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THE IMPACT OF A RESONANCE-BASED INTERVENTION ON THE CYCLING
PERFORMANCE, WELL-BEING, AND INTRINSIC MOTIVATION
OF ENDURANCE ATHLETES

by

CHRISTINE FAUBERT

B.A. (Honours), Concordia University, 2002

THESIS

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ABSTRACT

The purpose of this study was to examine the process of resonance and overall experience of four endurance athletes participating in a 6-week resonance-based intervention. A second objective was to assess the impact of the intervention on the athletes' cycling performance, subjective well-being, and intrinsic motivation. This 16-week study was a multiple case, single-subject design comprising three phases: (1) a 5-week baseline period, (2) a 6-week resonance-based intervention period, and (3) a 5-week post-intervention period. The resonance-based intervention consisted of four in-depth, open-ended, and semi-structured interviews using the Resonance Performance Model (RPM, Newburg et al., 2002) as a framework and daily reflective journalling. The athletes also participated in a follow-up interview 5 weeks following the intervention to discuss whether or not they continued to apply resonance in their life and experienced any benefits from participating in the study. Measures of cycling performance, life satisfaction, positive and negative affect, and intrinsic motivation were taken twice weekly during the three phases of the study. Qualitative results were analyzed deductively based on the components of the RPM, whereas quantitative results were analyzed using the split-middle technique for single-subject designs. Although quantitative analyses provided mixed evidence for the value of the intervention, qualitative results showed that all four endurance athletes perceived that they enhanced their performance, well-being, and intrinsic motivation for both practices and races that occurred during the intervention. They also reported a significant increase in self-awareness, a positive change in focus from outcome to process, and an empowered ability to manage their emotional responses to events. Practical implications for using the RPM with athletes and other populations in exercise and health settings are discussed.

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*PART ONE: EMPIRICAL, THEORETICAL
AND METHODOLOGICAL CONSIDERATIONS*

CHAPTER I

INTRODUCTION

The present study aimed to examine if and how endurance athletes could experience resonance in their sport and daily lives by participating in a resonance-based intervention. Another intention of the study was to evaluate the impact of a resonance-based intervention on the participants' cycling performance, subjective well-being, and intrinsic motivation. To this end, the Resonance Performance Model (RPM, see Appendix A, Newburg, Kimiecik, Durand-Bush, & Doell, 2002), an educational model developed to empower individuals to experience resonance, was used with four endurance athletes. Recent research using the RPM has suggested that it can help individuals to enhance their perceptions of subjective well-being, satisfaction with training, and athletic performance (Doell, Durand-Bush, & Newburg, 2003; Durand-Bush, Doell, Soulard, Trudel, & Newburg, 2001; Newburg et al., 2002; Soulard & Durand-Bush, 2003). Yet, these previous inquiries, which mainly used qualitative methods to explore the participants' process of resonance, did not examine whether or not resonance had an impact on the real performance of athletes. Consequently, this study attempted to examine if and how endurance athletes could not only perceive benefits from their experience of resonance but also quantitatively observe improvements in their cycling performance, subjective well-being, and intrinsic motivation.

This document will first introduce the general context of the study and present the conceptual framework that guided its development and completion. Relevant research regarding resonance and related concepts in sport and other performance domains will be presented in the second chapter. Important gaps in the literature will be highlighted as they provided the rationale for conducting this study. The third chapter will present the methodology that was used to

answer the research questions and will be followed by two articles that comprise the results of this study. These results are discussed in the fourth chapter along with applied and methodological contributions of the findings to the field of sport psychology. Concluding remarks are presented in the fifth chapter.

General Context

Does how we feel affect how we perform? Everyone would most likely agree that our daily feelings affect our everyday performance, whatever the context of that performance may be (e.g., playing sports, teaching children, or directing a theatrical production). Yet, very few of us actually think about how we want to feel in our daily life and regularly reflect on those desired feelings (Newburg, 1998). Even less likely are we designing our life based on those feelings or helping people around us feel the way they want to feel. In our outcome-oriented Western society, little attention has been devoted to the role of positive feelings in the process of achieving high levels of well-being and performance (Fredrickson, 2000). This is surprising given that feelings, or the larger encompassing notion of emotions, play such a substantial role in the human experience and are essential for our understanding of various phenomena, including athletic excellence, life engagement, and subjective well-being (Davidson & Cacioppo, 1992). One reason for this might be that we seldom take ownership of our feelings and emotions, that is, we often passively accept our emotions as we experience them or are told how we should feel in specific circumstances (Newburg, 1998).

Another reason might be that much of the research that has examined emotions in sport has been negatively biased; focusing predominantly on the effect of anxiety on performance and thus influencing practitioners and consultants to design their interventions based on the traditional “treatment” (i.e., problem-centered) approach (Seligman & Csikszentmihalyi, 2000).

Since World War II, pathology, weakness, and negative bias have overly dominated the field of psychology. As a result of adopting almost exclusively a disease model to explain human behaviour and repair the damage caused by human behaviour ailment, psychologists have failed to recognize the importance of fostering human thriving to enhance psychological health (Sheldon & King, 2001). Unfortunately, this negative bias also prevails in other related fields, including education and sport (Jackson, 2000). The last century spent in an attempt to understand and cure pathologies and illnesses has not resulted in helping people become happier; rather it made them less miserable (Seligman & Csikszentmihalyi, 2000). As a result, little effort has been devoted to identify concrete approaches and strategies to help people increase their general perception of happiness. Certainly, psychology is also the study of human strengths and virtues, thus more investigations need to be directed at helping normal individuals reach a more positive and fulfilling existence.

Recently, a recurring interest for the study of subjective well-being, emotional health, and optimal experiences has been observed. Seligman and Csikszentmihalyi (2000) brought forward a new stream of research known as “positive psychology” in order to accentuate ordinary human functioning, potentials, and capacities and focus more narrowly on positive experiences. According to this recent movement, individuals can learn to enhance and nurture their own happiness. Recent research has focused on understanding the cognitive and motivational processes underlying long-standing happiness (Lyubomirsky, 2001). According to Lyubomirsky, some individuals generally tend to perceive, experience, and respond to situations and events in a more positive and adaptive way than others. For instance, they perceive life circumstances in more positive ways, they appreciate themselves and are satisfied with what they have, they mindfully live in the present moment, and they are less likely to dwell on negative events.

Lyubomirsky reports that these happy individuals show cognitive, judgmental processes that almost automatically and often unconsciously maintain or enhance their level of well-being. Yet, it is not known whether these mental processes are acquired or developed.

Newburg and colleagues (2002) have found that individuals who set goals that concord with how they want to feel and who commit on a daily basis to engage in activities that make them feel good are more likely to live a happier and more satisfying life (Newburg, 1998; Newburg et al., 2002). More specifically, Newburg contended that when people construct and live in an environment that nurtures their ideal feelings, they better enjoy the process of everyday living and performing because it gives them the energy necessary to sustain their activities and attain their goals. In this sense, positive emotional experiences appear to be a crucial element in the process of living a fulfilling and happy life.

Newburg and colleagues have recently postulated an educational model, the Resonance Performance Model (RPM), that aims to help athletes and performers from all arenas of life to enhance their well-being and attain optimal levels of performance by experiencing resonance on a daily basis. Resonance is experienced as a seamless fit or harmony between an individual and his environment. It is a way of life that is designed based on how an individual wants to feel in the various activities in which he or she engages. The process of resonance typically allows people to fully engage in their endeavours and experience enjoyment, satisfaction, and an overall sense of well-being in their daily life. The RPM, which was used as the conceptual framework in this study, will be discussed next.

Conceptual Framework

As previously indicated, Newburg et al.'s (2002) RPM guided this study. The RPM emerged from a constructivist type of research. Using a grounded theory approach, the lead

author Newburg conducted in-depth, open-ended interviews with over 300 experts in a variety of domains including sport, music, medicine, sciences, business, and the performing arts using the approach of story-telling (Denison, 1996). He spent numerous hours on the field with the performers to examine how they found meaning in their performances and became experts in their endeavours. One general research question was asked: “Tell me how you arrived to this point in your life.” The RPM summarizes the main themes that emerged from the analysis.

The RPM consists of four components: 1) Dream Feeling, 2) Preparation, 3) Obstacles, and 4) Revisit the Dream Feeling. At the crux of the RPM lies the **dream feeling** component, which distinguishes the RPM from other performance enhancement models; that is, the dream feeling is not an ultimate outcome dream or goal, rather, it is how individuals want to feel when they engage in a particular activity. In their research, Newburg and colleagues (2002) found that experiencing this feeling on a daily basis intrinsically motivated the participants to pursue their chosen activity. Specifically, the participants revealed that their desired feelings allowed them to take pleasure in every step of their journey rather than appreciate only the end result. During the **preparation** stage, the individuals engaged in activities that helped them to elicit and experience their dream feeling, while at the same time developing the skills necessary for realizing outstanding performances and achieving desired goals. Given that the performers had clearly identified their dream feeling or the way they wanted to feel on a consistent basis, they were able to engage in high-quality preparation activities, which included physical, psychological, technical, tactical and/or emotional strategies. Examples found in previous studies are stretching, visualisation, good nutrition, self-talk, and rest (Doell, 2002; Newburg et al., 2002; Soulard, 2003). Most of the time, the preparation component was in itself inherently enjoyable as the

participants personalized their training in a way that allowed them to find meaning in and appreciate every part of the preparation process.

The **obstacles** component was created in the RPM to represent the inevitable setbacks and difficulties that the participants encountered during their career. These obstacles that disrupted the process of resonance were either internal, such as self-doubt and emotional reactions to obstacles like anxiety and fear, or external, such as parental pressure, faulty equipment, losses, and even successes. Newburg and colleagues (2002) cautioned about the danger of being trapped in an “obstacle-preparation loop.” More specifically, when facing various obstacles, some participants returned to the preparation phase to work harder but not smarter. The difficulty with such a response was that, in the long run, they lost sight of their dream feeling and became disengaged with the performance process. They forgot the intrinsic reasons that energized their involvement in their chosen activity. Conversely, the most resonating performers reported that in order to surmount the obstacles, they first revisited their dream feeling as a way to re-energize themselves and reconnect with the reasons they engaged in their activity, before returning to more preparation.

The fourth component of the RPM was thus labelled “**revisiting the dream feeling.**” Newburg and colleagues highlighted the importance attributed by the participants to revisit how they wanted to feel in their daily lives. The various strategies and tactics they developed as a way to remain engaged, particularly in the face of obstacles, served to motivate to continue the learning process. Every performer had unique expressions of revisiting their dream feeling (e.g., going for a walk in the woods, spending time with a loved one, listening to their favourite music, Newburg et al., 2002), which served the common purpose of breaking the obstacle-preparation loop and renewing their intrinsic motivation to experience their dream feeling and fulfill

meaningful goals. Taken as a whole, the process of resonance represents the application of the RPM components into one's life undertakings; it is reflected by the ability to move harmoniously between its components. Although some research has been conducted on resonance, the concept is still in its infancy. As previously mentioned, the limited studies on resonance have been based on the perceptions of participants. There is a need to examine the impact of resonance on the real or actual performance of individuals using more quantitative measures. It is this gap that led to the current study.

Purpose of the Study

The present study sought to examine if and how endurance athletes can experience resonance in their sport and daily life by participating in a resonance-based intervention. A second objective of the study was to examine the impact of the resonance-based intervention on the athletes' cycling performance, subjective well-being, and intrinsic motivation.

In sum, this study sought to answer the following specific questions: (a) Do endurance athletes experience resonance; that is: Can they feel the way they want to feel in their sport and daily life? Do they engage in activities to experience how they want to feel as often as possible? Do they revisit how they want to feel when they face obstacles that take away their desired feelings? Can they increase their level of resonance through a resonance-based intervention? If they do not initially experience resonance, can they learn to experience it over time by participating in the resonance-based intervention? (b) What impact does the resonance-based intervention have on the participants' cycling performance, components of subjective well-being (i.e., positive and negative affect and life satisfaction), and intrinsic motivation?

Significance of the Study

It is believed that this study will make an important contribution to the field of sport psychology from both a theoretical and applied perspective. From a theoretical standpoint, the results of this research will directly contribute to the literature on resonance and the role of feelings in sport. Very few studies have conceptualized performance and life as an emotional process. Consequently, practical interventions designed to help individuals identify and apply personally meaningful strategies to feel good on a daily basis are lacking. The RPM is a tool that allows individuals to design their life to do this. From a practical standpoint, this research will help to further understand the application of resonance and the results will be used to expand our database to eventually be able to develop resonance-based intervention programs that could guide professional practice in the field of sport psychology. Finally, this research could have valuable implications for athletes desiring to mindfully engage in their activities to achieve optimal levels of performance, well-being, and intrinsic motivation, and for parents and coaches who want to help in the process.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this literature review is to present and critically discuss the research on resonance, past work that relates to each component of the RPM, and concepts related to resonance such as subjective well-being, emotions/feelings, engagement, mindfulness, and intrinsic motivation. The gaps identified in the literature are also highlighted. An attempt was made to demonstrate how the several concepts reviewed are related to each other and to resonance (see Appendix B).

Resonance

As mentioned in the previous section, the RPM emerged from over 300 in-depth, open-ended interviews with experts from different domains such as sport, music, sciences, medicine, business, and the performing arts. It is a holistic and comprehensive model that describes the path through which these performers became experts in their field and self-actualized throughout the process. A recurrent finding in this grounded theory research was that the participants strove to achieve and preserve an overall sense of well-being and engagement in their every day life (Newburg et al., 2002). They all had a dream, which represented how they wanted to feel in their daily pursuits. They also engaged in extensive preparation, which allowed them to experience their desired feelings on a regular basis. All of the performers encountered obstacles in their career; however, they developed strategies to reconnect with their dream feeling before engaging in more preparation. These findings led to the inductive conception of the RPM, which comprises four components: (a) Dream Feeling, (b) Preparation, (c) Obstacles, and (d) Revisit the Dream Feeling. Recent research has examined the RPM components and the process of

resonance of several athletes and high school students. The results from these inquiries will be reviewed next.

Recent Research on Resonance

Recent research in the area of resonance has provided support for the RPM model. More specifically, five studies (Callary, 2004; Doell, 2002; Durand-Bush et al., 2001; Short, 2004; Soulard, 2003) were conducted to examine the process of resonance of a total of 27 athletes participating at different levels in different sport disciplines and five adolescents in a physical education class context (see Appendix C). In the first study (Durand-Bush et al., 2001), eight women participating at a recreational or national level in six different sports (i.e., swimming, water polo, mountain biking, volleyball, softball, cross-country skiing) participated in an in-depth, semi-structured interview to examine if and how they experienced resonance in their sport. The questions posed explored all four components of the RPM: Why do you engage in your sport? What feelings do you seek to experience in your sport? What prepares you to experience these feelings? What prevents these feelings from occurring? Do you try to get these feelings back when they are lost, if so, how? How does experiencing these feelings affect your training, competition, and overall well-being? In the following four studies (Callary, 2004; Doell, 2002; Short, 2004; Soulard, 2003), the athletes and adolescents participated in a resonance-based intervention, which comprised multiple interviews and daily reflective journaling to assess and monitor their level of resonance each day for the duration of the intervention.

Overall, the results indicated that all 32 participants identified with the four components of the RPM. Moreover, 21 out of the 24 participants who took part in the resonance-based intervention were able to experience resonance within their sport or physical activity context. As a result of the intervention, the 21 participants were able to describe their dream feeling,

developed and used numerous preparation strategies to experience their dream feeling, discussed obstacles they encountered that obscured how they wanted to feel, and developed revisiting strategies to reconnect with their desired feelings and activities. It is noteworthy that the RPM was developed based on the life experiences of elite performers from various domains, however, two studies (Callary, 2004; Doell, 2002) have involved the use of the RPM with athletes considered non-elite athletes in their specializing years of sport participation (Côté & Hay, 2002).

In the first study (Doell, 2002), results revealed that three of the four female track and field athletes had difficulty articulating their dream feeling at the start of the investigation because, although they had experienced positive feelings in the past, they had never made a conscious effort to identify and purposefully experience desired feelings on a daily basis. Interestingly, Doell (2002) demonstrated that a 9-week resonance-based intervention comprising four interviews and daily journalling helped these adolescent athletes to clearly identify and articulate how they wanted to feel in their sport and general daily life. Results also showed that the athletes were able to identify several preparation and revisiting strategies that helped them to connect with their desired feelings, as well as the obstacles that disengaged them from experiencing their dream feeling. Moreover, Doell's study revealed that all four athletes benefited from engaging in their personal process of resonance and reported enhanced well-being and higher-quality practices and races as a result of the 9-week intervention (Doell & Durand-Bush, 2002). Similarly, Callary's (2004) study revealed that two of the three adolescent competitive alpine skiers were able to integrate resonance into their ski racing and life in general as a result of their participation in a 7-week resonance-based intervention. They also perceived enhanced well-being and happiness with their ski racing as the intervention progressed, and

learned that they had control over their emotional responses to events. The third alpine ski racer did not fully benefit from the resonance intervention because she did not commit to it. She did not complete the daily reflective journal and seemed to only participate in the study because her friend signed up for it. Hence, a resonance-based intervention appears to be only beneficial to those individuals who invest time and effort into making observations and engaging in ongoing self-reflection to increase their awareness and make informed decisions that allow them to feel the way they want to feel.

On the other hand, many elite (i.e., national and international level) athletes in Soulard's (2003) cross-cultural study were initially aware of how they wanted to feel in their sport and daily life. Soulard's study sought to examine if elite athletes from different cultures could experience the process of resonance, as the development of the RPM was based on the life of North American expert performers. Results revealed that all 12 international elite athletes (i.e., four Canadians, four Singaporeans, and four French) identified with the RPM components and applied their personal process of resonance in their sport and life contexts. Despite some of the athletes' initial high level of emotional awareness, the 10-week resonance-based intervention was found to be effective as much by athletes from an individualist culture (i.e., Canada) as athletes from a more collectivist culture (i.e., Singapore) or a culture somewhat in the middle (i.e., France). Specifically, the athletes reported significant increases in self-awareness, perceptions of satisfaction with their training and general life, motivation in their sport, and overall well-being.

Finally, in Short's (2004) study involving five adolescents in the context of physical education classes, a 4-week resonance-based intervention increased their awareness of and reflection on daily feelings. It is notable that the intervention helped them to realize that they

could take some actions to deal with the undesirable feelings they were experiencing in their physical education class and everyday life. However, the results indicate that only three of the five participants perceived that the intervention had a significant impact on their life. Of interest, Short reported that the daily reflective journal was seldom used by the adolescents, which might have limited the impact of the intervention due to a lack of self-reflection.

In all four studies, many athletes reported having more than one dream feeling. Some identified a distinct dream feeling for competition, training, and their general daily life. For example, one Canadian athlete in Soulard's (2003) study reported that he wanted to feel "on fire" during his badminton competitions, "confident" in training, and "relaxed" in his everyday life. The nature of preparation and revisiting strategies were examined by Doell (2002). Track and field athletes in his study engaged in preparation activities that were psychological, physical, and/or social in nature. Furthermore, two dimensions of revisiting strategies were identified, that is, athletes reconnected with their dream feelings by engaging in "performance" or "non-performance" related as well as "momentary" or "delayed" activities. Soulard's (2003) research corroborated these dimensions but she also found an "organizational" type of preparation strategies, which characterized the international elite athletes in her study, particularly the Canadians who were quite independent and had to orchestrate much of their training and competitions. Soulard also emphasized the importance of individualizing sport psychology interventions because Singaporeans favoured collective, social preparation and revisiting activities more so than Canadian athletes (Soulard & Durand-Bush, 2003).

In general, the use of multiple interviews and daily reflective journaling in the resonance-based interventions used in the aforementioned studies facilitated self-examination and self-awareness, which led the participants to increase their experience of resonance and

personal growth (Callary, 2004; Doell, 2002; Doell et al., 2003; Short, 2004; Short & Durand-Bush, 2004; Soulard, 2003; Soulard & Durand-Bush, 2003). Throughout the intervention, the participants became increasingly aware of the presence and absence of their desired feelings in their sport and other areas of their life. They could then, as a result, develop and apply preparation and revisiting strategies to feel the way they wanted to feel on a regular basis.

In sum, the results from recent inquiries on resonance suggest that athletes can experience desired feelings, and more globally, the process of resonance, and as a result, increase their perceptions of performance and overall well-being. It is clear that research on the RPM is limited, but findings suggest that this conceptual framework can be used by sport psychologists and consultants to guide future research and interventions with athletes from various disciplines. The RPM can be seen as an educational tool that individuals can use to identify and experience desired feelings and choose or design activities that are in line with how they want to feel and that will allow them to adhere to and achieve specific goals.

The next section presents and critically discusses past work that relates to each component of the RPM (i.e., dream feeling, preparation, obstacles, and revisit the dream feeling).

Dream Feeling and Related Concepts

The dream feeling component of Newburg et al.'s (2002) RPM corresponds to the feelings that individuals mindfully seek when they engage in an activity. These feelings are personally meaningful and unique to people's experiences. For instance, in Doell's (2002) study, one novice track and field athlete wanted to feel "alive", "competitive", "energetic", and "on fire" while she was running. Yet, another athlete wanted to feel like she was "running free". By applying and engaging in certain preparation and revisiting strategies, individuals can experience desired feelings on a daily basis. When individuals feel the way they want to feel, they typically

report performing better and enjoying their experience on a more consistent basis (Callary, 2004; Doell, 2002; Doell et al., 2003; Soulard, 2003; Soulard & Durand-Bush, 2003).

Much of the research that has examined emotions in sport has been negatively biased, focusing predominantly on the anxiety-performance relationship. As a result, little empirical focus has been devoted to the role of positive emotions in enhancing experiences and performance in sport. A number of researchers have nonetheless explored the concepts of enjoyment and optimal psychological states and these will be reviewed, linked, and contrasted with the dream feeling.

Enjoyment. Enjoyment is a key construct that has been ranked among the primary motives for participating in sport and exercise (Durand-Bush, 2000; Kimiecik & Harris, 1996; Newburg et al., 2002; Schmidt & Stein, 1991; Wankel, 1985). However, there is still no clear definition of what enjoyment means to sport participants. For instance, enjoyment and fun have often been used interchangeably in the literature to indicate positive affect (Kimiecik & Harris, 1996). In contrast, Csikszentmihalyi (1990) conceptualized enjoyment as a process, and affect as the end product resulting from an enjoyable event. To further expand the notion of enjoyment, Kimiecik and Harris have proposed flow as a working definition of enjoyment. They argued that when athletes experience flow, they utterly enjoy themselves. One problem with such a definition is that it is not clear which one comes first: Do athletes experience flow because they enjoy themselves or do they enjoy themselves as a result of experiencing flow (Jackson, 1995)? Kimiecik and Harris have also described enjoyment as the process of actively engaging in an activity rather than as the end result of an action or event.

Seligman and Csikszentmihalyi (2000) thought it was necessary to distinguish enjoyment from pleasure. According to them, the former refers to “the good feelings people experience

when they . . . do something that stretches them beyond what they were – in an athletic event, an artistic performance” (p.12) while the latter denotes good feelings derived from satisfying homeostatic needs. They also claimed that enjoyment results in self-growth, but not pleasure. Again, it could be argued that enjoyment has been described but vaguely and that the nature of the enjoyment of athletes during training and competition is still unclear. Enjoyment, whether conceptualized as an emotional experience or as a process, can be directly tied to Newburg et al.’s (2002) concepts of resonance and dream feeling since individuals who feel the way they want to feel and engage in the process of resonance concurrently experience enjoyment (Newburg et al., 2002).

Optimal psychological states. The idea that one is more likely to derive good performances when in an optimal psychological state is not new to most athletes, coaches, and sport psychology consultants (Jackson, 1995; Jackson, 2000; Jackson & Roberts, 1992). In fact, several optimal mental states have been examined in sport psychology, including peak performances (Privette, 1981), peak experiences (Privette 1983; Ravizza, 1984), individual zones of optimal functioning (Hanin, 2000a), and flow (Csikszentmihalyi, 1990). Given the extensive literature that has emerged from studying the concept of flow, this optimal state will be discussed on its own in the following section.

Although peak performances and peak experiences are considered as two connected phenomena, they have been distinguished by several authors. On the one hand, a *peak performance* has been defined as a behaviour that largely surpasses one’s ordinary performance (Privette, 1981). According to Privette, a peak performance denotes the full use of one’s potential. Jackson and Roberts (1992) have described it in terms of “a state of superior functioning that characterizes optimal sport performances, resulting in personal bests and

outstanding achievements” (p.156). Typical characteristics associated with a peak performance include a full focus, confidence, feelings of control, and an absorption in the present (Privette, 1981).

On the other hand, a *peak experience* has been described as a subjective experience characterized by a moment of utmost happiness leading to growth and self-actualization (Maslow, 1968). Distinguishing qualities of a peak experience are fulfillment, significance, and spirituality (Privette & Bundrick, 1991). Maslow contended that a peak experience is involuntary and rather momentary. He argued that, although it cannot be controlled, it is possible to increase the probability of experiencing it under proper conditions, which he did not specify. A peak experience would thus reflect an intense feeling of joy or happiness while peak performance would correspond to an optimal state of functioning (Privette, 1983). Privette and Bundrick (1991) have further differentiated the two concepts by highlighting that a peak performance represents the positive extreme of performance (i.e., behaviour) while a peak experience corresponds to the positive extreme of a feeling or a sensation of intense well-being constituted of emotions and cognitions. Other researchers have agreed with these definitions (Cohn, 1991; Jackson et Roberts, 1992). Considering their intimate relationship, it is noteworthy that a peak performance may occur without the intense positive feelings associated with a peak experience, and equally, a peak experience may not entail an optimal performance (Jackson, 2000).

Similar to the notions of peak experience and peak performance, Hanin’s (2000a) model of Individual Zones of Optimal Functioning (IZOF) suggests that we are more likely to attain a peak performance when we are within our individual optimal level of physical and mental activation. Proposing a functional relationship between emotions and performance, the IZOF model considers the interaction of both the beneficial and debilitating effects of a variety of

emotions on performance outcome. One assumption of the model is that the emotion-performance relationship is bi-directional. Hence, emotions affect performance and inconsistency in the performance process and outcomes result in emotional alterations (Hanin, 2000a). For instance, Hanin demonstrated that emotions such as pride and anger can both improve and hinder performance and that likewise, changes in performance can potentially result in feelings of pride or anger. When people are within their individual “zone,” they typically demonstrate a complete involvement or engagement in the task at hand and recruit and use the necessary resources through various idiographic strategies and skills in an attempt to stay within their IZOF (Hanin, 2000a). Such characteristics of the IZOF have also been used to describe resonance (Newburg et al., 2002).

Both the IZOF and resonance involve very individualized emotional experiences or processes, however, the IZOF model determines one’s optimal zone of functioning based on the positive and negative emotional states linked to best, average, and poor performances (Hanin, 2000a). Conversely, the dream feeling that leads to resonance is identified and articulated by the individuals themselves based on the feelings that they want to experience in their daily activities (Newburg et al., 2002). Another difference between the IZOF and resonance lies in their relation to performance. The former is essentially determined by performance outcomes, such as one’s successful and poor performances, while the latter is focused on the process of performance, that is, on how individuals *like to feel during* the activity or event itself. Although athletes will attempt to achieve their IZOF during performances and they will probably recall past performances to figure out how they want to feel, resonating athletes are the sole judges of what they consider a successful performance. Thus, it is not only focused on objective outcomes but rather on the level of engagement and intrinsically motivating feelings they experience while

performing at their best. The notion of the dream feeling is not only specific to the sport context; it encompasses all spheres of one's life because it can be argued that all facets of one's life are intertwined and can affect each other. Encouraging individuals to identify the inherent feelings that drive their engagement in important activities in their life, rather than establishing a range of optimal positive and negative emotions based on performance outcomes, might be key to enhance positive psychological experiences in sport.

Flow. The work of Mihaly Csikszentmihalyi (1975, 1990) on the concept of flow has contributed much to our understanding of emotions and optimal experiences in sport. Flow is best portrayed as an optimal psychological state that can be elicited under suitable conditions, which include balancing perceived challenge with skill level, merging action and awareness, establishing clear goals, and engaging in ongoing appraisal and reappraisal of the performance process (i.e., unambiguous feedback). When individuals experience flow, they typically feel a loss of self-consciousness. They feel in control and perform in an effortless manner. They also experience perceptual transformation of time, feel totally absorbed in their activity, and utterly enjoy themselves (Csikszentmihalyi, 1975, 1990; Jackson, 2000; Jackson & Marsh, 1996).

A detailed appreciation of the characteristics and precursors of flow can be useful for understanding this optimal subjective state, yet, only a few researchers have identified the factors that influence its occurrence (Jackson, 1992, 1995; Kowal & Fortier, 1999; Massimini, Csikszentmihalyi, & Delle Fave, 1988). Overall, the main factors that have been shown to facilitate the experience of flow include physical and mental preparation, optimal levels of arousal, confidence, and a positive attitude (Jackson, 1992, 1995), intrinsic and self-determined forms of motivation (Kowal & Fortier, 1999), and concentration on the task at hand (Massimini et al., 1988). However, even with the identification of these factors, the information on how to

help people experience flow is very limited since performance is individual and physical and mental preparation is so broad. Interestingly, Jackson (1995) found that half of the elite athletes interviewed in her study reported that one important factor for the occurrence of flow was that their performance had to feel good. For instance, “feeling good in the water”, “feeling in total control of body”, and “going very fast and feeling comfortable at that speed” were raw data themes that comprised the higher order theme “movements feeling good”. These descriptions of feelings thought to contribute to flow very much resemble descriptions of dream feelings sought by athletes (Callary, 2004; Doell, 2002; Soulard, 2003). For example, in Soulard’s study, one athlete’s dream feeling had characteristics of flow:

I really feel in harmony with the air. What I really like is when I perform a movement and I know that there is going to be a response, it will have an effect. It is a real harmony between what I demand from my body and what air responds.

It is noteworthy that although repeated flow experiences contribute to positive affect, this type of enjoyable experience is difficult to predict and control (Csikszentmihalyi, 1990). It also requires a lot of energy and self-confidence. Moreover, flow is typically experienced by relatively high-level performers (Csikszentmihalyi, 1990). Interestingly, Jackson (2000) has provided support for a relationship between flow and peak performance. These findings imply that less accomplished performers would have fewer opportunities to benefit from the positive feelings that flow offers to more accomplished athletes. Furthermore, it is a state and thus it is short-lasting. This suggests that other means for maintaining positive feelings need to be explored in an attempt to enhance sport experiences as well as the pursuit of activities on a long-term basis.

Of interest is that the dream feeling postulated by Newburg and colleagues (2002) can be accessible to performers from all levels because it is identified by the performers themselves. In fact, individuals who have identified how they want to feel in their life and who are able to recognize when they are not experiencing their desired feelings can engage in their process of resonance and apply strategies to connect or re-connect with them. This implies a high level of awareness and controllability, as people should elicit their dream feelings through a variety of techniques and strategies that are meaningful to them. In this regard, the process of resonance can provide not only positive emotional experiences to performers of all levels but also a mindful way of living that allows them to engage in every important aspect of their daily life.

Preparation and Related Concepts

According to Newburg et al. (2002), individuals can engage in a variety of preparation strategies in order to experience their desired feelings on a daily basis and achieve performance excellence. In recent studies, athletes reported engaging in various forms of preparation: physical, psychological, social, organisational, and emotional. For example, athletes in Doell's (2002) study reported that nutrition, deliberate practice, self-talk, and visualization were the most important preparation strategies for experiencing their dream feeling. In Soulard's (2003) study, organisational preparation was central for her elite athletes and involved planning carefully and integrating everyday activities into a well-established routine.

One's preparation may not always be purely enjoyable; however, it can be tailored to make it engaging and meaningful. Given the scope of this document, this section will review some of the key concepts that have been shown to be central in one's preparation for the achievement of ideal feelings and optimal performance. Specifically, it will examine the notions of deliberate practice and psychological training.

Deliberate practice. Everyone has probably heard of the old dictum “practice makes perfect.” According to Ericsson, Krampe, and Tesch-Römer (1993), a minimum of 10 years or 10,000 hours of deliberate, effortful practice is necessary for reaching an elite level of performance. Ericsson and his colleagues refer to “deliberate practice” to describe highly structured, goal-oriented training activities that are characterized by optimal training conditions, specifically, well-defined tasks of proper difficulty level, information feedback, and sufficient occasions for repetition and error correction. Although ample opportunities for high quality practice involving repetitive drills may be provided, skill acquisition, refinement and improvement may not occur if individuals are not motivated to improve (Ericsson et al., 1993). Moreover, because deliberate practice requires intense effort and concentration to enhance performance in a specific area, it has been considered as not inherently enjoyable and motivating. This implies that most performers in the process of developing the skills and expertise in their domain experience undesired feelings that may disengage them from their activities. However, some researchers have found that some deliberate practice activities in sport can actually be enjoyable, provided that they are performed with high-quality (Durand-Bush & Salmela, 2002; Starkes, Deakin, Allard, Hodges, & Hayes, 1996; Young & Salmela, 2000).

Deliberate practice is an important component of the preparation in which athletes engage to facilitate the experience of their dream feeling in their sport (Doell, 2002; Doell et al., 2003; Durand-Bush & Salmela, 2002; Soulard, 2003). Yet, given that they train so many hours to develop a certain level of skills, it is essential that they identify ways to make deliberate practice an enjoyable and engaging activity. One notable difference between Ericsson et al.’s (1993) concept of deliberate practice and the preparation component in Newburg et al.’s (2002) RPM is that resonant individuals do not prepare to enhance their performance “at all cost” (e.g., loss of

motivation, burnout, injury, etc.). Rather, they organize and integrate activities in their training and life that elicit desired feelings and they recognize and take actions to reconnect with desired feelings when they no longer feel the way they want (Newburg et al., 2002). The process of resonance is intended at helping people to better situate sport and other activities in their everyday life in a way that gives preference to feelings experienced in the process of performing and living rather than to outcomes (Newburg et al., 2002). Thus, individuals who engage in their personal process of resonance can not only optimize learning and improvement but also make the whole experience of becoming an expert an enjoyable and motivating one.

Psychological skills. Empirical evidence has provided support for the importance of mental skills training in the development and achievement of high-level performance in sport (Orlick & Partington, 1988). Among other things, mental skills play an important role in the management of stress and anxiety by providing athletes with more positive and adaptive responses to potentially disturbing situations or events (Anshel & Anderson, 2002). Athletes who mentally prepare to more efficiently regulate their arousal level and the intensity of their emotional experiences have been shown to demonstrate more consistency in their performance (Williams & Harris, 2001). Similarly, Saarni (2000) contended that individuals who acquire the ability to handle their emotions demonstrate emotional competence, a sense of subjective well-being, and adaptive resilience in the face of stressful situations. However, before people can learn and practice self-regulatory techniques, they first need to become aware of their emotional states and arousal level (Ravizza, 2001). According to Ravizza, awareness is a key element for improving self-control. As athletes gain awareness, they can exert more control on their emotions, thoughts, and physiological responses and integrate them into optimal performances. Conversely, a lack of awareness in the present moment has typically been associated with an

excessive focus on the outcome. Enhanced awareness should thus be encouraged as it allows athletes to become mindful of their ideal performance state as well as the everyday behaviours in which they engage to achieve this state (Ravizza, 2001).

In the same way, individuals need to pay attention to their everyday feelings, thoughts, and behaviours in order to develop the ability to experience their dream feelings during a performance or any life event (Newburg, 1998). According to Newburg, experiencing desired feelings is the genuine skill of performing and living while concentration, self-regulation, and imagery are only some of the techniques utilized to develop this skill. In previous studies on resonance, the athletes were able to experience their dream feeling by developing and practicing a wide range of psychological skills, including self-awareness, imagery, and anxiety and emotional management (Callary, 2004; Doell, 2002; Soulard, 2003).

Obstacles and Related Concepts

Individuals may engage in numerous preparation strategies to experience their dream feelings on a daily basis; however, various obstacles can disrupt the occurrence of these feelings and, as a result, interfere with the resonance experience. In Newburg et al.'s (2002) study, all of the participants came across internal and external obstacles at some point in their endeavours that disengaged them from their dream feeling. Examples of internal obstacles found in recent research on resonance are self-doubt, performance anxiety, and negative thoughts. On the other hand, external obstacles for several athletes appear to be negative people (i.e., family, teammates, and coaches), faulty equipment, poor weather conditions, and lack of financial support (Callary, 2004; Doell, 2002; Soulard, 2003).

Research with endurance athletes participating in extreme endurance events (i.e., marathons, Ironman-length triathlons, and cycling events) has shown that these athletes can

potentially undergo intense psychological and physical stress (Hammermeister & Burton, 2001; Schomer, 1986). These stressors, namely, competitive stress and anxiety and sustained physical exertion and discomfort, are discussed in the following section.

Competitive stress and anxiety. Research suggests that athletes who participate in competitive sport can experience a vast array of stressors, including interpersonal problems, injuries, lack of social support, financial concerns, and competition anxiety (Woodman & Hardy, 2001). Competitive anxiety is one of the most important psychological factors believed to affect sport performance (Raglin & Hanin, 2000). Researchers generally agree that anxiety refers to a psychophysiological reaction resulting from the perception of a threatening situation (Woodman & Hardy, 2001). Perceived stressors can cause negative thoughts, feelings, and physiological reactions and thus disengage people from their activities (Jones, 2003). The results from Doell's (2002), Soulard's (2003), and Callary's (2004) studies indicated that competitive anxiety was a common obstacle that disrupted the experience or occurrence of the athletes' dream feeling.

A number of studies have examined the antecedents of competitive cognitive anxiety. In their investigation of male middle-distance runners, Jones, Swain, and Cale (1990) found that cognitive anxiety was predicted by the athletes' perceptions of readiness, their attitude towards previous performances, and their use of outcome goals. Specifically, when athletes did not feel ready, had a negative attitude regarding their previous results, and focused too much on outcomes, they were more anxious. Moreover, Hall, Kerr, and Matthews (1998) observed that precompetitive state anxiety was higher among cross-country-runners who were high in ego goal orientation (i.e., who focused on the outcome of a race rather than on mastery) compared to individuals low on that personality measure. Finally, Marchant, Morris, and Anderson (1998) found that the perceived importance of the outcome was a contributing factor in competitive state

anxiety among club level golfers. These results suggest that athletes might benefit from developing strategies to focus on the process rather than on the outcome of a competition.

Ample empirical evidence suggests that cognitive anxiety can potentially be beneficial or detrimental to sport performance (Woodman & Hardy, 2001). Eysenck (1992) noted that anxiety and worry uses up the attentional and cognitive resources that are needed to perform at an optimal level. Cognitive anxiety can hence impair performance when the remaining resources available are too few to adequately perform the task at hand. On the other hand, when at an optimal level, arousal allows relevant cues to be attended to and irrelevant cues to get gated out (Zaichkowsky & Baltzell, 2001). This implies that athletes need to develop various mental strategies in order to reach optimal levels of arousal and prevent anxiety from hindering their performance.

Sustained physical exertion and discomfort. Physical exhaustion and discomfort associated with prolonged, strenuous exercise or endurance activities is commonly experienced by endurance athletes (Taylor & Cusimano, 2003). The relationship between physiological symptoms experienced during ongoing physical exercise and athletes' perceptions of these symptoms has been described in a model developed by a number of researchers (Kinsman & Weiser, 1976; Pandolf, 1982; Weiser & Stamper, 1977). These researchers classified athletes' perceptions of exertion into four distinct categories or "levels," namely, (a) discrete sensations, which include sweating, heart pounding, leg aches and cramps, out of breath, vigorous mood, and determination; (b) subordinate symptoms, which involve cardiopulmonary, leg, and general fatigue; (c) ordinate symptoms, which are linked to task aversion, running/cycling fatigue, and motivation; and (d) superordinate symptoms, which are associated with extreme fatigue and physical exhaustion (Tenenbaum, 2001).

Noble and Robertson (1996) described that at the superordinate level, athletes cannot distinguish discrete sensations because they experience extreme general fatigue and exhaustion. Moreover, they highlighted that as physical load increases, exertion feelings intensify and as a result, athletes shift their attention from an external-dissociative mode to an internal-associative one. For instance, athletes can attend to external cues (i.e., music, problem solving) under low exertion as a means to dissociate from exertion feelings; however, this becomes very difficult under high exertion at the superordinate level because athletes typically feel extremely exhausted. Schomer's (1986) study with marathoners has provided support for the shift from dissociative to associative thinking as exertion intensity increases. With regards to resonance, associative thinking might be beneficial to athletes if they learn to focus on how they want to feel. Finally, research has shown that psychological variables including determination, self-efficacy, task goal orientation, familiarity with exertion, and effort investment are related to exertion persistence (Tenenbaum, 2001).

Ericsson and colleagues (1993) postulated that deliberate practice can only be sustained for a limited time each day without leading to extreme fatigue or burnout. In fact, adequate recovery periods must be built in training or preparation schedules in order for athletes to stay physically and mentally healthy and avoid overtraining (Ericsson, 1996; Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987). It is during these recovery periods including sleep, rest, or other downtime activities that athletes could take the opportunity to revisit their dream feeling, which will be discussed in the following section. Short (2004) found that high school students intensely involved in sports benefited from identifying a dream feeling that allowed them to feel vigorous during their athletic activities and a different feeling of peace and calmness to experience during their down time.

Revisiting the Dream Feeling and Related Concepts

The last but critical component of the RPM is revisiting the dream feeling. This component is important because in Newburg's original research, it distinguished high-standing performers from less accomplished ones (Newburg et al., 2002). Individuals can use a number of strategies to manage their feelings, refocus, and re-energize themselves in the face of adversity. Doell (2002) reported that the athletes in his study engaged in momentary or delayed revisiting strategies. For example, one of his athletes reported using self-talk immediately after a setback occurred (i.e., momentary) while another would reflect back on her race at night (i.e. delayed) as a means to reconnect with the feelings they sought. They also performed both sport-related (i.e., training with a weaker opponent to regain confidence) and non-sport related (i.e., talking with a friend) activities in an attempt to reconnect with how they want to feel. Soulard (2003) and Callary (2004) observed similar revisiting strategies.

Concepts in the literature related to Newburg et al.'s (2002) revisiting strategies include secondary appraisal and perspective.

Secondary appraisal. When obstacles are encountered, individuals can respond to them in a negative or positive fashion. Interestingly, the first emotional response to an obstacle was not considered as the most important one by the participants interviewed by Newburg (Newburg et al., 2002). Rather than focusing on their initial response, accomplished performers responded to their own response (i.e., response to response) in a positive and appropriate way, that is, in a way that was in line with how they wanted to feel. They realized that their first emotional response to an obstacle could also become an obstacle if they did not have a second response that enabled them to reconnect with how they wanted to feel. This second response helped them to gain

energy and motivation to overcome the obstacle and secure the connection with their desired feelings.

Newburg's idea of responding to one's first response resembles Lazarus' (2000) notions of primary and secondary appraisal. Primary appraisal pertains to one's interest or stake in the result of a situation, which will evoke an initial – often automatic – emotional response. Secondary appraisal relates to conscious coping options or scenarios (i.e., cognitive and behavioural efforts to cope with demands appraised as exceeding one's resources). The apparent difference between Newburg and Lazarus' concepts is that the initial response to an obstacle in Newburg's model is not necessarily evoked from one's interest in the result of a situation. Furthermore, the response to response, which can be compared to Lazarus' secondary appraisal, can help to cope or overcome the obstacle because it allows individuals to change unconstructive emotions that result from inappropriate primary appraisals and revisit desired, constructive emotions. Similarly, Deci (1996) suggested that a reappraisal process in which people regulate their emotions empowers them to manage their own emotional responses and fosters autonomy during difficult situations. Nevertheless, Deci contended that the majority of people do not reappraise their initial emotional reactions to obstacles. One reason for this may be that most people are not aware of or have never taken the time to identify the unique feelings that they want to experience in their daily pursuits. Therefore, it is crucial that individuals consciously identify their desired feelings in order to be able to develop appropriate responses to initial reactions that take them away from their dream feeling.

Perspective. Another way to revisit desired feelings may be to change or regain perspective. Botterill and Patrick (2003) recently highlighted how keeping things into perspective, particularly in the face of adversity, may contribute to the process of resonance.

Although no clear or elaborate definition of perspective has been provided, the concept possesses a number of characteristics that underscore how human potential can be realized. These characteristics were examined by Brown, Cairns, and Botterill (2001), who conducted a grounded theory study to explore the process by which individuals who have perspective live and perform. Results showed that those who had a healthy perspective (a) knew who they were (i.e., they understood, accepted and appreciated the depth and nature of their identity), (b) had a strong support system, and (c) held strong personal values and priorities. Moreover, they fully engaged in their performance and had meaningful daily experiences. According to Botterill and Patrick, individuals with a positive perspective demonstrate humility and gratitude, and are further characterized as students for life. The authors stress the importance of mastering perspective in one's life as it helps people to stay in touch with the core components of their identity and provides them with better coping skills for dealing with life's challenges and difficulties.

Perspective can help people to revisit their roots so that their identity, values, lessons, and important people in their life can be re-appreciated (Botterill & Patrick, 2003). Maintaining or regaining perspective can be a valuable strategy to revisit ideal feelings when they are lost (Botterill & Brown, 2002). When people know how they want to feel as well as the reasons why they do what they do, they can more efficiently evaluate and respond to obstacles and take the time to reflect on the meaning of their actions in relation to the obstacles and what they want to experience in the future.

In sum, the RPM is a holistic model that embraces four components that can be applied in all spheres of one's life. It will become clear in the following section that the model is linked to subjective well-being, emotions and feelings, mindful engagement, and intrinsic motivation.

Concepts Related to Resonance

The idea that a connection or sense of harmony between a person (i.e., needs, values, abilities, etc.) and his or her environment (i.e., demands of tasks or activities to be performed, responsibilities, freedom, pressures, etc.) must exist to experience the dream feeling is central to the process of resonance. This is where the notion of resonance is derived. According to Lazarus (2000), “resonances” are processes underlying the generation of emotions. They denote “an ineffable sense of compatibility or incompatibility between our personal identity and the outer world” (p.49). A number of words can be found in the literature to suggest this sense of connection or harmony between an individual’s inner self and his or her environment, such as congruence (Ryan & Deci, 2001), concordance (Sheldon & Elliot, 1999), harmony (Smolensky, 1986), and agency (Ryan & Frederick, 1997). According to Newburg (1998), this sense of connection with the environment is a necessary condition for the experience of resonance.

Following are several concepts and psychological processes that are closely related to resonance. More specifically, subjective well-being, emotions/feelings, engagement, mindfulness, and intrinsic motivation will be examined and linked to the resonance process. It will become clear that resonance encompasses the notion of human thriving in its broader sense as it can be applied to all areas of daily living.

Subjective well-being. The topic of subjective well-being has generated considerable research in the last decade. In the field of psychology, subjective well-being has been used interchangeably with happiness to describe the cognitive and affective evaluations individuals make of their lives (E. Diener, 2000). Contributing to one’s well-being are life satisfaction, satisfaction with work, sport and other significant activities, many positive emotional experiences (e.g., joy, satisfaction, and pride), few unpleasant emotions (e.g., fear, anger, and

sadness), and positive self-esteem (E. Diener, 1984, 2000; E. Diener & Lucas, 2000). Consistent with these findings, happiness can be measured by summing up an individual's momentary experiences of positive and negative emotions. A prevalent belief regarding subjective well-being is that pleasant affect predominates over negative affect in normally functioning humans, a tendency known as the "positivity offset" (Cacioppo, Gardner, & Berntson, 1999; E. Diener & C. Diener, 1996; E. Diener & M. Diener, 1995; Fredrickson, 2001). Of importance, E. Diener (2000) stressed the merit of feeling pleasant emotions most of the time over experiencing less frequent, but more intense positive emotions. Indeed, the frequency of pleasant emotions is a better predictor of subjective well-being than intensity as intense positive feelings are rarely experienced even among the happiest persons. Moreover, those individuals who do experience intense positive emotions tend to experience intense negative emotions as well (E. Diener, Sandvik, & Pavot, 1991).

Fredrickson (2000, 2001) also contended that the experience of frequent positive emotions can nurture one's well-being. Suggesting that they play a central role in individuals' psychological and physical health, she makes a case for addressing positive emotions in treatment interventions. According to this researcher, positive emotions such as interest, joy, and love have a short-term effect on one's mood and subjective well-being and they also promote psychological growth and happiness over time. Positive emotions are believed to act as the building blocks of long-standing happiness because they play a vital role in facilitating the development of enduring personal resources. For example, Fredrickson posited that positive emotions help people to broaden their "thought-action repertoires" (i.e., widen the array of the thoughts and actions that come to mind), cope with persistent debilitating emotions, develop psychological resilience, and increase their emotional well-being. The long-term benefits of

positive emotions and a high level of subjective well-being on physical health (Salovey, Rothman, Detweiler, & Steward, 2000), meaning of life (Zika & Chamberlain, 1992), stress management (Fredrickson, 2001), social relationships (McCollough, Kilpatrick, Emmons, & Larson, 2001), and quality and efficacy of work (E. Diener, 2000) have also been demonstrated in several studies. Nevertheless, a gap with reference to the relationship between positive emotional experiences and enduring subjective well-being must be addressed as few researchers have concentrated on the issue. Furthermore, the direct effect of positive emotions on *psychological* health is not clear and often small (E. Diener & Lucas, 2000), and as such, it is imperative, in future research, to discern the relationship between subjective well-being, positive emotions, and psychological health.

Emotions/feelings. A significant outgrowth of research on emotions in the sport domain has been observed in the past 15 years (Vallerand & Blanchard, 2000). In fact, researchers are increasingly recognizing the important role that emotions play in sport. As discussed above, emotions significantly contribute to subjective well-being, and they are part of every human experience, including exercise and sport. Given that contemporary researchers in sport psychology disagree over the definition of emotions, most authors have used the terms “affect,” “feeling,” “emotion,” and “mood” to refer to the richness of the human emotional life. Oatley and Jenkins (1996) have suggested a time-course difference, among other features, to help distinguish each concept. In essence, an emotion results from a sudden reaction to an event and involves physiological, behavioural, cognitive, and experiential changes, while feelings refer to the subjective experience of emotions, and usually last from minutes to days. Moods are typically dispersed; they last longer than feelings and emotions, are devoid of a connection with

an object, and can result from an emotion. Finally, affect stands for the broad affective phenomenon and encompasses emotion, feelings, and mood (Vallerand & Blanchard, 2000).

Empirical efforts to study emotions in sport have been generally separated in two areas: the antecedents and the consequences of emotion in sport (Vallerand & Blanchard, 2000). Of interest in this thesis are the motives for sport participation (i.e., antecedents) and the effect that feelings and emotions have on sport performance (i.e., consequences).

Research has shown that people usually engage in athletic activities for intrinsic and extrinsic reasons, such as acquiring feelings of self-efficacy, and also to fulfill different goal orientations (i.e., task vs. ego involvement). To illustrate the influential relationship between emotions and athletic activities, Csikszentmihalyi (1992) wrote that, “the bottom line of sport activity is the feelings it provides” (p. 181). This statement highlights the importance of feelings and it is often a reason why individuals play sports. Upon examining the motives of young athletes for playing sport, Wankel (1985) reported that they not only liked the friendships they developed and the organized nature of their sport programs, but also the good feelings the experience of playing provided them. The feelings that athletes experience when they play sports were examined by Boyd, Trudel, and Donahue (1997). The researchers found that young women hockey players enjoyed playing for the positive feelings their sport provided them. They emphasized that they enjoyed not only the social aspect but also the kinesthetic aspect of their sport, that is, the feelings of power and fulfillment combined with exhaustion and speed.

It is interesting that much of the research on the relationship between emotion and sport performance has focused on how arousal relates to performance (Vallerand & Blanchard, 2000). There is a need to discern the emotional processes accountable for peak performance. A common belief is that positive affect results in optimal performances while negative affect produces poor

performances. However, preliminary work by Hanin (2000b) proposes that both types of affect can have facilitating and debilitating consequences on athletic performance. For instance, Hanin demonstrated that positive emotions (e.g., pride) can perturb the use of resources due to an inappropriately low level of alertness and that negative emotions (e.g., anger) can function to motivate athletes and increase the energy and effort devoted to the performance task.

As discussed more thoroughly in a previous section, resonance is a process from which one can derive desirable emotions and feelings. In fact, the subjective experience of feelings is at the core of the resonance process. These feelings underlying resonance are most comparable to what Denzin (1984) identified as “lived feelings.” According to Denzin, lived feelings are extensions of the body and form a single manifestation or experience. The subjective, emotional experience of happiness, joy, but also despair and sadness, are best captured by these feelings. Lived feelings have unique value content or meaning to the individual, and “they are experienced as embodied bodily states, associated with particular states of consciousness and with the person’s current location in the world-at-hand” (p. 125). Most importantly, Denzin indicated that lived feelings mirror a person’s minded intentionality. In the same way, resonance is about intentionally doing things that will make us feel the way we want to feel thus there is a direct relationship between our actions and feelings. Also, resonance can be linked to Denzin’s concept of “reflective emotional consciousness.” People who are reflective emotionally conscious engage in a double reflection, asking themselves whether they are feeling the way they want to feel. They also situate themselves in the present, where “the self of the person feels, reflects the emotion, and reflects on the emotion” (p. 73). Akin to resonance, individuals who reflect on their emotional experiences can access their feelings, manage and regulate them, and mould the interpretation they give to their emotions.

Another concept closely linked to resonance is emotional competence (Saarni, 2000). According to Saarni, emotional competence refers to “the demonstration of self-efficacy in emotion-eliciting social transactions” (p. 68). In other words, it is the ability to regulate one’s emotional experiences within our interactions. One basic tenet of emotional competence is that individuals develop and acquire emotional self-efficacy as they mature. Based on the results of developmental studies with children and adolescents, Saarni presents emotional competence as a skill rather than an innate ability (i.e., as inferred by the construct of emotional intelligence, Goleman, 1995; Mayer & Salovey, 1997), thereby allowing room for learning and development. Emotionally competent persons are typically aware of their own feelings or emotional states and they see themselves as feeling the way they want to feel. They understand that their emotional states may impact others around them and they use self-regulatory strategies to cope with aversive and distressing emotions (Saarni, 2000). Saarni also emphasized the influential role played by the context surrounding the emotional experience because emotional competence stems from the interaction between individuals and their environment.

According to Saarni (2000), the processes by which people become emotionally competent are complex and are influenced by such factors as their sense of self (i.e., interactions between individuals and their social and physical environments), moral dispositions (i.e., personal integrity), and developmental history (i.e., beliefs and attitudes toward culture, social roles, observation of important others). She further suggests that the development of emotional competence starts at birth and stretches into adolescence. Although Saarni argues that mature adolescents can potentially demonstrate and apply the skills of emotional competence efficiently, she notes that “given the significance of context, there will inevitably be situations in which we [including adults] respond with relative emotional incompetence, in spite of our best efforts to

cope effectively” (p. 77). Finally, Saarni (2000) postulated that as the skills of emotional competence are acquired and developed in a variety of social contexts, significant consequences result, including emotional management skills, an overall sense of subjective well-being, and adaptive resilience.

Saarni described the construct of emotional competence from a developmental perspective but failed to indicate how individuals can reliably demonstrate the skill of emotional competence in their everyday social interactions. For instance, she does not present concrete strategies or tools for helping people respond to and cope with challenging situations in a desirable and adaptive way and consequently feel the way they want to feel, which is one of the skills of emotional competence. Considering the numerous characteristics common to both concepts, one could argue that resonance may be a fundamental process playing a role both in the development and consistent demonstration of emotional competence. The RPM is a tool that allows individuals to identify how they want to feel in the various contexts of their social life and helps them to develop preparation and revisiting strategies to consistently and efficiently regulate the occurrence of desired feelings. Through the process of resonance, people can learn to meaningfully connect their emotional experiences to their social environment and thus, demonstrate the skill of emotional competence.

Engagement. Engagement is another concept intimately linked to resonance. Experiencing total task absorption is believed to be the most eminent indication of a flow state (Csikszentmihalyi, 1990; Jackson, 2000) and a peak experience (Cohn, 1991). Similarly, Newburg and colleagues have highlighted that engagement is key for experiencing dream feelings. In their research, Newburg et al. (2002) and Csikszentmihalyi (1990) showed that engagement was crucial for sustained energy and performance excellence. They also emphasized

that engagement is most likely to occur when people free themselves from their everyday worries and participate in meaningful and fulfilling activities.

According to Maddux (1997), being engaged in the moment and being mindfully aware of the present are important factors that contribute to enjoyment and happiness. Interestingly, this goes against the definition of flow because although individuals who experience flow are completely absorbed in what they are doing, they most often perform effortlessly with an altered state of consciousness, that is, they are not consciously aware of their actions. Maddux reported that happiness results from living in the here and now, that is, from being immersed in the present moment of an activity. He also claimed that individuals will have difficulty attaining happiness and enjoyment if they focus all their attention on reviewing the past or preparing for future events. He argued that people should mindfully connect to the present and dissociate from the concerns related to the outcome or goal of an activity. On distinguishing between habit and routine, Maddux suggested that practitioners should encourage and promote “mindful routines” rather than “mindless habits.” He clearly conveyed that happiness, meaning, and well-being are found only in such mindful living when individuals pay full attention to every moment and every experience as it happens.

Maddux (1997) also argued that as long as people consider the activities in which they engage as work instead of play, they will have difficulty turning these activities into meaningful and enjoyable experiences. Being engaged in the moment is important to experience positive feelings on a regular basis, and according to Maddux, engagement precedes positive experiences. Maddux’s idea of mindfully engaging in or connecting with an activity resembles the notion of engagement that underlies resonance. Precisely, people who experience resonance enjoy meaningful living and fully engage in what they do because the activities they choose to do allow

them to experience their desired feelings on a daily basis. Although Maddux increased our understanding of engagement and happiness, he did not offer hands-on suggestions to help people be more engaged and happy, and experience desired feelings more consistently in their life.

Mindfulness. Another concept that bears an intimate relation to engagement and resonance is that of mindfulness. Mindfulness is an inherent state of consciousness characterized by enhanced and receptive attention and awareness of what is happening in the present moment (Brown & Ryan, 2003). Individuals in more mindful states typically display an open attention to psychological and emotional states. However, mindfulness may be challenged when people behave routinely or mechanically, without awareness of or attention to their emotions, thoughts, and actions. Williams James (1911/1924) was keen about the study of consciousness, still, he stated that “compared to what we ought to be, we are only half awake” (p.237). Sharing a similar perspective, Brown and Ryan underlined that “in less mindful states, emotions may occur outside of awareness or drive behaviour before one clearly acknowledges them” (p. 823). Mindfulness may thus play a key role in disengaging people from habitual or automatic functioning that does not lead to optimal performances. Recent research indicates that high-level mindfulness is associated with various aspects of well-being, including self-regulated behaviour and positive emotional states (Brown & Ryan, 2003; Kabat-Zinn, 1990). It has also been suggested that mindfulness may enhance well-being by increasing the quality of everyday experiences (Brown & Ryan, 2003). Brown and Ryan contended that when people actively engage in what they do and pay careful attention to what is occurring, the clarity and vividness of their daily experiences are enhanced, which might directly contribute to their well-being and happiness.

Langer's (1988, 1989) extensive work on mindfulness also demonstrates the importance of a mindful state for several aspects of health as well as longevity of life. Distinguishing between two primary states of mind, that is, mindfulness and mindlessness, Langer describes the former as a process in which one actively treats information and creates meaningful categories (i.e., cognitive differentiation), while the latter represents rule-governed and inflexible behaviour. When in a mindful state, one is actively involved in a task by differentiating and categorizing new information as it is perceived. Furthermore, similar to Brown and Ryan (2003), Langer maintains that a mindfulness state facilitates enjoyment and well-being.

Mindfulness is an underlying component of resonance as resonance requires self-awareness and engagement in meaningful activities, which suggests that individuals must cognitively differentiate between what is and is not meaningful to them, or what makes them feel the way they want to feel or not. Moreover, the RPM serves as a tool to guide individuals to regulate their thoughts and actions based on how they want to feel and thus it empowers them to self-regulate their behaviours. Hence, the process of resonance not only leads individuals to have heightened awareness and attentional sensitivity to daily feelings, thoughts, and behaviours, but it also cultivates self-endorsed regulation.

Intrinsic motivation. A number of empirical studies have revealed that happiness and satisfaction are increased when individuals set personal goals that are intrinsic in nature (Kasser & Ryan, 1993, 1996; Ryan, Chirkov, Little, Sheldon, Timoshina, & Deci, 1999). Intrinsic motivation is described as a "natural inclination toward assimilation, mastery, spontaneous interest, and exploration that is . . . essential to cognitive and social development and that represents a principle source of enjoyment and vitality throughout life" (Ryan & Deci, 2000, p. 70). Deci and Ryan's (1985) self-determination theory points to the necessity to satisfy

psychological needs for competence, autonomy, and relatedness in order to develop and cultivate inherent growth tendencies, self-motivation, and personal well-being. In essence, intrinsically motivated behaviours are those in which people engage out of interest, volition, authenticity, and which afford a sense of self-efficacy and autonomy (Ryan & Deci, 2000).

People usually engage in sport because they are genuinely interested in it, and because it provides them fun, enjoyment, and satisfaction (McAuley & Tammen, 1989). This intrinsic drive can be undermined by external influences and events such as parental pressure and competitive situations. However, Deci and Ryan (1985) indicated that depending on how external events and outcomes are interpreted, they can nurture intrinsic motivation if individuals perceive them to reflect competence and self-determination. Intrinsic motivation is likely to blossom when events or activities involve free choice, active engagement, and personal endorsement (Ryan & Deci, 2000). The concept of resonance is, in essence, related to the central notion of intrinsic motivation. Resonating individuals reflect on why they do the things they do. They pay attention to what motivates them and makes them feel good and freely and actively pursue activities that allow them to live their dream feelings. They align their goals and actions with the feelings that they daily seek and because they constantly revisit their motives for engaging in their activities, they are in a position to change these activities when they are no longer interesting, meaningful, or engaging. According to Newburg et al. (2002), the key factor that helps people to remain engaged in what they do, particularly when they encounter obstacles, is revisiting the intrinsic reasons for doing the activity, that is, the experience of dream feelings.

It is clear that the notions of subjective well-being, emotions and feelings, engagement, mindfulness, and intrinsic motivation all conceptually overlap with resonance, at least to some extent. The RPM is intended to empower individuals to create and incorporate more

opportunities for positive experiences in their life. Although in its infancy, research examining the process of resonance is promising. However, more research is needed to determine how the RPM can be applied in different sport, exercise, and health contexts. In addition, non-elite athletes (Callary, 2004; Doell, 2002; Doell et al., 2003) and adolescents (Short, 2004; Short & Durand-Bush, 2004) seem to have more difficulty clearly identifying their dream feeling than elite athletes (Durand-Bush et al., 2001; Newburg et al., 2002; Soulard, 2003; Soulard & Durand-Bush, 2003). Thus, the level of sport participation or overall experience in a sport may be a factor influencing the extent to which athletes can articulate their desired feelings. All in all, research on resonance remains limited thus more studies need to be conducted to address the nuances and intricacies involved when working with athletes from different levels and sports.

In light of the gaps identified and need for more research on resonance, the purpose of this study was to examine if and how endurance athletes can experience resonance in their sport and daily life by participating in a resonance-based intervention. This study also sought to examine the impact of a resonance-based intervention on the athletes' cycling performance, subjective well-being, and intrinsic motivation. The next chapter will present the methodology that was used to carry out the study.

CHAPTER III

METHODOLOGY

This chapter first presents the research paradigm that guided the current inquiry. Then, it provides detailed information concerning the participants, the design of the study, and the instruments, procedures, and methods that were used to collect and analyze the data. The first section pertains to the research paradigm.

Research Paradigm

After a meticulous review of Lincoln and Guba's (2000) summary of the ontological, epistemological, and methodological premises of the positivist, post-positivist, critical theory, and constructivist paradigms, it was determined that the post-positivist paradigm would be the most appropriate to answer the research questions of this investigation. The post-positivist paradigm endorses the idea that, although reality can never be perfectly apprehended, it must be subjected to the largest possible systematic examination in order to understand it as completely as possible. Acknowledging that investigators and participants are more or less dependent individuals that exert influence on each other, this paradigm stresses the importance of remaining objective by comparing findings to pre-existing knowledge and subjecting them to peer and referee review. In the present study, the findings were evaluated and discussed in relation to the conceptual framework (i.e., RPM) that guided the resonance-based intervention. Moreover, objectivity was maximized by subjecting the findings to a peer-review process and following certain procedures to ensure the trustworthiness of the study. Finally, the post-positivist paradigm considers discovery as an important component of inquiry, encourages the collection of data in more natural settings, and promotes the use of both quantitative and qualitative methods to study a phenomenon of interest in the most accurate manner. Both qualitative and

quantitative methods were used in this study. In addition, a deductive analysis based on the components of the RPM was used to examine the data.

Participants

The participants in this study were four athletes competing in endurance sports. More specifically, the sample comprised three specializing triathletes and one elite multisport athlete competing in long-distance mountain bike races and adventure races (eco-challenges). The participants were two men and two women, and their age ranged from 18 to 45 years old.

One condition upon recruitment of the participants was that cycling had to be an important aspect of their sport and training due to our intention to measure and monitor the athletes' cycling performance on a bicycle ergometer at an exercise facility over the period of the study.

The three specializing athletes mostly competed at a regional or provincial level. According to Côté and Hay's (2002) stages of sport participation, athletes in the specializing years have limited their attention to one or two specific sport disciplines. Although fun and enjoyment are central to their sporting experience at this level, the athletes develop sport-specific skills through more structured and extensive practice. The elite athlete in this study competed at a national and international level and according to Côté and Hay, engaged in the investment years of sport participation. Athletes at the investment stage usually narrow their focus on one particular sport and devote most of their time and effort to refining technical skills and strategies through extensive deliberate practice. Accordingly, they are regarded as pursuing an elite level of performance (Côté & Hay, 2002).

The four athletes were recruited at the Peak Centre for Human Performance in Ottawa. They were approached via the owner of the centre after a letter of information (see Appendix D)

was posted on the news board of the facility. The participants formed a convenience sample because they were selected based on their suitability for this investigation. More specifically, they were chosen based on their availability and willingness to participate in the present study. Hence, the aim of this study was not to generalize the results to the entire athletic population but rather to explore whether four endurance athletes experienced resonance and could increase not only their resonance but also their cycling performance, subjective well-being, and intrinsic motivation by participating in a resonance-based intervention.

At the onset of the study, the researcher met with potential participants and scheduled individual information sessions to discuss the study and call attention to the commitment necessary to ensure a successful experience for both them and the researcher. Upon agreement to participate in the study, the athletes read and signed a consent form approved by the Research Ethics Board of the Social Sciences and Humanities of the University of Ottawa (see letter of information, Appendix D). The participants were ensured that confidentiality and anonymity would be maintained throughout the study.

Design of the Study

This study was a single-subject A-B-A experimental design involving three phases: (A1) a baseline period, (B) a resonance-based intervention period, and (A2) a post-intervention period (see Appendix E for a comprehensive outline of the structure of the design). This type of design was chosen because it allows investigators to demonstrate the effectiveness of an intervention by showing that performance or behaviour across experimental conditions changes as a result of introducing the intervention (Barlow & Hersen, 1984). Several researchers in the past 25 years have advocated the use of single-subject designs to evaluate applied sport psychology interventions aimed at enhancing performance (Bryan, 1987; Hrycaiko & Martin, 1996;

Shambrook & Bull, 1996; Wollman, 1986; Zaichkowsky, 1980). Despite several calls for its increased use, very few studies using single-subject designs have been conducted and/or published (Hrycaiko & Martin, 1996). Yet, Barlow and Hersen have encouraged this type of design for inquiries involving a small number of participants, of which the results may otherwise be obscured in group-averaged data (Kendall, Hrycaiko, Martin, & Kendal, 1990). Furthermore, given that skilled athletes are not likely to improve as much from baseline levels as less skilled athletes, single-subject designs have been considered more suitable than group designs for examining performance changes across experimental phases (Barlow & Hersen, 1984; Kazdin, 1984). With four endurance athletes comprising the sample and an intent to examine individual responses to the intervention, a non-parametric, split-middle technique (Barlow & Hersen, 1984) was used to assess changes in behaviour for cycling performance, subjective well-being, and intrinsic motivation.

Instruments

Four methods of data collection (i.e., interviews, daily journalling, a bicycle ergometer, and questionnaires) allowed for a careful examination of each participant's process of resonance throughout the study. Cycling performance was assessed based on the average wattage obtained when completing a set time-trial using a specific, pre-determined individual cycling program. Several psychological variables were also examined in this study, namely: life satisfaction, positive and negative affect, intrinsic motivation, perceptions of performance, and resonance.

Interview Guide

Resonance was examined using the RPM as the conceptual framework. To assess the four components of resonance and the impact of the resonance-based intervention on the psychological and performance measures, an interview guide was developed (see Appendix F).

The first interview primarily attempted to explore if and how the participants experienced resonance in their sport and daily life. The interview was in-depth, semi-structured, and open-ended and began with a broad introductory question such as “Tell me why you engage in your sport.” In previous studies on resonance (Callary, 2004; Doell, 2002; Durand-Bush et al., 2001; Short, 2004; Soulard, 2003), this question often led the participants to talk about how they wanted to feel because a typical response was that they participated in their sport because of the enjoyment it provided them and because it made them feel good. This then led to the identification of their desired feelings, which then directed subsequent questions to assess the other three components of the RPM. Briefly, questions to examine the dream feeling included: “How do you like to feel when you engage in your sport?” and “Talk to me about the feelings you seek in training, competition, and your daily life. Are they the same?”

It is important to understand that individuals might not initially be aware of how they want to feel, whether this be when they play sports, work, or spend time with their family and friends. This might be particularly true for beginner athletes and young sport participants (Callary, 2004; Doell, 2002; Short, 2004). A period of introspection following a series of interviews and the use of a journal to assess the level of resonance experienced each day has been found to promote self-reflection and growth and to gain insight into one’s desired feelings (Doell & Durand-Bush, 2003). Consequently, a similar type of protocol was used in the current study. To further help the participants to identify their dream feeling, they were asked to describe a picture of themselves, or an image from a magazine, book, newspaper or other source that represented how they wanted to feel in their sport. It has been argued that pictures help individuals to access their inner images and feelings and thus facilitate their expression (Weiser, 1990). Upon completion of the first interview, they were asked to follow-up on their chosen

mental image and find a picture that helped them to connect with their dream feeling. This picture was incorporated into their journal.

Examples of questions assessing the preparation component included: “What allows you to feel this way in your sport and daily life?” and “What do you need to do to experience this feeling more often?” To identify obstacles or setbacks the participants had faced in the past, questions such as: “What prevents you from experiencing this feeling on a daily basis?”, “Tell me about some of the obstacles that you have faced in the past?” and “How do these obstacles affect your preparation, performance, well-being, and motivation?” were asked. Finally, questions to explore revisiting strategies comprised: “What do you do when you face an obstacle?” and “Do you do anything to reconnect with the feelings you seek in your sport?”

In response to the first interview and the daily reflective journalling, the three subsequent intervention interviews were intended to further examine the participants’ experiences of resonance as well as any changes in their thoughts, feelings, performance, well-being, and motivation that might have resulted from enhanced introspection, self-awareness, and engagement in the resonance process since the preceding interview. Questions included: “What have you learned in the last two weeks?”, “Talk to me about how you have been feeling.” The participants were also invited to describe some of their most and least resonating experiences and explain why they were highs or lows. Their experience with the journalling process was also examined. The last intervention interview was similar to the previous ones, yet other questions were posed to assess their overall learning experience of resonance and to explore the impact of the resonance-based intervention on their cycling performance, well-being, motivation, and life in general.

Journal

The participants were asked to keep a journal to closely monitor their daily experiences of resonance throughout the intervention period. The journal included: (a) their personalized resonance model, based on the first interview; (b) a graph that charted their level of resonance throughout the day; (c) descriptions along with explanations of their most and least resonating situations/events during the day; (d) rating scales (with justification) that assessed: (i) their level of resonance within their sport (e.g., training or competition); (ii) their level of well-being and satisfaction with their performance in training or competition; and (iii) their overall daily level of resonance, satisfaction, and well-being; and (e) lessons learned from their overall daily experience of resonance. The journal form is provided in Appendix G.

Bicycle Ergometer

The athletes' cycling performance was measured using a specialized bicycle ergometer (i.e., CompuTrainer) that assessed the average power output in watts of a standard, set 5 or 10-minute time trial cycling program. The athletes were given the choice over the amount of time of their trial to not overload their training program, but they were instructed to use the same time trial throughout the study. It was assumed that the athletes' performance increased as their average power output increased for a given set time trial cycling program. A trained exercise physiologist at the Peak Centre for Human Performance conducted the first assessment with each athlete, and then the participants assessed and reported their own performance measures in a personal cycling assessment logbook.

Measures of Subjective Well-Being

Subjective well-being was examined by means of two of its major components: life satisfaction and positive and negative affect.

Life satisfaction. The revised version of the “Satisfaction With Life Scale” (SWLS-revised, Pavot & E. Diener, 1993; see Appendix H) comprised five statements relating to global life satisfaction that were rated on a 1 (strongly disagree) to 7 (strongly agree) point Likert scale. Total scores could vary between 5 and 35. The SWLS-revised version has satisfactory internal validity (.87) and test-retest stability (.82) and has shown adequate sensitivity to detect changes in life satisfaction throughout the course of a 2-month intervention program (Pavot & E. Diener, 1993).

Positive and negative affect. An adapted version of the “Positive And Negative Affect Schedule” (PANAS, Watson, Clark, & Tellegen, 1988; see Appendix I) included 26 different words (original included 20 items) describing different feelings and emotions (i.e., 16 positive and 12 negative) that were rated on a 1 (very slightly or not at all) to 5 (extremely) point Likert scale. A high score of positive affect reflected a sense of fulfillment and a feeling of enthusiasm whereas an elevated score of negative affect represented feelings of hostility and distress. Participants were instructed to indicate the extent to which they had felt a certain way in the past few days. The original PANAS has shown acceptable psychometric properties with adequate test-retest stability and internal consistency estimates situated between .84 and .90, and it is sensitive to fluctuations in mood when used with short-term instructions (Watson et al., 1988). Having used an adapted version of the PANAS does, however, pose a limitation.

Measure of Intrinsic Motivation

To assess the level of intrinsic motivation for sport participation, a shortened version (McAuley, Duncan, & Tammen, 1989) of the interest-enjoyment subscale of the Intrinsic Motivation Inventory (IMI, Ryan, 1982, see Appendix J) was used. The IMI is a multidimensional measure dividing intrinsic motivation into four subscales: interest-enjoyment,

perceived competence, effort-importance, and pressure-tension. However, the interest-enjoyment subscale is the only subscale of the IMI that measures intrinsic motivation. The shortened interest-enjoyment subscale consisted of 5 items scored on a Likert scale from (1) strongly disagree to (7) strongly agree. It should be noted that the single negatively worded item was rescaled before the analysis of the data. The IMI has shown good factorial and construct validity as a hierarchical model of intrinsic motivation. Additionally, alpha coefficients for the four dimensions and the overall scale indicated adequate reliability (McAuley et al., 1989).

Data Collection Procedures

Researcher's Preparation

As the primary researcher in this study, it was imperative that I conduct a pilot study and interview a number of athletes to become skilled at using the interview guide, verify the different procedures, and to gain experience in collecting and analyzing meaningful information from the participants. My pilot work consisted in interviewing four athletes from different levels of sport participation (i.e., national, provincial, and recreational), as well as serving as a peer debriefer in a previous study involving the use of the RPM with 12 athletes (Soulard, 2003). In addition, Dr. Doug Newburg visited the University of Ottawa in November 2002 and 2003 to present his work on resonance and discuss with me various issues about researching the concept of resonance. This allowed me to confirm and further increase my understanding of the model and variables involved, as well as ask questions to clarify different issues with regard to this research project. All in all, I was adequately prepared to conduct the study.

Baseline Measures

As previously mentioned, a single-subject design was used that involved three phases: a baseline period (i.e., 5 weeks), a resonance-based intervention period (i.e., 6 weeks), and a post-

intervention period (i.e., 5 weeks), for a total period of 16 weeks. Prior to the introduction of the resonance-based intervention (i.e., interviews and daily reflective journalling), each participant was assessed twice a week over a period of 5 weeks to obtain baseline measures of their cycling performance, life satisfaction, positive and negative affect, and intrinsic motivation. In total, ten baseline measures for each of these variables were collected. The baseline measures served as standards against which the value or impact of the resonance-based intervention was determined. The reader is referred to Appendix E, which illustrates the steps of the data collection process.

Resonance-Based Intervention

Following the 5-week baseline period, each athlete participated in a 6-week resonance-based intervention which included a total of four interviews and daily journalling. The athletes were scheduled for a first interview the week following their 10th baseline measure. All four athletes started the study a few weeks apart from each other. This interval or time-lag between the introductions of the intervention was meant to control for the effect of history. The three subsequent intervention interviews were then held every second week after the first interview. All of the interviews were audiotaped. Throughout this 6-week intervention period, like in the baseline period, the cycling performance, life satisfaction, positive and negative affect, and intrinsic motivation of the participants were assessed twice a week for a number of 12 measures in order to determine any effect of resonance on these variables.

First interview. The first interview lasted between one to two hours and attempted to explore if and how the participants experienced resonance in their sport and daily life. The interviewing process was flexible so that the questions were asked in an order that flowed with the information provided. This was important because we wanted the athletes to talk about themselves in a way that was meaningful to them without disrupting or biasing their responses.

At the end of the interview, I generated, with the help of the participants, their personal model of resonance based on the information they provided during the interview. This model was inserted as the first page of the journal that they completed during the study to monitor and increase their daily experience of resonance. At the end of the first interview, the participants were given instructions on how to complete their journal and we scheduled the three subsequent interviews as well as the follow-up interview based on the proposed timeline for the study.

Subsequent intervention interviews. As previously mentioned, the three subsequent intervention interviews were held every second week following the first interview over a period of 6 weeks. They served to further examine the participants' process of resonance, highlight any change in their experiences during the preceding weeks, and discuss journal entries. These interviews lasted between 45 to 60 minutes.

Journalling period. At the end of the first interview, the participants were shown how to fill out their daily journal. They were required to make a journal entry for each day of the 6-week intervention period. The journals were collected at the end of every second week to ensure compliance and the content was discussed during the intervention interviews. The use of daily journalling in Callary's (2004), Doell's (2002), and Soulard's (2003) studies stimulated reflection and self-awareness and was found to be extremely valuable and successful in helping athletes increase and track their experience of resonance in their sport and daily life. Also, keeping a journal has been shown to be an effective tool for monitoring and enhancing one's performance (Zimmerman & Kitsantas, 1997) and for guiding individuals to examine and reflect on their emotional states and well-being (Newburg et al., 2002).

Post-Intervention Period

To assess changes in the athletes' cycling performance, life satisfaction, positive and negative affect, and intrinsic motivation following the intervention, 10 measures of each of these variables were collected for each participant over a period of 5 weeks. The athletes also participated in a follow-up interview lasting approximately 30 to 45 minutes at the end of the 5-week post-intervention period. The follow-up interview was similar to the intervention interviews, but primarily aimed to determine if the athletes continued to apply resonance in their sport and life and created new opportunities to resonate on a daily basis.

Data Analysis Procedures

To collect and analyze the data, both qualitative and quantitative methods were used. The qualitative data resulted from the transcribed interviews and journal entries while the quantitative data was compiled from the questionnaires and the bicycle ergometer. The qualitative data were analyzed using a deductive approach, with the RPM serving as the conceptual framework, whereas the quantitative data were analyzed using the split-middle technique for the analysis of single-subject designs (Barlow & Hersen, 1984).

Qualitative Analyses

A first step before beginning the analysis of the data was to transcribe each interview verbatim. Only grammatical corrections were made to ensure the flow of the text. The participants were then given their interview transcript for authentication purposes and two of them made a few changes to them. Upon return of the transcripts, the minor changes that were made by the participants were conserved for the analysis. All of the interviews and written responses from the journals were analyzed deductively, using the RPM as a guideline to categorize the responses. The specific data analysis steps included: (a) transcribe the interviews

and journal responses verbatim; (b) clean up the text (i.e., grammatical errors); (c) send transcripts to participants for authentication and make proper changes; (d) import the data in the software program Nvivo (Fraser, 1999); (e) create meaning units; (f) deductively create categories; and (g) categorize similar meaning units under appropriate categories (Côté, Salmela, Baria, & Russell, 1993).

Quantitative Analyses

The data from the questionnaires (i.e., SWLS-revised, PANAS, and IMI) and the bicycle ergometer assessments (i.e., average power) for all 32 measurements [pre-intervention baseline (A_1), 10 measures; resonance-based intervention (B), 12 measures; and post-intervention (A_2), 10 measures] were plotted on graphs for each participant and analyzed using a non-parametric, split-middle technique to assess the rate of behaviour change for each variable across the three experimental phases of the study (Barlow & Hersen, 1984). Following the split-middle technique for the treatment of data outlined by Shambrook and Bull (1996), data points (including changes in levels and slopes) from the three phases of the study were examined for each participant. The split-middle technique also involves the use of a Binomial test that allows for a statistical comparison of trend lines between adjacent phases (i.e., the baseline and the intervention phases). In sum, this method of analysis enabled us to determine for each individual athlete if the intervention had an impact on the variables measured.

Steps to Establish Trustworthiness

Several measures were taken to maximize the trustworthiness (Lincoln & Guba, 1985) or credibility (Patton, 1990) of this study. First, credibility and confirmability were addressed using (a) peer debriefing, which was ensured by meeting bi-weekly with my thesis supervisor and other peer researchers and students involved in research on resonance; (b) member checking,

whereby participants authenticated their interview transcripts for accuracy; and (c) triangulation, which was ensured by using: (i) journal entries to guide the questioning in the intervention interviews; this allowed the participants to validate their entries as well as my interpretation of them, and (ii) questionnaires and journals (e.g., resonance graphs and scales) to complement the qualitative data from the interviews; this in itself improved dependability. Finally, to increase applicability and consistency, “thick descriptions” of the method, procedures, and results are provided to permit readers to assess the generalizability of the results to their own context, and allow researchers to replicate the study with athletes in similar or different contexts.

PART TWO: RESULTS OF THE STUDY

CHAPTER IV

ARTICLE 1:

INTEGRATING RESONANCE IN THE LIFE OF FOUR ENDURANCE ATHLETES:

A QUALITATIVE INQUIRY

Running head: RESONANCE

Integrating Resonance in the Life of Four Endurance Athletes: A Qualitative Inquiry

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Running head: RESONANCE

Integrating Resonance in the Life of Four Endurance Athletes: A Qualitative Inquiry

August 2004

Abstract

The purpose of this study was to examine the experience of four endurance athletes participating in a 6-week resonance-based intervention. The intervention consisted of four in-depth, open-ended, semi-structured interviews using the Resonance Performance Model (RPM, Newburg et al., 2002) as a framework and a daily reflective journal. A 5 week follow-up interview served to assess the athletes' overall experience, lessons learned and perceived benefits. Results showed that all four endurance athletes benefited from the intervention. They reported a significant increase in self-awareness, a positive change in focus from outcome to process, and an empowered ability to manage their emotional responses to events. The participants' overall experience with the intervention and their lessons learned are discussed as individual case studies as there were both similarities and differences in their experience of resonance. Practical implications for using the RPM with endurance athletes and other populations in sport, exercise, and health settings are also addressed.

Integrating Resonance in the Life of Four Endurance Athletes: A Qualitative Inquiry

Does how we feel affect how we perform? Most likely everyone would agree that our daily feelings affect our everyday performance, whatever the context of that performance may be (e.g., playing sports, teaching children, or running a business meeting). Yet, very few of us actually think about how we want to feel in our daily life and regularly reflect on those desired feelings in a critical and constructive way. Even less likely are we designing our life around those feelings or helping people around us feel the way they want to feel (Newburg, 1998).

In our outcome-oriented Western society, little attention has been devoted to the role of positive feelings in the process of achieving high levels of well-being and performance (Fredrickson, 2000). This is surprising given that daily feelings or emotions play such a substantial role in the human experience and are essential for our understanding of various phenomena, including athletic excellence, life engagement, and subjective well-being (Davidson & Cacioppo, 1992). One reason for this might be that much of the research that has examined emotions in sport has been negatively biased; focusing predominantly on the effect of anxiety on performance and thus influencing practitioners and consultants to design their interventions around the traditional “treatment” (i.e., problem-centered) approach (Seligman & Csikszentmihalyi, 2000). Another reason might be that we are often unaware of our feelings and emotions as well as the situations leading up to them (Botterill & Brown, 2002). Brown and Ryan (2003) have argued that “in less mindful states, emotions may occur outside of awareness or drive behaviour before one clearly acknowledges them” (p. 823). Sharing a similar view, Newburg (1998) emphasized that people seldom take ownership of their feelings and emotions, that is, we often passively accept our emotions as we experience them or are told how we should feel in specific circumstances.

Conventional problem-centered approaches to mental skills training, with their emphasis on the teaching of specific cognitive and behavioural strategies for enhancing performance, appear ill-equipped to support athletes in identifying the feelings that they seek in their sport and life and creating opportunities for experiencing these feelings on a daily basis. Due to time constraints, most interventions are technique-focused and thus barely contribute to the emotional awareness and growth of athletes (Newburg, Kimiecik, Durand-Bush, & Doell, 2002). Newburg (1998) has argued that the ability to experience one's desired feelings (e.g., feeling engaged, loved, fulfilled, peaceful, etc.) is the genuine skill of performing and living while concentration, self-regulation, and imagery are some of the techniques that can be used to develop this fundamental life skill. Ravizza (2001) and Botterill and Brown (2002) all shared a similar idea by highlighting the need for athletes to first become aware of their emotional states before they learn and practice self-regulatory techniques. As athletes gain awareness, they can exert more control on their emotions, thoughts, and physiological responses and integrate them into optimal performances. According to Ravizza, awareness should thus be encouraged as it allows athletes to become mindful of their ideal performance state as well as the everyday behaviours in which they engage to achieve this state. However, he advocates awareness of optimal performance states as opposed to desired feelings. Clearly, concrete approaches to help athletes identify and experience their desired feelings in the various spheres of their life are lacking.

Perhaps an increasing appreciation of the idiosyncratic nature of the relationship between emotion and performance (Hanin, 2000) and the need to nurture the development and performance of athletes (Amirault & Orlick, 1999; Danish & Nellen, 1997; Orlick, 1998) have led to the emergence of more humanistic, athlete-centered approaches in applied sport psychology. The athlete-centered model espouses a Rogerian philosophy of counselling and

encourages the integration of sport and life skills within the sport experience (Miller & Kerr, 2002). In essence, sport is seen as a vehicle to enhance the psychosocial development of athletes (Petitpas, 1996). Mill and Kerr have recently advocated the use of an athlete-centered model as it develops independence and self-reliance and empowers athletes to assume responsibility for their personal development, training, and competitions. Similarly, other researchers have proposed a paradigm shift in sport psychology practice from problem-centered to athlete-centered in order to accentuate greater practitioner self-reflection and self-knowledge (Anderson, Knowles, & Gilbourne, 2004; Holt & Streat, 2001). Hence, consultants might soon recognize the equal value of developing the self-knowledge and self-awareness of their clients prior to implementing any mental skill program.

One such person-centered model that emphasizes great levels of self-awareness and self-reflection is the Resonance Performance Model (RPM, Newburg et al., 2002). Interested in identifying the specific mechanisms or processes underlying life satisfaction and performance excellence, Newburg and colleagues found that individuals who design their life according to how they want to feel experience a heightened sense of connection to their daily activities. Derived from over 300 in-depth, open-ended interviews with accomplished individuals from different domains such as sport, music, sciences, medicine, business, and the performing arts, the RPM is a holistic and comprehensive model that describes the path through which these performers became proficient in their field and lived an engaging and meaningful life. The process in which they engaged to do this was termed resonance (Newburg et al., 2002). Resonance is a process that allows individuals to fully engage in their endeavours as a result of being in complete harmony with their environment. It is a way of living that allows them to feel the way they want to feel in their daily activities and consequently experience enjoyment,

satisfaction, and an overall sense of well-being. A recurrent finding in this grounded theory research was that the participants identified and strove to not only experience but also protect how they wanted to feel in the process of achieving personal goals. Results showed that they all had a dream feeling, which represented how they wanted to feel in their daily pursuits. They also designed and engaged in extensive preparation that allowed them to experience their chosen desired feelings on a regular basis. All of these accomplished individuals encountered obstacles in their endeavours; however, rather than going back to their preparation phase and work harder (i.e., obstacle-preparation loop), they engaged in a number of activities to reconnect with their dream feeling and re-energize themselves before engaging in more preparation. These findings led to the inductive conception of the RPM, which comprises four components: (a) Dream Feeling, (b) Preparation, (c) Obstacles, and (d) Revisit the Dream Feeling.

Recent research in the area of resonance has provided support for the RPM model. In total, five studies (Callary, Durand-Bush, Trudel, & Newburg, 2004; Doell, Durand-Bush, & Newburg, 2003; Durand-Bush, Trudel, Doell, Soulard, & Newburg, 2001; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003) were conducted to examine the process of resonance of a total of 27 athletes participating at different levels in different sport disciplines and five adolescents in the context of a physical education class. In the first study (Durand-Bush et al., 2001), eight women participating at a recreational or national level in six different sports (i.e., swimming, water polo, mountain biking, volleyball, softball, cross-country skiing) participated in an in-depth, semi-structured interview to examine if and how they experienced resonance in their sport. The questions posed explored all four components of the RPM: Why do you engage in your sport? What feelings do you seek to experience in your sport? What prepares you to experience these feelings? What prevents these feelings from occurring? What do you do when

you face an obstacle? Do you try to get these feelings back when they are lost, if so, how? How does experiencing these feelings affect your training, competition, and overall well-being?

In the following four studies (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003), the athletes and adolescents participated in a resonance-based intervention, which comprised multiple interviews and daily reflective journaling that encouraged them to reflect on and monitor their personal process of resonance each day for the duration of the intervention. Overall, the results indicated that all 32 participants identified with the four components of the RPM. Moreover, 21 out of the 24 participants who took part in the resonance-based intervention were able to experience resonance within their sport or physical activity context. As a result of the intervention, all of them were able to describe their dream feeling, developed and used numerous preparation strategies to experience their dream feeling, discussed obstacles they encountered that obscured their engagement, and developed revisiting strategies to reconnect with their desired feelings and activities.

It is noteworthy that the RPM was developed based on the life experiences of elite performers from various domains, however, three studies involved the use of the RPM with adolescent athletes (Callary et al., 2004; Doell et al., 2003) and students in the context of physical education classes (Short & Durand-Bush, 2004). Taken together, the results revealed that several of the teenage participants had difficulty articulating their dream feeling at the start of the investigation because, although they had experienced positive feelings in the past, they had never made a conscious effort to identify and purposefully experience desired feelings on a daily basis. Interestingly, the resonance-based intervention helped these adolescents to clearly identify and articulate how they wanted to feel in their sport and general daily life, and increased their awareness of and reflection on their daily feelings.

Although most participants perceived that the intervention had a positive impact on their well-being and satisfaction with their training/physical education classes, one alpine ski racer in Callary et al.'s (2004) study and two adolescents in Short and Durand-Bush's (2004) investigation did not fully benefit from the resonance intervention because they did not commit to it. For instance, they did not complete the daily reflective journal, which most likely limited the impact of the intervention due to a lack of self-reflection and commitment. The other participants who did benefit from the intervention clearly stated that daily reflective journaling was absolutely essential in their learning and self-growth. Indeed, the use of daily journaling in previous studies (Callary et al., 2004; Doell et al., 2003; Soulard & Durand-Bush, 2003) was found to be extremely valuable and successful in helping athletes track their experience of resonance in their sport and daily life. Keeping a journal has been shown to be an effective tool for monitoring and enhancing one's performance (Ravizza, 2001; Zimmerman & Kitsantas, 1997) and in guiding individuals to examine and reflect on their emotional states and well-being (Newburg et al., 2002). A resonance-based intervention thus appears to be only beneficial to those individuals who invest time and effort into making self-observations and engaging in ongoing self-reflection to increase their awareness and make informed choices that allow them to feel the way they want to feel.

On the other hand, several elite (i.e., national and international level) athletes in Soulard and Durand-Bush's (2003) cross-cultural study were initially aware of how they wanted to feel in their sport and daily life. Aiming to examine if elite athletes from different cultures could relate to and experience the process of resonance, the researchers found that all 12 Canadian, French, and Singaporean athletes were able to integrate resonance in their sport and daily life. The athletes reported significant increases in self-awareness, perceptions of performance, satisfaction

with their training and general life, motivation in their sport, and overall well-being as a result of the intervention.

In general, the use of multiple interviews and daily reflective journaling in the resonance-based interventions applied in the aforementioned studies facilitated self-examination and self-awareness, which led the participants to increase their experience of resonance and personal growth (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003). Throughout these investigations, the participants became increasingly aware of the presence and absence of their desired feelings in their sport and other areas of their life. They could then, as a result, develop and apply preparation and revisiting strategies to feel the way they wanted to feel on a regular basis.

In sum, the results from recent inquiries on resonance suggest that athletes can experience desired feelings, and more globally, the process of resonance, and as a result, increase their overall well-being and performance. This line of research fills a gap in the literature because it goes beyond examining the relationship between emotions and performance. It highlights how people can be empowered to identify and experience desired feelings more consistently in their life. It is not about applying a set psychological skills intervention program, it is about guiding individuals in a process of self-reflection so that they can themselves create more opportunities for mindful, engaging, and meaningful experiences in their life. Non-elite athletes and adolescents appear to have more difficulty identifying their dream feeling than elite athletes (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004). Thus, the level of sport participation or overall experience in a sport may be a factor influencing the extent to which athletes can articulate their desired feelings. All in all, research on resonance is promising but

remains limited thus more studies need to be conducted to address the nuances and intricacies involved when working with athletes from different levels and sports.

The purpose of this study was to examine if and how endurance athletes can experience resonance in their sport and daily life by participating in a resonance-based intervention. Specific research questions included: (a) Do endurance athletes experience resonance, that is, (i) do they know how they want to feel in their sport and daily life? (ii) Do they engage in activities to experience their desired feelings as often as possible? (iii) How do they respond to obstacles? (iv) Do they revisit their desired feelings when they face obstacles? (b) If they do not initially experience resonance, can they learn to experience it over time by participating in a resonance-based intervention? (c) How do participants evolve as they increase self awareness and develop their personal process of resonance? (d) What do they learn from their experience with the intervention? (e) What are their perceived benefits of the resonance-based intervention?

Method

Participants

The participants in this study were three specializing triathletes and one elite athlete competing in mountain bike races and adventure races (eco-challenges). The two male and two female endurance athletes ranged in age from 19 to 45 ($M = 34.0, \pm 11.0$) years old. The specializing triathletes mostly competed at a regional and provincial level while the elite multisport athlete competed at a national and international level (Côté & Hay, 2002). The athletes were recruited at the Peak Centre for Human Performance in Ottawa and were chosen based on their availability and willingness to participate in the study.

Resonance-Based Intervention

Each athlete participated in a 6-week resonance-based intervention that consisted of four interviews held every second week and a reflective journal completed on a daily basis over a period of 6 weeks. All of the interviews were audiotaped and followed the interview guide developed based on the RPM (Newburg et al., 2002).

Interviews. The first interview aimed to explore if and how the participants experienced resonance in their sport and daily life. The interview was in-depth, semi-structured, and open-ended and began with the broad introductory question: “Tell me why you engage in your sport.” In previous studies on resonance (Callary et al., 2004; Doell et al., 2003; Durand-Bush et al., 2001; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003), this question most often guided the participants to identify and talk about their dream feelings because a typical response was that they participated in their sport because of the enjoyment it provided them (i.e., it made them feel good). This led to the identification of their desired feelings and subsequent questions to assess the other three components of the RPM. Briefly, questions to examine the dream feeling included: “How do you like to feel when you engage in your sport?” and “Talk to me about the feelings you seek in training, competition, and your daily life. Are they the same?”

To further help the participants identify their dream feeling, they were asked to imagine a picture of themselves, or an image from a magazine, book, newspaper or other source that best represented how they wanted to feel in their sport and life. It has been argued that pictures help individuals to access their inner images and feelings and thus facilitate their expression (Weiser, 1990). Upon completion of the interview, they were asked to follow-up on their chosen mental image and find a picture that helped them to connect with their dream feeling. This picture was incorporated into their journal. It is important to understand that individuals might not initially be

aware of how they want to feel, whether this be when they play sports, work, or spend time with their family and friends. This might be particularly true for less elite athletes and younger individuals (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004). In previous studies on resonance, a period of introspection following a series of interviews and the use of a journal to assess the level of resonance experienced each day have been found to promote self-reflection and growth and to gain insight into one's desired feelings (Doell & Durand-Bush, 2003; Soulard & Durand-Bush, 2003). Consequently, a similar type of protocol was used in the current study.

Examples of questions assessing the preparation component included: "What allows you to feel this way in your sport and daily life?" and "What do you need to do to experience this feeling regularly?" To identify obstacles or setbacks the participants had faced in the past, questions such as: "What prevents you from experiencing this feeling on a daily basis?", "Tell me about some of the obstacles that you have faced in the past?" and "How do these obstacles affect your preparation, performance, well-being, and motivation?" were asked. Finally, questions to explore revisiting strategies comprised: "What do you do when you face an obstacle?" and "Do you do anything to reconnect with the feelings you seek in your sport?"

The first interview lasted between one to two hours. The interviewing process was flexible so that the questions were asked in an order that flowed with the information provided. This was important because we wanted the athletes to talk about their experiences in a way that was meaningful to them without disrupting or biasing their responses. At the end of the first interview, a personal model of resonance based on the information they provided during the interview was generated. This model was inserted as the first page of the journal that they completed during the study to monitor their daily experience of resonance.

In response to the first interview and the daily reflective journalling, the three subsequent intervention interviews were intended to examine the participants' experiences of resonance as well as any changes in their thoughts, feelings, performance, subjective well-being, and motivation that might have resulted from enhanced introspection, self-awareness, and engagement in the process. Questions included: "What have you learned in the last two weeks?", "Talk to me about how you have been feeling." The participants were also invited to describe some of their most and least resonating experiences and explain why they were highs or lows. Their experience with the journalling process was also examined. The last intervention interview was similar to the previous ones, yet additional questions were posed to assess their overall learning experience of resonance and to explore any potential impact of the resonance-based intervention on their performance, well-being, motivation, and life in general.

Journal. The participants were asked to keep a journal to closely monitor their daily experiences of resonance throughout the study. At the end of the first interview, the participants were instructed on how to fill out their daily journal. The journal included the athletes' personalized resonance model, based on the first interview, and a graph that charted their level of resonance throughout the day. The participants were also asked to provide descriptions along with explanations of their most and least resonating situations/events during the day, as well as any lessons learned during the day. They were required to make a journal entry for each day of the 6-week resonance-based intervention. The journals were collected every second week to ensure compliance and they were discussed during each interview.

Five week follow-up interview. Each athlete participated in a follow-up interview of approximately 30 to 45 minutes 5 weeks following the resonance-based intervention. The follow-up interview aimed to discuss with the athletes any benefit gained from the intervention

and determine if they continued to apply resonance in their sport and life and created new opportunities to resonate on a daily basis.

Data Analysis

The qualitative data from the interview transcripts and the journals were analyzed deductively, using the RPM as a guideline to categorize the responses. The specific data analysis steps included: (a) transcribing the interviews and journal responses verbatim; (b) cleaning up the text (i.e., grammatical errors); (c) sending transcripts to participants for authentication and making proper changes; (d) importing the data in the software program Nvivo (Fraser, 1999); (e) creating meaning units; (f) creating categories; and (g) categorizing similar meaning units under appropriate categories (Côté, Salmela, Baria, & Russell, 1993).

Trustworthiness Procedures

Rigorous procedures and methods were used to enhance the trustworthiness (Lincoln & Guba, 1985) or credibility (Patton, 1990) of this study. These procedures included: (1) member checking, whereby participants authenticated their interview transcripts for accuracy; (2) triangulation, which involved using journal entries to guide questioning in the intervention interviews and allow the participants to validate their entries and the researcher's interpretation of them (and thereby ascertaining that the written responses from the daily journal corresponded to the information provided in the interviews); (3) bi-weekly peer debriefing sessions with the research team to discuss and clarify interpretations and decisions made, explore and minimize researcher bias, and making explicit all aspects of the study; and, (4) thick descriptions of the method and results to provide readers with sufficient detail of the data collection process and analysis procedures, and to allow researchers to assess the generalizability of the results to their own context and replicate the study with athletes in similar or different contexts (Maxwell,

1992). Furthermore, direct textual quotations were provided to allow the data to “speak for themselves” and enable readers to gain more insight into the participants’ experiences, thoughts and feelings (Patton, 1990).

Results

The results of this investigation are reported in two sections. The first section presents an overview of each athlete’s experience with the resonance-based intervention and their evolving process of resonance. The results from each individual case are divided in three sections, namely, (a) the participants’ initial process of resonance, based on the first interview, (b) their evolving process of resonance throughout the intervention, and (c) their lessons learned and overall appreciation of the intervention. The second part highlights benefits from the intervention as perceived by the four athletes. The names of the participants were deliberately changed to ensure anonymity. On a general note, all of the athletes were able to identify with the four components of the RPM, understood how each contributed to the process of resonance, and attempted to apply resonance in their sport and daily life.

Case Study # 1

Amy was a 19-year old specializing triathlete who had early experience in competitive swimming and running. She had been doing triathlons for two years and was very passionate about it. She reported that she very much enjoyed the health aspect of this sport as it kept her physically fit and made her feel good, confident, and allowed her to focus on something she found beneficial to her lifestyle, particularly when she was going through difficult situations. At the time of the study, Amy was a full-time University student and a part-time worker.

Initial process of resonance. In an attempt to describe the feelings she was seeking in her sport during the first interview of the intervention, Amy talked about the “runner’s high.” When

asked to describe this feeling further, she had difficulty at first because she had never made a conscious effort to identify and purposefully experience it on a regular basis:

Hmm, excited, happy, free...(hesitation) just without...(hesitation) you feel like without limits and you feel like you can just do anything...(hesitation). I've never really thought about it that much before...(laughing) It's kind of dumb (laughing)!

However, as she talked about it and described a mental picture of these feelings and some great races she had in the past, Amy could better articulate her dream feeling. She said that she wanted to feel confident, energetic, and focused in her sport, and especially aggressive during races. Although Amy was very animated in describing these feelings, she shared that it was hard to feel them on a consistent basis. With respect to the other spheres of her life, Amy was encouraged to identify the feelings that she liked to experience in school, at work, and with her family and friends, which was also difficult for her to define.

When asked about what allowed her to feel the way she wanted in her sport and general life, Amy reported a number of preparation strategies which included proper nutrition and sufficient sleep, daily physical training, short and long-term goal setting, support and encouragement from her coach and other athletes at her training facility, positive people in her environment, and motivational and meditation CDs and books. She also talked about several obstacles that disengaged her from experiencing her ideal feelings, such as the lack of support from her family, negative people in her environment, an overwhelming schedule (i.e., training, school, work), a lack of motivation, physical tiredness, negative thoughts and depressive mood she periodically experienced due to her diagnosis of clinical depression, as well as her difficult financial situation.

Amy discussed that her first reaction to these obstacles was principally to feel disorganised, depressed, and out of control. In response, she would engage in organisational and cleaning activities (i.e., planning her week and cleaning her apartment) to manage her negative feelings. Other revisiting strategies Amy utilized to reconnect with the feelings she was seeking included talking to a person she trusted, relaxing and taking deep breaths, reading, writing poems, listening to music, sleeping or taking a nap, and spending some time by herself to calm down. However, Amy realized that she was not using revisiting strategies on a consistent basis. Moreover, she said that several of her strategies were effective only temporarily because they typically allowed her to avoid the problem for a certain period of time rather than to manage it right away. Part of the intervention was thus focused on helping Amy develop effective revisiting strategies that would allow her to reconnect with the feelings she sought when she did not experience them.

Evolving process of resonance. In the second interview, Amy showed the picture she found that represented her dream feeling. It portrayed a very athletic and healthy woman running on a path with her muscles bulging out, and typically evoked in her feelings of a “burning fire.” Of interest is that the words that she used to describe her dream feeling had changed since the first meeting. Her dream feeling had now evolved into feelings of peacefulness, strength, power, and health. Amy used these words to describe her dream feeling for the remainder of the intervention. Throughout the 6-week period, Amy’s process of resonance developed and was progressively refined as she identified new preparation activities (e.g., pre-competitive routine, self-talk to deal with physical discomfort from prolonged exertion, watching triathlon races to enhance her motivation, regularly visualizing how she wanted to feel, training with athletes slightly faster than her, and making her part-time job more interesting by bringing books to

read), obstacles (e.g., uncertainty about how to measure effort, fear of passing out during a race, boredom at work), and effective revisiting strategies (e.g., talking with boyfriend, releasing negative emotions through writing and drawing, self-talk) in an attempt to experience peacefulness, strength, health and power more consistently in her sport and life. The reflective journal proved to be a useful tool for Amy to increase her awareness of her daily feelings and overall resonance process. When asked to comment about her journalling experience, she stated:

I like it because it makes me rethink over my day and my workouts and think of how they went and it helps me to notice if I could have changed anything and look for patterns. It just makes me be more aware of how I felt.

Charting her daily feelings using the resonance journal allowed Amy to realize that she was mainly experiencing desired feelings during her training sessions and races, and that she was usually feeling depressed in the morning. Moreover, she normally would train in late afternoon after work but feel tired at this time of the day. As a result, she decided to reorganise her schedule and devote her mornings to training, which made her feel strong and energetic and work the evening shift for which she did not need as much energy.

Lessons learned and overall appreciation. One notable lesson that Amy learned throughout the intervention was the importance of preparing to experience her dream feeling in her sport and life. She mentioned several times that common sense things like getting enough sleep, eating properly and being around positive people used to be inconsistent in her life because she was just unaware of her feelings and was mainly training or doing things out of habit. For example, she said:

I think that it's really important to prepare for how you want to feel. You can't just go out and do anything and expect to do well. You actually have to prepare and know how you

want to feel. So basically, [the biggest lesson for me is] all the preparation aspect of it because I didn't do a lot of that before. . . . [I would say to anyone] don't underestimate it, even the little things because, a lot of times I'd be like "Ah! You know, whatever, I don't have to prepare for that, that's just stupid, that's easy. I don't have to visualize it, I know what to do." But don't underestimate it, prepare as much as you can because it will make a really big difference. And don't give up looking for that dream feeling, it will come eventually!

Other significant insights Amy gained from her participation in the intervention were an increased awareness of the presence and absence of her desired feelings, an appreciation that the outcome generally reflected time and effort invested in the resonance process, and the realization that achieving her dream feeling during a race or a training session was more important for her than the outcome of the event itself:

It's really important to know why you're doing it and not just win. That's how I try to think. You can't control what other people do because even if you had the most perfect race, somebody else could have been faster even if you felt totally good. But if I felt 100% strong, then I'd be happy with the race, no matter what place I'd came in . . . because if you feel 100%, your outcome is going to be way better than if you don't.

In the fourth interview, Amy reported that she had been experiencing her dream feeling on a more consistent basis and generally more frequently (i.e., 70% as opposed to 50%) than she did at the beginning of the intervention. Also, she was not struggling as much with her general motivation as she used to. Although Amy shared that she had some difficulty during the interviews to find the exact words and explain why she was feeling a certain way, she stated that she found the RPM useful and reasonably easy to apply not only in her sport but also in other

aspects of her life. During the five-week follow-up interview, Amy reported being more satisfied with her training and races and said that she experienced her best two races during and following the resonance-based intervention.

Case Study # 2

Stephen, a 45-year old specializing triathlete, was in his first year of training and competing in triathlons. He had been involved in martial arts at an earlier age and had seven years of experience doing duathlons. Stephen said that he engaged in triathlons because he loved feeling fit, enjoyed the competitive aspect of this sport as well as the camaraderie at the races. He continually sought to push beyond his limits to see how strong he could get. Stephen had been working full-time in a bank for 20 years.

Initial process of resonance. Before the first interview, Stephen was skeptical about doing the intervention because it was based on “dream feelings.” Nevertheless, he was looking forward to it because he hoped to be more methodological in how he approached the mental aspect of his sport and wanted something concrete to work on and apply in his training. Like Amy, Stephen demonstrated some difficulty at the beginning of the intervention to articulate the feelings he was seeking in triathlon. Moreover, it was not clear to him how he wanted to feel when he was swimming because it was a new discipline that he had recently added to his duathlons and had not swam since high school. This is illustrated as Stephen describes his mental image of the feelings he likes to feel in his sport:

Sometimes when you get into that groove, you’re on the bike and you are working hard and the legs are just chucking away and then I get this image of...a big whole black steam engine just riding down the trace . . . or sometimes when you’re running, a feeling of lightness, where your feet are just going “flouff” and you’re either pulled along by a

bungee strap, by somebody in front of you or the wind is pushing you in the back and you just float, you are dancing over the pavement or the ground without leaving any marks.

Swimming, I'm still new with that. You try to get into a certain breathing rhythm. . . . I haven't developed a whole lot of mental imagery there on that side yet.

Throughout the discussion, these mental images translated into feeling "strong" on his bike and feeling "light" or "having wings on his back" while running. With regards to swimming, Stephen later came up with the image of a torpedo, which reminded him to feel "relaxed and focused" as if he was "rolling nicely." He reported that he had never given much thought about how he wanted to feel in his daily life, such as with his wife and friends. Moreover, he said that it was hard to feel any of the positive feelings and have the dedication, focus, and discipline that he had in his sport or life at his job because he found that it was a very stressful and unhealthy environment.

During the first interview, Stephen identified numerous preparation and revisiting strategies that allowed him to feel the way he wanted in his sport and life. With regards to obstacles, he initially did not see any reasons for not feeling good and performing well. As he described past races he had and events that were happening at his workplace however, he realized that there were actually a number of obstacles that prevented him from experiencing the feelings he sought in his sport and daily life. For instance, Stephen often felt very frustrated when he talked about his work at the beginning of the intervention. Accordingly, the first half of the intervention mainly consisted in developing his process of resonance in his sport and life at home. As he became more acquainted with the process, however, he showed a gradual openness to discuss issues related to his job at the bank.

Evolving process of resonance. During the two weeks following the first interview, Stephen reported that he had been asking himself the same questions over and over again:

How am I feeling? What space do I want to be in? I'm very, very much more aware of it. I'm always, constantly thinking, ok, how do I really want to feel? How am I going to recapture that moment from before? So yeah, I think it's been going well! I've been thinking about it a lot more.

One obstacle that particularly disengaged Stephen from experiencing his desired feelings during races was his concern about the outcome and where his competitors were standing relative to him. It took a period of self-observation and self-reflection for him to recognize that this was an obstacle to his dream feelings and optimal performance. During the second interview, Stephen realized that he was allowing himself to get distracted by the end result and that he was forgetting about the whole process. These distractions were what distinguished his ability to feel the way he wanted during races versus during training:

In training, well it's all about the process, exactly! And that's why I'm going into this race, thinking of it as a hard training session because, that's where I feel the best! Yeah! Bingo! The light just turned on! Yeah, when you go into a race and you are worrying about "Oh geese, how am I going to place?" or "What other people are going to think of me?" It becomes a distraction and I forget about the in-between part, which is the whole purpose of being there! So when you are in a race, why should it be any different?

That insight was a turning point in the intervention for Stephen. In the following weeks, he totally changed his focus from the end result of competitions and essentially concentrated on the process of performing and on replicating training sessions during his races. He was always

looking forward to apply his process of resonance in upcoming races. Following is an illustration of this sudden change in perspective:

So this weekend, my goal is to achieve that good feeling that I have out of a good training run, cycle or swim. I was flying on my run last Sunday, I was just flying! And all I was thinking about during those runs was feeling good. That's all I wanted to do. I wasn't worried if I was going to do it in this time or that time. So I want to do the same thing on Saturday. I absolutely know the feeling that I want to have in all three events right now, and I have a pretty good idea of how I want to go about doing it. And that's my story and I'll stick to it.

Stephen explained that as a child, he had never been taught at home about the whole process or the "in-between" part that was crucial in attaining his goals. During the resonance-based intervention, he learned a different approach to doing things, which he found practical and very important to connect with his dream feeling.

In the last week of the intervention, Stephen had the opportunity to put into practice what he had learned from resonance and apply his own process in a very challenging half ironman. He encountered many obstacles during the race, including dangerous weather conditions that led to a very windy and wavy swim in which wetsuits were disallowed, as well as a serious risk of drowning, fear, and negative thoughts during the swim due to his limited swimming experience. Yet, Stephen developed effective revisiting strategies that helped him to overcome these difficulties, stay in touch with his desired feelings and sustain the energy necessary to finish the swimming component:

There were two or three occasions where I said "Ok, who's going to come to my funeral?" So when I had those thoughts, it kind of made me a little bit nervous, I could

almost sense the onset of panic, and then as soon as I realized this, I had to change my thought pattern of course so I flipped a switch and said “Ok, enough of that. Just concentrate on your breathing. Take your time, don’t worry about the outcome, just concentrate on where you are” and it was better at that point. Same thing when I got the cramps. That was another point where it scared me.

Lessons learned and overall appreciation. During the last interview, Stephen shared that he accomplished everything he wanted to achieve at this half ironman. He overcame his fellow competitor’s negativity by deliberately sharing his hotel room with him, concentrated on the process throughout the whole race, and “survived” the swim:

I have rarely felt more aware of where I was as during this swim. There was no daydreaming here, just immediate focus on the task at hand. In some ways, I believe the best part of my race was the swim, in spite of the conditions. It was a learning experience in a good way.

The intervention impacted not only his performance in sport but also his decision-making regarding his unfulfilling job at the bank:

I think it’s helped me to think that I can maybe do something different, and that it’s not so bad if I leave the bank . . . I’ve told people, “You only live once!” Everybody says that but in the last few weeks, it’s had a deeper meaning. Here I am thinking about doing this job and for what? For the pay check at the end of the day? But I’m not fulfilled. And here in the last 6 weeks, all I’ve been doing is concentrating on how I feel and trying to achieve a dream feeling, and I’m doing it on one side [sport], and not getting any fulfillment on the other side [work]. I think it helped me come to a couple of decisions, and I’m definitely not going to be with the bank in the next couple of years.

Although Stephen reported that he still had to work on his resonance process, particularly in the other spheres of his life, he acknowledged that it was an ongoing process that required constant effort and reflection. At the same time, he felt that his resonance model was fairly ingrained in his mind and he was looking forward to applying it on a daily basis. Overall, Stephen found that the intervention turned into a very positive experience. It allowed him to enjoy the whole experience of doing triathlons, live more fully, and embrace the process of pursuing goals with an increased awareness and empowerment.

Case Study # 3

Michele was a 38-year old triathlete who had been training for long course triathlons, half ironman and ironman competitions for four years. She was a former aerobic instructor and said that she participated in triathlons because she loved it and enjoyed the social and training aspects of this sport, emphasizing that it was a lifestyle for her. Michele was working full-time as an aviation meteorologist.

Initial process of resonance. In the first interview, Michele reported that she had used key words in a previous ironman which served to remind her of how she wanted to feel during each event of the race. She used the words “fluid” for the swim event, “strong” for the bike, and “relaxed” during the run as prompts to refocus and get back to how she wanted to feel when she was disengaged. When asked if she was also seeking these feelings in training, Michele reported that she had never thought about how she wanted to feel in training, especially on the bike where she feels more anxious because that’s when she feels she really has to push herself.

Of interest, Michele already had a number of preparation strategies integrated into a routine to feel the way she wanted while swimming, cycling, and running in her races. Moreover,

she realized, following reflection, that the two races for which she had prepared and during which she had focused on her desired feelings had resulted in good performances:

I did a lot of work, visualizing how I wanted to feel, thinking about these words, even when I was in training. Like if I was just sitting on my bike at Peak or even sitting in my living room, listening to music with my eyes closed, I would think about the race, how I wanted to feel and what my strategy was going to be during each part of the race. I had prepared myself for how I wanted to feel during the race which I think maybe helped me to keep those feelings. But the two races that stand out in my mind in which I did well, I did think about those things the days leading up to the race.

Although Michele did not have difficulty to identify the feelings she liked to experience in other aspects of her life, she reported that she had never thought about preparing for feeling a certain way with her family and friends. In contrast, she said that she had always taken these feelings for granted and affirmed that preparing for such feelings was a very new idea for her.

Major obstacles that Michele discussed early in the first interview included negative self-judgments, comparing herself with others during training sessions and races, and a great concern about the outcome:

The thing that I would like to be able to just not do is judge myself before the race, like think to myself, “I have to achieve a certain thing or I am going to fail”, or “I should be able to be faster than this person.” I don’t like to do that because it puts too much stress. . . . But I think I’ve probably done that for every race that I have ever done. . . . Hmm, I never thought about this before, really!

Of interest, Michele highlighted that she had never tried to get her desired feelings back during races once she switched to a negative mindset. Identifying coping strategies that allowed

her to overcome her obstacles and manage the negative feelings that resulted from her initiated pressure and comparisons was key for Michele to be able to resonate in her sport. One revisiting strategy that Michele found particularly effective was to keep things into perspective and remind herself of the reasons she was doing triathlons:

I have to keep this into perspective because you can always find somebody who's better than you, unless you are the world champion. There's not too many of those around (laughing) so you got to stay realistic with your own goals, but still have dreams. So I try and stay happy with my own accomplishments.

Evolving process of resonance. During the first two weeks of the intervention, Michele became increasingly aware of the fact that she was allowing people and situations to affect how she was feeling in a negative way. As a result, she spent the following weeks trying to identify what was specifically causing her stress and negative feelings in her training and races and attempted to understand why certain things were obstacles for her. This allowed her to feel better in her workouts and life in general.

As the intervention progressed, Michele learned to cope more efficiently with obstacles that occurred during her training sessions and races by developing a second response to her initial, counterproductive response. For instance, she used self-talk and perspective and decided to not finish one of her races because she had serious hamstring cramps during the bike event:

When it was clear to me that going on could have led to an injury, which would have set me back for the whole season, it made sense to stop, and I thought, "What is everybody going to think?" I'm not finishing, oh my god, I've never done this before and then I thought, "Wait a minute, it doesn't really matter what anybody else thinks, what I do is what's important" and so I got back on track pretty quickly. Then I decided, "Ok, for 5

minutes, feel bad. Oh poor me!” I didn’t want to stop because I worked so hard. “Ok, it’s over. Finish your bike, and don’t worry about it, you’ve made your decision.” And so this is what I did, and I was totally cool with it. And it didn’t bother me, which I think is really different. I think before it would have really bothered me.

Furthermore, despite the fact that Michele was sick during her most important race of the season, she turned the whole experience into a positive one. By engaging in a variety of coping strategies during the race in order to feel the best she possibly could, she managed to finish the race, which allowed her to make the National team. For instance, she reassessed her goals, did the best she could considering the circumstances, thanked all the volunteers by whom she passed, helped a man who had a flat tire, and crossed the finish line holding hands with her niece and nephew. On recounting the race, Michele stated:

It was a really interesting experience for me and I have to give credit to this process that I’ve been doing with you [first author] for getting through that race because I was sick. . . . It was the best race I had, it was just so good! I was able to cope with the disappointment of being sick and not let it bother me and just focus on having as much fun as I could have on that day.

Lessons learned and overall appreciation. In the last interview, Michele shared that her biggest lesson was realizing that she had some control over how she felt:

I think the biggest thing that I’ve really learned is that I can control how I feel about what I do; other people can’t make me feel a certain way. They may do something or have an influence but I’m the one that decides how I’m going to react to that and how I’m going to feel about it, and if it’s a bad thing, how I am going to deal with it.

In sum, Michele's experience throughout the intervention was very positive. She became increasingly aware of the stressors in her sport and daily life, constantly sought to understand the source and reasons of her stressors, and developed coping strategies that helped her to regulate her emotional reactions to situations that were out of her control. She learned to focus on herself and her personal goals rather than to worry about how she was doing relative to others, and believed that this was crucial for experiencing her desired feelings.

Case Study # 4

David was a 34 year old elite athlete competing in long distance (i.e., 24-hours and over) mountain bike races and adventure races (expedition style). He trained on a full-time basis and worked as a personal trainer. David shared that he was participating in endurance events because he had not been satisfied with short format races in the past. He felt that his body craved physical exhaustion and said that he loved the feeling of adrenaline that he would get from the very high level of competition and from pushing beyond his limits.

Initial process of resonance. Although David enjoyed the feeling of physical exhaustion at the end of long format races, he described the feelings that he sought *during* solo and adventure (team) races very differently:

[In solo races] I want to feel strong. I want to feel focused, competitive. I want to feel very confident . . . Adventure races are different because I'm on a team. With my team events, I want to feel valuable to my team. That is the main priority in an adventure race. Do not let the team down! Nothing else matters as long as I can stay with the team and provide them with whatever they need, then I feel ok.

It also seemed very clear to him during the first interview how he wanted to feel while training (i.e., determined) and in his everyday life (i.e., positive, completed and fulfilled). David

qualified his lifestyle as selfish because everything he did revolved around what he wanted, that is, full-time training and racing. However, he described the importance of designing his life the way he wanted in order to feel completed and fulfilled on an everyday basis:

I had a big gang of friends I used to go out with all the time, and now I don't do stuff like that. I'd rather rent a movie and hang out at home, because I don't want to feel like crap the next day from drinking beer all night so I can go outside and go hiking or climbing all day or mountain biking or have fun. It's 24 hours that you can never repeat so I want to make sure everyday has something that I can take, remember, and be a good experience.

Other preparation activities that allowed him to feel the way he wanted to feel in his sport and life included training 6 hours a day and 6 days a week, keeping a positive and a "nothing-to-lose" attitude, enjoying and living each day to the fullest, setting short and long-term goals, visualizing where he wanted to go, building on his strengths, bringing good luck crystals to his races, and using self-talk, psyching-up, and confidence building strategies.

When asked what prevented or disengaged him from feeling the way he wanted in sport, David stated:

It's a very good question...Hmm...nothing I don't think. No, the choice is there for me to feel that way or not feel that way. We're always responsible for our own feelings and reactions. It's definitely not anyone else because no one else can hurt you. You can only allow them to hurt you. Or no one can take away your confidence. You have to give away the confidence. So I don't think that there's any reason other than, maybe...if I don't feel good that day because I'm sick. That would be the only one thing.

However, throughout the interview, David became increasingly aware of a number of internal and external obstacles that disengaged him from his desired feelings. These included

worrying about getting injured, a fear of failing or not doing well in front of people he knew, fatigue, not being fully sponsored, a feeling of nervousness and a fear of freezing at mass race starts, and self-doubts during races:

If someone passes me, it really affects me. I start to panic a little bit. I start to think “Am I losing it? What’s happening? Maybe I’m not as strong as I thought?” And those thoughts wander in my mind. Part of that killer instinct disappears for some reason. Rather than it fuelling me, it makes me think the opposite, “There goes third place, there goes fourth place”, rather than thinking “Ok, that guy is going to ill-wear out. I’ll wear him down, I always do.” But I know that’s not my initial thought. Eventually my thought process changes and I rationalize the situation. Because I’m thinking he’s in the same boat as I am, he’s pushing as hard as I am. But my initial reaction is feeling defeated.

The above citation indicates that David already had a constructive response to his initial reaction, which in this case was to rationalize the situation. Other revisiting strategies that David used to reconnect with his desired feelings in the face of obstacles included putting things into perspective, engaging in a lot of self-talk during races, re-evaluating negative events to see what he could have done differently, and turning negative thoughts and feelings into positive ones.

Evolving process of resonance. Despite the fact that David could identify with the four components of the RPM during the first interview, he was very outcome driven and thus initially had difficulty to understand that the RPM revolved around preparing for and protecting his desired feelings rather than his outcome goals. The following reflection illustrates David’s strong ego goal orientation and the common obstacle-preparation loop:

When I get passed, I look at the situation. I’m not thinking, “I have to look at the situation so that I can feel good again.” All I’m thinking about is, “I got to look at the situation so I

can win this race.” . . . I won’t let myself fail, I try not to. I’ll do everything I can not to fail, so it’s just, at all cost, “Do well!”

A large part of the intervention was thus centered on trying to make David more aware of the fact that “trying to do well *at all cost*” and focusing too narrowly on the outcome could be obstacles to his dream feelings and negatively impact his performance. By consciously engaging in ongoing personal reflection and paying close attention to his everyday life, training activities, and preparation for an upcoming mountaineering expedition and an ultra marathon during the intervention, David realized that he was putting a lot of pressure on himself by constantly seeking to avoid failure. As a result, he gradually changed his perspective and concentrated on the process of his performance; that is, on protecting his desired feelings by preparing for them and targeting and eliminating the obstacles that disengaged him from his dream feelings. The following illustrates his change in focus from outcome to process:

Remember what I was telling you before, when I get into a race, I want to win. Now, I’m more relaxed and comfortable with my surroundings and accepting of the way the race is, like who I’m racing against. I just do the best I can and know that if I go out there and give 100% of my effort, the outcome of that is 100% of my effort.

Lessons learned and overall appreciation. Reflecting back on his experience with the intervention during the last interview, David indicated that he became increasingly selective of the people with whom he would surround himself and work. He also gained trust in his feelings with regards to certain preparation decisions. For instance, he was able to take some time off for recovering from injuries or fatigue without feeling worried of losing his fitness, and he allowed himself to modify certain aspects of his training, nutrition, and equipment he always thought were wrong but feared to change in order to feel stronger and more confident:

The biggest [lesson for me] is to listen to my gut instinct in preparation and just do what I think sounds right and feels right. . . . Each time I allow myself to change things, the positive benefits flow in and I'm more and more willing to change things. It gets added in to the preparation for the dream feeling. There's a consistency throughout these last four weeks, which is to listen to what my body is telling me. It was always there in front of me, but the shutters were closed. And then all of a sudden, I just opened them up.

David further reported that the RPM turned out to be an effective awareness tool to clarify the link between the numerous things that he was doing unsystematically. Having a model to work with helped him to organize his training as a means to facilitate the experience of his desired feelings and maximize his performance:

Before I would just have haphazardly gone through things. Now, with this resonance process, I'm very aware that in order to get the dream feeling, I have to prepare a certain way. You might get lucky, and hit the dream feeling without preparation because I have in the past, but if you want to ensure the dream feeling or get a 90% chance instead of a 70% chance of getting it, you have to think about the preparation carefully. So logistically, I'm thinking about things more.

In sum, David's experience during the intervention was enlightening. He reported that the intervention helped him to become generally more aware of things going on around him and to take a different outlook with regards to his daily preparation activities. He shared that the hard work he invested in his personal process of resonance allowed him to have more consistent high-quality training sessions and increase his performance.

Perceived Benefits

In the 5-week follow-up interview, the athletes reported a number of benefits that they associated with their participation in the resonance-based intervention. The most prevalent benefit was a significant increase in self-awareness. The athletes reported being generally more aware of: (a) their overall daily feelings, (b) the occurrence and absence of their dream feelings, (c) the obstacles or setbacks that disengaged them from their dream feelings, and (d) the fact that most of their obstacles were internal (e.g., perception of or reaction to a situation/event) and were thus under their control. They also felt that they had an empowered ability to regulate their desired feelings by engaging in numerous preparation and revisiting strategies that they identified and tried out themselves. The participants reported that the daily reflective journal was a useful self-awareness tool that encouraged them to mindfully examine their day and reflect on their resonating and less resonating experiences. While none of them continued the journal on their own following the intervention, two of the four athletes indicated their intent to resume its use during the follow-up interview.

All four athletes reported that following the intervention, they were experiencing their dream feeling in their sport more consistently and/or more frequently than they used to prior to learning about and developing their process of resonance. Although most of them said that, due to the short duration of the intervention (i.e., 6 weeks), they did not have the chance to apply their process of resonance as much in their everyday life as they did in their sport, they found that the positive feelings that they were experiencing in their sport overflowed into the other spheres of their life. They all described with great enthusiasm races, training sessions, and other activities and situations in which they continued to apply their personal process of resonance.

Finally, the athletes shared that concentrating on the process rather than on the outcome of their performance enhanced their overall satisfaction and motivation. Although outcome goals were part of their resonance process, they realized that feeling the way they wanted to feel during training and races was generally more engaging and fulfilling, and reported that their performance and well-being were enhanced as a result of engaging in their process of resonance.

Discussion

The purpose of this study was to examine if and how endurance athletes could experience resonance in their sport and daily life by participating in a resonance-based intervention. Another intention was to explore their overall experience as well as any benefits gained from their participation in the intervention. The results of this study suggest that all four endurance athletes were able to identify, develop, and apply their personal process of resonance in their sport and daily life contexts. Although the learning process was unique for each athlete, they all derived valuable lessons and benefits from participating in the intervention.

Given the personalized nature of the RPM and each of its components (Newburg et al., 2002), athletes identified the way they wanted to feel using personally meaningful key words and images. Perhaps with the exception of David, the three specializing triathletes had never consciously thought about how they wanted to feel in their sport and daily life and thus it was difficult for them to initially articulate their dream feeling. This supports Doell et al.'s (2003) finding that individuals, adolescents athletes in his case, might not be aware of their dream feeling(s) because they never considered or were never told that how they felt when they performed mattered. This might be more prevalent for athletes in their specializing years of sport participation (Côté & Hay, 2002) who are not as experienced and thus might not yet know how they want to feel while engaging in their sport.

The feelings the athletes in the current study articulated and discussed often differed across their various sport and life contexts (e.g., training, races, work, relationships, etc.), which supports previous studies on resonance (Doell et al., 2003; Soulard & Durand-Bush, 2003). However, although the dream feeling identified by some athletes in Soulard and Durand-Bush's (2003) and in Doell et al.'s (2003) studies evoked characteristics of "flow" or "the zone," this was not the case in the present study.

All four athletes identified a number of preparation and revisiting strategies that allowed them to experience their dream feelings, as well as some internal and external obstacles that disengaged them from their desired feelings. The most common preparation strategy was physical training, which supports Ericsson's (1996) notion that deliberate practice is fundamental for achieving high levels of performance. With regards to obstacles, the athletes most frequently reported competitive anxiety or nervousness as an obstacle to their desired feelings. This finding corroborates previous studies on resonance (Callary et al., 2004; Doell et al., 2003; Soulard & Durand-Bush, 2003), which found that competitive anxiety typically disrupted the resonance experience.

Although each athlete could identify with the four components of the RPM during the first interview, their personal model was incomplete due to their initial limited self-awareness. Furthermore, none of them appeared to consciously, deliberately, or naturally go through the process of resonance. For instance, they did not consistently revisit the feelings that motivated and energized their sport participation when they faced difficulties and they sometimes got caught in the preparation-obstacle loop. They were also not initially aware of some important obstacles that obscured their dream feelings. Throughout the intervention, however, the athletes devoted a considerable amount of time and effort to pay attention to and reflect on their daily

feelings. The four bi-weekly interviews and the daily reflective journalling served as tools to facilitate this ongoing reflective process. Of interest is that each athlete developed their RPM as the intervention progressed. They were gradually able to identify obstacles (i.e., outcome goal orientation, self-doubts, self-imposed pressure, anxiety) as well as preparation (i.e., carefully selecting network of people, openness to change equipment and aspects of training, self-talk, setting process goals based on feelings) and revisiting strategies (i.e., keeping things into perspective, re-evaluating goals, self-talk, taking time off to recover from injuries) as they became more aware of them and tested their effectiveness. This was also the case with the participants in previous studies on resonance (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003).

Paying attention to themselves and their interactions with their environment was not only the first but also a continuous task as the athletes designed their life based on how they wanted to feel. According to Newburg (1998), paying attention to how we feel is key and should become a priority in our life in order to collect all of the data we need to make well informed decisions. As the athletes in the current study gained more awareness, they exerted more control on their emotions, thoughts, and physiological responses and were able to integrate them into optimal performances. This finding supports Ravizza's (2001) as well as Botterill and Brown's (2002) contention that self-awareness precedes self-regulation. Newburg and colleagues (2002) specified that awareness of not only one's thoughts and actions but also how one wants to feel should be of the utmost importance.

Three of the athletes also mentioned that prior to the intervention, they would haphazardly engage in certain preparation activities in the days or weeks leading up to a race. Once they were familiar with their personal RPM, they found that they were more clear,

engaged, organized, and consistent as they performed their everyday activities. Maddux (1997) and more recently, Brown and Ryan (2003) have underlined that mindfulness plays a key role in disengaging people from the habitual or automatic functioning that often precludes engagement and interest in a task. The period of introspection that followed each interview and the use of a daily reflective journal encouraged the athletes to be more mindful of what they did on a daily basis. A perfect example is David. As he paid more attention throughout the intervention, he began to listen to his body and eventually trusted himself enough to change things and break old habits that were not optimally useful.

Results show that the intervention empowered the athletes to organize their daily activities in order to feel the way they wanted as often as possible, and to reconnect with those feelings when they lost sight of them. Amy and David particularly highlighted how much they benefited from the preparation component of the RPM. As a result of the intervention, they selected more carefully the people with whom they interacted in an attempt to protect their feelings and energy. Durand-Bush and Salmela (2002) found this to be a common thing done by World and Olympic champions, particularly before important competitions. These outstanding athletes also focused on the process rather than the outcome of their performance. Interestingly, the intervention in the current study helped the athletes to shift their focus from outcome to process. Stephen, Michele, and David clearly had an ego orientation prior to the intervention as they were constantly concerned with demonstrating their ability or avoided displaying a lack of ability. They also compared themselves with others or external standards. Research has shown that having too much of an outcome or goal orientation can be detrimental to performance (Solmon & Boone, 1993; VanYperen & Duda, 1999) and intrinsic motivation (Duda, Chi, Newton, Walling, & Catley, 1995).

However, all three athletes realized throughout the intervention that changing their approach or perspective from outcome to process was crucial for experiencing resonance in their sport. Stephen particularly noticed that he experienced his dream feelings in training because he did not focus as much on results. He thus subsequently tried to replicate his training sessions during races. All of them recognized that using self-referenced standards to judge their individual performances and being satisfied with their personal accomplishments were important preparation strategies to more consistently experience their dream feelings. This process was not easy and required that the athletes change often embedded irrational thoughts (e.g., “I have to achieve a certain thing or I am going to fail” or “I won’t let myself fail . . . at all cost”). This change in perspective might have resulted from an enhanced self-awareness since a lack of awareness of the present moment has been associated with an excessive concern about the outcome (Ravizza, 2001).

Another important finding in this study is that the endurance athletes acknowledged that most obstacles to their dream feelings were internal, and thus under their control. Like elite performers in Newburg et al.’s (2002) study, they realized that their initial negative emotional reaction to obstacles, including those that were out of their control like negative competitors and injuries, could become an obstacle if they did not have a second response that enabled them to cope with their temporary disengagement and reconnect with their desired feelings. Rather than focusing on their initial response, the athletes learned to respond to their own response (i.e., response to response) in a positive and appropriate way, that is, in a way that was in line with how they wanted to feel. This second response helped them to gain energy and motivation to overcome the obstacle and continue their preparation feeling good about themselves.

Other researchers have emphasized the importance of reappraising emotions as a means to regulate one's emotional responses and experiences (Deci, 1996; Lazarus, 1975). Deci suggested that people who reappraise their emotions demonstrate a heightened sense of autonomy when negotiating stressful situations. Furthermore, cognitive reappraisal has been associated with the experience and expression of more frequent positive emotions, fewer negative emotions, as well as with enhanced interpersonal functioning and well-being (Gross & John, 2003). Nevertheless, Deci contended that the majority of people do not reappraise their initial emotional reactions to obstacles. One reason for this may be that most people are not aware of or have never taken the time to identify the unique feelings that they want to experience in their daily pursuits so that they can replace unwanted feelings with desired ones. When Michele (case study #3) recognized that allowing people and circumstances to dictate her emotional reactions disrupted her resonance experience, she decided to take ownership of her emotions and to utilize a number of strategies to refocus on her desired feelings. One such strategy she used was maintaining perspective in her life. Perspective is believed to provide people with better coping skills for dealing with life challenges and difficulties because it allows them to revisit their roots and re-appreciate their identity, values, lessons, and important people in their life (Botterill & Patrick, 2003). The findings of this study support that although individuals can use a wide range of strategies to manage their emotional experiences (Gross, 1998), it is important that they first identify their desired feelings in order to be able to regain them when they are lost (Newburg et al., 2002).

Another objective of the study was to explore the athletes' overall experience and perceived benefits from their participation in the intervention. The intervention was designed to encourage self-reflection, self-awareness, and autonomy as a means to empower the athletes to

experience resonance in their training, racing, and life. The athletes themselves identified and applied the preparation and revisiting strategies they found meaningful, effective, and relevant and were not taught specific mental techniques to achieve their dream feelings. All of the athletes reported an increased self-awareness of their daily emotional experiences as a result of reflecting on and developing their personal process of resonance, and all underlined the positive impact that experiencing their dream feelings and living resonance had on their performance, well-being, and intrinsic motivation. These results support previous studies on resonance (Callary et al., 2004; Doell et al., 2003, Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003). Overall, the findings suggests that one's awareness and continual experience of desired feelings may be crucial in achieving optimal levels of performance, subjective well-being, and intrinsic motivation.

There are certainly limitations to this study, for example, our limited ability to generalize the findings beyond that of four endurance athletes, the use of self-reported data, and the fact that the interviewer was also the first author of this article could have potentially influenced the data. However, several procedures previously outlined were taken to enhance the trustworthiness of the data. Nevertheless, more research should be conducted to replicate or expand the findings of this study. The promising results obtained so far suggest that the RPM is a valuable athlete-centered framework that could be used to enhance the overall sporting and life experiences of athletes.

Conclusion

The results of this study showed that the four endurance athletes learned to identify, develop, and actualize their personal process of resonance via their participation in a 6-week resonance-based intervention. Living resonance was an ongoing learning process for these

athletes because it entailed a daily commitment to experiencing their dream feeling and protecting it when they encountered obstacles or difficulties. The multiple interviews, the period of introspection that followed each interview, and the use of a daily reflective journal promoted the participants' self-reflection and self-awareness, which were fundamental steps toward the full actualization of their RPM. The participants in the present study learned and benefited from their participation in the intervention. Examples of valuable insights include changing their perspective from outcome to process, preparing to feel the way they want to feel, developing appropriate responses to initial responses to obstacles, and being in control of how they want to feel in their sport and life in general. The RPM, which guided the resonance-based intervention, proved to be a useful framework to help athletes enhance perceptions of performance, well-being, and intrinsic motivation. The RPM is also a valuable tool to demonstrate the uniqueness of each athlete's overall experience and evolving process of resonance and lends support to the recent call for a shift to more athlete-centered approaches to sport.

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ARTICLE 2:

EVALUATING THE IMPACT OF A RESONANCE-BASED INTERVENTION ON
THE CYCLING PERFORMANCE, WELL-BEING, AND INTRINSIC MOTIVATION OF
ENDURANCE ATHLETES USING A SINGLE-SUBJECT DESIGN

Running head: RESONANCE-BASED INTERVENTION

Evaluating the Impact of a Resonance-Based Intervention on the Cycling Performance, Well-Being, and Intrinsic Motivation of Endurance Athletes Using a Single-Subject Design

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Running head: RESONANCE-BASED INTERVENTION

Evaluating the Impact of a Resonance-Based Intervention on the Cycling Performance, Well-Being, and Intrinsic Motivation of Endurance Athletes Using a Single-Subject Design

August 2004

Abstract

The purpose of this study was to examine the effects of a resonance-based intervention on the cycling performance, well-being, and intrinsic motivation of four endurance athletes. A single-subject design was used for this 16-week study that comprised three phases: a baseline period (5 weeks), a resonance-based intervention period (6 weeks), and a post-intervention period (5 weeks). Measures of cycling performance, life satisfaction, positive and negative affect, and intrinsic motivation were taken twice weekly throughout the three phases. The resonance-based intervention consisted of four in-depth, semi-structured interviews using the Resonance Performance Model (RPM, Newburg et al., 2002) as a framework and daily reflective journalling. Results from the split-middle method of analysis for single-subject designs suggest that only one participant benefited from the intervention. Still, the intervention appeared effective in reducing the negative affect of two athletes. In comparison, the qualitative data indicate that all four athletes perceived the intervention as beneficial to their cycling performance, well-being, and intrinsic motivation.

Evaluating the Impact of a Resonance-Based Intervention on the Cycling Performance, Well-Being, and Intrinsic Motivation of Endurance Athletes Using a Single-Subject Design

Several researchers in the past 25 years have advocated the use of single-subject designs to evaluate applied sport psychology interventions aimed at enhancing performance (Bryan, 1987; Hrycaiko & Martin, 1996; Shambrook & Bull, 1996; Smith, 1988; Wollman, 1986; Zaichkowsky, 1980). Despite several calls to increase its use, few studies utilizing single-subject designs have been conducted and/or published (Hrycaiko & Martin, 1996). The conventional method of evaluating psychological interventions in applied sport psychology research has been group designs (i.e., nomothetic designs examining group averages). Yet, the number of studies involving single-subject designs is on the rise. Since the publication of Hrycaiko and Martin's (1996) article, a growing number of applied sport psychology investigators are starting to recognize the advantages offered by ideographic designs over that of the currently preferred methods of evaluation (Baron & Faubert, in press; Callow, Hardy, & Hall, 2001; Ming & Martin, 1996; Pates, Oliver, & Maynard, 2001; Rogerson & Hrycaiko, 2002; Shambrook & Bull, 1996; Swain & Jones, 1995; Thelwell & Greenlees, 2001; Wanlin, Hrycaiko, Martin, & Mahon, 1997).

The salient features of single-subject designs were highlighted by Hrycaiko and Martin (1996) who attempted to clarify some basic misunderstandings that might have discouraged researchers from using them. According to these authors, single-subject designs offer a valuable and simple alternative for inquiries that assess real-life sport performance and involve a small number of participants. Given that all the participants receive the treatment condition at one point or another, this design is particularly appealing to coaches and athletes who might oppose participation in a no-treatment control group. Furthermore, this type of design has been considered more appropriate than group designs for examining individual behaviour changes

across experimental conditions, which may otherwise be masked in group-averaged data (Perone, 1999). This is especially relevant to skilled athletes, who are not likely to improve substantially from baseline levels compared to less skilled athletes (Kazdin, 1984). Certainly, slight increments in performance have practical significance to experienced athletes, even though the observed gains are not statistically significant (Bryan, 1987; Hrycaiko & Martin, 1996; Shambrook & Bull, 1996).

Another central characteristic of single-subject research designs is the importance placed on social validation (Martin & Hrycaiko, 1983). A social validity assessment is conducted to ensure that three criteria of social validity are met, namely: (a) the target behaviours selected should be important to the participants, (b) the intervention should produce behavioural changes large enough to be considered as significant by the individuals, and (c) the procedures used should be deemed acceptable to all participants (Wolf, 1978). Evaluating the clinical (i.e., practical) significance of treatment procedures and outcomes from the participants' point of view in addition to conducting a standard scientific assessment enhances one's confidence that an experimental effect has been observed (Hrycaiko & Martin, 1996). In sum, single-subject research designs can provide sport psychology consultants and researchers with valuable insights into the utility and effectiveness of their interventions within real-life sport contexts and guide them in tailoring successful programs to enhance the performance and well-being of individual sport participants (Smith, 1988).

One particular model that has been used in interventions is the Resonance Performance Model (RPM; Newburg, Kimiecik, Durand-Bush, & Doell, 2002). The RPM is an educational model intended to help athletes and performers from all arenas of life to enhance their well-being and attain performance excellence by experiencing resonance on a daily basis. Resonance is a

process in which individuals experience harmony or a seamless fit between themselves and their environment. It allows them to fully engage in their endeavours and feel the way they want to feel on a daily basis.

The RPM emerged from over 300 in-depth, open-ended interviews with high-level performers from different domains such as sports, music, sciences, medicine, business, and the performing arts. It is a holistic and comprehensive model that describes the path through which these performers became experts in their field and lived a meaningful and satisfying life in the process. A recurrent finding in this grounded theory research was that the individuals strove to achieve and preserve an overall sense of well-being and engagement in their every day life (Newburg et al., 2002). They all had a dream, which represented how they wanted to feel in their daily pursuits. They also engaged in extensive preparation, which allowed them to experience their desired feelings on a regular basis. All of the performers encountered obstacles in their career; however, they developed strategies to reconnect with their dream feeling before engaging in more preparation. These findings led to the inductive conception of the RPM, which comprises four components: (a) Dream Feeling, (b) Preparation, (c) Obstacles, and (d) Revisit the Dream Feeling. The RPM can be seen as a person-centered tool that individuals can use to experience their desired feelings and enhance the intrinsic motives necessary for the adherence to and achievement of specific goals.

In recent research using the RPM as a framework to guide a resonance-based intervention, it was found that it can help individuals to enhance their perceptions of subjective well-being, satisfaction with training, and athletic performance (Callary, Durand-Bush, Trudel, & Newburg, 2004; Doell, Durand-Bush, & Newburg, 2003; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003). The resonance-based intervention in these studies consisted of

multiple interviews and daily reflective journaling over a period of 4 to 10 weeks. Its purpose was to facilitate the participants' self-reflection, self-awareness, and individual process of resonance. Results showed that throughout the course of the intervention, the participants became increasingly aware of the presence and absence of their desired feelings in their sport and other areas of their life. This increased awareness allowed them to develop and apply preparation and revisiting strategies to stay connected with their ideal feelings as often as possible. Overall, those individuals who were willing to invest the time and effort into making observations and reflecting on their sport and life reported experiencing positive feelings and more globally, the process of resonance as a result of the intervention. Engaging in their personal process of resonance allowed them to regulate their feelings and experience an overall sense of well-being (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003).

The RPM is innovative because it is directed at helping individuals not only enhance their performance but also live a more fulfilling and engaging life. In this sense, Newburg et al.'s (2002) work is in line with the "positive psychology" movement, which suggests that individuals can learn to enhance and nurture their own happiness (Seligman & Csikszentmihalyi, 2000). Prior to this movement, much of the research in psychology focused on understanding and curing pathologies and illnesses and did not help people become happier, but rather less miserable (Seligman & Csikszentmihalyi, 2000). As a result, little effort has been devoted to identify concrete approaches and strategies to help people feel good and happy. This negative research bias unfortunately prevails in other psychology-related fields, including education and sport (Jackson, 2000). Clearly, applied sport psychology research that accentuates ordinary human functioning, potential, and capacities is warranted. The RPM seeks to empower individuals to

design their life to feel good on a daily basis and offers valuable insights into processes underlying human performance and well-being.

Although limited, research examining the impact of resonance on people's lives is promising. So far, researchers have mainly used qualitative methods to explore the process of resonance of athletes and perceived benefits from the resonance-based intervention (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003). Accordingly, they did not examine whether or not resonance had an impact on more objective measures of their performance and well-being. Consequently, this study sought to quantitatively examine if endurance athletes could improve their cycling performance, subjective well-being, and intrinsic motivation through their participation in a resonance-based intervention. In light of the recommendations to use ideographic designs to assess the effectiveness of applied sport psychology interventions with a limited number of participants (Bryan, 1987; Hrycaiko & Martin, 1996; Shambrook & Bull, 1996; Smith, 1988; Wollman, 1986; Zaichkowsky, 1980), a multiple case, single-subject experimental design was utilized.

Method

Participants

The participants in this study were two men and two women athletes competing in endurance sports (mean age 34.0 ± 11.0 years, range = 19-45). Three of them were specializing (Côté & Hay, 2002) triathletes and a fourth participant was an elite multisport athlete competing in long-distance mountain bike races and adventure races (eco-challenges). The participants were recruited at a training center in Ottawa and were chosen based on their availability and willingness to participate in the study. Following a first session in which the athletes were informed of the nature and extent of the investigation, they read and signed a consent form,

which ensured that ethical principles, including confidentiality and anonymity, would be maintained throughout the study.

Experimental Design

A single-subject A-B-A experimental design was used to examine the effects of a resonance-based intervention on the athletes' cycling performance, well-being, and intrinsic motivation. The study involved three phases extended over a period of 16 weeks: (A1) a baseline period (5 weeks), (B) a resonance-based intervention period (6 weeks), and (A2) a post-intervention period (5 weeks). This type of design was chosen because it allows investigators to demonstrate the effectiveness of an intervention by showing that performance or behaviour across experimental conditions changes as a result of introducing the intervention (Barlow & Hersen, 1984). Given the irreversible educational nature of the intervention, a replication-reversal (A-B-A-B) design whereby the intervention would be introduced a second time was deemed inappropriate for the present study. Nevertheless, a post-intervention phase was included to examine whether or not the participants maintained any gain in performance, well-being, and intrinsic motivation as a result of continuing to apply resonance in their life once the intervention was terminated. The post-intervention phase was exploratory since no previous study examining resonance included a follow-up evaluation. To minimize the potential effects of history and maturation, the athletes began the intervention at least one week apart from each other. Moreover, the study took place during the middle or the end of the athletes' competitive season so that significant performance gains associated with the increase in training volume and intensity normally expected at the beginning of the season did not coincide with the introduction of the intervention.

Measures

Cycling performance. The athletes' cycling performance was measured using a specialized bicycle ergometer (i.e., CompuTrainer) that assessed the average power output in watts of a standard, set 5-10 minute time trial cycling program. The athletes were allowed to choose the amount of time for their trial but were instructed to use the same time for all trials throughout the study. It was assumed that their performance increased as their average power output increased for a given set time trial cycling program. A trained exercise physiologist at the Peak Centre for Human Performance conducted the first assessment with each athlete, and then the participants assessed and reported their own performance measures in a personal cycling assessment logbook.

Subjective well-being. Subjective well-being was examined by means of two of its major components: life satisfaction and positive and negative affect. The revised version of the "Satisfaction With Life Scale" (SWLS-revised, Pavot & Diener, 1993) comprised five statements relating to global life satisfaction that were rated on a 1 (strongly disagree) to 7 (strongly agree) point Likert scale. One such item was "I am satisfied with my life." Total scores could vary between 5 and 35. The SWLC-revised version has satisfactory internal validity (.87) and test-retest stability (.82) and has shown adequate sensitivity to detect changes in life satisfaction throughout the course of an intervention program. The longer the program is, the more chances are that changes will be detected (Pavot & Diener, 1993).

An adapted version of the "Positive And Negative Affect Schedule" (PANAS, Watson, Clark, & Tellegen, 1988) included 26 different words (original included 20 items) describing different feelings and emotions (i.e., 14 positive and 12 negative) that were rated on a 1 (very slightly or not at all) to 5 (extremely) point Likert scale. Positive affect items included "engaged",

“enthusiastic”, and “fulfilled” while negative affect items included “upset”, “disconnected” and “nervous”. The participants were instructed to indicate the extent to which they had felt a certain way in the past few days. The original PANAS has shown acceptable psychometric properties with adequate test-retest stability and internal consistency estimates situated between .84 and .90 and it is sensitive to fluctuations in mood when used with short-term instructions (Watson et al., 1988). Having used an adapted version of the PANAS does, however, pose a limitation.

Intrinsic motivation. To assess the participants’ level of intrinsic motivation, a shortened version (McAuley, Duncan, & Tammen, 1989) of the interest-enjoyment subscale of the Intrinsic Motivation Inventory (IMI, Ryan, 1982) was used. The IMI is a multidimensional measure dividing intrinsic motivation into four subscales: interest-enjoyment, perceived competence, effort-importance, and pressure-tension. However, the interest-enjoyment subscale is the only subscale that truly measures intrinsic motivation. The shortened interest-enjoyment subscale consists of 5 items scored on a Likert scale from (1) strongly disagree to (7) strongly agree. The single negatively worded item was rescaled before analyzing the data. The IMI has shown good factorial and construct validity as a hierarchical model of intrinsic motivation. Additionally, alpha coefficients for the four dimensions and the overall scale indicated adequate reliability (McAuley et al., 1989).

Procedure

Baseline measures. Prior to the introduction of the resonance-based intervention, each participant was assessed twice a week over a period of 5 weeks to obtain baseline measures of their cycling performance, life satisfaction, positive and negative affect, and intrinsic motivation. In total, 10 baseline measures for each of these variables were collected. The baseline measures

served as standards against which the value or impact of the resonance-based intervention was determined.

Resonance-based intervention. Following the 5-week baseline period, each athlete participated in four interviews conducted every 2 weeks and daily reflective journaling over a period of 6 weeks. The interviews and the personal journal aimed to facilitate the participants' exploration of and reflection on their personal process of resonance. The RPM served as the conceptual framework to guide the intervention. The first interview primarily attempted to explore if and how the participants experienced resonance in their sport and daily life. The interview was in-depth, semi-structured, and open-ended and began with a broad introductory question such as "Tell me why you engage in your sport." In previous studies on resonance (Callary et al., 2004; Doell et al., 2003; Durand-Bush, Trudel, Doell, Soulard, & Newburg, 2001; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003), this question often led the participants to talk about how they wanted to feel because a typical response was that they participated in their sport because of the enjoyment it provided them and because it made them feel good. This then led to the identification of their desired feelings, which then directed subsequent questions to assess the other three components of the RPM. Briefly, questions to examine the dream feeling included: "How do you like to feel when you engage in your sport?" and "Talk to me about the feelings you seek in training, competition, and your daily life. Are they the same?" To further help the participants to identify their dream feeling, they were asked to describe a picture of themselves, or an image from a magazine, book, newspaper or other source that best represented how they wanted to feel in their sport. It has been argued that pictures help individuals to access their inner images and feelings and thus facilitate their expression (Weiser, 1990). Upon completion of the interview, they were asked to follow-up on

their chosen mental image and find a picture that helped them to connect with their dream feeling. This picture was incorporated into their journal.

Examples of questions assessing the preparation component included: “What allows you to feel this way in your sport and daily life?” and “What do you need to do to experience this feeling more often?” To identify obstacles or setbacks the participants had faced in the past, questions such as: “What prevents you from experiencing this feeling on a daily basis?”, “Tell me about some of the obstacles that you have faced in the past?” and “How do these obstacles affect your preparation, performance, well-being, and motivation?” were asked. Finally, questions to explore revisiting strategies comprised: “What do you do when you face an obstacle?” and “Do you do anything to reconnect with the feelings you seek in your sport?” The interviewing process was flexible so that the questions were asked in an order that flowed with the information provided. This was important because we wanted the athletes to talk about themselves and their sport in a way that was meaningful to them without disrupting or biasing their responses. At the end of the interview, the first author generated, with the help of the participants, their personal model of resonance based on the information they provided during the interview. This model was inserted as the first page of the journal that they completed during the study to increase and monitor their daily experience of resonance. The first interview lasted between one to two hours.

Following the first interview, the participants were also shown how to complete their daily journal. The daily reflective journal included: (a) their personalized resonance model, based on the first interview; (b) a graph that charted their level of resonance throughout the day; (c) descriptions along with explanations of their most and least resonating situations/events during the day; and (d) lessons learned and other comments from their overall daily experience of

resonance. The participants were required to make a journal entry for each day of the 6-week intervention period. The journals were collected at the end of every second week to ensure compliance and the content was discussed during the subsequent intervention interviews. The use of daily journalling in Callary et al.'s (2004), Doell et al.'s (2003), and Soulard and Durand-Bush's (2003) studies was found to be extremely valuable and successful in helping athletes increase and track their experience of resonance in their sport and daily life. Keeping a journal has been shown to be an effective tool for monitoring and enhancing one's performance (Zimmerman & Kitsantas, 1997) and in guiding individuals to examine and reflect on their emotional states and well-being (Newburg et al., 2002).

In response to the first interview and the daily reflective journalling, the three subsequent interviews were intended to further encourage the participants' exploration of their resonance process as well as examine any changes in their thoughts, feelings, performance, well-being, and motivation that might have resulted from enhanced introspection, self-awareness, and engagement in the process. Questions included: "What have you learned in the last two weeks?", "Talk to me about how you have been feeling." The participants were also invited to describe some of their most and least resonating experiences and explain why they were highs or lows. Their experience with the journalling process was also examined. The last (i.e., fourth) interview of the intervention was similar to the previous ones, yet other questions were posed to assess their overall learning experience of resonance and the impact of the resonance-based intervention on their cycling performance, well-being, intrinsic motivation, and life in general. These three interviews lasted between 45 minutes and an hour.

All of the interviews were audiotaped. Throughout this 6-week period, akin to the baseline phase, the cycling performance, life satisfaction, positive and negative affect, and

intrinsic motivation of the participants were assessed twice a week for a total number of 12 measures in order to determine any effect of resonance on these variables.

Post-intervention period. Each athlete participated in a 5 week post-intervention evaluation during which their cycling performance, life satisfaction, positive and negative affect, and intrinsic motivation were again assessed twice a week. In total, 10 measures of each of these variables were collected for each participant.

Social Validation

In order to assess the social validity of the intervention, the participants were enquired about their view of the practical importance of the intervention during the last (i.e., fourth) interview of the intervention, as well as in a 5-week follow-up interview, which took place at the end of the post-intervention period. Specifically, questions were asked to assess perceived effects and benefits of the intervention as well as aspects (i.e., procedure, relevance of target behaviours) of the intervention that they liked, found useful, did not like, and would have changed or done differently (i.e., length of intervention, number of interviews, format of the reflective journal, etc.). The 5-week follow-up interview was similar to the previous intervention interviews, but primarily aimed to assess how the participants felt about the procedures used and the results obtained, as well as determine if they continued to apply resonance in their sport and life and created new opportunities to resonate on a daily basis.

Data Analysis

The traditional technique used to examine single-subject design data is visual inspection. However, there has been some dispute about whether experimental effects can be determined reliably from visual analyses alone (Cone, 2001; Kazdin, 1984). For instance, this approach ignores the potential influence of the learning effect upon performance (Shambrook & Bull,

1996), a problem most relevant in the present study in view of the nature of the cycling performance variable. Moreover, the effectiveness of visual inspection is restricted by such factors as variability and trend in the data (Kazdin, 1984). Finally, there is a probability that data points across the experimental conditions be “autocorrelated” (i.e., when the points in a series are not independent of one another). Serial dependency makes visual inspection misleading and inferential statistical tests erroneous (Cone, 2001).

Evidence has demonstrated that statistical analyses often do not support conclusions from visual analyses (Parsonson & Baer, 1992). Conversely, relationships and patterns not visible to the naked eye can be uncovered through statistical analyses. Some researchers have proposed that the two approaches be combined for optimal intervention evaluation (Cone, 2001; Kazdin, 1984; White & Haring, 1980). After reviewing several of the alternative methods of analysis for single-subject designs, it was decided that the non-parametric, split-middle technique (White & Haring, 1980) was the most appropriate method of analysis for the current study. To complement the visual inspection of data whereby mean scores are compared between experimental phases, White and Haring suggest that a careful analysis of the slope and level of trend lines across conditions be performed. The split-middle technique is used to describe trend patterns across phases and predict intervention outcomes. It has been shown to provide a more reliable estimate of trend lines than other methods of visual inspection and typically allows for an evaluation of the rate of behavior change across experimental conditions (White & Haring, 1980).

Specifically, the split-middle technique involves three stages of assessment of change, namely (a) the change in level across experimental conditions, which refers to the difference between the last slope value of the baseline and the first slope value of the intervention phase. (b) the change in slope across experimental conditions, which refers to the difference in the

steepness and direction [i.e., accelerating (i.e., multiplication sign), decelerating (i.e., division sign), or zero celeration but most importantly, improving or decaying relative to the intervention objective] of trend lines of adjacent conditions, and (c) a Binomial test, which assesses significance of change across the baseline and intervention phases by determining whether there are sufficient data points above (or below, depending on the intervention objective and/or nature of the dependent variable being measured) the projected baseline slope to reject the null hypothesis that no change occurred as a result of introducing the intervention.

The post-intervention interview data were analyzed using the software program Nvivo (Fraser, 1999) to categorize the participants' responses concerning their perception of the benefits and effects of the intervention, aspects of the intervention they liked, found useful, did not like, and would have changed, and resonating experiences during the post-intervention period. The specific analysis steps included: (a) transcribing the interviews verbatim; (b) verifying the text for grammatical errors; (c) sending transcripts to participants for authentication and make appropriate changes; (d) importing the data in Nvivo; (e) creating meaning units; (f) creating categories based on the social validity questions specified above, and (g) categorizing meaning units under appropriate categories (Côté, Salmela, Baria, & Russell, 1993).

Several measures were taken to maximize the trustworthiness of the interview data (Sparkes, 1998). Credibility and confirmability were addressed using: (1) peer debriefing, which was ensured via bi-weekly meetings with peers conducting research on resonance; (2) member checking, whereby participants authenticated their interview transcripts for accuracy; and (3) triangulation, which involved: (i) journal entries to guide the questioning in the intervention interviews, which allowed the participants to validate their entries as well as the researchers' interpretation of them, and (ii) questionnaires and cycling assessments to complement the

qualitative data from the interviews, which in itself improved dependability. Thick descriptions of the interview data were provided via interview quotes to give insight into the participants' thoughts and feelings about their experience with the intervention (Patton, 1990).

Results

Cycling Performance

Table 1 shows that all participants enhanced their cycling performance during the intervention phase relative to the baseline period, with participant 1 (P1) having the largest gain (12.4 W) and participant 2 (P2), the smallest gain (9.3 W). Post-intervention wattage scores indicate that three participants (P1, P3, and P4) further increased their cycling performance following the end of the intervention, while P2's average wattage returned below baseline levels.

However, results from the split-middle analysis do not provide strong support for the value of the intervention in enhancing the athletes' cycling performance (see Table 2). The intervention appears to have been effective only for P1. The 25% increase in level ($\times 1.25$) of performance suggests that the intervention had a strong and immediate effect on P1's cycling performance. Moreover, the decelerating baseline slope reversed to a zero acceleration trend during the intervention period, indicating a positive effect of the intervention. The post-intervention interview data indicated that factors outside the intervention (i.e., P1 reported she was sick) explained the abrupt decrease in performance data during the last week of the intervention (see Figure 1). Fortunately, the post-intervention level of performance increased above baseline levels, which suggests that the skills acquired during the intervention were maintained during the post-intervention. The Binomial test indicated a significant increase in average wattage on the bicycle ergometer when comparing the intervention data with projected average wattage ($p <$

.001). However, the lack of stability observed in P1's baseline data makes it difficult to make any strong conclusion about the intervention for this participant (see Figure 1).

Split-middle results show a decrease (or no change in one case) in the wattage level and slope between the baseline and intervention phases for P2, P3, and P4, which suggest that the initial rate of improvement in average wattage observed in these athletes was slowed as a result of implementing the intervention. The fact that their wattage level was not stable during the baseline phase does pose a limitation in the data. On the other hand, a visual inspection of P3's and P4's data suggests a smooth but gradual increase in average wattage throughout the three phases of the study. This increase might reflect a learning effect from the task performed, as athletes are likely to observe improvements in their performance from repeated training sessions.

Life Satisfaction

Compared with the baseline phase, P1 and P4 reported higher life satisfaction and P2 and P3 reported lower life satisfaction during the intervention period. Paradoxically, post-intervention scores indicate that these increases and decreases reversed following the intervention, with P1 and P4 noting a decrease and P2 and P3 reporting an increase in life satisfaction. Results from the split-middle analysis indicate that only P1 benefited from the intervention; there was an increase in her level of performance across the first two experimental phases, a change in slope in the direction of the intervention objective across all three phases of the study, and the Binomial test was significant ($p < .001$). However, the particularly unstable baseline measures interfere with our ability to assess any real effect of the intervention with regards to life satisfaction for P1 (see Figure 2).

A visual inspection of P3's intervention data suggests a delay in the impact of the resonance-based intervention on her life satisfaction. The SWLS scores increased significantly at

assessment 19 (i.e., after 4 weeks into the intervention) and remained higher than baseline levels for the remainder of the intervention. The maximum possible score on the SWLS was 35, thus there was minimal room for improvement for P4 since his scores were elevated at the end of the baseline phase. This ceiling effect visibly made it impossible for the Binomial test to reach significance. Shambrook and Bull (1996) have cautioned readers about the assumption of the split-middle technique that there is no ceiling effect to limit the slope of the dependent variable. Hence, projected trend lines from baseline phases may lead to misinterpretation of the results.

Positive Affect

All participants with the exception of P3 displayed unstable baseline positive affect data (see Figure 3). Similar to life satisfaction mean scores, Table 1 indicates that positive affect mean scores increased for P1 and P4 and decreased for P2 and P3 during the intervention phase relative to baseline levels. P1 again presented the highest gain (+11.8) and P2 reported the largest reduction (-7.4). During the post-intervention period, P1 and P4 maintained relatively high levels of positive affect, P2's positive affect increased near baseline levels, and P3 reported a decrease in her positive affect.

Once again, split-middle results suggest that only P1 observed a notable improvement in positive affect as a result of participating in the resonance-based intervention. The increase in positive affect level (from 45 in the baseline phase to 55 in the intervention phase, a 22% increase) indicates an immediate influence of the intervention on P1's positive affect. However, a reversal in the direction of the slope was observed during the intervention period. The Binomial test nearly reached significance ($p = .054$), indicating that the resonance-based intervention was most probably helpful in enhancing P1's positive affect. A visual inspection of P3's data in the intervention phase again suggests a delayed increase in her positive affect between assessments

18 and 22 (again 4 weeks into the intervention). Further visual inspection show that P4's positive affect scores remained fairly high throughout the intervention and post-intervention phases, and that it was visibly impossible for the Binomial test to reach significance given the increasing baseline trend and projected slope.

Negative Affect

Table 1 shows that all participants reported a reduction in negative affect during the intervention phase relative to the baseline period, with P1 noting the most significant decrease (14.1) and P2, the smallest decrease (1.0). Post-intervention mean scores indicate that P2 and P3 reported an additional decrease in negative affect following the intervention while P1's and P4's negative affect slightly increased but at a level below their respective baseline mean.

Results from the split-middle analysis indicate that the resonance-based intervention significantly reduced the negative affect of P2 and P4, as suggested by their respective positive drop in level between the baseline and intervention phases, their change in slope in the anticipated direction upon implementation of the intervention, and their significant Binomial test.

It is noteworthy that P1 displayed the most pronounced decrease (−8, which represents a 44.4% decrease) in negative affect upon the introduction of the intervention. Despite this decrease in level and the positive change in slope across the first two experimental phases, the Binomial test did not reach significance. A visual inspection of the data nevertheless suggests that P1's negative affect remained fairly low during the 6 week intervention period, as well as for a large portion of the post-intervention phase (see Figure 4). It is probable that a more stable baseline could have yielded different results with regards to the Binomial test as a closer look at the data reveals that the intervention assessments 18 through 22 could not emerge above the projected baseline slope due to a ceiling effect. Similarly, visual inspection of P3's negative

affect data shows that the sharply decelerating baseline slope and the limited opportunity for improvement within the intervention phase likely prevented the Binomial test to reach significance.

Intrinsic Motivation

A comparison of intervention intrinsic motivation mean scores with baseline scores indicates that all of the participants except P3 increased their level of motivation as a result of the intervention. P4 noted the most pronounced increase (+8.2). Conversely, P3 reported a slight decrease in intrinsic motivation across the intervention (−1.1). Only P4 maintained a high level of motivation during the post-intervention period.

On the other hand, split-middle results provide mixed support for the usefulness of the intervention in enhancing the participants' intrinsic motivation. Only P1 appears to have benefited from the intervention, as suggested by the 400% increase in level (from 8 to 32) from the last point of the baseline slope to the first point of the intervention slope, the increase in slope in the expected direction, and the significant Binomial test ($p < .001$). Nevertheless, Table 2 shows that there was a change in the direction of P3's slope (from $\div 1.05$ in the baseline to $\times 1.27$ in the intervention), which implies that the intervention reversed a descending baseline pattern of intrinsic motivation for P3. Moreover, visual inspection of the data suggests that the resonance-based intervention enhanced P3's intrinsic motivation only mid-way through the intervention phase (see Figure 5). This apparent delay affected the results of the Binomial test, which did not reach significance with only 8 of the 12 intervention data points above projected levels ($p = .1208$).

Furthermore, P4's markedly accelerating baseline slope makes it impossible for the Binomial test to reach significance as projected levels of intrinsic motivation are above the

maximum score on the IMI. Of particular interest is the high level of intrinsic motivation scores for P4 maintained across the intervention and post-intervention phases. However, it would be misleading to suggest that the resonance-based intervention was responsible for this high level of intrinsic motivation as P4's scores increased prior to the implementation of the intervention. Taken as a whole, these mixed results make it difficult to assess the value of the resonance-based intervention in enhancing the participants' intrinsic motivation.

Social Validation

Although the mixed results obtained from the quantitative assessments make it impossible to ascertain the value of the resonance-based intervention, the post-intervention interview data analysis revealed that all four athletes perceived to have enhanced their cycling performance, well-being, and intrinsic motivation as a result of participating in the intervention. For instance, when asked about his perception of the effect of resonance on his cycling performance in training and competition, P2 stated:

I have to say that it has been a tool that I did not have before. I don't concentrate on what the outcome is going to be, I am now more interested in the process, and then looking at the results at the end and being confident that if I go through the process, the results will be there. I believe that more and look forward to that more.

Moreover, all four participants reported a positive effect of the resonance-based intervention on their subjective well-being. For example, P1 and P4 said, respectively:

The more I resonate, the better I feel my well-being is because it transfers over to everything else that I do. If I have a good workout in the morning then, I'll be happy in the afternoon when I'm doing whatever I'm doing. So, the more I resonate, the higher my well-being is.

Oh! I feel better because it's clearer to me now how to do things to get to where I want to go. Now, a bad workout does not make me have a bad day necessarily. I look at it and say "Ok, was there something in my preparation that was missing or, is this the obstacle itself?" And if it is, why is this an obstacle? Like what happened? And I'm able to cool the tension and look at it and then fix it right away, within minutes. . . . I'm more consistent in terms of how my training dictates how I feel.

Finally, when asked about the impact of resonance on their intrinsic motivation, all of the participants reported an increase in their motivation for training and the enjoyment they derive from it. For instance, P3 stated:

Oh! I'm way more motivated! Yeah, I think it's all tied together, resonance, that good feeling that you want to get. For me, it just makes me want to go out and do everything. Do even more, like no questioning, let's just go and do the workout. Like, "Oh I can't wait for tomorrow's workout!" . . . So more motivated, it's like the circle really, it just feeds on itself in a good way.

Overall, all four athletes described the experience of participating in the resonance-based intervention as a positive one. They all benefited in personally meaningful ways and derived unique lessons from their resonating experiences. While all the participants reported that they enjoyed meeting for the interviews, two of them said they struggled with a particular section of the journal where they had to chart their level of resonance for the day. Yet, all agreed that it was a valuable self-awareness tool. For example, P2 stated:

It's a good exercise in self-awareness for sure. It keeps you in touch with how you are feeling, like a reminder to help you to view things a little bit differently, in a more positive light to turn things around to your advantage and make the best of a situation.

When asked to comment about their general appreciation of the methods, three of the athletes (P1, P2, and P3) found that the cycling assessments were particularly difficult and demanding considering the extensive volume of their training program during the competing season. One athlete mentioned that he would have had a different attitude towards the cycling assessments if they would have taken place during the off-season. The fact that the cycling assessments were viewed in a perhaps more negative fashion due to their level of difficulty and additional impact on the athletes' training load may have affected the results.

Finally, results from the 5-week post-intervention interview revealed that the participants continued to apply resonance in their sport and daily life. Three of the athletes indicated that they will somehow miss the interview sessions as they were an opportunity for them to revisit their dream feelings and more globally, their personal process of resonance. For example, P2 stated:

It has made me realize that perhaps I still have a long way to go, which is ok. I hope that I can continue on with this [resonance process] after our sessions are done. Now, I've got a little bit of a crutch, to be able to talk, having somebody to listen to this. It's always a constant refresher for me. I hope that once this is over, I can continue on . . . I think I will, you know after 16 weeks, it will be pretty much ingrained, and I like the idea of thinking that way. So I hope for the process to be useful to me in continuing on with all the things I do, not just in sports but other things in my life. . . . Again it's an on-going process . . . but the effects so far, what I've done so far has been very positive. The exercise has been rewarding, it's been fun doing it.

Discussion

Conventional group designs and statistical analysis procedures might obscure important individual improvements in performance (Kendall, Hrycaiko, Martin, & Kendall, 1990).

Consequently, the single-subject design used in this study provided a valuable alternative method to evaluate the impact of a resonance-based intervention on the cycling performance, well-being, and intrinsic motivation of four endurance athletes. In recent research examining the impact of a resonance-based intervention, it was found that athletes perceived, among other benefits, an increase in their subjective well-being and athletic performance from their participation in the intervention (Callary et al., 2004; Doell et al., 2003; Short & Durand-Bush, 2004; Soulard & Durand-Bush, 2003). As qualitative methods were primarily used in these aforementioned inquiries, this study sought to determine whether endurance athletes could observe measurable improvements in their cycling performance, well-being, and intrinsic motivation using repeated, objective measures.

Overall, with the exception of P1, the mixed results obtained in this study make it difficult to determine the effectiveness of the resonance-based intervention. Results from the split-middle analysis show that only P1 experienced significant increases in cycling performance, life satisfaction, positive affect, and intrinsic motivation as a result of the intervention. Caution must, however, be taken in interpreting these results as P1 displayed markedly unstable baseline data on all dependent variables. One possible reason for the fluctuation in P1's data might be the fact that she was suffering from clinical depression at the time of the study. Although P1 reported she was taking antidepressant medication, the irregular data pattern found in her baseline period might reflect her "minicyclical" mood fluctuations, which has been associated with depression and antidepressant treatment (Benedetti, Barbini, Colombo, Campori, & Smeraldi, 1998). Visual inspection of the data nonetheless shows that the variability in P1's data is reduced during the intervention period and is somewhat maintained in the post-intervention

phase for all dependent variables. This suggests that the intervention might have rendered P1 more consistent in terms of her cycling performance, well-being, and motivation.

Results of the Binomial test indicate that P1's negative affect did not significantly decrease across the intervention phase, probably as a result of the unstable baseline data and minimal room for downward change (i.e., ceiling effect) resulting from the decelerating baseline slope. However, the decrease in means and the important drop in level across the baseline and intervention phases, as well as the reasonably stable intervention slope offer encouraging evidence for the positive influence of the intervention on P1's negative affect. Kazdin (1984) has noted that the Binomial test may prove to be invalid when applied to baseline data that present accelerating or decelerating trends because the data points are more likely to fall above or below the projected baseline slope when there is a trend in the baseline data. Hence, any inference drawn from the Binomial test alone is potentially problematic. Kazdin further underlined that statistical significance should not be the sole determinant for establishing that behaviour change has occurred. Rather, visual and statistical techniques should be used as complementary rather than as competing methods of analysis. The information provided by the level and slope patterns helps to explain more subtle aspects of the study and is valuable to the applied researcher who can modify his or her intervention when behaviour is not changing in the desired direction or at a sufficient pace (Kazdin, 1984).

Interestingly, two other participants (P2 and P4) experienced a significant decrease in negative affect during the intervention, as indicated by the decrease in slope level, direction, and the results of the Binomial test. These findings are further strengthened by the stability observed in the baseline negative affect scores of both participants. This suggests that the resonance-based intervention might play an important role in lessening individuals' subjective experience of

negative feelings. The “revisiting the dream feeling” component of the RPM might play an influential role here. When individuals encounter obstacles, they can respond to them in a negative fashion, however, during the intervention, the participants were taught to respond to their initial response in a way that allowed them to reconnect with how they wanted to feel (Newburg et al., 2002). In Newburg and colleagues’ research, the accomplished performers realized that their first emotional reaction to a situation could become an obstacle if it disengaged them from their endeavours. Consequently, they developed a second response that allowed them to reconnect with their desired feelings and re-engage in more preparation. In the present study, the athletes were encouraged, as part of the intervention, to identify and develop personally meaningful strategies to get back in touch with their desired feelings when they lost sight of them. As a result, they were better equipped to manage their negative feelings, refocus and re-energize in the face of adversity. This could be why we observed a decrease in their negative affect.

Although a comparison of mean scores across the baseline and intervention phases point to a positive effect of the intervention on all dependent variables for at least two of the participants (see Table 1), these positive mean changes are not corroborated by the split-middle technique of analysis. A number of reasons might explain this disparity in results. Shambrook and Bull (1996) have argued that, as psychological skills are learned and acquired, a period of latency is likely to occur before significant improvements in performance are observed. They further proposed that a slight decrease in the rate of improvement (i.e., slope) might initially transpire as individuals incorporate and adjust to the new skill. A lack of immediate effect upon performance combined with a drop in the intervention slope make it very improbable that the Binomial test will reach statistical significance (Shambrook & Bull, 1996). Thus, when

evaluating the effectiveness of sport psychology interventions using the split-middle technique of analysis, sufficient time for the participants to learn, practice, and integrate the skill may need to be provided. This suggests that the participants might have benefited from a longer resonance-based intervention.

The observed escalating trends in P3's life satisfaction, positive affect, and intrinsic motivation and the decelerating trend in her negative affect in the second half of the intervention period could possibly be accounted for by a delayed effect of the intervention. In fact, there may be a period of time during which the athletes learn about themselves, the RPM components, and the process of resonance and no improvement occurs. Identifying and applying one's personal process of resonance takes time and requires commitment and ongoing self-reflection to increase self-awareness. The resonance-based intervention used in the present study involved four interviews spread over 6 weeks and daily reflective journalling. It might not have been long enough to produce significant changes immediately following the first interview (i.e., after assessment 10). An adequate period of time to initially articulate and identify one's dream feeling(s), preparation strategies, obstacles, and revisiting strategies, and to subsequently apply the RPM into one's sport and life is certainly required before one can experience any benefits from the resonance-based intervention. Thus, it might be unrealistic to expect an immediate upward change in performance, well-being, and intrinsic motivation upon introduction of the intervention as little change would be expected during the "training part" of the intervention.

A second plausible explanation for the disparity between results from the mean scores and those from the split-middle technique is the apparent limit of using the Binomial test when baseline scores are unstable and/or very high or low (i.e., ceiling effect), which were the case for several variables. As previously mentioned, stability should be ascertained before the

intervention is implemented so that changes can be accurately evaluated and confidently attributed to the intervention (Barlow & Hersen, 1984). However, when baseline stability cannot be achieved, the Binomial test is invalid and thus inappropriate (Kazdin, 1984). In light of these limitations, future studies evaluating resonance-based interventions would largely benefit from collecting baseline information until stability is established, or from using only the most suitable technique of analysis (e.g., visual analysis) when it is appropriate. Extending the baseline phase in the current study was, in a practical sense, difficult in light of the demand posed by the examination of numerous dependent variables (i.e., multiple questionnaires and performance measure) and the time and effort required of the participants for completing the cycling assessments.

Although exploratory in nature, the 5-week post-intervention period specifically served to explore whether or not the participants maintained or enhanced any acquired skills during the intervention as a result of continuing to apply resonance in their sport and life, or if the effects weakened once the intervention ceased. In general, the post-intervention quantitative data provided mixed evidence with regards to the maintenance of acquired skills.

It is possible that resonance-based interventions lead to perceptions of increased performance, well-being, and motivation that cannot be quantifiable. It could be argued that feelings and emotions are abstract and thus their impact on individuals is abstract as well. As mentioned beforehand, resonance is a process that emerged from the reports of hundreds of high-level performers who were living their life in accordance with how they wanted to feel in their everyday pursuits (Newburg et al., 2002). By creating and purposefully placing themselves in environments or situations that elicited their desired feelings, these individuals secured a sense of total engagement in their daily activities and thus better enjoyed the process of everyday living

and performing. According to the post-intervention interview data, the four participants in this study perceived to have benefited from the intervention in several ways. One important lesson shared by all of them is that as a result of the intervention, they started to concentrate on the process of their performance and life rather than on the outcome because they were confident that the outcome would reflect their high quality preparation and overall engagement in their sport and daily life. Moreover, all of them said that the intervention enhanced their awareness of daily feelings, which made them realize that they had control over their responses to obstacles. Thus, learning and engaging in their personal process of resonance over a period of 11 weeks (i.e., intervention and post-intervention phases together) and increasing their ability to regulate their desired feelings might have resulted in perceptions of increased performance, well-being, and intrinsic motivation for these participants.

A number of methodological limitations have already been discussed and these should be taken into consideration by consultants and applied researchers who wish to design resonance-based interventions and evaluate its impact on the variables of utmost interest to their clients. As previously highlighted, there is a limitation in using the Binomial test when the baseline data is unstable and when there is a latency of effect and a ceiling effect in the intervention data. Moreover, this study cannot be generalized beyond that of four endurance athletes from the Ottawa region. Another important limitation in this study is the period of the year during which the athletes participated in the intervention. One athlete mentioned how much of a commitment the study necessitated, and that it was difficult to “go all-out” and extend himself for the cycling assessments in addition to his already loaded training program. One recommendation for future research is that indicators of performance that are already part of the athletes’ training activities be used rather than laboratory tasks, which are often not meaningful and motivating for the

participants. During the intervention, the participants learned to engage in preparation strategies that they found meaningful and which allowed them to feel the way they want. However, the cycling performance task used in this study was not something they deliberately chose to engage in, which might have negatively affected the results. Another inherent weakness of this inquiry is experimenter expectancies, as the individual administering the intervention was also the main researcher in the study. Nevertheless, a number of precautions previously outlined were taken to minimize any bias that could potentially contaminate the results.

There are also apparent limitations in using the PANAS to quantify the influx of positive and negative feelings that people experience when they engage in the ongoing process of resonance. Although the PANAS measures distinct feelings experienced during a recent period of time, these feelings are not situated in a particular context. Thus, we do not know how long participants experienced these feelings and in what order. Individuals who engage in the process of resonance are not only aware of several feelings they experience throughout a day; they most importantly develop the ability to reconnect with desired feeling (e.g., positive affect) when they experience undesired ones (e.g., negative affect). The reflective journal best captures these fluctuations. Another apparent limitation of the PANAS is that it asks “to what extent you have felt this way (e.g., satisfied) during the past few days.” It is unclear whether the number attributed to the item represents the frequency or intensity of the feeling experienced or both. Diener (2000) advocates that the frequency of mild to moderate positive emotions contributes more to well-being than less frequent, intense positive emotions. Resonance is more about experiencing desired feelings as often as possible rather than experiencing extreme, intense feelings.

Finally, the fact that the data was analyzed per variable allowed us to see the impact of the intervention from one angle, which could be described as very positivist. Analyzing the data per participant on the other hand could offer a different perspective with regards to the effectiveness of the intervention, as observable patterns within participants' measures might be clarified by the qualitative data available from the numerous interviews.

Several research possibilities arise from the results of this study. First, there is a need to replicate this resonance-based intervention study using similar procedures and methods to gain a more clear and comprehensive idea of the potential effects of resonance. An additional recommendation is that future research examining resonance-based interventions allow for a training period at the beginning of the intervention so that individuals have sufficient time to learn about the RPM components, make self-observations, identify their personal process of resonance, and apply it in their daily activities before the intervention is evaluated. Furthermore, they should combine quantitative and qualitative analyses to provide a more complete image of the effects of the intervention on individual participants. Finally, it would be interesting to examine resonance in clinical contexts using the RPM as a counselling approach, as the participant diagnosed with clinical depression exhibited the most pronounced improvements.

In sum, from a quantitative standpoint, it is unclear whether or not the resonance-based intervention produced a significant increase in the cycling performance, life satisfaction, positive affect, and intrinsic motivation of the endurance athletes. From a qualitative view, the athletes did appear to improve. Also, the intervention shows some promise in decreasing the participants' negative affect. Due to several limitations that may have confounded the results, the study should be replicated with similar and different populations. If anything, this study in itself was a valuable learning experience and much can be learned from its limitations. Certainly, the single-

subject design used in this study proved to be useful for examining the athletes' individual responses to the resonance-based intervention. Thus, more research using single-subject designs should be conducted to evaluate the potential impact of interventions on such variables as athletic performance, well-being, and intrinsic motivation.

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Table 1

Mean and Standard Deviation Scores for Each Participant's Cycling Performance, Life Satisfaction, Positive Affect, Negative Affect, and Intrinsic Motivation for the Baseline, Intervention, and Post-Intervention Phases

Participant	Baseline		Intervention		Post-Intervention	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Cycling Performance						
1	176.7	19.2	195.3	17.1	206.9	6.3
2	315.6	16.2	324.9	12.3	312.2	9.3
3	196.5	10.9	207.2	2.2	215.3	2.3
4	342.6	5.2	355.0	4.7	361.7	1.8
Life Satisfaction						
1	20.4	5.9	26.8	2.6	24.9	2.8
2	30.2	0.4	29.6	0.5	30.9	0.3
3	30.7	1.2	30.3	2.3	30.4	0.7
4	31.1	1.5	33.6	0.7	32.9	1.1
Positive Affect						
1	45.5	13.6	57.3	7.0	55.2	6.2
2	52.5	7.7	45.1	10.5	49.9	6.3
3	54.8	4.6	54.3	8.3	50.9	6.0
4	52.2	18.6	61.3	2.0	60.8	2.1
Negative Affect						
1	32.2	9.6	18.1	3.5	20.4	5.4
2	17.2	5.5	16.2	3.1	15.0	2.2
3	24.2	5.8	18.1	6.6	13.2	1.2
4	16.7	4.2	12.4	0.7	13.2	2.1
Intrinsic Motivation						
1	20.6	8.9	28.4	4.2	23.4	5.9
2	26.5	5.1	28.3	3.4	24.6	6.1
3	30.2	3.4	29.1	4.1	29.3	1.4
4	24.7	7.0	32.9	1.2	32.7	0.7

Table 2

Split-Middle and Binomial Results for Each Participant's Cycling Performance, Life Satisfaction, Positive Affect, Negative Affect, and Intrinsic Motivation for the Baseline, Intervention and Post-Intervention Phases

Part.	Baseline Level	Intervention Level	Change in Level	Baseline Slope	Intervention Slope	Post-Interv. Slope	<i>f</i>
Cycling Performance							
1	160	200	x1.25	÷1.14	1.00	÷1.02	.001
2	335	331	÷1.01	x1.09	÷1.01	x1.05	N/S
3	206	204	÷1.01	x1.07	x1.03	x1.02	N/S
4	348	348	1.00	x1.06	x1.02	÷1.03	N/S
Life Satisfaction							
1	13	27	x2.08	÷1.88	÷1.08	÷1.04	.001
2	30	30	1.00	1.00	1.00	1.00	N/S
3	32	29	÷1.10	x1.14	x1.07	÷1.03	N/S
4	32	33	x1.03	x1.14	x1.01	x1.03	N/S
Positive Affect							
1	45	55	x1.22	x1.07	÷1.22	÷1.02	.054
2	55	47	÷1.17	x1.02	x1.02	x1.02	N/S
3	57	54	÷1.06	x1.10	x1.06	÷1.15	N/S
4	66	61	÷1.08	x1.62	÷1.02	÷1.02	N/S
Negative Affect							
1	26	18	x1.44	÷1.37	1.00	x1.31	N/S
2	19	16	x1.19	x1.38	÷1.14	x1.01	.01
3	16	21	÷1.31	÷1.55	÷1.50	1.00	N/S
4	16	12	x1.33	1.00	1.00	1.00	.001
Intrinsic Motivation							
1	8	32	x4.00	÷2.40	÷1.81	÷1.18	.001
2	30	26	÷1.15	x1.09	x1.13	x1.47	N/S
3	29	24	÷1.21	÷1.05	x1.27	÷1.05	.121
4	35	31	÷1.13	x1.82	x1.08	÷1.05	N/S

Note. *f* = Binomial test $[(n/x) p^n]$, where *n* = the number of total data points in the intervention phase, *x* = the number of data points above (or below) the projected baseline, and *p* = .5 by definition of the split-middle slope]

Figure Captions

Figure 1. Average Power (in Watts) obtained from CompuTrainer over the three phases of the study (baseline, intervention, and post-intervention phases) for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

Figure 2. Scores on the Satisfaction With Life Scale (SWLS) over the three phases of the study for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

Figure 3. Positive affect scores on the Positive and Negative Affect Schedule (PANAS) over the three phases of the study for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

Figure 4. Negative affect scores on the Positive and Negative Affect Schedule (PANAS) over the three phases of the study for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

Figure 5. Scores on the Intrinsic Motivation Inventory (IMI) over the three phases of the study for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

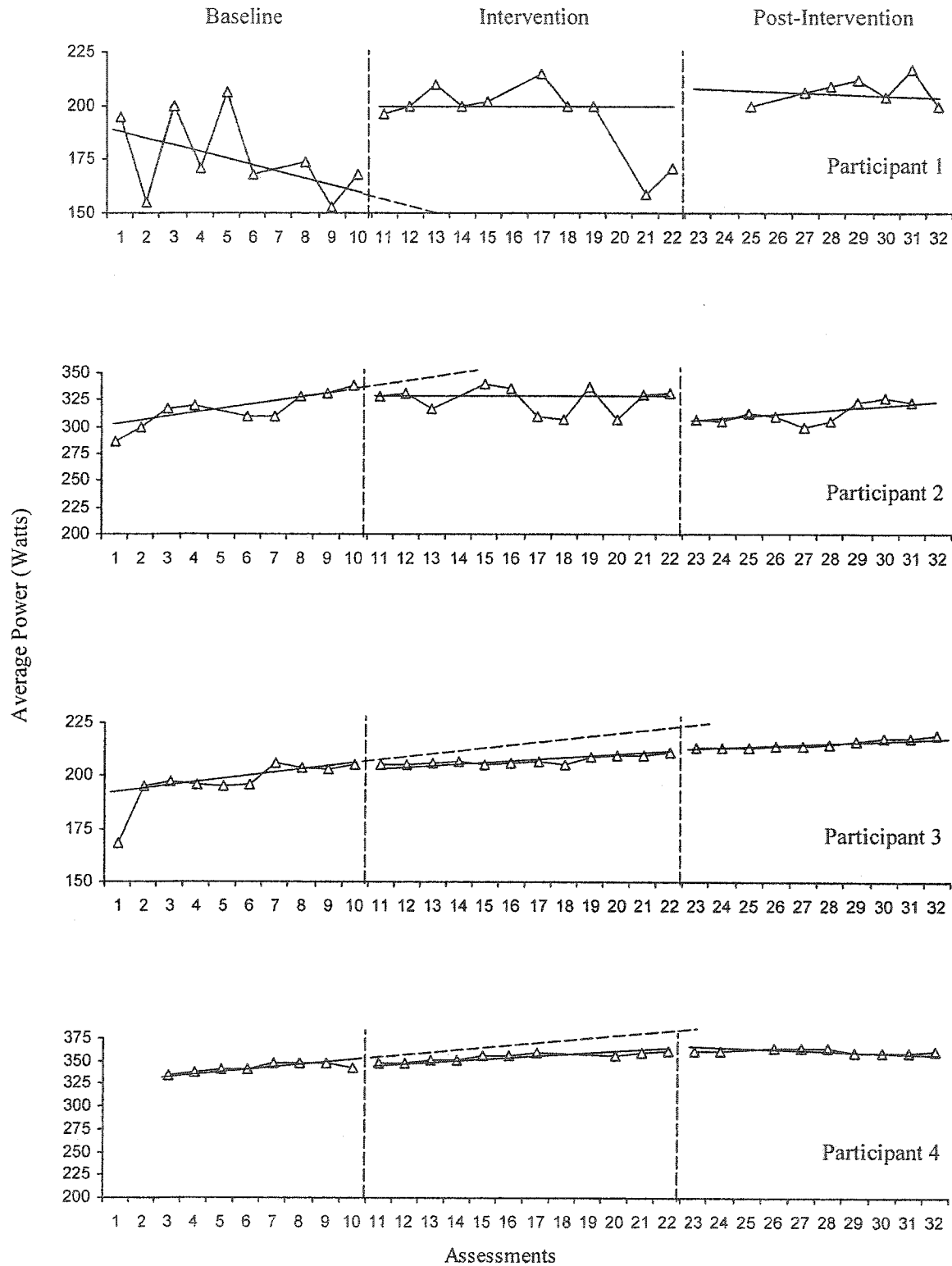


Figure 1. Average Power (in Watts) obtained from CompuTrainer over the three phases of the study (baseline, intervention, and post-intervention phases) for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

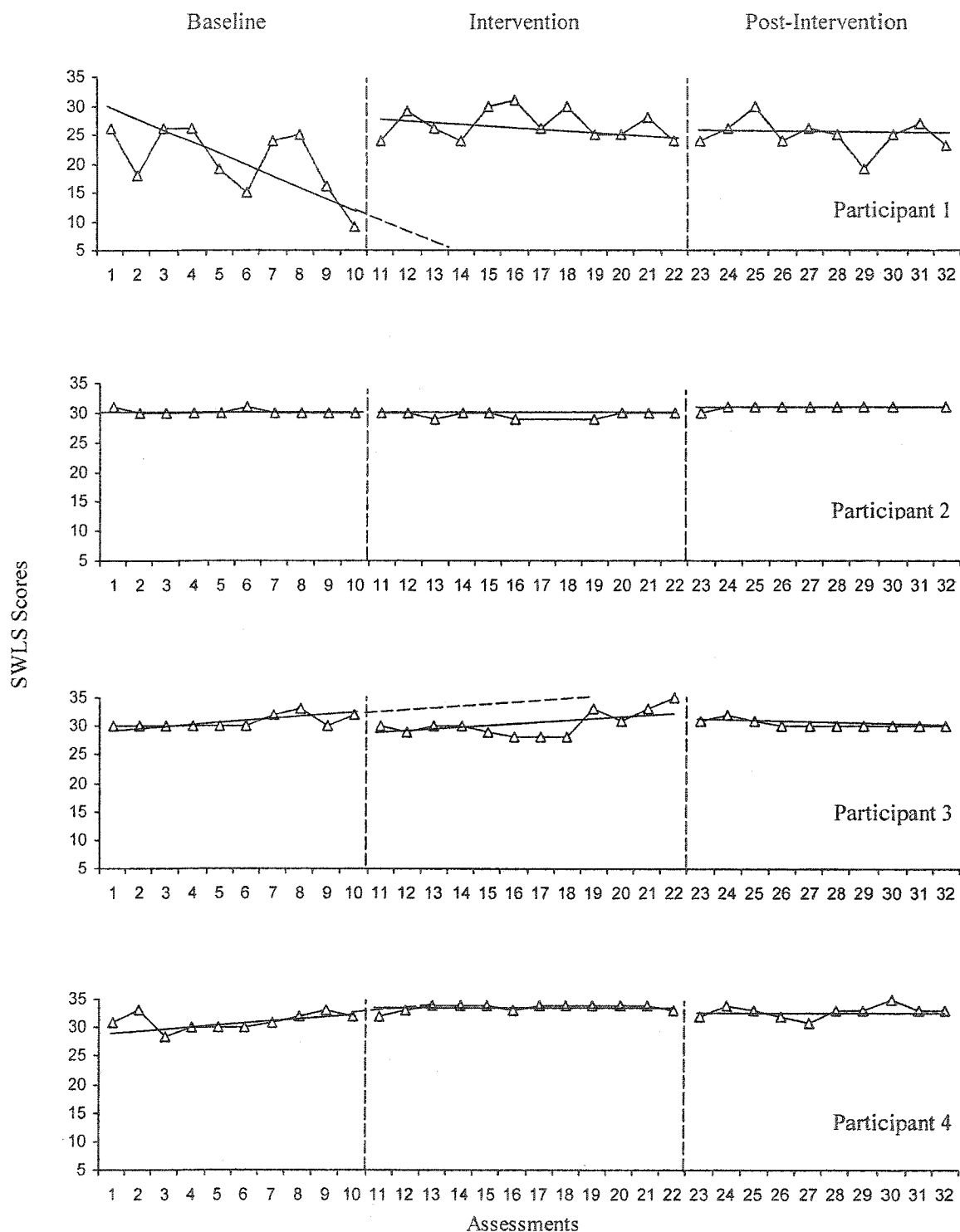


Figure 2. Scores on the Satisfaction With Life Scale (SWLS) over the three phases of the study (baseline, intervention, and post-intervention phases) for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

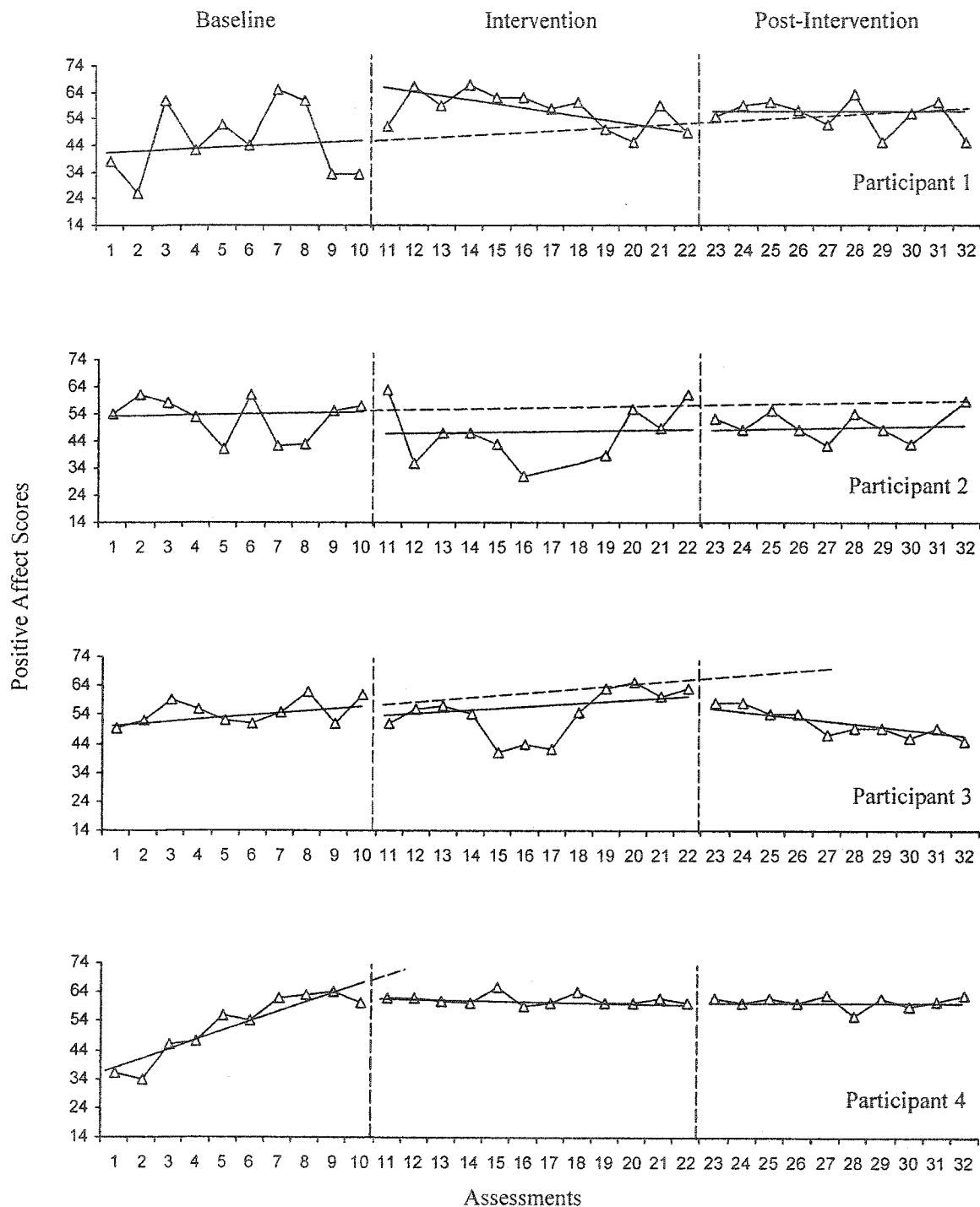


Figure 3. Positive affect scores on the Positive and Negative Affect Schedule (PANAS) over the three phases of the study (baseline, intervention, and post-intervention phases) for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

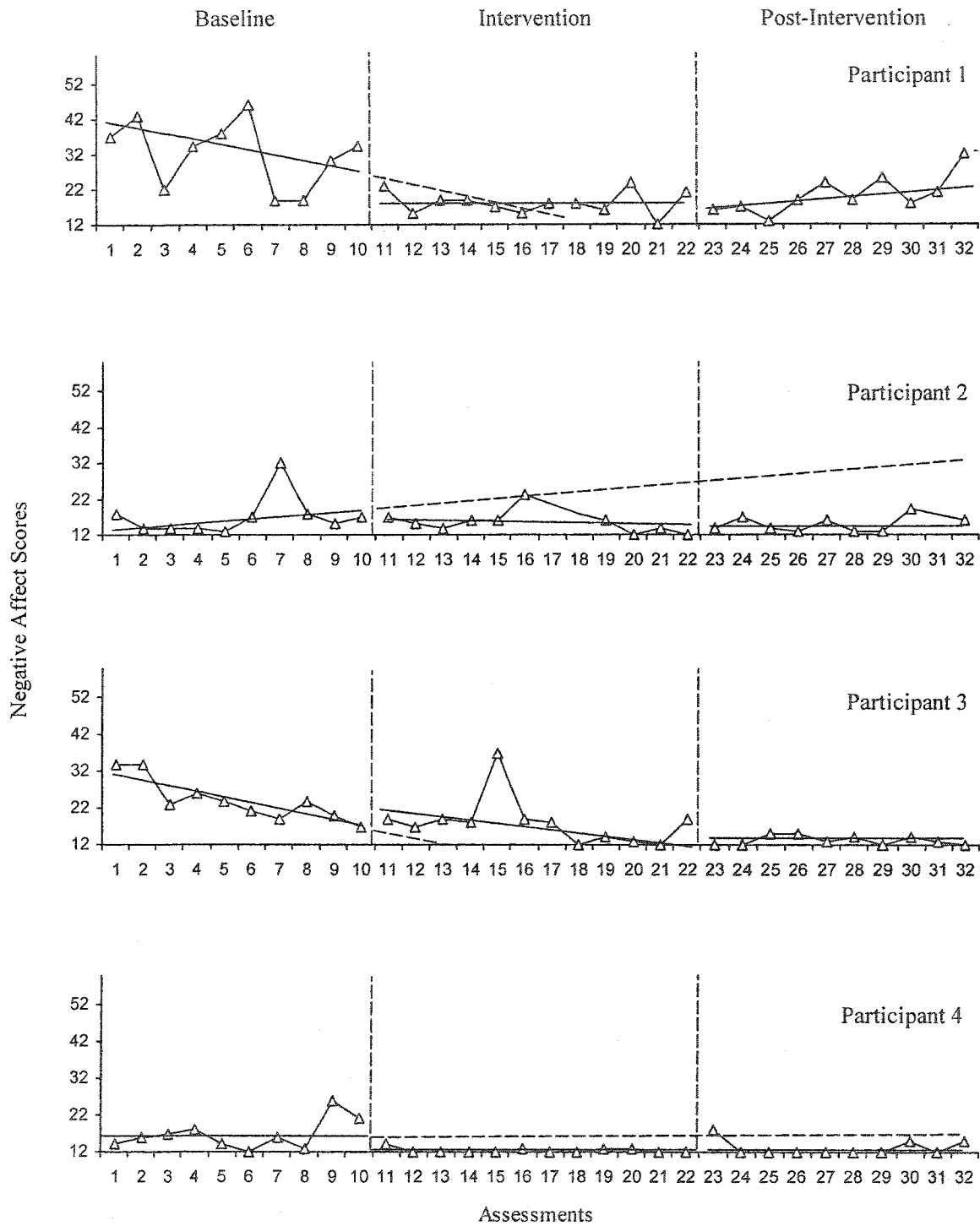


Figure 4. Negative affect scores on the Positive and Negative Affect Schedule (PANAS) over the three phases of the study (baseline, intervention, and post-intervention phases) for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

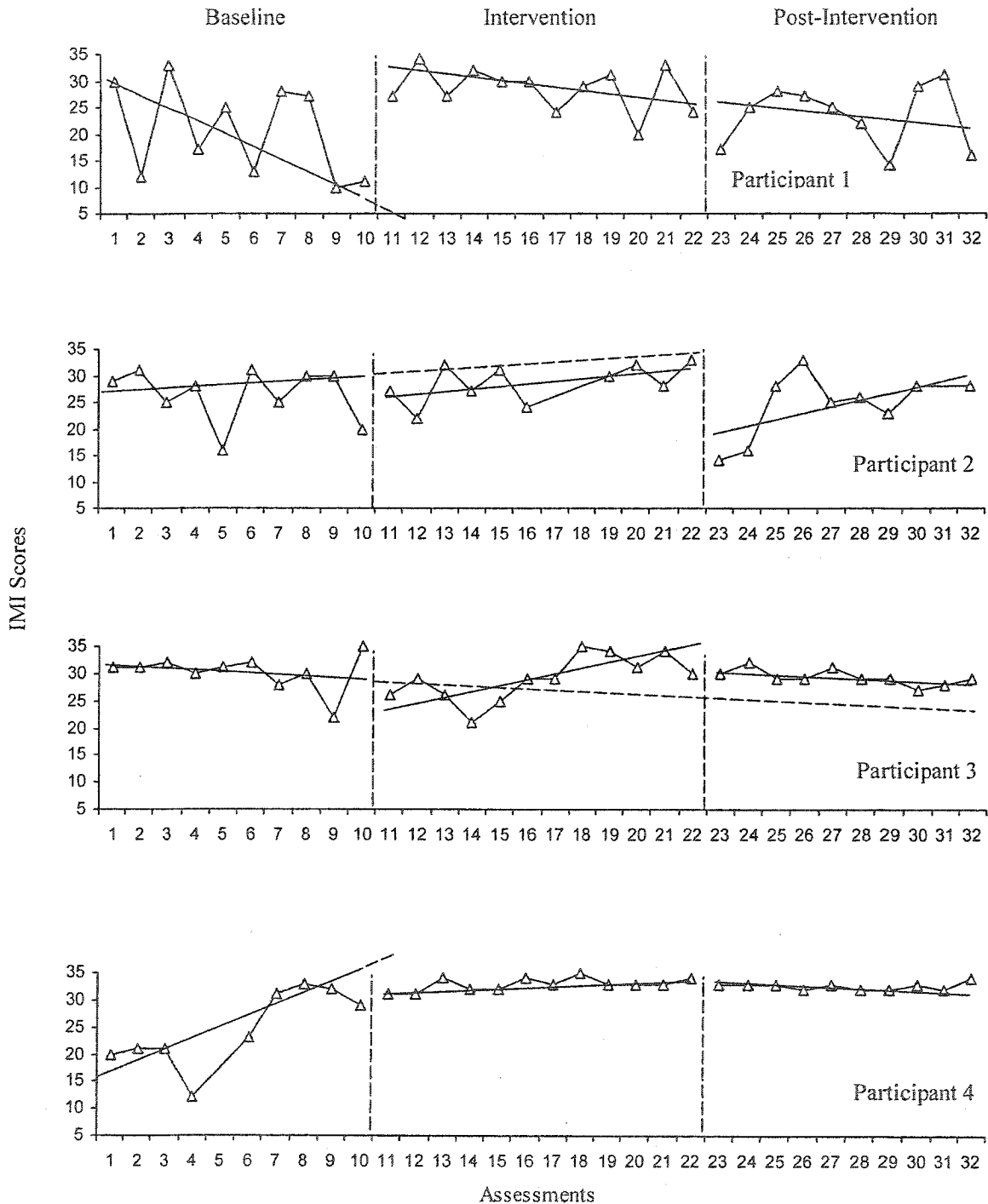


Figure 5. Scores on the Intrinsic Motivation Inventory (IMI) over the three phases of the study (baseline, intervention, and post-intervention phases) for each participant. Solid horizontal lines are trend lines within each phase. The dashed horizontal line is the baseline trend line projected within the intervention and post-intervention phases.

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PART THREE: GENERAL DISCUSSION AND CONCLUSION

CHAPTER V

GENERAL DISCUSSION AND CONCLUSION

The present study aimed to examine the overall experience of four endurance athletes participating in a 6-week resonance-based intervention. A second objective of the study was to assess the impact of the intervention on the athletes' cycling performance, subjective well-being, and intrinsic motivation. The results of this study, which were presented and discussed in the two preceding articles, suggest that all four athletes identified with the four components of the RPM and understood how each contributed to living resonance. At the onset on the intervention, their personal model was incomplete due to their limited self-awareness and lack of connection with desired feelings. Throughout the intervention, they progressively developed their personal model and applied resonance in their sport and daily life. The learning process was unique for each athlete, but it essentially started with self-observations and self-awareness. The four bi-weekly interviews and daily reflective journal served as tools to facilitate this ongoing reflective process. As athletes paid more attention to themselves, their daily feelings, and how they interacted with their environment, they began to take ownership of how they wanted to feel and gradually took steps to modify their surrounding environment in order to facilitate the experience of their dream feelings. These findings support those of previous studies on resonance in which athletes participated in multiple interviews and completed a daily reflective journal (Callary, 2004; Doell, 2002, Soulard, 2003).

All four participants extracted valuable lessons and benefits from their participation in the resonance-based intervention. These included a noticeable increase in self-awareness of how they wanted to feel in their daily endeavours, a positive change in focus from outcome to process, recognition that most obstacles were under their control, and an empowered ability to

manage their emotional responses to events. Furthermore, the athletes discussed how the RPM was a useful tool to help them choose, clarify, and organise their preparation activities so that those in which they engaged were meaningful and made them feel the way they wanted to feel as often as possible. According to Newburg (1998), this is crucial because so many people get caught into performing activities that are meaningless and that do not contribute to their performance and well-being.

Ericsson and colleagues (1993) demonstrated that 10 years or 10,000 hours of effortful, deliberate practice are required to reach a high level of expertise in a domain. These authors also found that motivation is often a constraint because it is challenging to sustain deliberate practice over time, particularly since some activities are not inherently enjoyable. Results of the current study suggest that engaging in an ongoing personal process of resonance could help athletes to get through the strenuous training and even design it so that it is more enjoyable and motivating over time. What is interesting is that some athletes reported identifying a different dream feeling for other facets of their life. They wanted to feel calm and at peace rather than energized and strong. This is innovative and important since researchers advocate the inclusion of appropriate recovery periods in training and competition schedules in which athletes take a break from their strenuous activities in order to prevent debilitating fatigue or discomfort, overtraining, and burnout (Ericsson et al., 1993; Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987). More research should be conducted to further examine the feelings experienced during recovery periods and their effects on performance and well-being.

All of the athletes emphasized the positive impact that experiencing their dream feelings and living resonance had on their performance, well-being, and intrinsic motivation, which supports the findings from previous studies on resonance (Callary, 2004; Doell, 2002; Soulard,

2003). However, the benefits that they perceived appeared difficult to measure, as suggested by the results from the quantitative data analysis discussed in the second article. In fact, the mixed findings obtained from the split-middle analysis and the visual inspection of the data make it difficult to assess the effect of the resonance-based intervention on the cycling performance, life satisfaction, positive affect, and intrinsic motivation of the athletes. The intervention seemed effective for P1 (Amy), but her very unstable baseline data and those of other athletes as well jeopardized our ability to make any conclusions about the value of the intervention.

One promising positive effect of the resonance-based intervention might be the reduction of individuals' subjective experience of negative feelings, as suggested by the results from the Binomial test for P2 (Stephen) and P4 (David), and from the important drop in mean and level, and the change in slope in the anticipated direction for P1 (Amy). One way the resonance process might do this is by helping people to identify, connect, and reconnect to desired feelings as often as possible. By doing so, they keep their focus on positive rather than on negative feelings. Newburg et al. (2002) highlighted how the "revisiting the dream feeling" component of the RPM is key after individuals encounter obstacles or setbacks. It is not uncommon for people to respond negatively, disengage, or experience undesired feelings in the face of difficult situations. However, those who have mastered resonance will not only cognitively reappraise the situation (Deci, 1996; Lazarus, 2000), they will also reconnect with how they want to feel. An important objective of the intervention was to help the participants realize that they can respond to their initial response when it is negative and counterproductive. The results suggest that this objective was attained. During the last interview, the participants reported that as a result of the intervention, they were better equipped to manage their negative feelings, refocus, and re-

energize in the face of adversity. This finding strengthens the observed decrease in their negative affect.

Doell (2002) provided more insight into the nature of the revisiting strategies used by the adolescent track and field athletes in his study. These strategies were performance-related (e.g., recalling one's best performance) or non-related (e.g., talking with a significant other) as well as momentary (e.g., using self-talk as the obstacle occurs) or delayed (e.g., writing lessons in a journal once the race was over). In the current study, the revisiting strategies that the athletes reported using corresponded to the two dimensions (i.e., performance vs. non-performance related and momentary vs. delayed strategies) identified by Doell. Future research examining the nature of various coping strategies that individuals use to overcome obstacles and revisit their desired feelings, as well as their influences on affect and well-being would be a welcome addition to the existing literature on the RPM.

As a whole, the findings of this study extend prior research on resonance in three important ways. First, they suggest that the RPM is a valuable athlete-centered framework that can be used by applied researchers and consultants to explore the overall sporting and life experiences of athletes and help them enhance their performance, well-being, and intrinsic motivation. Second, the results provide some evidence for the positive influence of the resonance-based intervention in reducing the athletes' negative affect and empowering them to manage their emotional responses to events. Finally, the use of a single-subject research design as opposed to a more traditional nomothetic design to investigate the impact of the resonance-based intervention provided valuable lessons for future research examining the effects of similar types of interventions.

A number of methodological limitations have already been discussed in the articles and these should be taken into consideration by consultants and applied researchers who wish to research or design resonance-based interventions with their clients. As previously underlined, the lack of stability of some baseline data, the appearance of latency of effect in some cases, and a ceiling effect may have rendered the use of the Binomial test inappropriate for several variables. Other important limitations include the restricted generalizability of the results, the positivist approach used in analyzing the data (i.e., per variable as opposed to per participant), experimenter expectancies, the period of the year during which the intervention took place, and the nature of the cycling performance task. Moreover, considering the limited relevance, level of difficulty and additional impact on the athletes' training load the twice weekly cycling assessments posed in this study, future research should use indicators of performance that are already integrated in the athletes' training activities or implement the intervention during their off-season. Also, the intervention only lasted 6 weeks, which was perhaps too short to observe any changes in the variables. It is interesting that two of the athletes expressed a desire to extend the length of the intervention during the 5-week follow-up interview. In view of this finding and the individualized nature of the RPM, the process of resonance, and the participants' evolution throughout the intervention, consultants and applied researchers who intend to implement a resonance-based intervention with athletes or other individuals should consider the needs of their clients and be flexible to shorter or extend the intervention in order for them to get full benefits from their experience.

Several research possibilities arise from the results of this study. First, there is a need to replicate this single-subject design study taking into account the limitations and lessons learned to further assess the potential effects of resonance. Another important recommendation for future

research on resonance is to allow for a period at the beginning of the intervention for participants to learn and make observations about themselves, identify, and applying their personal process of resonance before evaluating the intervention. For example, it might be a good idea to extend the length of the intervention, incorporate a “training period” within the early phase of the intervention, and/or prolong the post-intervention period to get a better appreciation of the impact of the intervention. This recommendation when evaluating the efficacy of sport psychology interventions using the split-middle technique of analysis has also been proposed by other researchers (Shambrook & Bull, 1996).

In conclusion, the results of this study showed that the four endurance athletes learned to identify, develop, and experience their personal process of resonance by participating in a 6-week resonance-based intervention. The use of multiple interviews and daily reflective journalling nurtured participants’ self-reflection, observation, and awareness, which were crucial in this learning process. The participants in the present study derived valuable lessons and gained concrete benefits from participating in the intervention and by committing to living resonance on a daily basis.

The use of both qualitative and quantitative methods in this investigation proved to be interesting and useful. Had quantitative analyses only been performed, it would have been impossible to conclude that the resonance-based intervention had a positive impact on the cycling performance, well-being, and intrinsic motivation of the endurance athletes. The rich qualitative data gathered from the many interviews show that the athletes did benefit from their mindful engagement in their personal process of resonance. The RPM which was apprehended and applied in unique ways by each athlete was valuable in personalizing their overall experience and evolving process of resonance, and lends support for the recent call for a shift to more

athlete-centered approaches to sport. In view of the limitations of the present study that may have influenced the results, replication of this study is warranted. In addition, more research using single-subject designs should be conducted to evaluate the impact of interventions conducted with a limited number of participants as the single-subject design used in this study proved to be useful for examining individual responses to the resonance-based intervention.

PART FOUR: REFERENCES AND APPENDICES

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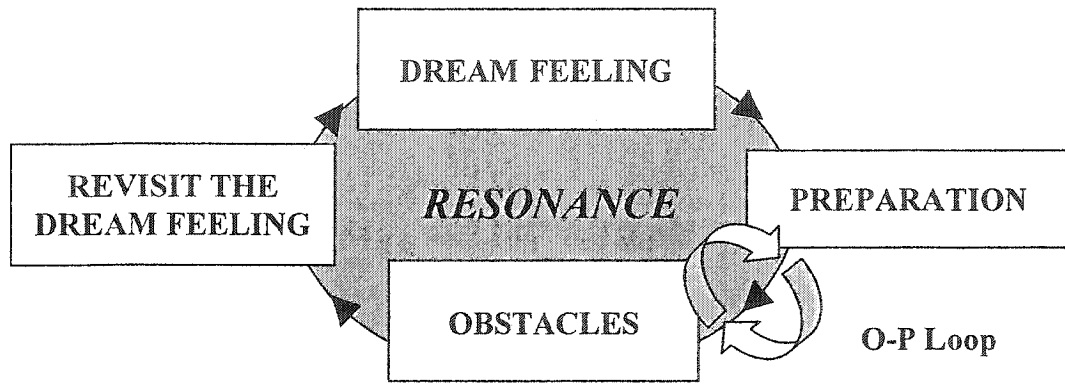
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Appendix A

The Resonance Performance Model (Newburg et al., 2002)



Appendix B

Concept Map

Table 1

Similarities and differences between resonance and relevant concepts reviewed in the literature

Resonance	Enjoyment	Peak experience	Flow	IZOF
(Newburg et al., 2002)	(Klimek & Harris, 1996)	(Privette, 1983; Privette & Bundrick, 1991; Maslow, 1968; Ravizza, 1984)	(Csikszentmihalyi, 1990)	(Hanin, 2000a)
Process that elicits desired feelings, which presumably leads to enjoyment	Positive affect; "flow" as a working definition of enjoyment; process of actively engaging in an activity	Subjective experience characterized by a moment of utmost happiness; involuntary and momentary; positive extreme of a feeling; sensation of intense well-being		
Process subjectively experienced that is characterized by a sense of harmony between a person and her environment; elicits desired feelings that can be extreme or not; voluntary, ongoing process if person commits to it; could create opportunity to have a peak experience				
Broader, positive, most often conscious experience; can occur on an ongoing basis with effort and commitment; could create opportunities to experience flow			Narrow, positive, subjective unconscious experience; occurs sporadically and often spontaneously	Characterized by the experience of positive and negative emotions associated with optimal performance; necessitates complete engagement in the task at hand; individualized emotional experience; identified by individuals based on positive and negative emotional states linked to best, average, and poor performances
Process characterized by the experience of desired feelings, positive or negative – do not have to be linked to performance; requires an engagement in the process; individualized emotional experience; identified and articulated by individuals based on the feelings they seek				

Table 3 (Continued)

Resonance (Newburg et al., 2002)	Perspective (Botterill & Brown, 2002; Botterill & Patrick, 2003)	Subjective well-being (Diener, 2000)	Emotional competence (Saarni, 2000)
Process that encourages people to recognize how they want to feel and develop strategies to feel this way as often as possible; requires that people be able to see the big picture and the intricacies that affect how they feel; changing perspective has been shown to help individuals reconnect with how they want to feel and overcome obstacles (Doell, 2002; Soulard, 2003) ↔ Ability to see things in different ways; example, stepping out of a situation and seeing the bigger picture; helps people to stay in touch with the core components of their identity and provides them with better coping skills for dealing with life challenges and difficulties			
Process that allows people to observe, reflect on, and make decisions based on how they want to feel		Cognitive and affective evaluations people make of their life; determined by frequency not intensity of positive emotions	
Process that allows people to feel the way they want, protect desired feelings in the face of adversity, and reconnect with them when they are lost; awareness of feelings and strategies to regulate them			Ability to regulate one's emotional experiences within interpersonal interactions; awareness of and experiencing desired feelings; stems from interaction between individuals and environment

Table 3 (Continued)

Resonance (Newburg et al., 2002)	Engagement (Maddux, 1997)	Mindfulness (Brown & Ryan, 2003)	Intrinsic motivation (Deci & Ryan, 1985; Ryan & Deci, 2000)
Process that allows people to fully engage in their activities, live in the present, and experience a sense of harmony with their environment	Living on a moment-to-moment basis contributes to enjoyment and happiness; precedes positive experiences		
Encourages conscious awareness and focus on daily feelings, thoughts, and behaviours; cultivates self-endorsed regulation		Awareness of what is happening in present moment; associated with well-being, self-regulated behaviour and positive emotional states	
Process that allows identification of motives for engaging in an activity; self-determined process of resonance and strategies that make you feel the way you want to feel (and thus are motivating)			Free engagement in tasks for the pleasure of doing them; promotion of growth

Appendix C

Table 2

Overview of Recent Research on Resonance

Authors (s)	Year	# of Participants	Level	Context
Durand-Bush, Trudel, Doell, Soulard, & Newburg	2001	12	Elite	Individual Sports
Doell	2002	4	Novice	Track and Field
Soulard	2003	12	Elite	Individual Sports Cross-cultural
Callary	2004	3	Novice	Alpine Ski
Short	2004	5	Recreational	High School Physical Education Classes

Appendix D

*Consent Form*LETTER OF INFORMATION**Recruitment of endurance athletes for a 16-week study aimed at enhancing sport performance and well-being.**

Dear members of the Peak Centre for Human Performance,

As part of my M.A. thesis, I will be conducting a study under the supervision of Dr. Natalie Durand-Bush who is a professor at the University of Ottawa and who also works at the Peak Centre as a sport psychology consultant. The purpose of my study is to examine if and how cyclists from different levels experience resonance in their sport. In this research, "resonance" occurs when there is a connection or harmony between you and your environment; it is a process that allows you to fully engage in your activities and experience enjoyment, satisfaction, and an overall sense of well-being.

If you are interested, you will be asked to participate for a total period of 16 weeks. Your involvement will consist of:

1. Having your cycling performance assessed on a bicycle ergometer (i.e., CompuTrainer) at the Peak Centre twice a week for a period of 16 weeks.
2. Filling out three short questionnaires, which should take between 5-10 minutes, twice a week for a period of 16 weeks.
3. Attending five interviews:
 - a. Initial interview (approximately 1-2 hours)
 - b. Second interview (approximately 30-45 minutes)
 - c. Third interview (approximately 30-45 minutes)
 - d. Fourth interview (approximately 30-45 minutes)
 - e. Follow-up interview (approximately 1 hour)
4. Completing a journal on a daily basis for a period of six weeks. You will be asked to submit your journal entries at the end of each week. I will pick them up at your training facility or at another pre-arranged location. You will also be asked to keep a log of your training schedule for the duration of the study.

The interviews will be audio taped and scheduled at a time convenient to both you and myself. The information you will share throughout the study will remain strictly confidential. Anonymity will be assured by assigning a number to your file so that your name will not appear on or identify any transcript. Furthermore, the audiotapes and transcripts of the interviews will be stored in Dr. Durand-Bush's office, and only the research team will have access to the codes and data. You will be able to receive, by providing a mailing address below, a summary of the findings of this research, which will be available in March 2004.

LETTRE D'INFORMATION

Recrutement d'athlètes de sports d'endurance pour une étude d'une durée de 16 semaines ayant pour but l'amélioration de la performance et du sentiment de bien-être.

Chers (Chères) membres du Peak Centre for Human Performance,

Je mènerai, dans le cadre de ma maîtrise en psychologie du sport, une étude sous la supervision du Dr. Natalie Durand-Bush, une professeure à l'Université d'Ottawa qui travaille aussi au Peak Centre en tant que consultante en psychologie du sport. Le but de mon étude est d'examiner si et comment des cyclistes de différents niveaux vivent la résonance dans leur sport. Dans cette étude, la « résonance » a lieu lorsque tu te sens en parfaite harmonie avec ton environnement ; c'est un processus qui te permet de t'engager entièrement dans ton activité, et qui t'apporte du plaisir, de la satisfaction, et une sensation de bien-être total.

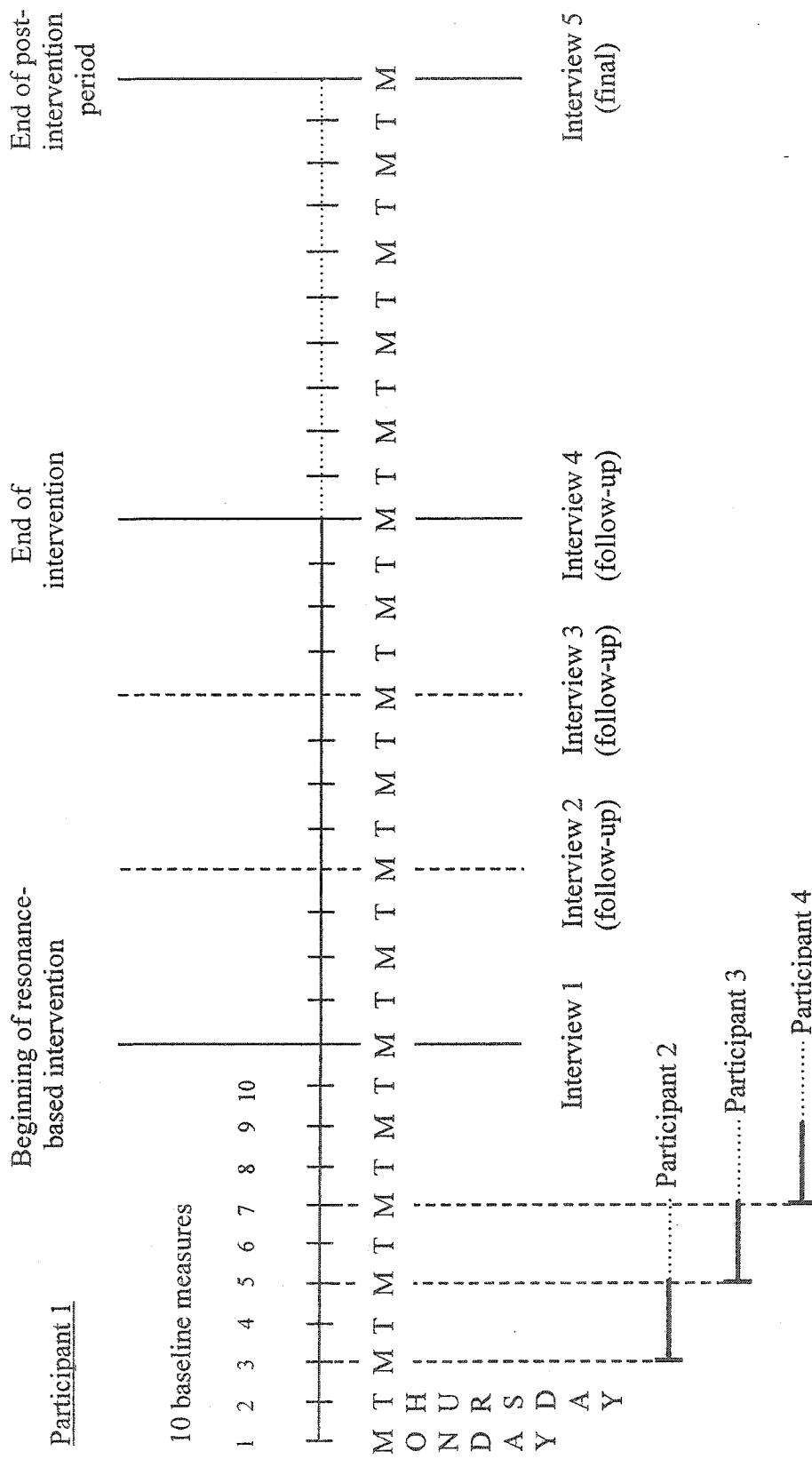
Si tu es intéressé(e), ta participation sera sollicitée pour une période de 16 semaines. Ton implication consistera à :

1. Effectuer un test de performance sur un vélo d'entraînement (ex. : CompuTrainer) au Peak Centre deux fois par semaine pour une période de 16 semaines.
2. Remplir trois petits questionnaires, qui devraient prendre entre 5 et 10 minutes, deux fois par semaine pour une période de 16 semaines.
3. Participer à cinq entrevues :
 - a. Entrevue initiale (environ 1 à 2 heures)
 - b. Deuxième entrevue (environ 30 à 45 minutes)
 - c. Troisième entrevue (environ 30 à 45 minutes)
 - d. Quatrième entrevue (environ 30 à 45 minutes)
 - e. Entrevue finale (environ 1 heure)
4. Tenir un journal hebdomadaire pour une période de six semaines. Tu devras soumettre les entrées de ton journal à la fin de chaque semaine. Je les collecterai à ton centre d'entraînement ou à un endroit pré-déterminé. Tu devras aussi garder un journal de ton horaire d'entraînement tout au long de l'étude.

Les entrevues seront enregistrées avec un appareil audio, et elles seront planifiées à un moment qui nous conviendra le mieux, à toi et à moi. L'information que tu partageras au cours de l'étude restera strictement confidentielle. L'anonymat sera assuré en assignant un numéro à ton dossier afin que ton nom n'identifie ou n'apparaisse sur aucun document ou transcription d'entrevue. De plus, les cassettes d'enregistrements audio et les transcriptions d'entrevue seront entreposées dans le bureau du Dr. Durand-Bush, et seuls les membres de l'équipe de recherche auront accès aux codes et données. Tu pourras obtenir, en laissant une adresse postale ci-dessous, un résumé des résultats de l'étude, qui sera disponible en mars 2004.

Appendix E

Design of the Study



Note. Questionnaires were administered and cycling performance assessed twice a week for a total period of 16 weeks.

Appendix F

*Interview Guide Based on RPM (Newburg et al., 2002)***A) First Interview****General opening questions**

- Tell me about yourself and your sport.
- Why do you engage in your sport?

Main questions and probes**Dream feeling.**

- How do you want to feel on a daily basis?
- How do you like to feel when you engage in your sport? Describe this feeling to the best of your ability.
- Is this feeling the same in training, competition, your daily life? Explain why and how if it is different.
- Can you summarize this feeling in a few words or sentences?
- Imagine a picture (i.e., of yourself or something else) that represents how you want to feel. Describe this mental picture.

Preparation.

- What allows you to feel this way (i.e., personal thoughts/behaviors, environmental factors, strategies, goals, etc.)
- Tell me more about those situations in your sport where you experience this feeling.
- How often do you experience this feeling?
- How often would you like to experience this feeling?
- What do you need to do to experience this feeling more often?

Obstacles.

- What prevents you from experiencing this feeling on a daily basis?
- How often does this happen?
- Tell me about some of the obstacles that you have faced in the past.
- How do these obstacles affect (a) your preparation, (b) performance, (c) well-being, (d) intrinsic motivation?
- Do negative feelings carry over in other aspects of your life? If so, how?

Revisiting the dream feeling.

- What do you do when you face an obstacle or setback?
- Do you do anything to reconnect with the feeling you previously described? Explain.
- Did an obstacle ever get so big that you dropped out of your sport or at least considered it? Describe why and what you did or did not do.

Effect on performance and well-being

- Does this feeling that you seek in your sport affect your performance? Explain why and how.
- Does this feeling affect your overall well-being? Explain why and how.
- Tell me what else this feeling affects in your sport and daily life (i.e., motivation, enjoyment, satisfaction, affect).

Summary

- What is your feeling now that we are approaching the end of the interview? Have you learned anything so far?
- Is there anything you would like to add?

B) Subsequent Intervention Interviews

- Tell me about the last two weeks. How have you been feeling?
- What have you learned in the last two weeks?
- Describe your most resonating experience and tell me why it was a high?
- Describe your least resonating experience and tell me why it was a low?
- Tell me about the journalling process.

C) Five-Week Follow-up Interview

- Tell me about your experience since the beginning of the study. How are you feeling?
- Tell me about resonance in your (a) sport (i.e., training and competition), and (b) life in general?
- Tell me about the journalling process. Have you continued it on your own?
- What are your overall impressions of the last 16 weeks? What are the biggest lessons?
- Is there anything you would like to add?

Appendix G

Resonance Journal Form and Example of Completed Journal Form

My Image of Resonance

Definitions



Resonance

Occurs when there is a connection or harmony between you and your environment; it is a process that allows you to fully engage in your activities and experience enjoyment, satisfaction, and an overall sense of well-being.

Dream feeling

Your chosen feeling when you engage in a particular activity.

Preparation

Activities in which you engage to experience your dream feeling.

Obstacles

Obstacles or setbacks that prevent you from experiencing your dream feeling.

Revisit the dream feeling

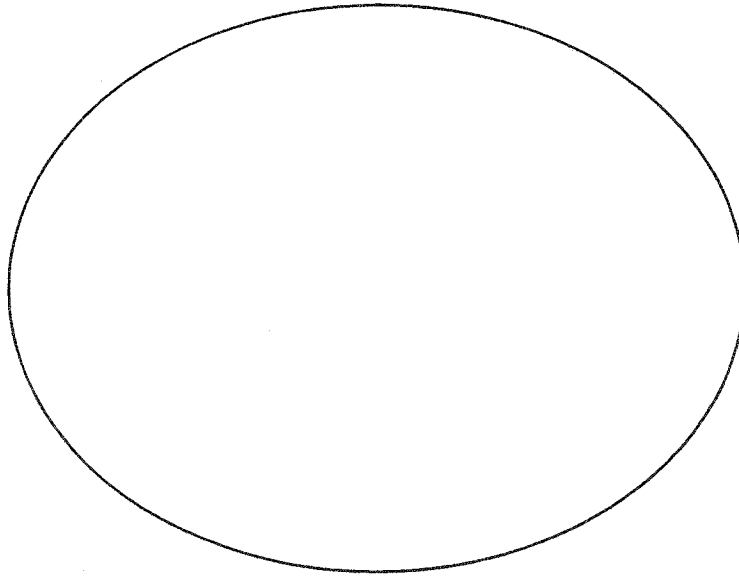
Strategies or activities that allow you to reconnect with your dream feeling.

Subjective well-being

What you think or feel about your own life.

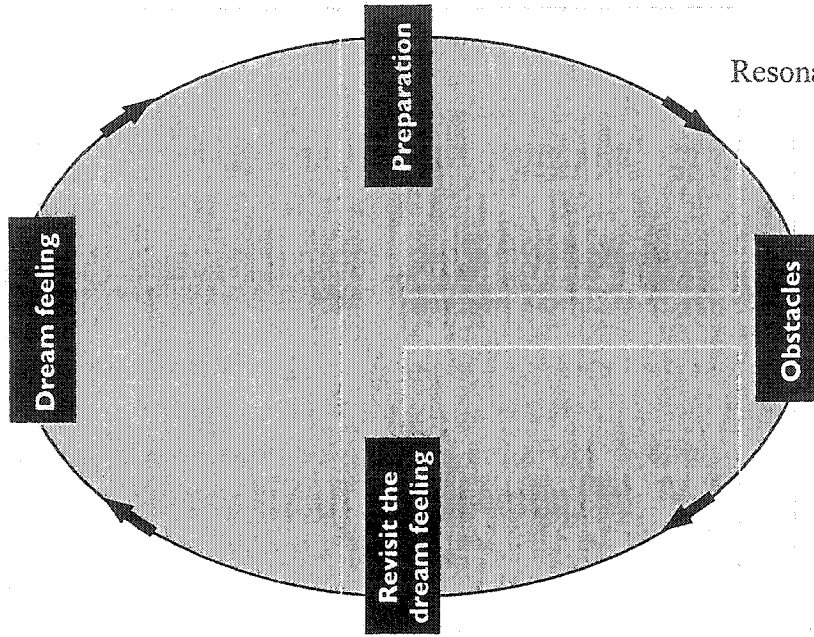
For more info, contact:

Natalie Durand-Bush, Ph.D.
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University of Ottawa
125 University St., Ottawa, ON K1N 6N5
Telephone: (613) 562-5800 ext. 4281
E-mail: ndbush@uottawa.ca



Lessons learned:

My Personal Resonance Performance Model



Resonance-based intervention

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Name: _____

Date: _____

Time of completion: _____

High resonating situation

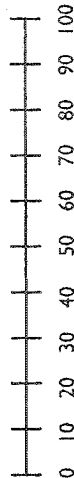
What was it?

Why was it a high?

Training / Competition

What did you do?

What was your level of resonance? _____ %



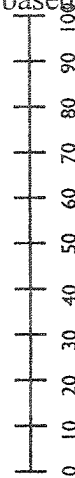
Why this level of resonance?

Low resonating situation

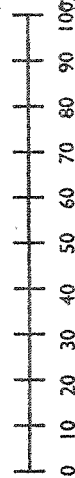
What was it?

Why was it a low?

How satisfied were you with your performance in training or competition? _____ %



What was your overall level of well-being? _____ %



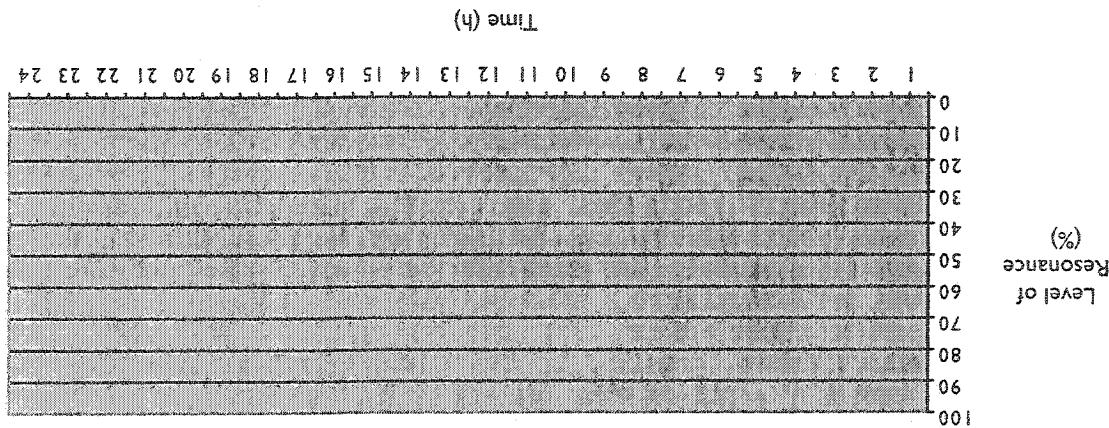
overall daily level of: (0-100%)

Resonance: _____ %

Satisfaction: _____ %

Well-being: _____ %

My Daily Resonance Profile



My Image of Resonance

Definitions



Resonance

Occurs when there is a connection or harmony between you and your environment; it is a process that allows you to fully engage in your activities and experience enjoyment, satisfaction, and an overall sense of well-being.

Dream feeling

Your chosen feeling when you engage in a particular activity.

Preparation

Activities in which you engage to experience your dream feeling.

Obstacles

Obstacles or setbacks that prevent you from experiencing your dream feeling.

Revisit the dream feeling

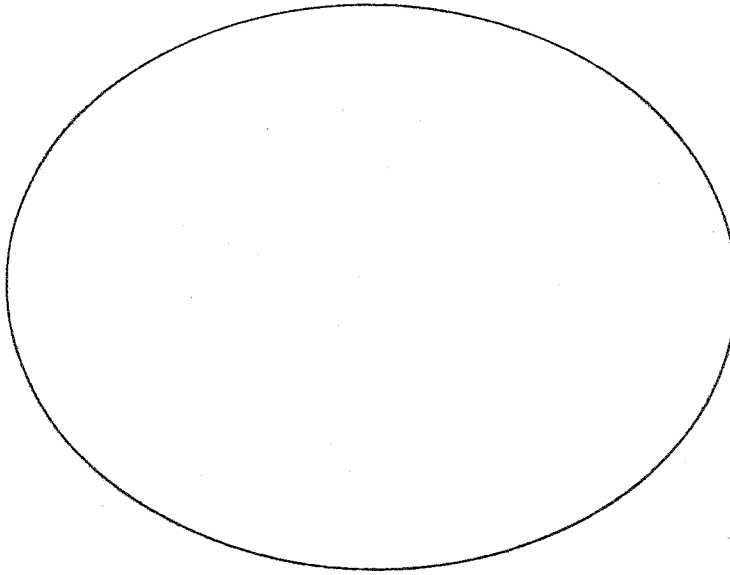
Strategies or activities that allow you to reconnect with your dream feeling.

Subjective well-being

What you think or feel about your own life.

For more info, contact:

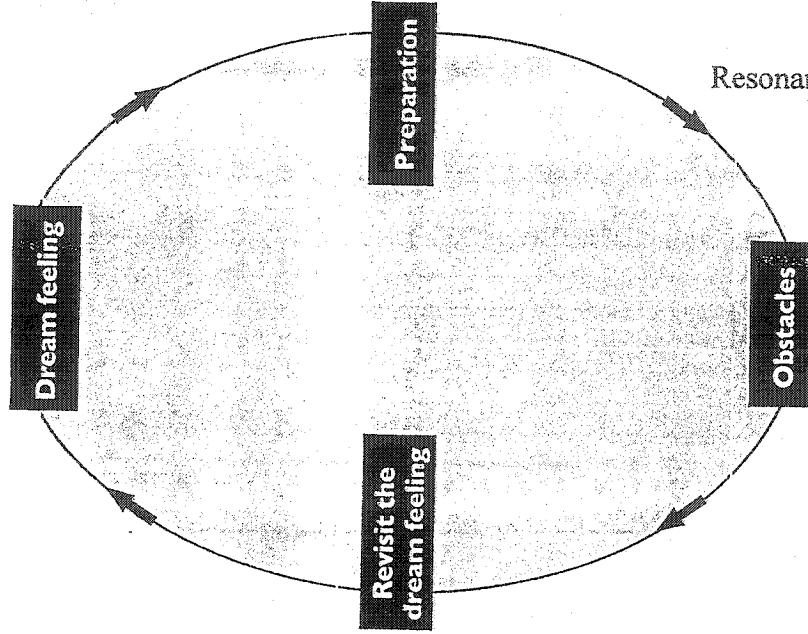
Natalie Durand-Bush, Ph.D.
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Lessons learned:

If you consistently think of positive thoughts the negative ones will eventually go away.

My Personal Resonance Performance Model



Resonance-based intervention

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Amy (P1)

Name:

Date: June 3rd, 2003

Appendix H

Satisfaction With Life Scale – Revised (SWLS-R, Pavot & E. Diener, 1993)

Below are five statements with which you may agree or disagree. Using the 1-7 point Likert scale, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responses. The 7-point scale is as follows:

- 1 = strongly disagree
- 2 = disagree
- 3 = slightly disagree
- 4 = neither agree nor disagree
- 5 = slightly agree
- 6 = agree
- 7 = strongly agree

- _____ 1. In most ways, my life is close to my ideal.
- _____ 2. The conditions of my life are excellent.
- _____ 3. I am satisfied with my life.
- _____ 4. So far I have gotten the important things I want in life.
- _____ 5. If I could live my life over, I would change almost nothing.

Appendix I

Adapted Version of the PANAS (Watson, Clark, & Tellegen, 1988)

This scale consists of a number of words that describe different feelings and emotions. Read each item, and mark the appropriate answer in the space next to that word using the 1-5 point Likert scale below. Indicate to what extent you have felt this way during the past few days. Use the following scale to record your answers.

1 = Very slightly or not at all

2 = A little

3 = Moderately

4 = Quite a bit

5 = Extremely

_____satisfied	_____engaged
_____interested	_____irritable
_____distressed	_____alert
_____excited	_____ashamed
_____upset	_____inspired
_____strong	_____nervous
_____guilty	_____determined
_____scared	_____attentive
_____hostile	_____jittery
_____enthusiastic	_____active
_____proud	_____afraid
_____happy	_____disappointed
_____disconnected	_____fulfilled

Appendix J

*Shortened Interest-Enjoyment Subscale of the Intrinsic Motivation Inventory (IMI) –
(McAuley et al., 1989)*

Below are five statements with which you may agree or disagree. Using the 1-7 point Likert scale, indicate your agreement with each item in relation to your performance during your last cycling training by placing the appropriate number on the line preceding that item. Please be open and honest in your responses. The 7-point scale is as follows:

- 1 = strongly disagree
- 2 = disagree
- 3 = slightly disagree
- 4 = neither agree nor disagree
- 5 = slightly agree
- 6 = agree
- 7 = strongly agree

_____ 1. I enjoyed my cycling performance very much.

_____ 2. Cycling in itself was fun.

_____ 3. I would describe my cycling performance as a very interesting experience.

_____ 4. While I was cycling, I was thinking about how much I enjoyed it.

_____ 5. This cycling performance did not hold my attention.