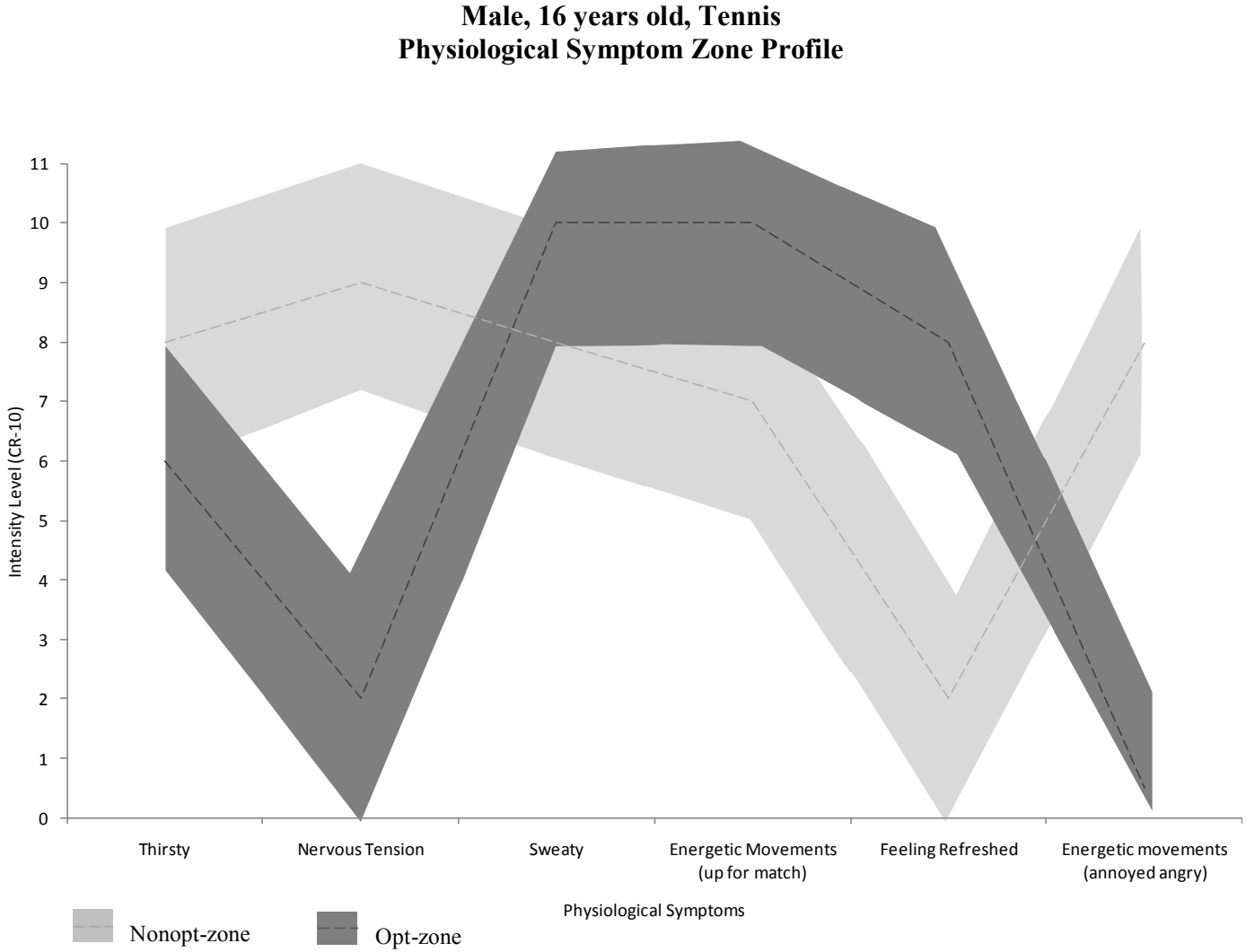

Figure 8.6. Visual representation of a male 16 year old tennis player's physiological symptom opt-zone and nonopt-zone.

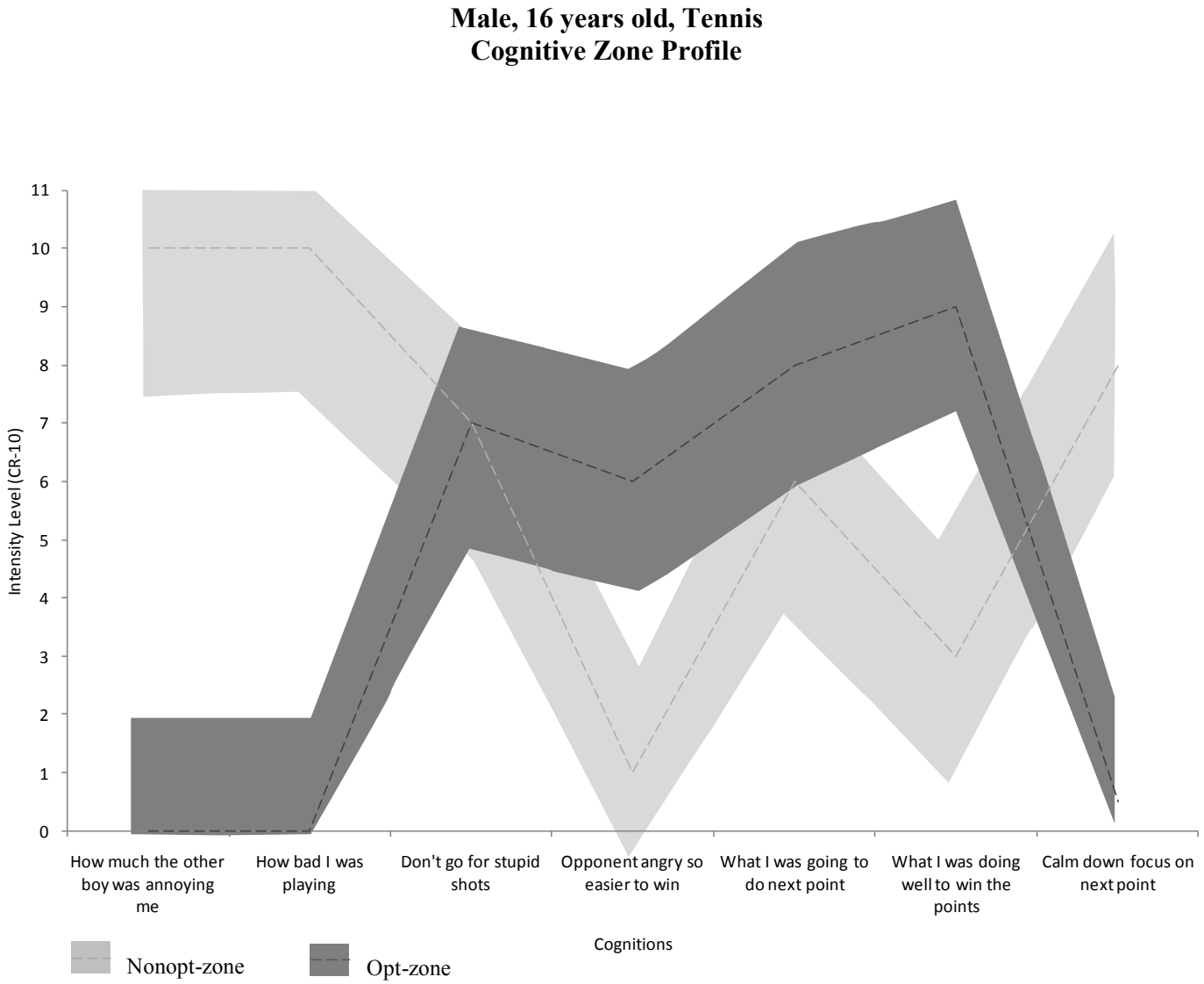

Figure 8.7. Visual representation of a male 16 year old tennis player's cognitions opt-zone and nonopt-zone.

Figure 8.8. Visual representation of a male 13 year old tennis player's emotion opt-zone and nonopt-zone.

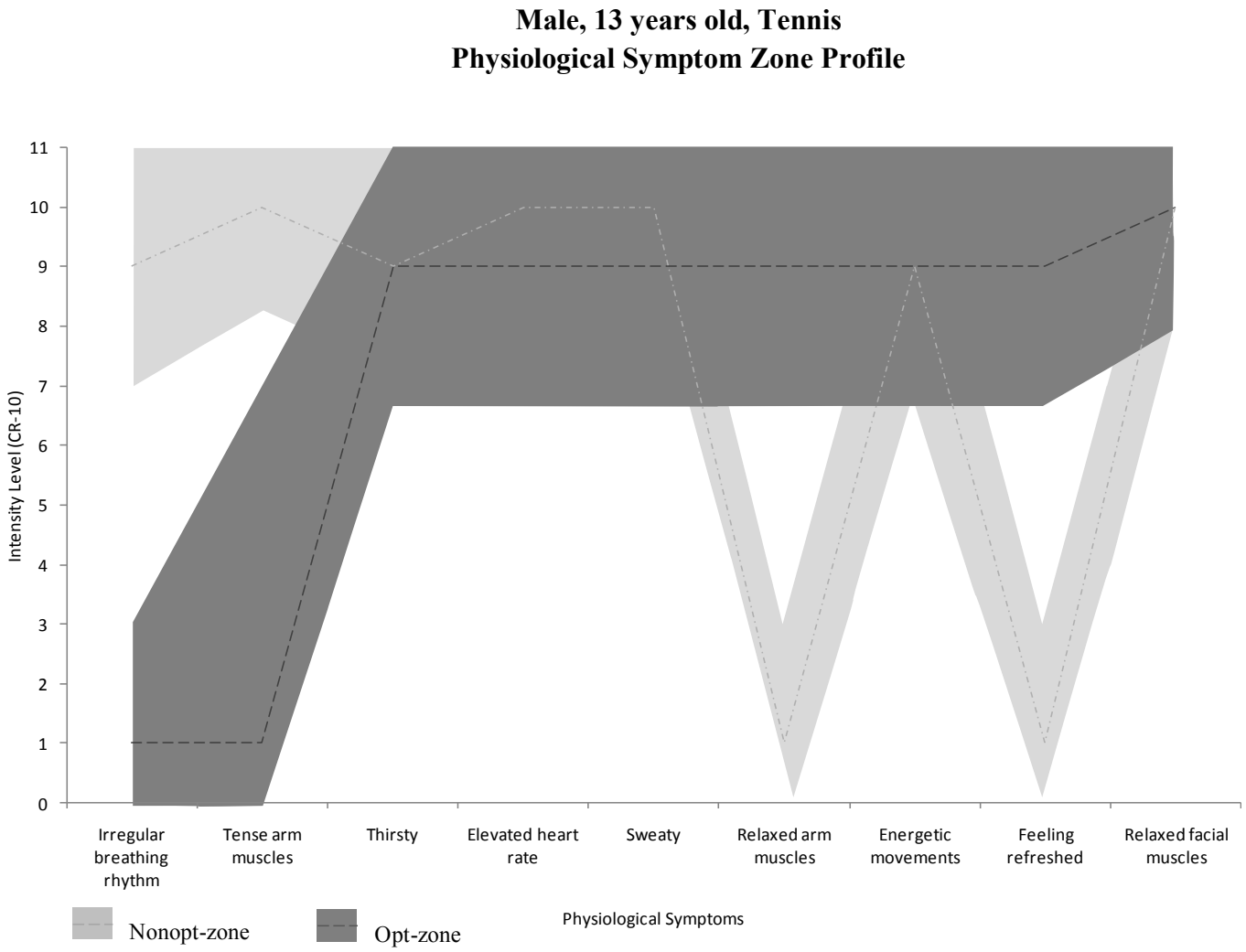

Figure 8.9. Visual representation of a male 13 year old tennis player's physiological symptoms opt-zone and nonopt-zone.

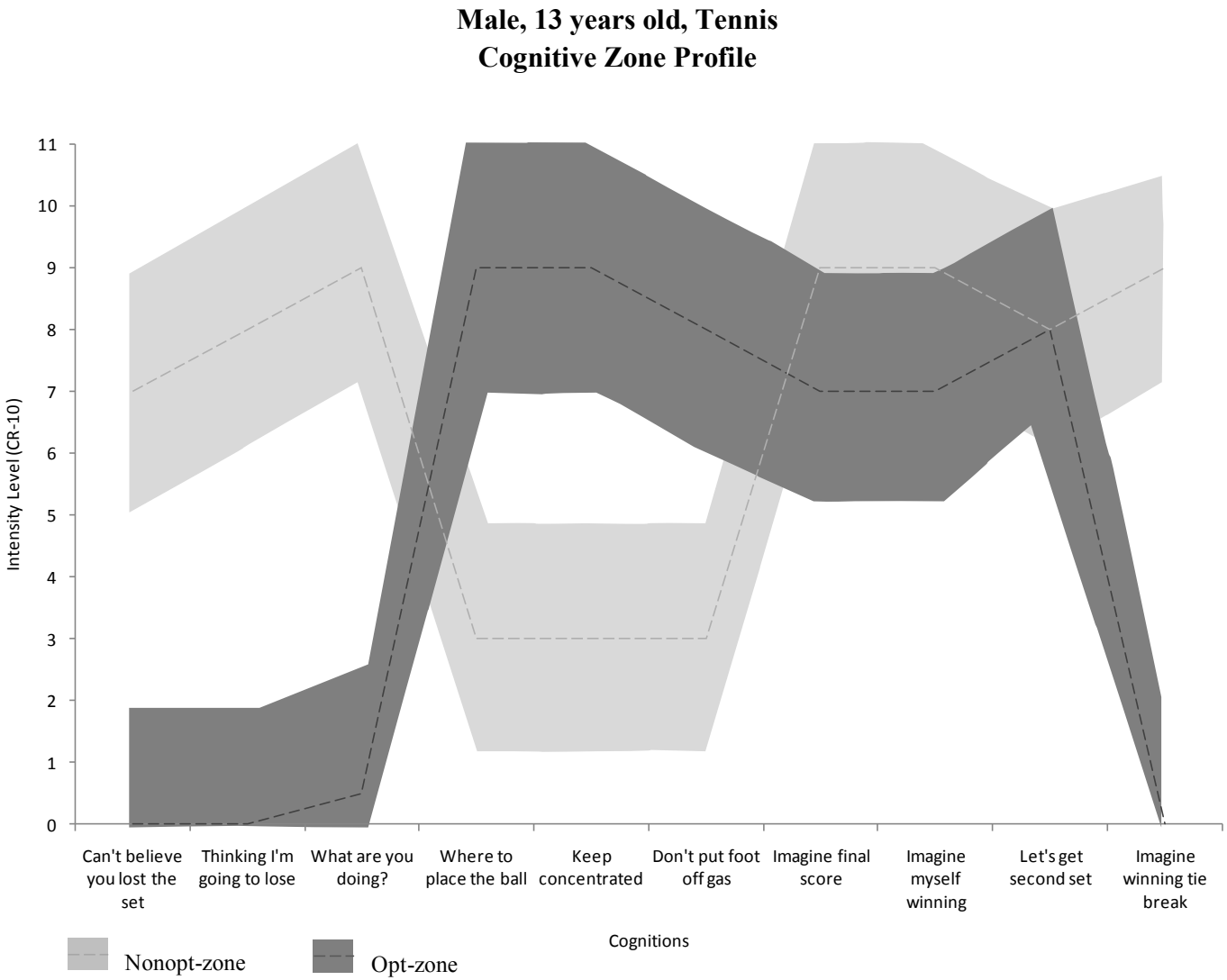

Figure 8.10. Visual representation of a male 13 year old tennis player's cognitive opt-zone and nonopt-zone.

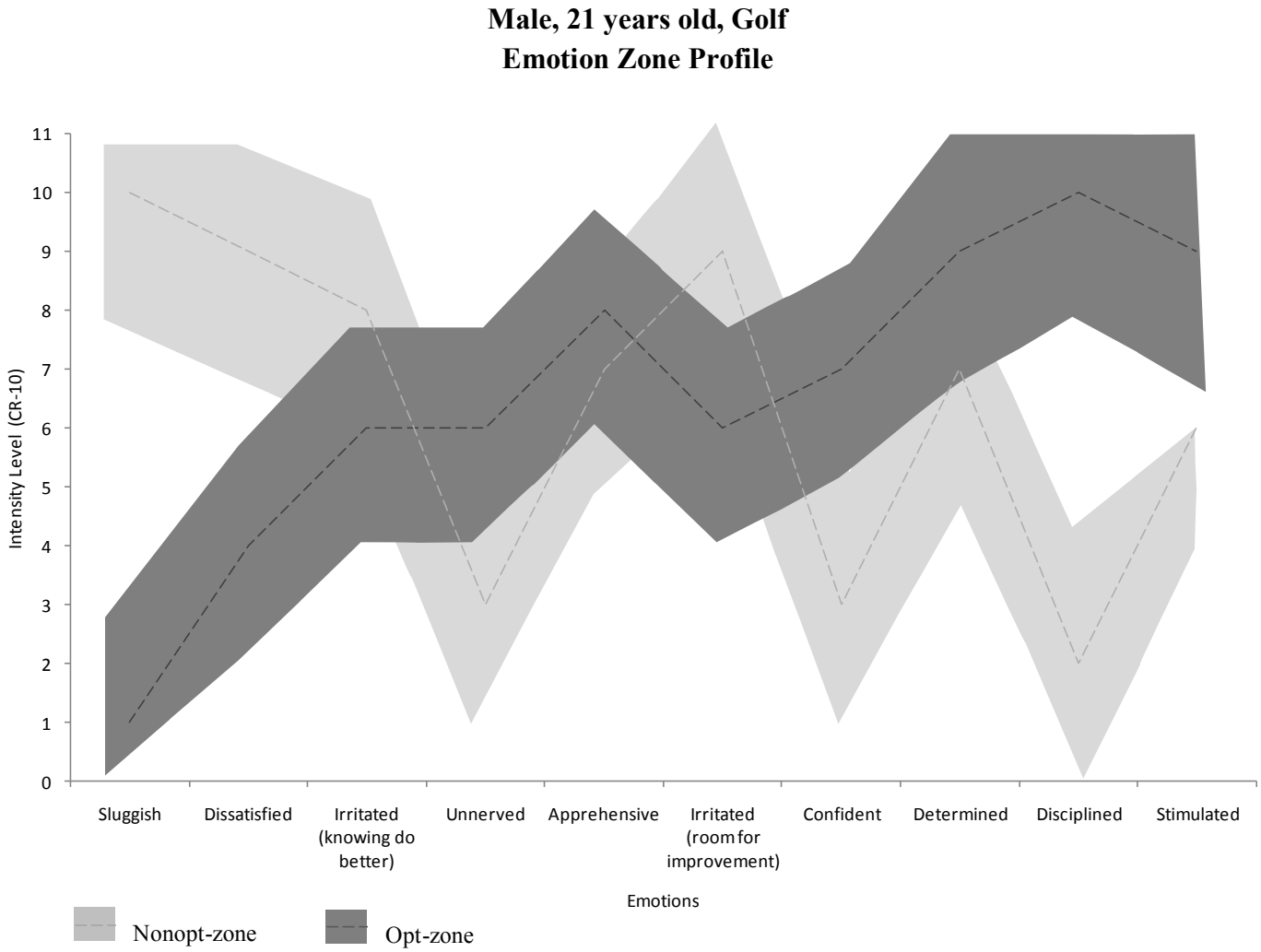

Figure 8.11. Visual representation of a male 21 year old golfer's emotion opt-zone and nonopt-zone.

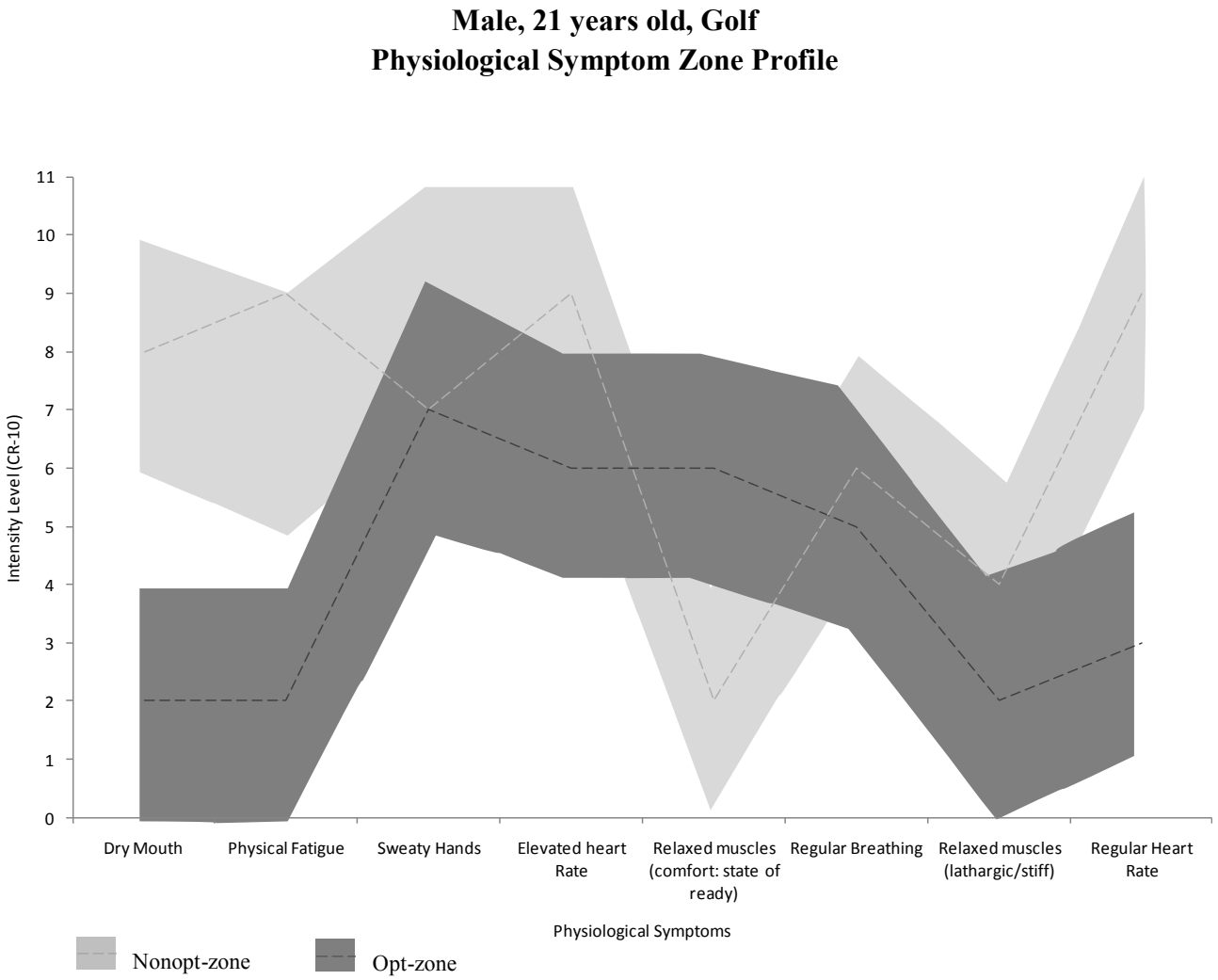

Figure 8.12. Visual representation of a male 21 year old golfer's physiological symptoms opt-zone and nonopt-zone.

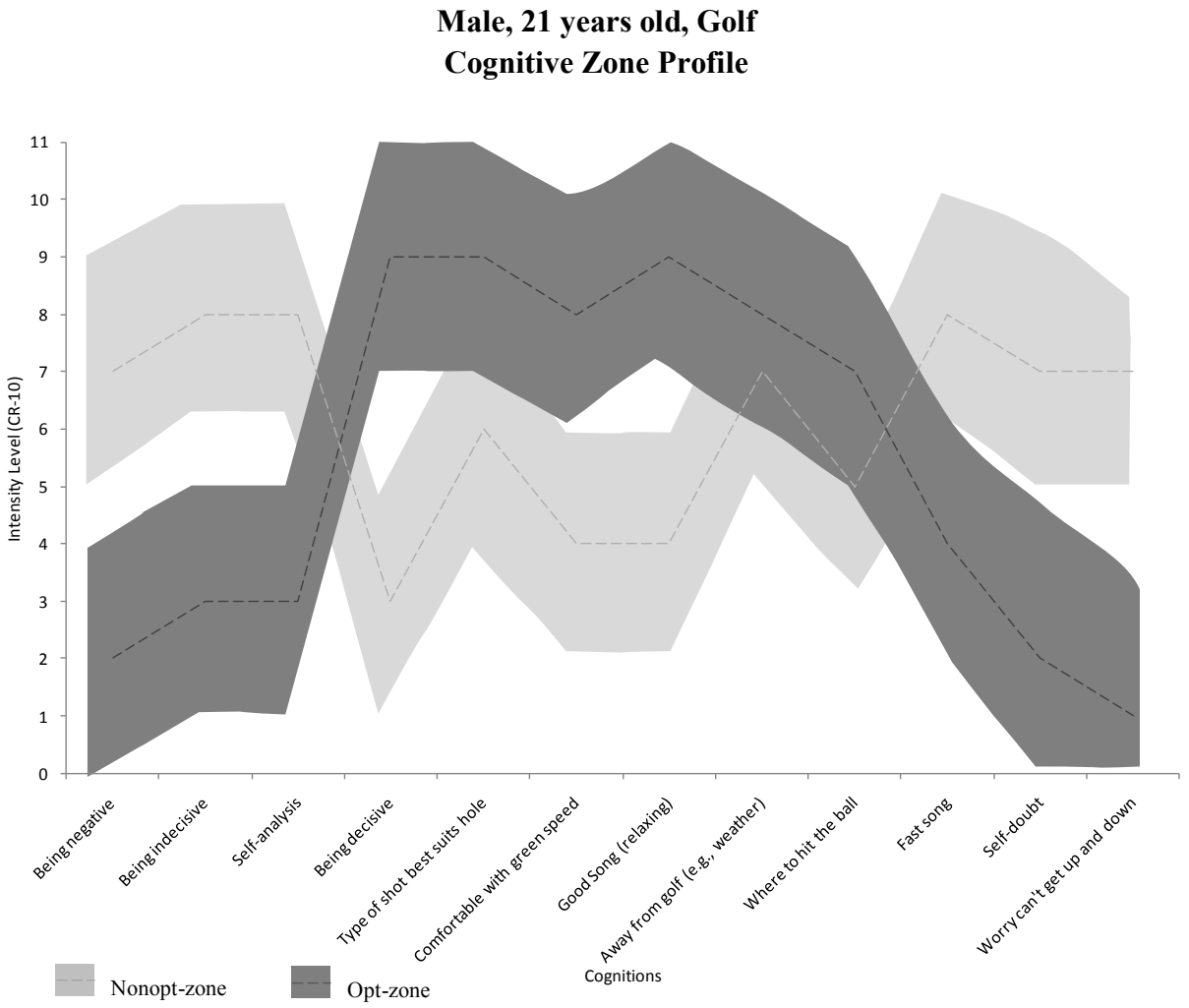

Figure 8.13. Visual representation of a male 13 year old tennis player's cognitive opt-zone and nonopt-zone.

Table 8.3

An Overview of Participants' Individualized 5-week Regulation Program (for Julia and Tony's intervention programs please see Table 8.2)

Session Theme	Session Activities	Male, 16 years old, Tennis	Male, 13 years old, Tennis	Male, 21 years old, Golf
1. *Regulation techniques I: Current regulation techniques*	**e. Reflect on recent performance experiences.**	b. Consultant guided reflections	b. Self-awareness activity based on IZOF descriptor words	a. Consultant guided reflections
	f. Review IZOF emotion, physiological symptom, and cognitive zone profiles.	c. see Appendix C for zone profiles	c. see Appendix C for zone profiles	c. see Appendix C for zone profiles
	d. Identify current regulation techniques	e. Deep breathing to help control anger and frustration	g. Focused when winning	c. Block out a bad hole on the golf course
	f. Identify intervention goal	e. "To get angry a lot less as I will have routines to do"	h. "To have learned different techniques to control my temper"	d. "Feel more comfortable on the course and have a better understanding of how to focus"
2. *Regulation techniques II: Building on athletes' current and introducing new techniques*	**b. Reflect on recent performance experiences.**	b. Consultant guided reflections	b. Consultant guided reflections	a. Consultant guided reflections
	d. Build on and refine current regulation techniques	d. Diaphragmatic deep breathing relaxation exercise to enhance effectiveness of current deep breathing.	d. Self-awareness and monitoring activity for current state (e.g., diaphragmatic deep breathing relaxation exercise compared to completing a high cognitive load task). Relate to opt-zone and nonopt-zone performance states.	b. Highlight current regulation techniques of goal-setting, and suggest appropriate refinements (e.g., setting self-referent goals).
	e. Introduce new regulation techniques	e. Introduce imagery through a familiarization exercise (Zinsser et al., 2006).	e. Continue to practice and develop diaphragmatic deep breathing as a way to reduce	c. Introduce the idea of building a pre-shot routine for use before shots on the

Session Theme	Session Activities	Male, 16 years old, Tennis	Male, 13 years old, Tennis	Male, 21 years old, Golf
			and control ones temper.	fairway (e.g., long game).
3. *Regulation techniques III: Building on athletes' current and new techniques*	**c. Reflect on recent performance experiences, and effectiveness of techniques.**	b. Consultant guided reflections	c. Consultant guided reflections	a. Consultant guided reflections
	d. Build on and refine current and new regulation techniques	c. Develop a personally meaningful imagery script incorporating opt-zone descriptor words, and use of current regulation technique of diaphragmatic deep breathing.	c. Develop relaxation skills through practice of diaphragmatic deep breathing.	b. Identify long game pre-shot routine: • Identify the shot to be played • Steps up to the ball • Focus on target (where the ball should land) • Execute the shot • Evaluate the shot Identify a start and end signal to the routine. The pre-shot routine begins with cleaning a club head, and ends when the club is returned to the golf bag.
	e. Introduce new regulation techniques	d. Introduce cognitive restructuring through by replacing unhelpful self-talk with helpful self-talk. Identify a helpful phrase to use to help control feelings of anger: "focus on next point".	c. Introduce goal setting for sport (previous experience of setting goals in school). Sets a goal to practice deep breathing during training.	
4. *Regulation techniques IV: Refine regulation techniques*	**b. Reflect on recent performance experiences, and use and effectiveness of techniques**	b. Consultant guided reflections	b. Consultant guided reflections	a. Consultant guided reflections
	c. Build on and refine current techniques	b. Develop a between-shot routine comprised of regulation techniques	b. Develop a between-shot routine comprised of regulation techniques	c. Identify pre-shot routine on the putting green (e.g. short game):

Session Theme	Session Activities	Male, 16 years old, Tennis	Male, 13 years old, Tennis	Male, 21 years old, Golf
		introduced: • Turn back on net • Check frustration levels (0-11) • Go to towel and wipe face (metaphorically wiping away last point) • Deep breath is required • Walk up to baseline	introduced: • Turn back on net and jog on spot • Let go of last point (focusing on tennis racquet strings) • Checks in on performance state (e.g., temper levels and adjust if necessary through deep breathing) • Image next point • Say to self "come on!"	• Lines ball up with hole • Checks line of shot from behind the ball • Steps up to the ball • Takes a couple of practice swings • Executes shot • Evaluate the shot Set goals for performance preparation and process goals of: i. Help de-clutter the mind (i.e., cognitive anxiety) the night before a tournament by writing out all thoughts. Cross out unhelpful thoughts and highlight those cognitions perceived to be helpful. ii. Keep routines consistent and focus on present shot.
5. *Review of the regulation program*	**a. Reflect on recent performance experiences, and use and effectiveness of techniques**	a. Consultant guided reflections	a. Consultant guided reflections	a. Consultant guided reflections
	b. **Review regulation program**	b. Review regulation program	b. Review regulation program	b. Review regulation program

Appendix D

Study 4

Test of Performance Strategies 3
(TOPS 3; Thomas, personal communication; www.topsfirst.com)

Each of the following items describes a specific situation that you may encounter in your practice and competition. Please rate how frequently these situations apply to you from 1 (**never**) to 5 (**always**).

	Never	Rarely	Sometimes	Often	Always
1. I set realistic but challenging goals for practice	1	2	3	4	5
2. I say things to myself to help my practice performance	1	2	3	4	5
3. During practice I visualize successful past performances	1	2	3	4	5
4. My attention wanders while I am training	1	2	3	4	5
5. I practice using relaxation techniques at workouts	1	2	3	4	5
6. During matches I set specific result goals for myself	1	2	3	4	5
7. My self-talk during matches is negative	1	2	3	4	5
8. I rehearse my performance in my mind before practice	1	2	3	4	5
9. During competition I have thoughts of failure	1	2	3	4	5
10. I use practice time to work on my relaxation technique	1	2	3	4	5
11. I manage my self-talk effectively during practice	1	2	3	4	5
12. I visualize my competition going exactly the way I want it to go	1	2	3	4	5
13. I am able to control distracting thoughts when I am training	1	2	3	4	5
14. I get frustrated and emotionally upset when practice does not go well	1	2	3	4	5
15. I have specific cuewords or phrases that I say to myself to help my performance during competition	1	2	3	4	5
16. I evaluate whether I achieve my competition goals	1	2	3	4	5
17. I set very specific goals for competition	1	2	3	4	5
18. At practice, I can allow the whole skill or movement to happen naturally without concentrating on each part	1	2	3	4	5
19. I keep my thoughts positive during competition	1	2	3	4	5
20. I say things to myself to help my competitive performance	1	2	3	4	5
21. At competitions, I rehearse the feel of my performance in my imagination	1	2	3	4	5
22. I manage my self-talk effectively during competition	1	2	3	4	5
23. I set goals to help me use practice time effectively	1	2	3	4	5

	Never	Rarely	Sometimes	Often	Always
24. At practice, when I visualize my performance, I imagine what it will feel like	1	2	3	4	5
25. During practice I focus my attention effectively	1	2	3	4	5
26. I set personal performance goals for a competition	1	2	3	4	5
27. I motivate myself to train through positive self-talk	1	2	3	4	5
28. I have trouble maintaining my concentration during long practices	1	2	3	4	5
29. I talk positively to myself to get the most out of practice	1	2	3	4	5
30. I have very specific goals for practice	1	2	3	4	5
31. I imagine my competitive routine before I do it at a match	1	2	3	4	5
32. I imagine screwing up during a match	1	2	3	4	5
33. I talk positively to myself to get the most out of competitions	1	2	3	4	5
34. I don't set goals for practices, I just go out and do it	1	2	3	4	5
35. I rehearse my performance in my mind at competitions	1	2	3	4	5
36. I can control my emotions when things are not going well at practice	1	2	3	4	5
37. My emotions keep me from performing my best at competitions	1	2	3	4	5
38. My emotions get out of control under the pressure of a competition	1	2	3	4	5
39. At practice, when I visualize my performance, I imagine watching myself as if on a video replay	1	2	3	4	5
40. I can allow the whole skill or movement to happen naturally in competition without concentrating on each part	1	2	3	4	5
41. I use relaxation techniques as a coping strategy at competitions	1	2	3	4	5
42. I can psych myself to perform well in practice	1	2	3	4	5
43. I am able to perform skills at practice without having to consciously think about them	1	2	3	4	5
44. I can get myself ready to perform when I am at competitions	1	2	3	4	5
45. I have difficulty with my emotions at matches	1	2	3	4	5
46. During training sessions I use relaxation techniques to improve my performance	1	2	3	4	5
47. I need to monitor all the details of each move in order to successfully execute skills in practice	1	2	3	4	5
48. I have difficulty controlling my emotions if I make a mistake at competitions	1	2	3	4	5
49. My attention wanders during competition	1	2	3	4	5

	Never	Rarely	Sometimes	Often	Always
50. My emotions keep me from performing my best during practice	1	2	3	4	5
51. I am able to control distracting thoughts during competition	1	2	3	4	5
52. I have difficulty getting into an ideal performance state during training	1	2	3	4	5
53. I can psych myself to perform well in competitions	1	2	3	4	5
54. I use relaxation techniques during matches to improve my performance	1	2	3	4	5
55. I can get myself 'up' if I feel flat at practice	1	2	3	4	5
56. I am able to perform skills at competition without having to consciously think about them	1	2	3	4	5
57. If I'm starting to 'lose it' at a match, I use a relaxation technique	1	2	3	4	5
58. I can get my intensity levels just right for competition	1	2	3	4	5
59. During practice, I can perform automatically without having to consciously control each movement	1	2	3	4	5
60. I am able to trust my body to perform skills in competition	1	2	3	4	5
61. I relax myself before matches to get ready to perform	1	2	3	4	5
62. In competition, I am sufficiently prepared to be able to perform on automatic pilot	1	2	3	4	5
63. I can get myself 'up' if I feel flat at a competition	1	2	3	4	5
64. I focus my attention effectively during matches	1	2	3	4	5
65. My practice performance suffers when something upsets me at training	1	2	3	4	5
66. I use workouts to practice relaxing	1	2	3	4	5
67. I have trouble maintaining concentration during competition	1	2	3	4	5
68. I can get my intensity levels just right for practice	1	2	3	4	5

Athlete Engagement Questionnaire
(AEQ: Lonsdale, Hodge, & Jackson, 2007)

Below are some statements people have made about their experiences in sport. Using the scale provided, **please indicate how often you have felt this way about your participation** in your main sport this season. Your sport participation includes all training and competition.

	Almost Never	Rarely	Sometimes	Frequently	Almost Always
1. I believe I am capable of accomplishing my goals in sport.	1	2	3	4	5
2. I feel energized when I participate in my sport.	1	2	3	4	5
3. I am dedicated to achieving my goals in sport.	1	2	3	4	5
4. I feel excited about my sport.	1	2	3	4	5
5. I feel capable of success in my sport.	1	2	3	4	5
6. I feel energetic when I participate in my sport.	1	2	3	4	5
7. I am determined to achieve my goals in sport.	1	2	3	4	5
8. I am enthusiastic about my sport.	1	2	3	4	5
9. I believe I have the skills/technique to be successful in my sport.	1	2	3	4	5
10. I feel really alive when I participate in my sport.	1	2	3	4	5
11. I am devoted to my sport.	1	2	3	4	5
12. I enjoy my sport	1	2	3	4	5
13. I am confident in my abilities.	1	2	3	4	5
14. I feel mentally alert when I participate in my sport.	1	2	3	4	5
15. I want to work hard to achieve my goals in sport.	1	2	3	4	5
16. I have fun in my sport	1	2	3	4	5

Athlete Burnout Questionnaire Revised
(ABQr)

Each of the following items describes how athletes may feel towards sport participation. Please consider your own sport participation and rate the following items on **the extent to which you feel you experience each one of them** from 1 (never) to 5 (always).

	Almost Never	Rarely	Sometimes	Frequently	Almost Always
1. I'm accomplishing many worthwhile things in my sport	1	2	3	4	5
2. I am emotionally drained from my involvement in my sport	1	2	3	4	5
3. The effort I spend in my sport would be better spent doing other things	1	2	3	4	5
4. I am not achieving much in my sport	1	2	3	4	5
5. I feel so physically tired from my sport training that I have trouble finding energy to do other things	1	2	3	4	5
6. I don't care as much about my sport performance as I used to	1	2	3	4	5
7. I'm not performing to my ability in my sport	1	2	3	4	5
8. I'm not into my sport like I used to be	1	2	3	4	5
9. I'm feeling emotionally burned out in terms of my sport participations	1	2	3	4	5
10. I feel less concerned about being successful in my sport than I used to	1	2	3	4	5
11. I am exhausted by the emotional demands of my sport	1	2	3	4	5
12. It seems that no matter what I do, I don't perform as well as I should	1	2	3	4	5
13. I feel successful at my sport	1	2	3	4	5
14. I have negative feelings toward my sport	1	2	3	4	5
15. I am exhausted by the physical demands of my sport	1	2	3	4	5
16. My body feels overly tired from my sport participation	1	2	3	4	5
17. I feel physically 'wiped out' from my sport	1	2	3	4	5
18. I feel like I have little left in the emotional tank when playing my sport	1	2	3	4	5

Appendix E

Study 5