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To the Graduate Council:

I am submitting herewith a dissertation written by Greg Young entitled "It Can Start From Anything": An Existential Phenomenological Investigation of Athletes' Experiences of Psychological Momentum." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Kinesiology.

Craig A. Wrisberg, Major Professor

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“It Can Start From Anything”: An Existential Phenomenological Investigation of Athletes’

Experiences of Psychological Momentum

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Greg Young
May 2011

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Dedication

To my entire family for their constant love and support. I could not be in the position, nor the person I am today if it were not for you. Thank you.

Acknowledgements

I would like to acknowledge people that have made significant contributions, not only to this project, but also during the entire course of my graduate studies at The University of Tennessee. Firstly, my committee chair, Dr. Craig Wrisberg. There is not a person in the world that does not want to learn from the best, and I have been honored to spend the past five years doing so. I consider you not only a teacher and a mentor, but also a friend. Thank you for all of your guidance and support throughout my time at UT, and I look forward to continuing with all you have taught me. Secondly, the remaining members of my committee, Dr. Jeff Fairbrother who has challenged me to look at situations from a number of angles and with new perspectives, while providing boundless encouragement for me to pursue my goals; Dr. Joe Whitney, who has always pushed me to think outside the box and produce thoughtful considerations that will help athletes perform at their very best; and Dr. Sandra Thomas who has opened my eyes to the possibilities of existential phenomenology, it has been a pleasure to have the guidance of someone who quite literally wrote the book.

I would also like to thank my friends that have inspired and motivated me throughout my Doctoral studies. Dr. Duncan Simpson, who sparked my initial interest in psychological momentum, I simply could not have asked for a better friend and ally throughout my time at UT. Dr. Jenny Withycombe, whom without I would most likely still be transcribing interviews. Thank you for your friendship, constant support and assistance, and your ever-ready editing pen. Mark Whitley, for bringing the final image to life with your considerable skill and creative vision. Finally, the interpretative research group at UT for their help with data analysis, and the co-participants of this study, without you, this would not have been possible. Thank you.

Abstract

Psychological Momentum (PM) is a commonly recognized phenomenon in sport, yet remains one of the least understood (Taylor & Demick, 1994). Previous research examined PM using archival data (Gayton & Very, 1993; Gilovich, Vallone, & Tversky, 1985; Koehler & Conley, 2003; Silva, Hardy, & Crace, 1988), hypothetical and contrived scenarios (Eisler & Spink, 1998; Miller & Weinberg, 1991; Perreault, Vallerand, Montgomery, & Provencher, 1998; Vallerand, Colavecchio, & Pelletier, 1988), and actual performance (Mack, et al., 2008). More recently, Jones and Harwood (2008) used semi-structured interviews to examine participants' perceptions of PM. However, their research was focused on the specific components of existing conceptual models. The purpose of this study was to explore athletes' experiences of PM without a priori assumptions. In-depth phenomenological interviews were conducted with seven NCAA D-I intercollegiate and professional soccer, volleyball, basketball, and tennis players. Co-participants were asked the following open-ended question: "Think of a time that you experienced momentum in your sport and describe as fully as you can what stands out for you about that experience." Audio-recorded interviews were transcribed verbatim. Qualitative analysis of the transcripts revealed a final thematic structure of five major dimensions that characterized these athletes' experiences of psychological momentum: *Instantaneous momentum*, *Created Momentum*, *Internal Indicators*, *External Indicators* and *Resistance*. These major themes appeared against the contextual backgrounds of an *Awareness of Momentum* and *Competitive Performance*. Results were largely consistent with previous literature examining PM, but also included new findings not previously discussed in that research. For example, co-participants described experiencing *Instantaneous Momentum* from a single event. In addition, they also described a systematic approach to experiencing PM using strategies to alter

performance leading to *Created Momentum*. Co-participants also described a critical level of *Resistance* required to experience PM. While perceptions of PM were described when this *Resistance* level was low, they were not described as having a significant impact on performance. Finally, co-participants described an *Awareness of Momentum*, suggesting they were aware of PM during competition but not directly focusing on it. Put simply, the strategies used during competition were directed towards performing more successfully, not towards the altering of PM.

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CHAPTER 1

Introduction

“Most athletes and coaches would acknowledge that momentum exists, but if asked to specifically define momentum, they may have difficulty” (Smisson, Burke, Joyner, Munkasy, & Blom, 2007, p. 90).

Momentum is a commonly recognized component of sporting performance, yet it remains one of the least understood (Taylor & Demick, 1994). Both players and coaches often refer to momentum as a legitimate and tangible force that needs to be planned for and navigated during competition. This belief is compounded by popular media, sports writers, and spectators, who often refer to momentum as a key factor in the direction, and ultimately end result, of many sporting competitions (Burke, Aoyagi, Joyner, & Burke, 2003; Smisson et al., 2007). However, momentum is a somewhat elusive concept that is difficult to, with any certainty, completely understand much less scientifically quantify (Burke & Houseworth, 1995; Crust & Nesti, 2006; Vergin, 2000).

Brief Review of Literature

Although no universal definition of momentum exists, early definitions from social psychology referred to *momentum* as a bi-directional concept, affecting the probability of winning or losing as a function of the preceding event (Adler, 1981). Plainly stated, it is the tendency of an effect to be followed by a similar effect. The term *psychological momentum* (PM), which is more commonly used in sport psychology, describes the changes in an athlete's performance based on success and failure in recent events, which in some way change the

psychology of the athlete and exert either a positive or negative influence (Vallerand et al., 1988). Positive PM is expected to occur when successful performances increase the probability of subsequent successes, while negative PM would most likely be seen when unsuccessful performances increase the probability of subsequent failures. As would be expected, positive PM is characterized as a time when everything seems to “go right” for the performer, while negative PM produces the opposite experience (Burke, Edwards, Weigand, & Weinberg, 1997).

Three conceptual models have been proposed to explain the effects of momentum on performance: the Antecedents-Consequence model (AC) (Vallerand et al., 1988), Multidimensional model (MD) (Taylor & Demick, 1994), and Projected Performance model (PP) of PM (Cornelius, Silva, Conroy, & Petersen, 1997). The AC model of PM represented an attempt to unpack the phenomenon by specifying the antecedents and consequences of PM. Antecedents are considered to be the precipitating events that act as catalysts or triggers for perceptions of PM, while consequences are the results of such perceptions, such as increased confidence, optimism, and energy (Vallerand et al., 1988). The primary mediating factor arising from this model is whether the performer considers the preceding event to be important. If this is the case, then the event is more likely to influence their perceptions of PM. Feelings of personal control are also presumed to influence perceptions of PM. Increased or decreased feelings of control lead to perceptions of positive or negative momentum, respectively (Vallerand et al., 1988).

A second conceptual model of PM is the MD model (Taylor & Demick, 1994). According to this model, momentum is defined as “a positive or negative change in cognition, affect, physiology, and behavior caused by an event or series of events that will result in a commensurate shift in performance and competitive outcome” (Taylor & Demick, 1994, p. 54).

Expanding on the earlier AC model, this model suggests a more complex mechanism is required for PM to occur. Specifically six stages or elements are postulated to explain the momentum chain: (a) a precipitating event, (b) change in cognition, affect, and physiology, (c) change in behavior, (d) change in performance consistent with the above changes, (e) a contiguous and opposing change on the part of the opponent, and (f) a resultant change in outcome (Taylor & Demick, 1994). Consistent with the AC model, stages one and two of the MD model suggest that a performer's interpretation of a precipitating event is critical, and that the changes in thoughts, emotions, and physical responses associated with the event are required for perceptions of PM to occur.

The most recent model of PM is the PP Model (Cornelius et al., 1997). According to this model *positive* and *negative* momentum are labels used to describe performance that has deviated from the norm in either direction (Cornelius et al., 1997). It is suggested that labels of positive and negative momentum can be misused if they are attributed magical powers that determine the outcome of performance (Cornelius et al., 1997). An absence of PM is presumed to be the normative state of performance and for PM to be perceived as positive or negative, the correlated performance must be present for a sustained period of time (Cornelius et al., 1997). The PP model includes the notions of positive inhibition and negative facilitation proposed in earlier research on PM (Silva et al., 1988). Positive inhibition is when a decrement in performance follows a success, likely caused by complacency or lack of effort (Silva et al., 1988), while negative facilitation is evidenced by an increase in performance following a failure, likely brought about by an increase in effort and attention (Silva et al., 1988).

One of the earliest approaches to the study of PM was the quantitative examination of archival and observational data from actual competitions. However, research examining such

archival data from basketball (Gilovich et al., 1985; Koehler & Conley, 2003), ice hockey (Gayton & Very, 1993) and tennis (Silva et al., 1988) failed to provide consistent support for the concept of momentum. Results showed performance that followed previous successes or failures was no different than would be expected by chance. In the basketball studies, researchers attempted to identify the “hot hand” phenomenon, which is evidenced when shooting performance temporarily increases following a string of successes (Koehler & Conley, 2003; Vergin, 2000). For example, Koehler and Conley (2003) examined footage of NBA three-point shot competitions from 1994-1997 and defined a ‘run’ as a set of one or more made or missed shots. It was assumed that more clusters of sequential made shots than missed shots would indicate the presence of a ‘hot-hand’ (Koehler & Conley, 2003). However, the results revealed no evidence of sequential dependencies for any of the shooters.

Similar findings were obtained in other examinations of archival basketball data (Gilovich et al., 1985; Vergin, 2000). However, more promising outcomes have been obtained in studies of PM for the sports of racquetball (Iso-Ahola & Mobily, 1980), ice-hockey (Gayton & Very, 1993), and tennis (Silva et al., 1988), particularly with regard to the impact of momentum on performance outcomes after the first set/period of play. Specifically, momentum generated by the outcome of game/set one appeared to predict the outcome of game/set two and the overall match (Gayton & Very, 1993; Iso-Ahola & Mobily, 1980; Silva et al., 1988). However, taken together, the findings of previous research generally have not supported the notion of PM, and in those instances where support was obtained, the effect was conditional and difficult to interpret.

Another approach to examining PM has been to obtain participants’ perceptions of PM. Most often this approach has consisted of the use of post-performance questionnaires. Hypothetical or contrived scenarios are created in an attempt to induce perceptions of PM in a

controlled setting. For example, in one study perceptions of PM were assessed by asking participants to complete a questionnaire after reading descriptions of hypothetical volleyball scenarios with manipulated scoring patterns (Eisler & Spink, 1998). The patterns included a neutral scoring pattern (i.e. no team leading by more than one point at any time) and a positive scoring pattern, (i.e. the participants' 'team' comes from behind to tie the score with five consecutive points). Participants were asked to rate which team they felt had more momentum, confidence, control, anxiety, discouragement, and motivation, using a Likert scale (Eisler & Spink, 1998). Results revealed significantly higher perceptions of PM with the positive scenario than the neutral scenario (Eisler & Spink, 1998). Since both scenarios ultimately depicted a tied score, it was concluded that winning consecutive points was the primary reason for participants' perceptions of PM in the positive scenario (Eisler & Spink, 1998). Other research employing a hypothetical scenario approach revealed similar perceptions of PM influenced by scoring configurations, such as coming from behind in volleyball (Miller & Weinberg, 1991) and tennis (Vallerand et al., 1988). In one study participants perceived that the player coming from behind was more likely to win the set if the player had won consecutive games (Vallerand et al., 1988). One limitation to this approach to examining perceptions of PM is that it lacks ecological validity, since participants are not directly experiencing momentum shifts, but rather observing them in the performance of other players.

More recent attempts to increase ecological validity have adopted an approach in which participants were provided false feedback while performing in a bogus bicycle race with a predetermined result, unaffected by their actual performance (e.g., average power output during the race). Following the race, participants completed a questionnaire and provided their perceptions of PM at four different stages of the event. Results indicated that the average power

output was highest for participants when they perceived both positive and negative PM (Perreault et al., 1998). The latter finding was interpreted as support for the phenomenon of negative facilitation (Taylor & Demick, 1994). While this approach enhanced ecological validity by having participants actually perform a task, a possible limitation was that participants' perceptions of PM were in response to a contrived scenario that was not a true representation of their actual performance.

More recent research (Mack, Miller, Smith, Monaghan, & German, 2008) has examined perceptions of PM immediately following an actual competitive basketball-shooting task. Participants competed head to head in three best-of-ten free throw shooting contests, with the goal of winning two out of three. Immediately following the first contest, participants completed a questionnaire rating their own shooting ability and that of their opponent. They were then asked to indicate whether they had performed up to their ability and if they felt they had positive PM, negative PM, or no PM going into the next contest (Mack et al., 2008). The results provided support for the presence of perceptions of PM immediately following performance success. Participants were more confident of winning the next contest and perceived greater levels of positive PM following a win than following a loss (Mack et al., 2008). These findings are consistent with the MD (Taylor & Demick, 1994) and AC (Vallerand et al., 1988) models of PM, in that precipitating events, in this case winning the previous contest, were interpreted as significant to the performer and triggered perceptions of PM (Mack et al., 2008).

Taken together, the existing quantitative research examining the relationship between PM and performance, using both indirect and direct approaches, has provided little supporting evidence for the effects of the phenomenon (Cornelius et al., 1997; Eisler & Spink, 1998; Mack et al., 2008; Mack & Stephens, 2000; Perreault et al., 1998; Taylor & Demick, 1994). Due to the

subjective nature of PM, it is possible that the intricacies of the phenomenon could be better understood if a more focused and in-depth qualitative research approach was used. To date, however, only one published study has adopted such an approach. Jones and Harwood (2008) conducted semi-structured interviews with five high-level soccer players to assess their experiences of PM. Specific questions asked in the interview included: “Why do you think the tide turns in matches?” “Why does momentum swing your way?” “How do you respond if the run of play is going against you?” “How do you respond if you are on the front foot?” “What are you trying to accomplish when you feel like you have gained the upper hand?” (Jones & Harwood, 2008, p. 60). These questions were designed to examine triggers and consequences of PM as well as specific strategies used to maintain and develop PM within soccer performance. Follow-up probing questions were also asked to elicit elaboration of participants’ responses. The results revealed that players experienced both positive and negative PM, and were able to identify a range of triggers and associated outcomes (e.g., confidence and encouragement) (Jones & Harwood, 2008). Players also reported the use of specific individual and team strategies to overcome negative PM and maintain or develop positive PM. These included changing tactics, maintaining a positive attitude, encouraging teammates, executing basic skills, and maximizing effort (Jones & Harwood, 2008). While these results offer some insight into the mechanisms of PM, the use of an interview guide confined athletes’ responses to specific components of the existing conceptual models (e.g., precipitating events/triggers of positive and negative momentum), thus limiting athletes’ descriptions of their experiences of PM.

A potentially more fruitful qualitative research approach for examining athletes’ experiences of PM is the existential phenomenological interview. Such a method does not attempt to prove or disprove the predictions of models or, in the case of this study the presence

of PM; nor does it attempt to contradict the findings of previous research. Rather, existential phenomenology attempts to understand a person's lived experience of a phenomenon; in this case, athletes' experiences of psychological momentum.

The aim of existential phenomenology is to capture the *meaning* of an experience to an individual, which contrasts with other qualitative approaches that focus on descriptive accounts *about* behaviors and actions of the people involved (Nesti, 2004). Existential phenomenology combines two philosophies. The first represents a particular perspective on human existence (existentialism), while the second is vehicle for investigating that existence (Pollio, Henley, & Thompson, 1997). As a research method existential phenomenology is a "rigorous and unbiased study of things as they appear so that one might come to an essential understanding of human consciousness and experience" (Valle, King, & Halling, 1989, p. 6).

The method of existential phenomenology centers on in-depth interviews, conducted without a priori assumptions, based upon a single open-ended question. The question is of great importance because it defines the boundaries of the phenomenon participants are being asked to address. It is also important to note that in research of this nature, the participant is considered the expert, not the researcher, and as such is referred to as a *co-participant* in order to promote an air of equality (Giorgi, 1970). While one co-participant (i.e., the athlete) describes his/her experience, the other (i.e., the researcher) is careful to avoid "why" questions that may elicit theoretically based responses (Thomas & Pollio, 2002). All follow-up probing questions are phrased in a manner designed to promote continued description and interpretation of the co-participant's experiences (e.g., "What were you aware of?"; "Can you tell me more about that?"; "What about that stood out to you?"). The information obtained during an existential phenomenological interview is more nuanced and detailed than can be obtained with

questionnaires or semi-structured interviews. As such an existential phenomenological approach appears to be well suited to extending our understanding of the phenomenon of PM in competitive sports.

Statement of the Problem

Although PM has been researched for a number of years, the results of previous attempts to identify the characteristics of the phenomenon and its impact on performance have been equivocal. There appears to be a need for a more detailed examination of athletes' experiences of the PM phenomenon in order to better understand how this phenomenon influences athletes' perceptions and sporting performance. A greater understanding of PM might also offer important insights for athletes, coaches and sport psychology practitioners interested in enhancing athletes' sport experiences.

Purpose

The purpose of this study was to obtain and examine athletes' experiences of psychological momentum. To do so, in-depth interviews, consistent with the method of existential phenomenology, were conducted with current intercollegiate NCAA Division I and professional basketball, soccer, tennis, and volleyball players.

Significance of the Study

Exploring athletes' experiences of PM may provide practitioners and researchers with a greater understanding of the complexities and intricacies of this phenomenon than is possible by observation or statistical analysis alone. In addition, the interview process may also allow co-participants to more clearly understand and ascribe meaning to their own experiences of PM.

Assumptions

To ensure that co-participants were able to provide data rich disclosure, it was assumed that they had experienced what they perceived to be PM in their sport. It was also assumed that all co-participants were able to reflect upon and clearly articulate their experiences to the researcher, and were comfortable and willing to do so.

Limitations

The present study had several limitations. Because the interview process relied on the co-participants' self-disclosure, there is the possibility that co-participants were not completely honest and/or accurate when discussing the recollection of their experiences of PM or provided socially acceptable comments. In addition, the results of this study are limited to the experiences of the intercollegiate NCAA Division I and professional athletes that were interviewed and may not be generalized to other athletes in other sports. It should also be noted that while these athletes were currently participating in their respective sports, their descriptions of their experiences of PM were retrospective. As such, it is acknowledged that a limitation of the study was the accuracy with which co-participants recalled their experiences. While it might not have been the intention of co-participants to provide misleading information, there remains the possibility that some may have had difficulty retrospectively recalling their experiences of PM.

Delimitations

There were a number of delimitations in this study. Firstly, co-participants were restricted to athletes who were currently active in their sport, either in season competition, or out-of-season training. Secondly, co-participants were selected from the sports of basketball, soccer, tennis, and volleyball. It is essential that researchers using a phenomenological approach select co-participants who have firsthand experience of the phenomenon in question (Dale, 1996;

Thomas & Pollio, 2002). Previous research has shown the presence of perceptions of PM among participants competing in the aforementioned sports; increasing the likelihood that the co-participants in the present study had experienced PM (Burke, Burke, & Joyner, 1999; Burke & Houseworth, 1995; Cornelius et al., 1997; Eisler & Spink, 1998; Gilovich et al., 1985; Jones & Harwood, 2008; Mack & Stephens, 2000; Miller & Weinberg, 1991; Vallerand et al., 1988). In addition, all co-participants were English-speaking. Due to the importance of descriptive language in phenomenological research, interviews conducted in a language that was familiar to both the co-participants and the researcher enhanced the prospects that information or meaning would not be lost in translation from one language to another.

CHAPTER 2

Literature Review

Overview

Momentum is commonly referred to by athletes, coaches, fans, and pundits across all manner of sports and is often implicated as a mediating factor for performance outcomes. (Burke et al., 2003; Smisson et al., 2007). It is difficult to find a sporting broadcast on television or a post-match interview that does not, in some manner, address the possible influence of momentum on the outcome of a sporting event. However, despite the considerable research conducted on this phenomenon it remains difficult to, with complete certainty, establish whether it is real or illusionary (Burke et al., 1997).

It is important to note that PM does not exist as a single stand-alone concept devoid of connection to other aspects of sport psychology. However, a comprehensive depiction of how PM might be explained by various theoretical perspectives in sport psychology is beyond the scope of this literature review. Therefore, a brief paper examining how the phenomenon might be linked to three major theories, specifically self-efficacy theory, achievement goal theory, and arousal theory, can be found in Appendix A. In the remainder of this chapter a review of selected previous literature examining PM is provided. Specifically, discussion is devoted to the existing definitions of PM, the three conceptual models of PM cited most often in the literature, and research examining the relationship of PM and performance using various paradigms.

Definitions of Momentum

Early definitions of *momentum* from the field of social psychology refer to it as a bi-directional concept affecting the probability of winning or losing as a function of the preceding event (Adler, 1981). In other words, momentum is assumed to be reflected in the tendency for one event to be followed by a similar event. The term *psychological momentum* (PM) is more commonly used in the field of sport psychology and is used to describe the changes in an athlete's performance based upon previous and recent events representing successes or failures. It is posited that these previous events somehow influence the psychology of the athlete and exert either a positive or negative influence on subsequent perceptions and performance (Vallerand et al., 1988). Positive PM is expected to occur when successful performances increase the probability of subsequent successes, while negative PM is presumed when unsuccessful performances increase the probability of subsequent failures. As would be expected, positive PM is characterized as a time when everything seems to "go right" for the performer, while negative PM produces the opposite experience (Burke et al., 1997).

Often, the terms PM and momentum are used synonymously to describe the same phenomenon. However, a distinguishing feature of PM is that it highlights the presence of a change in the *psychology* of the athlete, that produces either a positive or negative affect on the athlete's subsequent performance. Earlier definitions of momentum did not specify this psychological component, but rather focused simply on a scoring configuration (of success/failure) of sport performance based on previous attempts (Iso-Ahola & Mobily, 1980).

Existing Conceptual Models of PM

Three conceptual models have been proposed to explain the effects of PM on performance. The earliest was the Antecedents-Consequence model (AC) proposed by

Vallerand et al (1988), which in turn was followed by the more complex “momentum chain” approach of the Multi-dimensional model (MD) (Taylor & Demick, 1994), and the more recent Projected Performance model (PP) of momentum (Cornelius et al., 1997). Each of these models is discussed in more detail in the following sections.

The antecedents–consequence model of PM. The AC model of PM represented the earliest attempt to unpack the mechanisms of the phenomenon. Specifically, the AC model centered on the antecedents and consequences of PM in an attempt to better understand the possible causes and effects (Vallerand et al., 1988). Antecedents are considered to be precipitating events that are likely to prompt perceptions of PM. Such events are presumed to be ‘momentum triggers or starters’ and, as such, act as catalysts for participants’ perceptions of PM. Commonly noted momentum starters in sports would include a successful 3-point shot in basketball, an important midfield tackle in soccer, or a successful long birdie putt in golf.

In the AC model, particular emphasis is placed on whether the performer considers the antecedent event to be important. If the performer perceives the event as important, it is more likely to influence the individual’s perceptions of PM. It is important to note that, as PM is considered bi-directional, antecedents may exert either a positive or negative influence. The perception of momentum as being positive or negative is contingent on the performer’s perception that he/she is progressing towards a goal. If the performer perceives a progression, then the perception of PM is accompanied by heightened levels of motivation, enhanced feelings of control, confidence, optimism, energy, and synchrony (Vallerand et al., 1988). Such an experience is posited to lead to an increase in performance (Vallerand et al., 1988). Conversely, if the athlete perceives no progression toward the goal then a reduction in the aforementioned

elements would be expected to occur and the resulting negative momentum would be presumed to lead to diminished performance (Vallerand et al., 1988).

According to the AC model, personal control is considered a fundamental variable influencing the performer's experiences of PM (Vallerand et al., 1988). Specifically, the performer is more likely to perceive positive PM if he/she perceives him/herself to be in control of the situation at hand. To enhance these feelings of control athletes may attribute previous events or perceived successes to their own abilities and not to external factors or outside influences (Vallerand et al., 1988). For example, a basketball player is more likely to experience PM during successful free throw shooting than during shots taken in the dynamic game context because the free throw shot is completely under the athlete's control and any success is a result of the athlete's own shooting ability.

An additional variable impacting athletes' perceptions of PM in the AC model is context. That is, any single event must be contextualized within the overall performance situation in order for athletes to perceive PM (Vallerand et al., 1988). For example, a basketball player who successfully blocks two shots in a row (single event) during the final minute of a basketball game with a tied score (context), is more likely to experience positive PM than a player who blocks the shot of a small opponent (single event) when the player's team is winning by thirty points (context).

Vallerand and colleague's provided support for their conceptual model by manipulating hypothetical scoring patterns, in terms of wins and losses of games in a single set of tennis. To examine the effect of previous events on subsequent performance Vallerand et al. (1988) obtained participants' perceptions of PM after they had read a script depicting a hypothetical tennis match, with one of two PM conditions. Participants were given hypothetical scenarios

depicting two player's progression through a set of tennis. In the momentum pattern condition, one player was said to have taken a five-to-one lead prior to the player's opponent winning four consecutive games to level the set at five games all. In the no-momentum condition, no pattern to the flow of games favoring either player was obvious, although this competition also ended in a five-all tie. Both experienced and inexperienced tennis players were asked to answer questions relating to the flow of the two game conditions and the potential presence of momentum, such as, 'Who has the momentum?' and 'Who demonstrates the most control?'

Results suggested the presence of perceptions of PM. Specifically, support for the AC model was provided by demonstrating the importance of the context on participants' perceptions of the antecedent event. In particular, PM was affected by patterns of scoring, particularly for the player coming from behind to tie the opponent. Additionally, participants believed that the player coming from behind was more likely to win the set if the player had won four consecutive games, than if the player had not. A limitation of this approach used by Vallerand and colleagues to study PM is that it lacked ecological validity, since participants did not directly experience momentum shifts but rather perceived what they might be like based on events involving hypothetical players.

The multidimensional model of PM. A second theoretical model of PM is the Multidimensional model proposed by Taylor and Demick (1994). According to this model, momentum is "a positive or negative change in cognition, affect, physiology, and behavior caused by an event or series of events that will result in a commensurate shift in performance and competitive outcome" (Taylor & Demick, 1994, p. 54). This model, which represented an expansion of the AC model, suggested a more complex series of events were required for PM to

occur. Specifically, six stages or elements were postulated to explain a more elaborate 'momentum chain'.

As in Vallerand et al.'s (1988) model, the multi-dimensional model suggests that precipitating events are important for perceptions of PM to occur. In stage one of the model the performer recognizes an event as important. Importance is evaluated in terms of the potential effect of the event, based on factors relating to confidence, control, and behavioral responses for the situation (Taylor & Demick, 1994). For example, a tennis player may consider breaking an opponent's serve with a well-placed passing shot an important event, based on the significance of the point and the confidence and perception of control that would likely accompany the event.

In stage two the performer's cognitions, emotions, and physical responses are impacted, which is similar to the Vallerand et al. (1988) model positing changes in cognition and affect as a result of perceptions of precipitating events. However, in the multidimensional model positive PM would require a shift towards an optimal level of arousal. Conversely, negative PM would be expected to occur with increasing departures from the optimal level (Taylor & Demick, 1994). Staying with the previous tennis example, the player may experience a shift toward optimal arousal by feeling 'pumped' as a result of the successful shot.

In stage three changes in observable behavior occur consistent with the existence of positive or negative PM. That is, a perception of positive PM would be manifested in observed behaviors that appear positive. These behaviors might include increasing pace, a more erect posture, and a more confident stride (Taylor & Demick, 1994). For the tennis player these might include striding more confidently when changing ends of the court, or beginning to speed up the pace of play if serving.

In stage four, the changes in behavior produce an increased frequency of successful performance. Such improvements may be related to the execution of a skill or achievement of a desired outcome. For example, the tennis player might consider both the consistent execution of first serves as well as holding serve to be indicators of successful performance. It should be noted that, according to the MD model, the normative condition for performance is the absence of PM. It is only when an event is seen as important by the performer that a shift in momentum would be predicted to occur in either direction (Taylor & Demick, 1994).

Stage five considers the influence of the actions of an opponent on the participant's performance. For example, in the tennis example the opponent may recognize that the player is serving better and playing with more confidence. If so, the opponent would be presumed to experience negative PM. The model suggests that in order for positive momentum to be manifested in successful outcomes, the opponent must simultaneously experience negative momentum. Thus, there an interactive influence on competitive outcome is assumed to occur when PM exists, with the influence operating in opposite directions for the two competitors (Taylor & Demick, 1994). Stage six is the change in competitive outcome (e.g. winning and losing) that ultimately results from PM. To conclude the tennis example, this would be game, set, or match outcome.

Taylor and Demick (1994) obtained some support for their model by examining the impact of preceding events on immediate and match outcomes in tennis and basketball. During the initial phase of that study, recreational level participants were asked to suggest significant precipitating events they commonly associated with the initiation of momentum. The events they suggested the most were then used as the significant precipitating events during the second phase of the study. Five significant events were identified for tennis, and four for basketball.

The events included dramatic plays in both sports (e.g., an ace, a drop shot, or a smash in tennis; and a steal, dunk, 3-point play, and a blocked shot in basketball). Additional events for tennis included an early break of serve, winning after a long deuce point, unforced errors and not converting a 0-40 opportunity. For basketball, the additional events included scoring runs of three baskets, time-outs called by the opponent, a player leaving the game for a negative reason (e.g., injury, foul trouble, or ejection). The researchers then analyzed five U.S. Open tennis matches and five games from the NCAA National Basketball Championships in order to determine the relative frequencies of these events and whether the proportion of precipitating events (positive or negative) differed for teams or players that won or lost. Additional analysis was conducted to determine whether immediate outcome (defined as a run of three or more points or break in serve game in tennis, and a five point lead increase in five minutes, or winning in overtime in basketball) was impacted by the presence of these precipitating events during competition, compared to when the events were absent.

The results provided some support for the MD model, suggesting that a higher proportion of positive antecedents resulted in more frequent positive outcomes. For example, winning tennis players had a significantly greater proportion of positive precipitating events (81.3%) and lesser proportion of negative precipitating events (18.7%) than did losing players (68.9% and 31.1%, respectively). While no significant differences were found for basketball teams that won or lost, a change in immediate outcome was found to occur significantly more often following a precipitating event (22.0%) than in the absence of such an event (0.0%). These results suggested modest support for the notion that precipitating events are necessary to trigger PM and subsequent outcome success (Taylor & Demick, 1994).

Other research suggesting support for the MD model of PM has come from Mack and colleagues. For example, Mack et al. (2008) found that early success in a head-to-head basketball shooting competition was perceived to be important to participants and also triggered perceptions of PM (more details from this study are provided in a later section examining PM and performance). In an earlier study, Mack and Stephens (2000) provided partial support for the MD model using a basketball-shooting task that required actual performance by the participants. The task required participants to shoot from 12 different locations around the basket. When participants made a shot they were awarded two points and moved on to the next location. Participants were allowed to attempt three shots at each location before moving to the next one, were told that they could stop at any time, and were informed that ending on a miss would affect their score (1, 3 and 5 points deducted for ending with 1 miss, 2 misses, and 3 misses, respectively). Momentum was measured by examining the scoring configuration preceding the conclusion of performance (i.e., either elimination or voluntarily cessation), and was classified as positive, neutral, or negative. Persistence was measured by the participants' willingness to continue in the final stage of performance. More specifically, 0, 1, 2, and 3 points were recorded for ending after 0, 1, 2, and 3 shots, respectively, in the final stage (Mack & Stephens, 2000). Participants indicated their confidence of making the next shot and their current arousal level immediately using a grid that corresponded to their general thoughts and feelings (positive/negative) and their arousal level (high/low).

The results indicated that participants experiencing negative momentum as a result of their scoring configuration had significantly lower self-efficacy scores compared to participants experiencing positive or neutral momentum. In addition participants with positive momentum reported more positive thoughts and feelings compared to those with negative momentum (Mack

& Stephens, 2000). Taken together, these results suggested support the early stages of the MD model of PM, demonstrating directional changes in cognition consistent with perceptions of positive or negative momentum (Taylor & Demick, 1994). However, the results for persistence failed to show significant differences between the positive, neutral, and negative momentum participants, suggesting that the level of previous shooting success had little influence on participants' decision to continue shooting (Mack & Stephens, 2000). Such a finding is contrary to the prediction of the MD model that positive momentum should lead to higher levels of persistence (Taylor & Demick, 1994)

The projected performance model of PM. The third, and most recent, theoretical model of PM is the Projected Performance Model proposed by Cornelius and colleagues (1997). In this model perceptions of positive or negative momentum are presumed to be the *result* of performance changes rather than the *cause* of such changes. Simply stated, positive and negative momentum are posited to be merely labels that are used to evaluate performance, and that perceptions of PM have little influence on actual performance. This model suggests that changes in performance, often perceived as momentum, are nothing more than random fluctuations that routinely occur. According to this model, performance must be maintained at extreme levels for an extended period of time in order for momentum to be produced (Cornelius et al., 1997).

The PP model also emphasizes the impact of positive inhibition and negative facilitation on performance. Positive inhibition refers to a negative change in performance following a successful performance (Silva et al., 1988), such as might be observed by the down-turn in performance when an athlete eases up or attempts to coast following the success. On the other hand, negative facilitation refers to a positive change in performance following an unsuccessful or poor performance (Silva et al., 1988), such as might be manifested by an increase in a

performer's focus and concentration following a mistake or an error. These two responses to PM add complexity to the phenomenon, suggesting that how the individual performer perceives and responds to fluctuations in performance determines the existence of PM and subsequent influence on performance (Cornelius et al., 1997).

Cornelius, et al. (1997) provided some support for their model in a study employing a series of questionnaires that assessed participants' perceptions of PM at six points during a competitive basketball free-throw shooting contest. Prior to the study participants were informed about the task and asked to complete a questionnaire assessing their confidence in performing it (Trait Sport Confidence Inventory). They were then informed that the task was to be performed during a contest with an opponent, and asked to complete the State Sport Confidence Inventory assessing their level of confidence at that point. Participants were told they would be given 90 seconds to attempt 20 successful free throws while an opponent did the same at the opposite end of the court. Following the first round of competition each participant was informed of his/her score and asked to complete the Postgame Performance Questionnaire on a 7-point Likert scale ranging from below average to above average. In addition, participants were asked to report their current level of PM on a 7-point Likert scale ranging from strongly negative to strongly positive. Participants were then brought together and told each other's score for the first round; that is, who was winning and by what margin. Having received this information, participants were asked to complete the Postgame Performance Questionnaire again, then switch ends of the floor and complete the shooting task again. After that they were individually informed of their respective total scores for the two rounds, completed the Postmatch Performance Questionnaire, brought together and told each other's total score, and informed of the overall winner of the contest. They were then asked to complete the Postmatch Performance Questionnaire, which

consisted of the same items rated previously as well as the following three additional questions assessing PM: “Do you think PM existed during a contest?”; “Do you think PM had a direct positive affect on your performance?”; “Do you think PM had a direct negative affect on your performance?” Participants responded to each question on a 6-point Likert scale, ranging from not at all to definitely.

The results of the study revealed that participants had experienced PM during the contest, held a strong belief in PM, and felt that PM had a positive affect on their performance (Cornelius et al., 1997). Specifically, higher ratings of performance in the first round of the competition were related to higher perceptions of PM. The findings also suggested that although participants rated their performances well above or below average, with these ratings being related to either positive or negative PM, they were unable to translate these perceptions of PM into significant improvements in performance during the second round of competition (Cornelius et al., 1997). The results also indicated that the number of baskets made in round one was negatively related to the number made in round two, in both directions (i.e., more made in one associated with less made in two and vice versa). This finding provided support for the constructs of positive inhibition and negative facilitation (Cornelius et al., 1997). Cornelius et al. (1997) concluded that performance fluctuations can rapidly be given the label of positive or negative PM, when in actuality they represent natural variations around a mean level. This conclusion was supported by the finding of high perceptions of positive PM unaccompanied by improvements in performance from round one to two.

Taken together, the three prevailing models of PM all appear to have obtained modest support from the research conducted by those proposing the models but little else. Thus, the

tenets of each model regarding the antecedents, consequences, and other factors impacting the existence of PM and its affect on performance remain equivocal.

Momentum and Performance

The relationship between PM and performance is of obvious interest to both researchers and practitioners. However, empirical tests of this relationship have been a challenge. One of the initial approaches was to examine archival and observational data from actual competitions in a variety of sports or sporting events, such as minor league hockey (Gayton & Very, 1993), professional basketball (Gilovich et al., 1985), National Basketball Association (NBA) three-point shooting contests (Koehler & Conley, 2003), and intercollegiate tennis (Silva et al., 1988). In the basketball studies, researchers attempted to identify the “hot hand” phenomenon, which is evidenced when performance temporarily increases following a string of successes (Gilovich et al., 1985; Koehler & Conley, 2003). It was believed that a possible explanation for the “hot hand” was the player’s perception of PM.

Other researchers have studied PM by examining patterns of successes and failures from archival data. In one study (Koehler & Conley, 2003), footage from NBA three-point competitions occurring from 1994-1997 was analyzed and the presence of a ‘hot-hand’ was defined by more frequent clusters of sequential hits than misses, referred to as “runs,” than would be expected by chance. The results revealed no support for the “hot-hand” phenomenon. Approximately half (52%) of the shooters had fewer runs than expected by chance while the remainder (48%) had more runs than would be expected.

In an earlier study, Gilovich, Vallone, and Tversky (1985) examined the shooting performance of individual players on Philadelphia 76ers basketball club during the entire 1980-1981 season. Analysis of the probability of a successful shot following a previous successful

shot, or a missed shot following a previous miss, revealed that players were actually more likely to make a shot following a miss (weighted mean: 54%) than following a successful shot (weighted mean: 51%). Additionally, analysis of shooting performance revealed that the probability of making a successful shot following three or four consecutive hits was lower (weighted mean: 50%) than following zero or one successful shot (weighted mean: 57%). The findings of this study did not support the presence of streak shooting and provided evidence contrary to the “hot-hand” phenomenon.

Vergin (2000) also found little statistical support for the presence of PM when examining winning and losing streaks of 28 Major League Baseball teams and 29 National Basketball Association teams over the course of entire season. In that study, the outcome of the game directly following a win or loss and the presence of ‘runs’ of games won or lost were examined. Momentum was assumed to exist if a win followed a win, a loss followed a loss, or the presence of ‘runs’ was greater than would be expected by chance. Results of archival analysis of 4,646 games revealed that wins and losses were independent of the result of the previous game, and that ‘runs’ of winning and losing were no longer than would be expected by chance (Vergin, 2000). Exceptions to this pattern have been obtained in studies examining several other sports (e.g., racquetball, ice-hockey, tennis), particularly with regard to the impact of momentum on performance outcomes after the first set/period of play (Gayton & Very, 1993; Iso-Ahola & Mobily, 1980; Silva et al., 1988). Specifically, PM generated by the outcome of game/set one has been shown to predict the outcome of game/set two and the match. However, PM was not found to predict match outcome when opponents split games/sets one and two (Iso-Ahola & Mobily, 1980; Silva et al., 1988).

Silva, Hardy, and Crace (1988) examined archival data for a men's team and a women's team over three competitive intercollegiate (D-I) tennis seasons. Match outcome for singles and doubles, set outcomes for singles, and tie-breaker outcomes for singles were analyzed using a coding system that denoted either a win or a loss. Results of the analysis indicated that singles match outcome predicted doubles match outcome for both males and females¹ (Silva et al., 1988). Additionally, set one outcome predicted set two outcome for both genders suggesting positive momentum was carried over from success in the first set into the second set (Silva et al., 1988). While these findings suggested the presence of momentum, additional results indicated that neither set one nor two could be used as a predictor of the outcome of set three when the first two sets were split (i.e., one set won by each player) (Silva et al., 1988). This result appears contrary to the expectation that the winner of set two would have momentum going into the third set.

Similar results have been obtained in PM studies of ice hockey games. Gayton and Very (1993) used archival data from the 1988-89 American Hockey League to establish the relationship of scoring the first goal to the final outcome of the game. A total of 510 games were examined, with 339 (66.5%) games being won by the team that scored the first goal (not including tied games). Additional analysis of 51 Stanley Cup playoff games revealed that 72.5% of the games were won by the team that was winning at the end of the first period (Gayton & Very, 1993). The authors interpreted this early period success as perhaps creating feelings of PM that positively impacted performance during the rest of the game (Gayton & Very, 1993).

In conclusion, the overall findings of previous research employing statistical analysis of archival outcome data have generally not supported the notion of PM, and in those instances

¹ At the time of this study the NCAA tennis order of play was singles followed by doubles, which differs from the current order of doubles followed by singles.

where support was obtained the effect has been relatively minor and difficult to interpret. Runs of successes and failures in basketball and baseball have been found to be no different than would be expected by chance (Gilovich et al., 1985; Koehler & Conley, 2003; Vergin, 2000), providing no support for the presence of PM. Research examining ice hockey, racquetball, and tennis have shown modest support for PM in that the outcome of the first set or period of play has at times been found to predict the outcome of the second set or period (Gayton & Very, 1993; Iso-Ahola & Mobily, 1980; Silva et al., 1988). However, when opponents have split the first two sets or periods PM has not been found to predict match outcome (Iso-Ahola & Mobily, 1980; Silva et al., 1988)

Perceptions of PM

Another approach to examining PM has been to obtain participants' perceptions of PM (Cornelius et al., 1997; Eisler & Spink, 1998; Jones & Harwood, 2008; Mack et al., 2008; Mack & Stephens, 2000; Perreault et al., 1998; Taylor & Demick, 1994; Vallerand et al., 1988; Vergin, 2000). Most often the relationship between PM and performance has been assessed using post-performance questionnaires. For example, Eisler and Spink (1998) asked participants to complete a questionnaire after reading two hypothetical volleyball scenarios. Each of the scenarios provided a different scoring configuration. One described a positive scoring pattern in which one team had come from behind, scoring 5 consecutive points to tie the game; and the other described a neutral scoring pattern, in which neither team led by more than one point at any time. Participants were asked to imagine themselves as a member of the team that won 5 consecutive points and instructed to rate which team they felt had more momentum, control, confidence, anxiety, discouragement, and motivation using an 11-point Likert scale (Eisler & Spink, 1998). The results revealed significantly higher perceptions of PM for the positive scoring

pattern scenario than for the neutral scenario (Eisler & Spink, 1998). As both scenarios ultimately ended with the score being tied, the authors suggested that coming from behind to tie as well as scoring consecutive points were the primary reasons for participants' increased perceptions of PM (Eisler & Spink, 1998). These results are consistent with earlier research by Vallerand et al. (1988), which revealed that tennis participants believed a player coming from behind was more likely to win the set if the player had won consecutive games.

Similar findings have been obtained in other research examining the sport of volleyball. In one study (Miller & Weinberg, 1991), participants were asked to complete a questionnaire describing four scenarios. The four scenarios included manipulations of the scoring pattern to reflect PM, and of the score to reflect 'situation criticality.' Specifically, PM was manipulated by showing one team coming from three points down to tie (PM) or a situation in which the game was tied with neither team having led by more than one point at any time (non-PM). Situation criticality was varied by creating a situation in which the score was tied at 5-5 in the first game (less critical) or at 13-13 in the fifth and deciding game (more critical). Participants were asked to rate the degree to which they and their opponents might experience PM, confidence, anxiety, control and discouragement using an 11-point Likert scale. The results indicated that participants felt the team coming from behind to tie would be more confident and have more control in the PM scenario than the non-PM scenario. In addition, teams with PM were perceived to be more likely to win the next point and the game in the PM condition than the non-PM condition. One limitation to this approach of examining perceptions of PM is that it lacks ecological validity, since participants do not directly experience PM shifts, but rather are asked to rate PM based on the hypothetical performance of others.

In an attempt to directly examine the perceptions of PM in participants actually performing a task, Perreault, et al. (1998) manipulated participants' performance while competing in two contrived bicycle races. In the first race, the participant and a mock opponent (represented on a computer screen) were tied for the duration of the race, while in the second race the participant lost the lead, only to regain it and eventually tie the opponent. Actual performance was measured by the participant's average power output during each race. Participants then completed a questionnaire and provided their perceptions of PM at four different stages of the race, at two minute and forty-five second increments. Results indicated that average power output was highest for participants when they perceived both positive and negative PM (Perreault et al., 1998). The latter finding supports the phenomenon of negative facilitation (Silva et al., 1988; Taylor & Demick, 1994). While ecological validity was achieved to a greater degree in this study, the approach is still somewhat contrived in that participants' perceptions of PM are not in response to an actual race performance, but rather to laboratory-induced scenarios.

More recent research conducted by Mack et al. (2008) examined participants' perceptions of PM immediately following a series of competitive basketball free throw shooting contests. Participants were placed in a head-to-head competition to determine which would hit the most free throws out of 10 attempts. The overall goal of the competition was to win two of the three contests. Participants were asked to complete a questionnaire rating their own shooting ability and that of their opponent immediately following the first contest. They were also asked to indicate whether they felt they performed up to their ability and if they had positive, negative, or no PM going into the next contest. The results provided support for the presence of perceptions of PM immediately following performance success in that participants were more confident of

winning the following contest and perceived greater levels of positive PM following a win than following a loss (Mack et al., 2008). Such findings are consistent with the MD (Taylor & Demick, 1994) and AC (Vallerand et al., 1988) models of PM, which predict that precipitating events, in this case winning the previous contest, should be interpreted as significant to the performer and trigger perceptions of PM (Mack et al., 2008).

Due to the equivocal pattern of findings emanating from quantitative research on PM, Jones and Harwood (2008) have more recently employed a qualitative research approach in an effort to uncover participants' experiences of the intricacies of the PM phenomenon using a qualitative research approach. In that study, semi-structured interviews were conducted with five elite soccer players. During each of three separate interviews participants were asked to respond to a predetermined list of questions, such as:

“Why do you think the tide turns in matches?”; “Why does momentum swing your way?”; “How do you respond if the run of play is going against you?”; “How do you respond if you are on the front foot?”; And “what are you trying to accomplish when you feel like you have gained the upper hand?” (Jones & Harwood, 2008, p. 60).

Follow-up questions were also asked during the second and third interviews in order to obtain additional elaboration of participants' responses during the first interview. Thematic analysis of the interviews revealed that the participants experienced both positive and negative PM and were able to identify a range of triggers of PM and associated outcomes. For example, players believed that confidence level was both a trigger for and an outcome of positive and negative PM. Additional triggers included the opponent, encouragement from teammates and spectators, a positive attitude, and luck (Jones & Harwood, 2008). The results also highlighted specific

individual and team strategies participants used to maintain or develop positive PM and overcome negative PM. These included changing tactics, maintaining a positive attitude, encouraging teammates, executing basic skills, and maximizing effort. While this qualitative study revealed several interesting aspects of athletes' perceptions of PM the the semi-structured nature of the interviews limited participants' responses to questions determined by the researchers.

Summary

To date, the available research has failed to either confirm or reject the notion of PM. A lack of consistency of findings of has been especially apparent in the research employing statistical methods to analyze archival data (Gayton & Very, 1993; Gilovich et al., 1985; Iso-Ahola & Mobily, 1980; Koehler & Conley, 2003; Silva et al., 1988; Vergin, 2000). Research examining participants' perceptions of PM using contrived and hypothetical scenarios have produced more consistent support for the presence of momentum, but the results have revealed little about the working complexities of the phenomenon (Cornelius et al., 1997; Eisler & Spink, 1998; Mack et al., 2008; Mack & Stephens, 2000; Perreault et al., 1998; Taylor & Demick, 1994). A recent exception is the work of Jones and Harwood (2008), in which a qualitative interview approach was employed. However, the interview guide developed for that study was based on existing conceptual models (e.g. precipitating events/triggers of positive and negative momentum), which prevented participants from discussing other possible aspects of their experience of the PM phenomenon.

An alternative qualitative approach with the potential to provide greater insight into athletes' lived experiences of PM is the existential phenomenological interview. Existential phenomenology is "directed at trying to capture what a particular experience means to an

individual, rather than as in other qualitative approaches, where the focus is on the descriptive account provided by people *about* their behaviors and actions” (Nesti, 2004, pp. 40-41). The existential phenomenological interview is conducted without a priori assumptions and is driven by the interviewee’s experience of the meaning of the phenomenon in question, in this case PM, rather than an a priori theoretical agenda. Therefore, existential phenomenological interviewing was the qualitative method chosen for the present study. A more detailed explanation of this method and the procedures used in this study is provided in Chapter 3.

CHAPTER 3

Method

Introduction

According to Valle and colleagues (1989) the traditional scientific method requires adherence to three criteria: 1) the phenomenon must be observable, 2) the phenomenon must be measurable, and 3) the phenomenon must lend itself to verification by other observers. This suggests that the scientific study of human behavior must be quantifiable, observable, and open to the verification of independent observers. Such a restrictive set of criteria is necessary if researchers are interested in examining causal relationships or “why” something happens. In contrast the phenomenological approach disregards any explicit attempts to search for causes, concentrating rather on what an experience means to a person (Nesti, 2004). In this chapter, discussion is devoted to the following methodological aspects of the present investigation: existential phenomenology and the Tennessee Model of phenomenological research (Thomas & Pollio, 2002).

Existential Phenomenology

Existential phenomenology is “a combination of two philosophies, one concerned with a certain perspective on human existence and the other with a certain mode of investigating that existence” (Pollio et al., 1997, p. 4). As a research method it is “the rigorous and unbiased study of things as they appear so that one might come to an essential understanding of human consciousness and experience” (Valle et al., 1989, p. 6). Existential phenomenology combines Søren Kierkegaard’s (1889-1976) philosophy of existence (existentialism) and the work of Edmund Husserl (1859-1938,), which provided existentialism with a method (phenomenology)

that could be used to effectively obtain participants' description of an experience (Thomas & Pollio, 2002). The existential phenomenological method was further articulated by Martin Heidegger (1889-1976), who is often credited with advocating its use to describe the experiences of everyday life (Valle et al., 1989).

Although the methods of Husserl and Heidegger are both examples of existential phenomenology, the Husserlian approach is often referred to as descriptive phenomenology, whereas Heidegger's hermeneutic approach is referred to as interpretive phenomenology. Descriptive phenomenology emphasizes the description of human experience, with objectivity on the part of the researcher being achieved by a bracketing (often referred to as epoché or reduction) interview. In the interview the researcher reveals his/her biases, preconceptions, and presuppositions regarding the phenomenon of interest (Pollio et al., 1997). Interpretive phenomenology suggests that objectivity cannot be achieved since we always carry with us our own experience that remains intact as a being in the world (Thomas & Pollio, 2002). Thus, bracketing is not assumed to assure objectivity, but rather to allow the researcher to become aware of his/her own experiences and way of thinking about those experiences.

Another scholar whose work has greatly influenced the manner in which phenomenological research is conducted is Maurice Merleau-Ponty. Merleau-Ponty emphasized the importance of ascertaining what is figural (or stands out) about an experienced phenomenon (Merleau-Ponty, 1962). In order to identify aspects of a person's experience that are figural asks a phenomenological question such as the following: "Describe an experience you have had (of a phenomenon of interest) and tell me what stands out for you about that experience?" Merleau-Ponty also emphasized the point that figural aspects of an experience are always perceived in the context of some form of background (Thomas & Pollio, 2002). The four major existential

backgrounds, which are more commonly referred to as “grounds,” are: Body, Time, World, and Others (Merleau-Ponty, 1962). The concepts of figure and ground are important aspects of the Tennessee Model of phenomenology developed by Thomas and Pollio (2002), which was the method employed in the present study.

The Tennessee Model of Phenomenological Research

The procedures outlined in the Tennessee Model include *exploring researcher bias, co-participant selection, data collection, data analysis, developing the thematic structure, and confirming the thematic structure*. Each of these is discussed in the remainder of this chapter.

Exploring Researcher Bias

In order to understand the predispositions and presuppositions held by the primary researcher it was imperative that he first participate in a bracketing interview conducted by a person familiar with phenomenological methods. The purpose of this interview was to “make transparent, overt, and apparent the researcher’s personal views, background, and cultural suppositions...in an effort to minimize their impact on the phenomenon under investigation” (Gearing, 2004, p. 1445). Having competed in the sport of soccer at a high level for a number of years it was important for the researcher to become aware of his own beliefs and assumptions regarding the phenomenon of PM before conducting interviews with co-participants. The interview was transcribed and thematized with the help of an interpretive research group at the University of Tennessee². Themes that emerged from the transcript included the researcher’s perceptions that PM is a key component in sporting performance; that PM is fluid and moves backwards and forwards throughout the course of a competition; that a person’s performance need not be extra-ordinary when experiencing PM, but be of a high standard; and that

² The interpretive research group is discussed in greater detail in the Data Collection section.

momentum is manifested in different ways in sports that have uninterrupted periods of play (e.g., soccer, basketball) and those that have more discrete aspects of play (e.g., volleyball, tennis). In addition, the researcher speculated that differences in participants' experiences of momentum might be different for athletes in team and individual sports. Themes that emerged from the bracketing interview were duly noted and referred to regularly throughout the analysis of subsequent co-participant interviews. Such reminders minimized the prospects that the researcher would interject his biases into the interview process. It should also be noted that the researcher continued to bracket his presuppositions during the subsequent stages of the study, including data collection and analysis.

Co-Participant Selection

When conducting phenomenological research it is important to consider the participant, who has experienced the phenomenon in question, to be the real authority regarding his/her experience. Thus, when conducting interviews, it is important for the researcher to create an atmosphere of equality between him/herself and the participant (Thomas & Pollio, 2002). The researcher must rely solely on the participant's insights and attempt to obtain a rich description of the phenomenon, without appearing to be superior due to age, position, or prior knowledge of the topic of interest (Thomas & Pollio, 2002). The spirit of equality between researcher and participant is often emphasized in phenomenological research by assigning each person the label of *co-participant* or *co-researcher* (Giorgi, 1970).

Co-participants in the present study were recruited after obtaining approval from the Institutional Review Board of The University of Tennessee (More specific demographic information is provided in Chapter 4, Table 1). They included male and female athletes currently performing at an elite level in their sport, both at the NCAA Division I level and the

professional level. Although it might be argued that professional sports are different from intercollegiate sports, it was assumed that the demands at both levels of competition are comparable. All co-participants were over the age of 18 years and were English speaking. Due to the influx of international student-athletes to the United States, foreign-born individuals were included as long as they were fluent in English.

To increase the likelihood that co-participants had experienced PM, athletes who participated in the sports of soccer, volleyball, tennis, and basketball were targeted. This decision was based on the fact that most previous research on PM had been conducted with individuals competing in these sports (Burke et al., 1999; Burke & Houseworth, 1995; Cornelius et al., 1997; Eisler & Spink, 1998; Gilovich et al., 1985; Jones & Harwood, 2008; Mack & Stephens, 2000; Miller & Weinberg, 1991; Vallerand et al., 1988).

All co-participants were initially contacted by email or telephone and asked if they had experienced what some people might describe as “momentum” in their respective sport experiences. Those that said they had were invited to participate in the study and scheduled for an interview at a later date. The intervening time allowed each co-participant to reflect on his/her experience of PM prior to the actual interview.

Data Collection

Pilot interview. Prior to the beginning of data collection the researcher conducted a pilot interview with one professional tennis player. The purpose of this interview was to determine whether the phenomenological question was worded in an understandable way that would enable athletes to provide a detailed description of their PM experiences. In addition, the pilot interview allowed the researcher to refine his interviewing skills and follow-up questioning prior to conducting subsequent interviews. The pilot interview was audio taped for subsequent review by

the researcher. In addition, the pilot participant provided positive feedback regarding the question and the researcher's interviewing technique. At that point, interviews with the co-participants were commenced.

Interviews with co-participants. All of the interviews were conducted face-to-face in a comfortable, one-on-one setting. The duration of the interviews varied and, as suggested by Dale (1996), continued "long enough to explore the topic in depth" (p.313). The interview times ranged from 41 minutes to approximately one hour.

Prior to the interview, co-participants were informed of the purpose of the study and asked to provide their consent to participate (See Appendix B). They were told that their participation was voluntary and that they were free to withdraw from the study at any time without penalty. They received no reimbursement for their participation.

Prior to conducting the interviews, the researcher engaged co-participants in informal conversation and obtained demographic information (age, sport, years of experience, highest level competed, etc.). These activities allowed co-participants to become more comfortable in the interview setting in the hope that it would provide as rich a description as possible of their experience of PM during the ensuing interview. Co-participants were also asked to provide pseudonyms that would be substituted for their names in all subsequent transcriptions of the interview or publications.

The question posed in any phenomenological interview is of great importance (Polkinghorne, 1989) and should be designed to elicit as broad a range of descriptive responses from co-participants as possible (Thomas & Pollio, 2002, p. 32). In the present study, the question co-participants were asked to respond was worded as follows: "Think of a time that you experienced momentum in your sport and describe as fully as you can what stands out for you

about that experience.” In addition to this question, probing follow-up questions were asked in order to gain additional clarification of, and details about co-participants’ responses (Thomas & Pollio, 2002). All probing questions were phrased in a manner intended to promote continued description and interpretation by the co-participant (e.g., “Can you talk a little more about...?”). The flow of dialogue was dictated by the co-participants and the interviews were concluded only when co-participants could think of nothing else to share or elaborate upon regarding their experiences of PM. Upon completion of the interviews the researcher thanked the co-participants and informed them that they would be asked to provide verification of the accuracy of their responses after the audio records were transcribed.

All interviews were audio taped using computer software (Garageband, Apple Inc., Cupertino, CA) and the recordings were stored in a secure location during the transcription process.³ Once transcription was completed, the audio recordings were destroyed. In addition to the audio recordings, the researcher made written field notes as soon as possible after each interview. These notes included details of the physical setting, any unusual events that occurred, the researcher’s overall impressions of the interview, and any nonverbal behavior of interest (See Appendix D). The notes provided additional context to each interview and were referred to later during data analysis (Thomas & Pollio, 2002).

In phenomenological research the number of interviews necessary for analysis purposes is driven by data saturation (Thomas & Pollio, 2002); that is, when the information presented in the interviews becomes redundant and no new information or themes appear to be emerging. At that point it is no longer considered necessary to conduct additional interviews. In the present study, it became apparent after the on-going analysis of five completed interviews that repetition

³ Audio recordings were shared with a single transcriber who signed a confidentiality agreement (See Appendix C).

was occurring in the information presented. Additional interviews were conducted and saturation occurred after seven interviews, the transcriptions of which were subjected to analysis.

Data Analysis

One of the major aims of a phenomenological research approach is to interpret and derive meaning from the transcribed text, rather than to infer meaning. The process of interpretation used in this study consisted of a number of steps. After each interview was completed, the audio recording was played back and transcribed verbatim by the researcher or a transcriber. To ensure that the interviews represented a clear and accurate depiction of the co-participant's experiences, co-participants were invited to review their transcripts and invited to make any changes, corrections, or elaborations they felt necessary in order to achieve complete accuracy (Sparkes, 1998). None of the co-participants in the present study made any changes to their original transcript.

Once the accuracy of the transcripts was assured, they were read by the researcher numerous times in order to achieve an overall understanding of the discussion, or a "sense of the whole" (Dale, 1996). The researcher then identified statements that seemed to stand out from the text, including recurring patterns of language and the continued repetition of individual words or phrases used by the co-participants. Text that was identified in this manner constituted the meaning units of co-participants' experiences of PM (Thomas & Pollio, 2002). Because the interpretation of existential phenomenological interviews is a continuous process that requires the relating of parts of the text to the whole so that all passages are understood by their relationship to the larger whole (Thomas & Pollio, 2002), the researcher invited an interpretive research group at The University of Tennessee to read the transcripts and challenge his

interpretations of the text (Pollio et al., 1997). This step helped to ensure that the meaning units identified by the researcher were supported by the larger text as a whole.

Interpretive research group. The interpretive research group consisted of two professors with considerable expertise in existential phenomenology who lead the discussions and 10-15 faculty members and graduate students representing various academic backgrounds (e.g., nursing, counseling psychology, psychology, experimental psychology, and sport psychology). This group assisted in bringing rigor to the interpretive process by providing insights on meaning units and potential themes that appeared within the text. They also served as a check to ensure that the researcher did not impose his biases during the data analysis process. All members of the group signed a confidentiality agreement (see Appendix E) prior to reviewing each transcript. Transcripts were read aloud by members of the group, with one person reading the part of the researcher and another the part of the co-participant. The rest of the group followed along and made notes on their copies of the transcript. Throughout the readings there were periodic pauses to discuss themes that appeared to be emerging from the text during which various members of the group provided opinions and comments.

Developing the Thematic Structure

Having identified meaning units and potential themes for three transcripts with the assistance of the group, the researcher conducted the same interpretive process independently with the remaining transcripts. The researcher identified meaning units across all of the transcripts and connected these small components of text. A meaning unit is simply a word or phrase that reflects a particular connotation. For example, “tempo” was a meaning unit that was frequently mentioned by the athletes in this research. In addition, these words or phrases were descriptive and appeared prominent within the overall context of a sentence or paragraph.

Meaning units were sometimes repeated several times in the language of the co-participants. Metaphors identified within the transcript were also examined and combined with the meaning units to develop themes consistent with the co-participants' experiences of PM. As a result of this process, a thematic structure illustrating athletes' experiences of PM was developed. This structure was refined several times to ensure it remained consistent with the information presented by the written testimony of the co-participants. This was achieved by constantly cross-referencing information across transcripts during the development of meaning units, sub-themes and themes (Dale, 1996). In addition, it is suggested that the final thematic structure use the language of the co-participants and the words present in the transcript to ensure that the interpretation remains close to their experiences (Dale, 1996). The interpretive research group also provided additional feedback on early versions of the thematic structure and offered suggestions for further refinement. Once completed the thematic structure should accurately and adequately depict the themes and relationships of the phenomenon (Thomas & Pollio, 2002). The final thematic structure is illustrated in Figure 1 in Chapter 4.

Confirming the Thematic Structure

The purpose of the thematic structure is to provide an accurate representation of the experiences of the co-participants in regard to the phenomenon in question. Therefore, the final step of the phenomenological research process was to obtain feedback from the co-participants to ascertain whether the thematic structure does indeed fulfill this purpose and reflect their personal experiences of PM (Dale, 1996; Thomas & Pollio, 2002). All co-participants were provided with a copy of the final thematic structure and a short description of the components of the image (Appendix F), and were asked to provide feedback. Four of the seven co-participants responded to this contact and indicated that the thematic structure was an accurate representation of their

experiences of PM. This use of member checks was an integral step in establishing data credibility and should be considered a standard part of research (Lather, 1986). In addition, the completed thematic structure was presented to the interpretative research group, which allowed the researcher to refine the model based on their comments and suggestions.

Validity and Reliability. As is the case with all research, if the conceptual idea is well-grounded and supported then one can have confidence in its validity (Polkinghorne, 1989). Additionally, research validity is judged on the use of suitable and rigorous research methods that provide illuminating and plausible findings that are appropriate to the research topic (Pollio et al., 1997; Thomas & Pollio, 2002). This plausibility refers to the ability to link the findings and researcher's interpretation of the data to the data itself. If a reader can find supporting evidence within the text for the researcher's interpretations and conclusions, and achieve a first person understanding of how the thematic structure has been developed, then the criterion for validity has been reached (Pollio et al., 1997). Although no two interviews will provide exactly the same information, as no two experiences are ever alike, the structure of these experiences may exhibit similar features. Giorgi (1971) suggested that an important component of validity is achieved if, when readers adopt the same viewpoint as the researcher, they are able to see the same themes as the researcher, regardless of whether they actually agree with them or not. Accordingly, the use of the interpretative research group and the feedback from co-participants regarding their experiences of PM and the suitability of the final thematic structure to describe the essence of these experiences, provided suitable evidence to support the interpretations of the researcher (Thomas & Pollio, 2002).

CHAPTER 4

Results

The purpose of this study was to examine athletes' experiences of psychological momentum (PM). In order to achieve this purpose in-depth interviews were conducted using an existential phenomenological methodology. In this chapter, demographic information for each of the co-participants is provided followed by a presentation of the thematic structure that emerged from the interview transcripts and a description of the major themes and sub-themes that comprised the structure. In addition, sample quotes that supported the structure are offered in several places as illustrations of some of the meaning units that were identified in the transcripts.

Co-Participants

The final sample of co-participants consisted of seven athletes (4 females, 3 males) currently participating in the sports of tennis, basketball, soccer, and volleyball at the NCAA Division I level or higher (i.e., professional). Demographic information and pseudonyms for each co-participant are presented in Table 1.

The Thematic Structure

The final thematic structure revealed five major themes that interacted to comprise these athletes' experiences of PM. A list of the major themes and sub-themes is presented in Table 2 and the thematic structure is depicted in Figure 1. The visual depiction of the structure is intended to represent the interactions between the themes and grounds that served as a context for the co-participants' experiences of PM. Because the co-participants represented four different sports it was impossible to provide an illustration that included pictorial elements of each. However, the figure represents an attempt to include the components of all co-participants'

Table 1.

Demographic Information

Pseudonym	Gender	Age	Sport	Highest Level of Competition	Years of Playing Experience
Brett	Male	24	Tennis	ATP Professional Tour	19
Johnny	Male	21	Basketball	Intercollegiate	15
Mike	Male	21	Tennis	Intercollegiate, ATP Tour Events	12
Jessica	Female	21	Volleyball	Intercollegiate, National Team	11
Simone	Female	20	Volleyball	Intercollegiate	9
Michelle	Female	19	Soccer	Intercollegiate, U17 National Team	15
Renée	Female	20	Basketball	Intercollegiate, Junior Olympic Team	12
<i>(N = 7)</i>		<i>(M = 20.8)</i>		<i>(M = 13.3)</i>	
		<i>(SD = 1.6)</i>		<i>(SD = 3.3)</i>	

experiences of PM. For example, the number “5” on the back of the player in white represents the number of internal indicators of PM discussed by the co-participants. The score of 4-2 on the scoreboard is characteristic of all four represented sports. The bi-directional arrow demonstrates that PM was experienced in both a positive and negative manner. However, because the vast majority of information revealed in the interview transcripts related to positive experiences of PM, the negative aspects are not represented in the visual depiction. Nevertheless, negative aspects of PM, such as cognitive and physiological processes, are presented in the following section in order to illustrate the ways they contrasted with the positive aspects of PM. Other meaningful aspects of the elements depicted in Figure 1 are described in the following sections.

Grounds, Major Themes, and Sub-Themes

According to Merleau-Ponty, existential phenomenology is specifically interested in the transaction between the human and the world, which he termed *Perception* (Merleau-Ponty, 1962). This perception allows an individual to describe figural aspects of their experience, which stand out or are viewed as prominent within their lived experience (Merleau-Ponty, 1962). That is to say that these aspects appear at the forefront, within the overall context of the experience. An understanding of what is figural is achieved by identifying the presence of perceived “things,” which are always experienced against a contextual background (Thomas & Pollio, 2002). This context is referred to in the existential phenomenology literature as *ground* (Merleau-Ponty, 1962). The four major existential grounds against which these things appear as figural are: Body, Time, World, and Others (Merleau-Ponty, 1962). The importance of establishing what is figural is imperative as it illustrates what is meaningful to an individual regarding a specific experience. It is also important to identify the grounds in which the figure is visible because the figure and ground exist as one and “co-create each other in human

experience” (Thomas & Pollio, 2002, p. 18). As such, neither the figure nor the ground can exist without the other, as experience is dependent on the appearance of a central figure within the contextual background and vice versa (Thomas & Pollio, 2002). The emergence of a figural aspect occurs in conjunction with that of the ground, representing a single event in which the figure is perceived against that ground (Merleau-Ponty, 1962)

The major figural themes that emerged from the interview transcripts in this study included *created momentum*, *instantaneous momentum*, *internal indicators*, *external indicators*, and *resistance*. The grounds that served as a context for these themes included a near ground of *awareness of momentum*, and the overall ground of *competitive performance*. The near ground represented a contextual background that was more active within the experience, that is to say it appeared closer to the figural themes. The overall ground appeared more distant, further away from the central figures, and encompassed the entire experience (Thomas & Pollio, 2002). In the following sections a discussion of the major themes and sub-themes comprising the near and overall grounds are provided.

Awareness of Momentum

Awareness of momentum was the near ground in which PM was experienced. The crowd depicted in the thematic structure is meant to represent this awareness. Athletes are aware of the presence of a crowd and can feel the crowd doing something, but the co-participants in this study tried to focus on other things more pertinent to their performance and experienced PM when doing those things. For example, Johnny described how while he was competing in basketball games he was “not really thinking about it [momentum] you are just focused on doing well.” Other co-participants described just “staying in the moment” and focusing on “doing my job” demonstrating that they were aware of PM but attending to other aspects of performance.



Figure 1. Visual Representation of Athletes' Experiences of Psychological Momentum

Table 2

Major Themes, Sub Themes, and Grounds

Major Themes	Sub-Themes
Instantaneous Momentum	The Big Play Recognizing and Taking Advantage of the Opportunity
Created Momentum	Finding a Way Achieving Early Success Balancing Effort and Playing Within Limits Going Back to Basics Doing What We Usually Do Controlling Rhythm and Tempo Trusting Preparation
Internal Indicators	Thinking Momentum Feeling Momentum
External Indicators	Winning and Losing Executing Skills Seeing It in Others
Resistance	Facing Resistance
Grounds	
Awareness of Momentum	Near Ground
Competitive Performance	Overall Ground

Brett provided a clear example of this awareness of PM during his tennis matches:

I mean you're more aware of [it (momentum)] than thinking about [it] because for me personally I think about each point at a time, point by point. But you are aware that if you win three or four points in a row that they [opponents] start getting down, that they start feeling it and vice versa if you start losing points in a row, you start, its not something yeah, I'm not thinking wow this momentum is not good, this momentum is swinging it's just, it's just kind of understood throughout the match that that's what's happening.

Co-participants also described alterations they made in order to perform more successfully. While these actions were not direct attempts at altering PM, subsequent perceptions of PM accompanied positive changes in performance.

Competitive Performance

Competitive performance emerged as the overall ground for co-participants' experiences of PM. All co-participants' descriptions of their experiences of PM seemed to occur within the competitive setting. Thus, the overall ground of *competitive performance* is depicted as the stadium roof in the thematic structure, representing the context in which the entire performance and experience of the athletes occurred. Within these two contexts, near and overall, co-participants experienced the five figural themes of PM, which are discussed next.

Instantaneous Momentum

Instantaneous momentum (IM) emerged as a significant characteristic of the PM experienced by the co-participants in this study. IM refers to a single moment or event within a performance that triggers perceptions of PM, in either a positive or negative manner. For these co-participants this trigger produced an instantaneous shift in PM, which they described as a

sudden swing that favored them or their opponent. Co-participants also stated that this instantaneous shift could occur at any time during play and could be prompted by numerous events occurring within performance. The two sub-themes that supported this theme and provided were *the big play* and *recognizing and taking advantage of the opportunity*.

The big play. Co-participants talked about how single events in a competition could have a profound impact on their perceptions of PM both in a positive and negative manner. *The big plays* were described as significant events that had an immediate impact on the co-participants' perceptions of PM because they produced sudden shifts or swings. For example, Simone described an important block from one of her teammates as a big play moment of IM by saying "And [pauses] with that, like with momentum it is so...it changes so fast in volleyball...like with one point or two points, it can switch completely the opposite way."

Renée described how taking a charge on the defensive end during a key moment produced instantaneous feelings of PM and a positive change for her and her basketball team:

Another thing that's a huge momentum change[r] in basketball, something, like taking a charge. That can be a huge momentum change just because, someone was making a strong offensive move, oh the crowd's "Oh hell yeah, she did a spin move, she's about to dunk," and here comes that defender right underneath her, "Uh, no you're not." Get the charge...teammates go "oh yeah," pop up, they're giving chest bumps here and there, running back and feeding off something like that. (Renée)

Michelle described the instantaneous impact that a single event, such as a good pass or a good tackle, had on her and her soccer team's PM. In addition she described some of the feelings associated with that moment:

The one good pass, or the one good tackle...because it is a momentum changer in soccer. So your team was messing up all their passes, you're giving the ball away the whole game...all of a sudden you get one good pass in and your team just...it's like their minds shift from being, "Ah man we're going to lose this game," to being "OK, we got this." Or...say, someone makes a huge tackle and you're back in their end...then everybody's positive again and you know that you've got...that you can somehow get out a goal from this. (Michelle)

Michelle also commented about the impact that a single big play tackle had on her PM over the entire first half of a match, suggesting that such an action can provide perceptions of PM that lasted for an extended period of time, not just momentarily:

I know against [opponent name] last year, [Teammate name] made the biggest tackle I had ever seen and it was right at the beginning. They had the ball at kick off and they passed it back and [Teammate name] just the biggest slide tackle of the year. And we had momentum for the rest of the half. It was like one thing can change it all. (Michelle)

Co-participants also described events that created IM, which were not necessarily due to their own actions. Mike provided an example of how an opponent supplied an IM shift in Mike's favor by failing to perform adequately:

I remember a match my sophomore year. I was playing a guy from [in conference school], and he was definitely a better player than I was. He was a senior, he was a foreigner as well, he was definitely playing the better set and it was just that one turning point, it was at 4 all, he was serving at 30 love, he was kind of cruising but during his service game I think he took the pedal off the accelerator [foot off the

accelerator] a little bit, threw in a couple of double faults... [I] didn't really have to do much. I know that all I did was hit the ball on court. (Mike)

In addition, Simone talked about the impact a volleyball official's decision had on her and her team's momentum. The decision swung the momentum in the direction of the other team and affected the subsequent outcome of the game.

[Opponent name] keeps siding out, siding out. And then this one call, the ref makes a bad call and it ties the game 13-13. And [opponent] ends up winning. So...that...I think that's the biggest momentum change...it was at [opponent's home court]. So I think that was the biggest momentum change I have ever seen because that one call completely changed the outcome of the game. (Simone)

According to these athletes, PM can occur instantaneously due to a single event described as a "big play." This big play can be a result of their own performance, the performance of others, or the decision of an official.

Recognizing and taking advantage of the opportunity. Co-participants talked about how being able to recognize potential PM events placed them in a better position to be able to capitalize on them and use them to their advantage. Previous experience seemed to be a key factor in their ability to read the tendencies of an opponent, and understand critical junctures within the sport. Brett talked about the importance of understanding that there might only be a select few instances during a tennis match where PM becomes a factor.

Tennis goes for a long time but in most matches there's just a few points here or there just a few little points during the match a few little situations that can just affect the whole match and its just all about trying to recognize those

opportunities, build as many opportunities as you can to get to that situation where you can break serve and get on top of an opponent that way. (Brett)

Mike also discussed the importance of being able to recognize when an opponent is not playing to the best of his ability and capitalize on the opportunity to experience positive PM. In one case Mike was able to recognize that his opponent was getting angry and not focusing fully on his game and took advantage of this opportunity to gain a competitive advantage:

Oh hey he's getting angry here, he's starting to speak out, this is great let's stay loose let's keep going and not let it bother you. I know a lot of people might go in their shell and not really understand the benefits that someone getting angry can have on you and you've got to make sure that you look at that in a positive way and make sure that you take advantage of that. Because obviously if they are saying that they are not in the right state of mind and try and make sure you take advantage of that you know, taking advantage of opportunities when they are given. (Mike)

Co-participants were particularly adept at recognizing specific opportunities for PM within their respective sports. Michelle described how she was aware of the possibility of an upcoming opportunity her soccer team could use to swing PM their way even when they were facing a two-goal deficit:

We were down like 3-1 this year in one of our games...So once we get that second goal it's...I guess it's like certain stages in the game and if the other team is beating you by 2-1, then you know it's the worst lead in soccer! So right when you get that... if it was 3-1 and we get the second goal, then you have the momentum. They're down on themselves and then it's like you have all the

power in the game again. So it's like there's a total shift from them having everything to you having everything. (Michelle)

For these co-participants, instantaneous momentum could be triggered by specific single events (big plays). However, they emphasized the importance of being able to recognize where and when these specific instances were occurring or had the potential to occur in order to seize the opportunity to influence PM in their favor.

Created Momentum

Created momentum (CM) emerged as perhaps the most complex figural theme in this study. CM refers to the perception that athletes are able to create or build momentum in addition to experiencing PM that is triggered by a single, stand-alone event. CM appeared alongside IM as a second component of the bi-directional arrow depicted in Figure 1. The gradual thickening of the arrow in the positive direction further emphasizes the notion that building towards perceptions of PM can be a creative process. The theme of CM was represented by seven sub-themes: *Finding a way, going back to basics, achieving early success, balancing effort and playing within limits, doing what we usually do, controlling rhythm and tempo, and trusting preparation.*

Finding a way. *Finding a way* described co-participants' awareness that a systematic formula could be used to promote perceptions of positive PM during performance. This formula generally consisted of several elements, although the formula was not the same across all athletes or competitive situations. For the most part, CM seemed to represent co-participants' attempt to change something within their performance to produce more positive results, which in turn prompted positive perceptions of PM. Brett described how he understood the need to try and find a way to overcome the pressure he might face from an opponent in order to build positive

PM for himself. He described alterations he made to his tennis game that helped him “lift [his] game.”

When they’ve got the momentum and they’re on a little bit of a roll, you have to do something to break it. And I mean, you’ve pretty much got to find a way to lift your game, you can obviously change it up a little bit, mix it up a bit, but I tend to try and lift my game whether it be to play a little bit bigger, just consciously make more of an effort to move my feet, to try and take the ball a bit earlier, just something to try and take the momentum back. (Brett)

Johnny described how he attempted to create PM during his basketball performance by finding ways to get more involved in the game. He achieved this by seeking out situations to get his hands on the basketball more regularly. Finding a way to do this allowed him to continually build his perceptions of PM by changing specific areas of his performance to become successful:

When things started I didn’t start off getting a lot of momentum, but the thing I did was, I mean I was passing the ball...I had momentum, but it wasn’t high. I was passing the ball, getting my teammates involved, getting them back up and down the basketball floor. But what I did was, I needed to get my hands on the basketball so I could start to get that rhythm and that momentum. So what I did was I crashed the glass and got a rebound. Once I got the rebound I felt more confident. The more and more I got my hands on the ball, the more comfortable I got within the game, within the structure of the game. So just getting my hands on the basketball and bringing it up, getting a couple of dribbles in, a couple of passes, bringing it up and down the basketball floor, driving, getting a pass

here...that increased my confidence and my momentum started to rise up.

(Johnny)

In conjunction with this notion of finding a formula, or a way, to create perceptions of PM within performance, co-participants emphasized the importance of being willing to deviate from their original plans and sometimes even experiment in order to find ways of changing their performance that would make them more successful. For example, Jessica talked about how her team made significant alterations during a game to try and build PM:

Well if you are stuck in serve-receive for a long time, then we'll try a different play, like try hitters running in different spots or like if someone isn't passing very well then we will pull people back to pass and take those people out.

(Jessica)

Jessica then elaborated on her comment about "changing things around" in order to achieve positive PM.

I think the purpose would be to just give a different look to the other team. If they are serving towards us and they've been serving for a while, and we change it up it kind of throws them off guard, they don't know exactly what's coming if we've been running the same play for like the past 3 plays, its easy for them to just identify what's about to happen. (Jessica)

Co-participants also described how they tried to build PM when their initial plans for performance were not working and even experimenting with other methods for doing so.

Michelle talked about a time when her team's efforts to break through a defense by making a

“big pass” were continually foiled by their opponents. In order to change things up they decided to experiment, by shooting from distance:

So settling the ball down, it’s just so much easier to gain momentum that way or to make the big tackle because...when you make that big pass and it goes through, your team is just like, “Oh my gosh, this is actually going to work out.” But if you keep doing it over and over again without success, then you know that that’s not going to work. And they keep stopping it every time you try to make that pass. So it’s like, that’s not going to gain your team momentum, if it’s never working. So you got to try something different and you’ve got to do, maybe, take that shot from 18 yards or 20 yards out. (Michelle)

Finding a way described co-participants willingness to experiment with their performance in order to achieve success. This process included a formula that was unique to each co-participant and usually consisted of several elements for promoting success and increasing perceptions of positive PM.

Going back to basics. *Going back to basics* represented a second sub-theme of CM and is closely related to the previous sub-theme of *finding a way*. Co-participants acknowledged that the easiest way for them to begin the process of creating and building momentum was to return to the basic components of their performance that had produced past successes. Johnny provided a clear example of how he went back to basics in his basketball game:

The way I find a rhythm and get my momentum started...I like to start by going to the basket. I think closer shots equal higher percentage shots. So I feel like if I can get a lay-up here, then step back, then if I can get a mid-range jump shot, then I start making threes, and bam bam, I mean my momentum is flowing, I am on

fire, I am going to the rack, I am doing different things on the basketball floor...That is just the way I like to start my momentum. (Johnny)

Mike provided a similar example from tennis when talking about focusing on the basic aspects of his game in order to create momentum:

That [the basics] might be just you know watching the ball even watching it more closely, or good feet, being more light on your feet, with that it's going to help you because it's just making you focus on one thing rather than the whole consequence that could result if you did lose that point. That's probably the biggest thing, just focusing on one point. (Mike)

Co-participants also described how going back to basics could involve larger strategic approaches to performance. Renée described this type of approach when she was trying to come back from a deficit:

You can't make a 7-point basket, you know what I mean? You can't...like I'm not going to shoot from half court, that's not going to mean that I get 20 points. You know, we're down by 20, but I'm not going to make the basket and then all of a sudden we are winning, you know what I mean? So instead of focusing on trying to make that 20-foot basket that's never going to happen, you've got to focus on, "OK, let's get those two points, then we gotta make a stop, OK? Then we gotta score again. Or hey, we might not score, OK? Yeah, we scored, they scored...or they scored and we got a stop, we might not score the next time but we gotta make another stop on defense." So...we just gotta focus on that, you know, making stops as many times as you can and scoring. (Renée)

Going back to basics was a way for co-participants to experience the progression of creating PM by achieving small successes within performance (i.e., completing a simple pass).

Doing what we usually do. This sub-theme emerged from co-participants' understanding of the aspects of performance they had previously used to produce success and positive perceptions of PM. This concept was summed up by Brett as "if it ain't broke don't fix it." *Doing what we usually do* often related to the role co-participants felt they fulfilled on the team. Jessica described the way her team created PM when all of the players were performing their roles correctly:

It gives our team momentum 'cause we've won so many games where people have played their roles on the team and we've won because of that. And when people are doing exactly what we've done before, then I think we have momentum because we feel like we are playing good. (Jessica)

Simone also described feeling positive PM when all of the players on her volleyball team carried out the responsibilities associated with their roles:

But, it [momentum] can...just...when it goes well, everyone just does their job...it's just...everyone plays and knows what to do. Like, the other team can be standing there screaming, stomping, having the greatest time, but on our side it is like we are gelling right now. Everyone is just doing what we are supposed to do.

Really, we are just playing the game and keeping it simple. (Simone)

In much the same way that *going back to basics* allowed the athletes to achieve small successes that led to positive perceptions of PM, getting back to *what we usually do* helped them build with

a purpose and create PM. Michelle talked about how the best parts of her soccer game were more evident when she was playing this way:

So, you're able to like make the tackles you usually do, you're able to put the ball through like you usually do, like how you know you can in practice. And it's like the momentum helps you. (Michelle)

Brett provided an interesting example of how losing heavily in tennis can help him relax and get back to doing what he does best, when he "start[ed] unloading on everything and just realizing there is nothing he (opponent) can do," which in turn helps him recover momentum. Brett also described how he has observed positive and negative shifts in play and momentum from an opponent:

...you'll see it all the time. Something like that where it will get back on serve like that and he'll have the momentum from 5-1 to 5 all and, then it goes either of two ways. He'll start to think "ooh I'm back in it now, 5 all", and he'll start to seize up a little, there's not that carefree hit out on every shot which, a lot of the time sucks because you need to keep that momentum going by doing what you've been doing to get back into the match. It usually goes one of two ways, he'll usually go back to the way he played - Being a bit tighter and not as free and not hitting out on his shots and could lose 7-5...or it can go the other way where if he can just find a way to keep that momentum going at 5-all he'll win. (Brett)

Doing what we usually do emerged from the co-participants' discussions of playing within specific roles and carrying out the responsibilities of that role. Additionally, the athletes described how playing in a manner they were accustomed to helped promote success and

perceptions of positive PM, and how going away from this style of play could have the opposite effect.

Balancing effort and playing within limits. This sub-theme emerged as a result of co-participants' understanding of the level of effort needed to accomplish successful performance and create perceptions of positive PM. Specifically, this understanding represented a balance between not trying hard enough and trying too hard. Co-participants were able to identify when their level of effort was not optimal for achieving success. They also recognized the influence that subsequent shifts in their own effort and that of those around them had on their PM. Jessica described defensive effort as a "big contributor to momentum" due to the belief that being willing to work to be successful is the "real hard part of it [performance]." Michelle provided an example of how not working hard enough to meet the demands of the game affected her soccer team's PM:

I guess, the whole fact that if our momentum is not very high, everyone kind of goes down on themselves and you can tell when they go down on themselves.

They don't work as hard as they usually do. So, when you...when your whole team is working together, you can tell, because everybody is putting in 100%.

But, you also can see when they're not. (Michelle)

She also described how the extra effort of her teammates could positively influence her PM:

They're coming in on our midfield, but say our midfield is all marked up. It's kind of tough for us to step up and do that [mark the extra player], unless someone else is backing us up from the front. So, they [teammates] need to help in that way. So it's like that little extra effort helps us win the ball back and helps us get momentum again. (Michelle)

The notion of balancing effort also related to the role the athletes felt they played on the team.

For example, Renée described how her game was focused on doing the “dirty work” and putting in effort where others may not:

[I do] a lot of just the hustle plays...the dirty work that nobody wants to do, you know, that, those things...that is what my coach always says that I bring, is doing all the dirty work. You know, I might not score one basket the whole game, but, you know, I will work my ass off on defense, I'll get some steals, I'll get, you know, 8 rebounds a game for you, um...I'll distribute the ball, you know, just like, things like that, I guess.

Renée also described how her efforts to do things on the basketball court contributed to the subsequent efforts of her teammates:

[I'm] diving and we're getting into the grime and doing all the dirty work, And, you know, like I said about that trickling down effect, you know...someone sees me, like, leading by example, someone sees me diving on the floor, well, “Hell yeah, I'm going to dive on the floor too!”

The co-participants were also aware of how finding a balance of effort sometimes meant trying easier rather than harder. Trying too hard was often evidenced when athletes tried to force *the big play*, or play beyond their capabilities. Jessica described how PM “shifts away from us” when she, or her teammates are trying too hard and provided an example of trying too hard to make something positive happen in a volleyball game:

If you want to get a kill really bad and you want to hit it straight down and there's a huge block in front of you, you can't hit it straight down but you do and you get blocked, [that] would be trying too hard. (Jessica)

Simone described how trying too hard would happen if her team started feeling frantic and think they needed to do something extra in order to create momentum:

[When] we get really frantic, people start playing outside of themselves and it's kind of hard to bring everyone back in because everyone is trying so hard to make a play and make it work. And I think momentum is one of those things you cannot force. (Simone)

When asked to elaborate on the concept of trying too hard and the impact of playing frantic on performance Simone said it led to her and her teammates trying to do things that were not normally a part of their game:

That whole concept of doing too much, when situations get stressful and everyone is just...it is like you are searching for an answer. You're searching for something to change and you just do too much versus just staying with who you are. I am not going to try to bounce balls...like I am 5'10, I'm going to get blocked so... when people get frantic they search for an answer, any answer, anywhere. So even if that means doing something they would not naturally do. And that is usually where a lot of errors are made. Because you want an answer so bad that you will do whatever it takes to make it happen. (Simone)

Balancing effort and playing within limits emerged as a sub-theme of CM. This sub-theme represented the athletes' awareness of the impact of trying too hard to force something positive to happen or not providing enough effort on their performance and their perceptions of PM.

Controlling rhythm and tempo. This emerged as co-participants described their ability to build positive PM by controlling the pace of play during competition. In particular, they

described how controlling their personal rhythm allowed them to execute their skills correctly. For example, Johnny emphasized the importance that his control of rhythm and tempo had in producing an “easier release for the [basket]ball.” When his footwork was in rhythm he was better able to “square up my second foot” for a successful shot after receiving the ball. Mike also described the importance of rhythm in executing his tennis strokes:

Rhythm is something that a lot of players play off. Whether it's hitting, you know, timing is crucial, timing brings a lot of rhythm to the strokes and to the serve and I think rhythm can be controlled...rhythm is something a lot of people work for because without rhythm you're spraying the ball around. (Mike)

In addition to controlling the rhythm and tempo of their own movements, co-participants also described how they attempted to control the overall tempo of the competition. The purpose of controlling tempo was to play at a pace that was comfortable to them while preventing opponents from settling into their own rhythm. Brett provided an example of some of the ways he went about creating PM by controlling the tempo of the game:

You keep that going by almost rushing, just taking as little time between points just so they can't mentally regroup - just to keep them frustrated, keep them angry at themselves and not give them a chance to think, “Hey I gotta do something about this, I have to turn it around.” You don't want to give them that chance. I try and rush a little bit, even at change of ends where you have the 90 seconds change of ends. If I feel like I'm still on top, I'm not going to take anywhere near that 90 seconds I'm going to be out there bouncing around after 60 and just take a sip of water and just try to keep the roll going you know. (Brett)

Co-participants also described how slowing down the tempo allowed them to figure out exactly how they needed to play in order to be successful. By controlling the pace and tempo of the game Michelle described how her soccer team was able to identify weaknesses in the opponent as they retained possession and dictated the speed of the game:

If it's all going back and forth between the teams, then settling it down gives you a lot of time to figure out what you need to do. So it's like as you start passing it back and forth between your players and your defensive line and midfield[er]s, you can start to see their team breaking apart and you can find those holes in their team. So it's like having enough time helps you figure out what you need to do to create that momentum. And then go from there. (Michelle)

The athletes further exemplified the importance of controlling the tempo of play when they described their experiences of not having control. Simone described the feelings that she had when she felt her opponents were in control and the speed of the game was quicker than she was comfortable with:

It's kind of overwhelming. Because you feel...like you're behind all the time. Like, you are always trying to play catch-up and you're trying...if you're trying to slow the game down and it's going faster than you had anticipated...that seems to be when people get more frantic...they don't know what to do...and that is when you make your mistakes and your unforced errors because you aren't calm. So, when the play is happening faster than you thought it was...the best way, at least in that moment is like "calm down" and try to slow it down if you can. (Simone)

Michelle also described a feeling of being rushed and how this caused her to "freak out" and "stop thinking," which lead to bad decisions and a breakdown in her technique. She

went on to explain that in order to counteract these feelings she has to “regroup and settle down again” allowing her enough time on the ball to let her “[soccer] mind set in.”

Co-participants also described how they or their opponents used tempo as a tactic for creating or breaking PM. For example, Mike mentioned a match where his opponent called a five-minute injury time-out in a clear attempt to break Mike’s momentum. Brett said he sometimes increased the pace of play between tennis games and change of ends to prevent his opponent from rethinking strategy that might change the match outcome. Conversely, Jessica described a strategy her team used to slow down the tempo in an effort to reverse the positive PM of the opposing team:

When the other team’s scored five points on you and it feels really rushed ‘cause like you throw them the ball and then they serve again. But you’re supposed to like just hold the huddle for as long as you can on your side, and just kind of regroup. Try to get a play to get the ball back for your team. So you try to take as much time as you need on the floor until the ref blows the whistle [to start the game again]. (Jessica)

Controlling rhythm and tempo emerged from co-participants’ descriptions of a desire to dictate the pace of play. This sub-theme included the rhythm of their individual skills during performance, the overall tempo and pace of the game, and the use of tempo as a tactic to create, maintain, or disrupt perceptions of PM.

Achieving early success. *Early success* emerged as a result of co-participants' descriptions of how they used successful performance in the opening stages of a competition as a foundation for building positive PM. Brett provided a description of how early success made him feel in control and helped him build PM for the remainder of a tennis match:

You feel in control when the momentum is obviously in your favor and that pretty much just comes from winning, especially if you can try and get on top of them early and try and control the match. If you can get up an early break within the first couple of games and then just, even if he's holding easily, you're holding easily, if you get that early break, I mean that first set's done, so you feel like you're in control of the whole match. (Brett)

Simone also related early success to feelings of control in her volleyball matches. Specifically, she described how early success disrupted the expectations of her opponent and created early perceptions of PM:

When we came out we just "block-kill-dig." We did not let them have anything and their faces kind of drained and they looked like "What's going on? We thought we were going to come in here and roll over you guys." (Simone)

Co-participants also related early success with establishing a sense of control of their rhythm during performance. As discussed earlier, controlling rhythm and tempo seems to be a significant contributor to perceptions of positive PM. Johnny described how a good warm-up and early success in a basketball game helped him to feel like his rhythm was there and the influence this had on his PM:

Things were going well for me ... and once I started to shoot I got into a rhythm and...I started making shots, that was just in warm-ups and I thought I was

getting into a good rhythm for the flow of the game. The game started and I knocked down a few shots and then I felt like my adrenalin just started to rise and my momentum just carried over to the defensive end and back to the offensive end. (Johnny)

Achieving early success emerged as a sub-theme from co-participants' descriptions of how they hoped to establish control of the competition and use this success as a platform to create subsequent successes and perceptions of PM. In addition, co-participants described how early success allowed them achieve control of the rhythm of their performance and play the way they wanted to.

Trusting preparation. This final sub-theme of CM emerged from co-participants' descriptions of aspects of their performance they had work on in preparation for competition. For example, in order for co-participants to be able to control the rhythm and tempo of play they must have an understanding of what tempo or rhythm best suits the manner in which they are trying to perform. The best way to achieve this understanding is by working on their rhythm and tempo during training sessions. Mike provided an example of how he practiced speeding up and slowing down his pace of play during practices in order to be able to trust his ability to do so during his tennis matches:

The biggest thing is, you have to practice this [tempo and tactics] before you put it into play, it's like with anything, practice makes perfect and I know a lot of people would want to just go out there and just throw in their own set of "throwing off tactics"... I know that I practice it a lot...the great thing about practice is you can test different theories and test what works for you... It's

crucial to find what's easy for you and what you can do when you are facing pressure situations. (Mike)

Johnny described *trusting preparation* as his "test":

I think when you know that you have done well in the gym on your own, you've gotten shots, you've prepared...once you know you have prepared, it is like a test, you know you've prepared for the test...you feel good going in about it and getting a high score. Once you prepare for that game and you've done all you can do to be successful...and you feel confident about your game and your skills and your ability to make plays and do well on the basketball floor, that boosts my momentum.

Co-participants also described tailoring their preparation for specific opponents in order to be able to perform as well as possible in competition. The most common examples of such preparation were watching film of an opposing team, or identifying the strengths of certain individual players. Simone provided a description of how her volleyball team used their preparation to understand the way a tough opponent would play and develop counters to "use it against them":

They came in thinking, "we're going to beat [School name]." And we just came out and just stole the thunder from them. And knew that with all the preparation and all the film we'd watched and with practicing...practicing with our male players who are like...they hit straight down. They touch like 7'10"! And with the preparation, we were able to steal the momentum. Because you can take what they've practiced so long, what they are used to doing and just use it completely against them because it's all they have. We know every shot a team's

going to do. We know how to defend every shot. So you're able to take their best and turn it into our best. (Simone)

Trusting preparation emerged from co-participants' understanding that using specific tools or skills practiced for specific opponents or situations would allow them to be more successful and in turn produce perceptions of positive PM during competition.

In summary CM emerged in the form of several sub-themes. These sub-themes included factors that allowed co-participants to experience the systematic building of PM during competition. In contrast to IM, co-participants described CM as being less spontaneous and more the result of systematic behaviors. Simone used the metaphor of building a fire that seemed to capture the essence of CM:

It is kind of like a fire, I feel like. Yeah you light the sticks and you're going a little bit, and the more momentum you gain, it is like the bigger the flame gets and you get...well me personally, I get more intense and I just feel stronger and like my moves are just like quicker and it's just...you just become a more of an elite player...I am not saying you start off from nothing, but it is one of those things where you are like, "Well, alright, it's going. Yeah it's going! Let's take this!" (Simone)

Internal Indicators

Internal indicators emerged as a major theme for co-participants and reflected ways they were aware of PM, irrespective of whether others were aware or not. These indicators included thoughts, feelings, emotions, and physiological responses associated with the experience of PM. In the thematic structure shown in Figure 1 *internal indicators* are represented as the name on the back of the shirt of the athlete experiencing PM. The number "5" represents the number of

internal indicators that emerged during data analysis. This figural theme consisted of two sub-themes: *Feeling momentum* and *thinking momentum*.

Feeling momentum. *Feeling momentum* emerged as a sub-theme of *internal indicators* due to co-participants' descriptions of physiological responses that accompanied their perceptions of positive PM. These feelings seemed to emerge from involuntary responses and were appraised by athletes as an indication they were experiencing positive PM. For example, an increase in adrenaline was appraised as a contributor to high-level performance rather than as a sign of over-arousal. Johnny described how he associated his feeling of increased adrenaline as an experience of positive PM in his basketball performance: "I was so riled up, I felt that my adrenaline was flowing and things were going well for me...I knocked down few shots and I felt like my adrenaline just started to rise and my momentum just carried over." Simone also linked increases in adrenaline that surfaced prior to an important game with a tough opponent to being "ready" to play at a high level, which in turn increased her perceptions of PM: "You're going to get yourself going, you're going to get adrenaline running and I think with adrenaline comes momentum."

Co-participants also described an increased level of physical energy when experiencing positive PM. Descriptions of this feeling of energy included "bouncy," "light," "energized," and like they were "flying." In contrast, co-participants felt "slow," "heavy," and "lethargic" when experiencing negative PM. Michelle explained how she experienced the relationship between changes in energy level and PM during a soccer game that shifted in her team's favor:

They are long games, so it's like you've been running around for an hour already and you are dead tired. But right when the momentum changes you have so much energy, you start working again and it's like now, now my technique's back. The

energy on the field is like a total changer. You finally start to make those passes and your touch is way better. It's like "man, now I am awake again," kind of thing... a momentum changer and it's, all of our team is, hyped up again.

(Michelle)

Brett described the energy and PM relationship when talking about a tennis match when he was "taking the momentum away from him [opponent] and taking over the match...I started being more vocal and energetic."

Finally, co-participants also described feelings of being relaxed and fluid that contributed to playing with ease of movement and increased their perceptions of positive PM. This relaxed feeling was in stark contrast to feeling tight, which was associated with negative PM. Mike provided a clear example of feeling relaxed and connected with his racquet when he was experiencing positive PM:

[Momentum] kind of makes you just play freely and makes you relax. I know sometimes I'm playing so relaxed I feel I'm not even holding the racquet, it's just like in my hand, it's stuck to my hand with sticky tape, that's how loose it is.

(Mike)

Mike described his desire to feel this way more often during performance:

You almost wish you could be in that frame of mind the whole time. You're loose, relaxed, and it just shows you just how beneficial it can be, being relaxed.

And if you are that relaxed, and that loose, and mentally stress free you can actually play your better tennis. (Mike)

Feeling momentum was represented by co-participants' appraisal of internal physiological processes as indicators that they were experiencing PM. Specifically, the athletes

associated increased levels of adrenaline and energy, as well as feelings of relaxation and easy fluid play, as internal indicators of positive PM.

Thinking momentum. This sub-theme deals with the thoughts that emerged from co-participants' performance and served as indicators of PM. Most prominent was an increase in self-efficacy, which the athletes described as confidence. Brett provided a clear example of how he experienced an increase in confidence that contributed to positive PM and the impact this had on the remainder of his tennis match:

It's like your confidence levels just go up, you feel as though you step up to the line and think "I'm not going to lose this point that we are playing." Everything seems clear but, yeah just, confidence I guess. It's tough to explain...It's almost like you go into auto-pilot, and you don't think, you just know you are going to win the point as you step up to the line. "I'm serving here, going to win the point, it's going to happen." There's no analyzing what you are going to do, no strategy, you just get on a roll and go with it. (Brett)

An additional component of this cognitive awareness of PM was the thought of being "unstoppable." Johnny described his experience of positive PM during a basketball game as "like you are on fire and you can't miss a shot." Simone talked about being unstoppable when experiencing positive PM in a volleyball match against a talented opponent:

When I get going I just want them to set me every ball...I don't care where I am...all the way in the back row, front row...it doesn't matter. You just feel like you can stop anybody and you can just do anything. And every ball you're going to swing as hard as you can at a ball and you'll get a touch somewhere, but it will go in...Because even when you get it going and you make an error, you are like,

“Whatever. Next ball.” You move on to the next ball much faster than would if you were playing bad and you had those negative feelings. (Simone)

Thinking momentum emerged as a sub-theme of *internal indicators* due to co-participants’ descriptions of the cognitive thoughts associated to positive PM. These thoughts included increased levels of confidence and the feeling of being unstoppable. It should be noted that one co-participant described the contrasting feeling of low levels of confidence when experiencing negative PM by saying “I could do nothing right.” However, all the other co-participants chose to focus on the thoughts they associated with positive PM.

Internal indicators emerged as a major theme from co-participants’ descriptions of how they felt and thought while experiencing PM. Specifically, increases in adrenaline and energy level, a feeling of playing relaxed and loose, increased confidence, and thoughts of being unstoppable were all associated with perceptions of positive PM.

External Indicators

External indicators emerged as a major theme that contrasted with the previous theme of *internal indicators*. Co-participants described external objects or people that served as indicators of their PM. These external reference points together with one or more *internal indicators* often served as a gauge of PM. In Figure 1, this theme is represented as the scoreboard. The score of 4-2 is meant to depict a generic score that might occur in basketball, tennis, soccer and volleyball. The theme of external indicators included three sub-themes: *winning and losing*, *executing skills*, and *seeing it in others*.

Winning and losing. *Winning and losing* emerged as a sub-theme of *external indicators* due to co-participants’ constant awareness of the score, or the final competition outcome. They described the score as a powerful indicator of momentum during competition. Brett even

suggested that if he loses the match he feels like his opponent had more PM than him: “I don’t think there has ever been a time where you have more momentum than another player and lose.” He went on to elaborate the relationship between score and momentum by saying “you can try and find a way to get that momentum, but if you are not winning points how can you have momentum?” Jessica also described her thoughts regarding winning and PM: “Well, all the cases I can think of when we have momentum, we win.” However, Michelle mentioned the impact of success in smaller components of the game that might be perceived as PM at the time yet not lead to winning the game, such as scoring goals: “right when we score it’s definitely momentum for us...Once you keep scoring and you get a lot of goals...its like momentum is in our favor.” Jessica talked about how winning numerous volleyball games in a row affected her perceptions of PM and how she used a change in outcome success (i.e., going from losing games to winning games) as an indicator of a change in her team’s PM:

This summer I played on the [National] team and we played in a tournament and we went through a streak where we lost 6 games in a row and then after that we won one game and we ended up going on like an 8 game winning streak and we didn’t lose another game after we lost those six...It was a change in momentum for us. (Jessica)

The impact of winning multiple games in a row on perceptions of positive PM was also suggested by Brett when he talked about a successful run he had in a tennis tournament. “Just winning match after match after match...and just advancing further on in the tournament.”

Winning and losing represented a sub-theme of *external indicators* that emerged due to co-participants’ descriptions of how they used outcome success, including the

ongoing score line, to determine whether they were experiencing positive or negative PM.

Executing skills. This sub-theme was based on co-participants' descriptions of how they used small successes within their performance as indicators of positive PM. Such successes included the successful execution of skills or other sub-components of performance that might not have been reflected in the score of the game or the eventual outcome, such as shooting and passing in basketball, serving and returning service in tennis and volleyball, and sustaining pressure and possession of the ball in soccer. Johnny provided a clear example of how he used a "heat check" to assess his shooting performance and level of PM during a basketball game:

Say I come down and make a shot; I come right back down, make another shot.

You have that heat check, I always have a heat check, if I make two shots...or if I make one I might come right back down [mimics shooting action] swoosh, and knock it down again, but I always have a heat check to see if I am on fire or not.

See if I make that third one, I know I am on fire and I know, I am feeling it.

Everything is flowing, my timing is right, I am stepping towards the ball [mimics shooting action] swoosh, and we have our fire right then. (Johnny)

Michelle described how she used the success or failure of her passing, shooting and first touch in soccer as indicators of her experience of PM:

In soccer, your touch, your shooting, your passing, all your movements ...it's like, sometimes I'm behind so I am never there enough to turn, or like I am never quick enough to get to the open space, but then when everything is working, you get there, everything just works out where you're just on time, you get the ball, you turn. But then when it's not working out you're just so under pressure,

...and...nothing works out. Like your passes don't work out, you can't play the ball through. (Michelle)

Executing skills represented aspects of co-participants' performance that may not be reflected in the outcome of a competition. Such execution did, however, provide feedback to the athletes that served as temporary indicators of positive or negative PM.

Seeing it in others. This sub-theme was based on co-participants' descriptions of the ways they used those around them as a reference for their own PM. Such 'others' included a wide variety of groups and individuals (e.g., spectators, teammates, coaches, opponents) whose reactions, comments, and behaviors co-participants used to evaluate their levels of PM. For example, athletes attributed a noisy crowd that was really into the game and cheering for their own team as an indicator of positive PM. In contrast, they interpreted a quiet and withdrawn home crowd as an indicator of negative PM. Renée provided a clear example of *seeing it in others* when playing basketball in front of large sell-out home crowds:

I definitely do notice it. You notice it, especially with 20,000 people in there.

They're going to notice it [team's performance and momentum] and they're going to be cheering, you know, screaming at the top of their lungs. Or they're going to be...dead silent. You know? So that kind of, you know, let's you know

whenever it's not going your way or when things are going your way. (Renée)

Johnny also provided an interesting contrast between the "others" that influence his performance and perceptions of momentum in practice and competition:

In practice you get...when you do something well you get a pat on the back from your teammates and coaches. But in the game you also have the fans that are cheering you on when you are doing things well...so you get a little boost of

momentum from that when you do something well. I think, after you do something well you want to do it again. You want to get that 50/50 ball, that loose ball, that block, or that steal. Because you know it is going to make everybody happy. (Johnny)

Co-participants also used their opponents as reference points for their own PM. Michelle described how she used her opponent “looking disorganized and all over the place, with their midfields just chasing us around” as an indicator of her team’s positive PM. Brett described how he was able to spot when an opponent was experiencing negative PM and how that impacted his own performance: “it gives you confidence if the other person gets a bit down and you can pick up on that...really make them stay down as long as possible to keep the momentum and everything going in your favor.” Brett continued by saying that he tries to show no negative emotion in a game, even when he is not playing well, so as not to afford his opponent any possible benefit of using his negative emotion to gain positive PM.

Mike provided further evidence that athletes recognize each other’s PM by describing a change he sometimes sees in his opponent’s behavior when they are experiencing negative PM:

You can really see it happening from the quality of points from your opponent. A lot of his intensity drops, his body language drops and I think it’s key to recognize those points in the match where body language starts to drop and deteriorate...it’s going to be on the scoreboard but it’s going to be evident in the way that you know, he’s playing, a lot of people when they are playing and they get down, they start tanking, and they start losing enthusiasm and it’s an opportunity to jump on them. (Mike)

Co-participants identified their teammates as another type of external indicator that influences their own PM. Johnny said that if he saw his teammates doing well, “it is just going to boost my momentum because I love seeing our guys riled up and doing well, it carries over to me.” He pointed out that the reverse was also true; that is, his positive PM could be seen by his teammates and “if they see me hyped, helping out, it is going to help their momentum as well.” Renée mentioned how the behavior of her teammates on the bench sometimes served as an indicator that she and the team were experiencing PM:

I think the momentum is going our way is when our bench is into it, our bench is standing up cheering, you know, yelling...providing that energy off the bench.

They can be clapping and cheering. As far as our team...everyone’s just got that look in their eyes, that “Eye of the tiger” look. Like, “We’re about to take it right to you.” (Renée)

Simone described how she was able to recognize that her team was experiencing positive PM by the way they performed on the volleyball court:

Everything kind of just moves smoothly...like within the team, it’s like everyone just moves together, plays defense together. No one is ever where they are not supposed to be...Like, everyone is making great shots. Everyone is playing well. You know, the defense is playing well. And it just, I guess it is like an amoeba, like everything is like a cohesive unit. Like everything just moves well when you get momentum. (Simone)

Co-participants also recognized the actions, comments, and behaviors of the coach as indicators of PM. Co-participants were aware that the coach was an important indicator of PM. Those in basketball interpreted the coach’s use of time-outs as being an indicator that the team

was experiencing negative PM. In contrast, the coach allowing the game to continue uninterrupted was interpreted as a sign of positive PM or that the coach believed that the team's PM was about to change. Renée described a time when her coach “stopped coaching completely and just sat there,” and how that she interpreted that behavior as “she [coach] just felt we were going to pull the game out somehow.” To the contrary Jessica talked of times when the comments of her coach actually changed her experience of PM from positive to negative:

I think that they [coaches] can really help momentum but they can also take away momentum. When we have a lot of momentum and they are like, ‘Well you guys aren't playing good and you need to not be satisfied.’ Like if we just won a game then they say we're not playing good and we need to try harder. That's usually when we start losing, when people are trying too hard because that's when the momentum shifts away from us but then it can also be really encouraging when we are on it and they [coaches] are giving really good information and it helps to keep our momentum. (Jessica)

Seeing it in others emerged as a sub-theme of *external indicators* due to co-participants' descriptions of how they were able to use the behaviors, comments, and emotions displayed by those around them as indicators of the PM they were experiencing. The athletes explained that the crowd, their opponents, coaches and teammates were prominent people who could impact their perceptions of PM.

In summary, *external indicators* emerged from these athletes' descriptions of how certain external objects, processes, or people affected their perceptions of PM.

Specifically, co-participants were able to describe how the score (in terms of *winning and*

losing), successfully *executing skills*, and being able to *see it (PM) in others* served as references for their own perceptions of PM.

Resistance

This final figural theme refers to some critical level of opposition to their quest for momentum that athletes need in order to experience perceptions of PM. This is not to say, however, that perceptions of PM are impossible in the absence of such resistance. Rather, co-participants stated that perceptions of PM were strongest when they emerged in response to a higher level of resistance from their opponent. This *resistance* is represented in Figure 1 as the opponent (pictured in blue), since resistance in the sports represented in the present study comes most often in the form of the opponent, at least during performance. In individual sports like golf it might be argued that the course is the “opponent” providing the resistance.

Co-participants connected the level of resistance to the expectations they had of the opponent’s skill level. These expectations typically came from of the athlete’s knowledge of the opponent’s past record of performance or how well the opponent was currently competing. Michelle said that when the level of resistance offered by an opposing team was not high, it was hard for her team to experience positive PM:

Obviously how good they [opponents] are is like the first thing. So, if you’re winning 8-0... we were winning 8-0 this year...I guess, we had momentum the whole game, but there were, like, parts where we were just passing it around and it’s, I guess, there can be parts where no one has momentum and it’s just kind of... ‘Yeah we have the ball.’ But we’re not really in momentum. (Michelle)

Michelle also acknowledged that a very high resistance level from a very good opponent made it just as hard for her team to experience positive PM: “Some teams we’ve played, they’ll have the

momentum most of the game because they are better than us. And I guess it really is just their quickness and their skill level that influences it.”

Renée pointed out that an optimal level of resistance did not necessarily translate into increased PM. In fact, she believed some of the most exciting competitions were between opponents that battled it out the entire contest with neither gaining PM:

I think it makes it a good game, honestly. I mean...think about the best games you've ever watched. It was like neck and neck the whole game, you know, it gets down to a buzzer beater...you know, it goes into overtime or something.

Versus, 'oh, we're beating this team by 75, like, whoooo, momentum is our way, but who cares? You're winning by 75.' Do you know what I mean? (Renée).

Johnny described how playing a better team helped him to perceive positive PM and talked about the importance of feeling excitement in every game even if the opponent is “weaker”:

I think it plays a big part. I mean we don't want to play down to a lower level if they are a weaker opponent...I think excitement helps our momentum increase.

Obviously, when you play a more tougher opponent that's going to give us a little more trouble to win the basketball game, we want to have that momentum and that fire and that desire to win...so I mean...so I think it differs. You have to find a way within your team and within yourself to keep it at the same rate [for each opponent]. (Johnny)

Simone explained how making it “personal” between she and her opponent affected her perceptions of PM:

I know a couple girls who play on like the [opponent] or [opponent]...and me, I am like, 'Screw her, I am better than her.' I think when I make it personal I play

better because, I mean, you can sit here and, ‘Oh, I want to win,’ but when it really comes down to beating somebody... I don’t want to say that, ‘Oh, I want to be better than her.’ But, I feel like for me, that when I make it personal that gets me going so fast. (Simone)

Mike described how his expectations of his opponent’s resistance level was influenced by the opponent’s most recent results and by how opponents reacted to him when he had similar results:

It almost gets you that respect from opposing teams, knowing that ”oh he beat him and we’ve got to make sure we watch out now. We can’t just you know just go in there and cruise now.” And with that respect from other teams it means that they are going to bring their better games towards you now. Understanding that other people are going to play their best now because they know you can compete at that level that’s where tennis is great. (Mike)

In summary, *resistance* emerged as a final figural theme from the interviews in this study.

Although there were no explicit sub-themes for *resistance*, co-participants’ descriptions indicated their belief that some critical level of resistance from an opponent was needed in order to experience significant perceptions of PM. In addition they referenced the perceived level of resistance by the expectations they had of their opponents. These expectations were most often based on the opponent’s current level of performance, the opponent’s ‘traditional’ abilities, their previous personal knowledge or experience of the opponent, and the opponent’s most recent results.

In conclusion, the figural themes that characterized and provided meaning to the experiences of PM for the athletes in this study were *instantaneous momentum*, *created momentum*, *internal indicators*, *external indicators*, and *resistance* emerged. These figural

themes all occurred against the near ground of an *awareness of momentum*, and the overall ground of *competitive performance*.

CHAPTER 5

Discussion

The title of this dissertation includes the following quote from one of the co-participants (Brett): “It can start from anything.” This phrase encapsulates the experiences of psychological momentum (PM) for the athletes in this study. The co-participants provided numerous examples of how they had experienced PM. Sometimes a single event sparked instantaneous perceptions of PM, while at other times it was the culmination of numerous events or components of performance that prompted athletes’ perceptions of PM. Co-participants’ descriptions of PM were complex and intricate and the resulting thematic structure that emerged from their interviews appears to provide a more nuanced understanding of the phenomenon than reported in previous literature on PM.

Prior to the present study, research on the phenomenon of PM has been conducted in a variety of ways. Researchers have examined PM using statistical analysis of archival data (Gayton & Very, 1993; Gilovich et al., 1985; Iso-Ahola & Mobily, 1980; Koehler & Conley, 2003; Silva et al., 1988; Vergin, 2000), using contrived and hypothetical scenarios (Cornelius et al., 1997; Eisler & Spink, 1998; Mack & Stephens, 2000; Perreault et al., 1998; Taylor & Demick, 1994), during actual performance (Cornelius et al., 1997; Mack et al., 2008), and using semi-structured interviews with athletes (Jones & Harwood, 2008). While the results of these studies have provided some support for athletes’ perceptions of PM, they have offered little information about the working complexities of the phenomenon. An exception is a recent study by Jones and Harwood (2008), which placed athletes in a more central position in the research process. Using an open-ended qualitative interview method, the researchers’ focus was to gain a

greater understanding of the specific components of existing conceptual models of PM (triggers and outcomes of PM) that characterized athletes' experience. However, due to the semi-structured nature of the interviews in that study, athletes may have neglected to mention other aspects of their lived experience of PM. Hence, the purpose of the present study was to obtain athletes' experiences of PM using an in-depth interview approach emanating from the domain of existential phenomenology.

This chapter includes discussion of the *major findings* of the present study, *connections to and extensions of previous research* regarding PM, *practical implications* for athletes, coaches, and sport psychology consultants, *suggestions for future research*, and *conclusions*.

Major Findings

The results of in-depth existential phenomenological interviews with current NCAA Division I intercollegiate and professional soccer, tennis, basketball, and volleyball players revealed five major themes of PM. These themes were *instantaneous momentum* (IM), *created momentum* (CM), *internal indicators*, *external indicators*, and *resistance*. The four major grounds of existential phenomenology are *Time*, *Body*, *World*, and *Others* (Thomas & Pollio, 2002). To some extent all five figural themes in this study are inter-connected with one or more of these four grounds. *Time* was present in CM as a result of co-participants' desire to *control rhythm and tempo*. *Body* was the ground against which the *internal indicators* of PM were experienced. *World* was present in the way that PM was *externally indicated*, specifically within the constructs of winning and losing during competitive performance. And *Others* appeared as a context within which *external indicators* and *resistance* were experienced.

Perhaps the most significant finding of this study was the contrast between IM and CM in producing co-participants' perceptions of PM. The athletes were able to distinguish and

articulate their experiences of PM that followed a single event and that was created or built in a more systematic manner over a longer period of time. It should be noted that in neither case did athletes appear to be intentionally trying to influence PM but were rather attempting to alter or improve their performance, which sometimes resulted in a change in their *perceptions* of PM. However, while the thematic structure developed from the co-participants' lived experiences of PM was developed using themes that seemed to be consistent across athletes, the phenomenon of PM was a very individualized process. The sub-theme of *finding a way* described the various ways co-participants successfully executed performance that subsequently produced perceptions of positive PM.

A second significant finding dealt with the way in which co-participants referenced their experiences of PM to both internal and external indicators. Perhaps the most salient external indicator was the score line; they described how winning and success related to outcome, which in turn was an external indicator of their perceptions of positive PM. This connection between outcome success and perceived momentum provides additional support for previous research that has shown scoring configuration, specifically continuous success, to be an important influencing factor of athletes' perceptions of PM (Eisler & Spink, 1998; Vallerand et al., 1988). However, the present co-participants also described other external indicators that may not actually influence the score line yet prompted feelings of PM, such as seeing PM in others or effective skill execution regardless of the outcome. In addition to external indicators, co-participants also described perceptions of PM that were influenced by internal processes such as increased confidence and a feeling of being relaxed. They also pointed out that both internal and external indicators could occur simultaneously, which may partially explain the discrepancies in the findings of earlier studies in which outcomes were the sole or major means of assessing PM.

The figural theme of *resistance* was also a significant finding of the present study. Specifically, co-participants believed that a critical level of resistance was needed in order to perceive of the existence of PM. While some athletes mentioned that they occasionally experienced PM when resistance was low, they felt those perceptions were modest compared to the PM they experienced in the face of higher levels of resistance. Previous research has suggested that factors dealing with the opponent or opposing team (e.g., experience, reputation, etc.) can impact athletes' perceptions of PM (Taylor & Demick, 1994), however, prior to this study the level of resistance provided by the opponent had not been identified as one of them. The AC model of PM (Vallerand et al., 1988) includes situational variables that represent the "script" of the performance, suggesting that the context of a game can influence the extent to which an event or series of events prompts perceptions of PM. This notion of a "script" suggests that a precipitating event must "fit" the overall context of the performance in order for PM to occur. For example, Vallerand et al. (1988) suggested that success is more likely to affect perceptions of PM in a close game against a good opponent than in a contest with an opponent that provides little resistance. The findings of the present study appear to be consistent with this notion. Moreover, they also extend the previous literature by suggesting that if the resistance level is too high, that is to say the opponent is significantly more talented or skilled, athletes may not perceive positive PM.

A final major finding of the present study appears to be the *way* in which co-participants perceived PM, specifically as "*awareness*" rather than a direct focus. This result suggests that although co-participants were able to provide detailed descriptions of their experiences of PM, it did not keep them from attending to other aspects of their performance that were more pertinent to the competition. Moreover, while changes in performance may have resulted in changes in

perceptions of PM, co-participants were not using their performance to specifically manage PM throughout the course of competition. Previous research has suggested that performers must complete a series of specific conscious processes in order to perceive PM, such as appraising the event as important or consciously changing behaviors (Taylor & Demick, 1994; Vallerand et al., 1988). The findings of the present study appear to extend this notion by suggesting that athletes may not be making conscious decisions to alter their perceptions of PM, but rather that PM is a by-product of their conscious decisions to improve their performance (i.e., to be more successful).

Connections to and Extensions of Previous Research

This dissertation is the first that has attempted to understand athletes' experiences of PM by using an open-ended interview process with no a priori assumptions. Some of the findings are consistent with previous research examining PM while others represent extensions to the existing body of literature.

The MD model of PM describes the first step in the development of PM as the occurrence of a precipitating event or series of events (Taylor & Demick, 1994). The present findings are consistent with this notion in the respect that some perceived that PM was the result of a single event (IM) or series of events (CM). However, the MD model does not address the possible differences between these processes, suggesting that there is one 'path' in the "momentum chain" that leads to perceptions of PM resulting from either a single event or a series of events (Taylor & Demick, 1994). The findings of the present study suggest that individuals perceiving PM may not necessarily experience these two processes in the same manner. For example, specific components and strategies that eventuate in CM, may not necessarily contribute to experiences of IM. In addition, due to the nature of CM revealed in the present study (i.e., the

gradual building of momentum using various components of performance), it appears that there may not be an ‘all or nothing’ formula for producing to perceptions of PM as postulated in the MD model’s “momentum chain.” According to the MD model, participants must complete or experience conditions within six stages of the “momentum chain” that result in a change in immediate outcome (i.e., winning or losing) in order to perceive PM (Taylor & Demick, 1994). However, the present findings suggest that specific aspects of performance may build upon one another to create growing perceptions of PM. This result extends previous research by suggesting a potential closed-loop operation within the MD model, in which performers may return to previous stages that prompt mild perceptions of PM while building towards an eventual change in immediate outcome that produces more significant perceived PM.

As suggested in Jones and Harwood’s (2008) study, strategies used by athletes to develop and maintain positive PM and overcome perceptions of negative PM have not been examined by previous research. The results of the present study include specific strategies co-participants used to alter aspects of their performance in order to become more successful, which in turn lead to perceptions of positive PM. These included controlling the rhythm and tempo of the game, going back to basics, and doing what is they usually do to achieve successful performance. While Jones and Harwood (2008) found that soccer players use specific strategies to overcome perceptions of negative momentum, such as retaining possession and maximizing effort (in an attempt to produce positive PM), they did not distinguish between perceptions of PM that were produced instantaneously through a single event or big play (IM) or perceptions of PM that resulted from strategies used to control performance over an extended time (CM). While the MD model suggests that PM can be perceived as a result of a single event or a series of events it fails to provide a clear distinction between the underlying processes prompting each. The higher

number of sub-themes associated with CM compared to IM found in the present study suggest that at the very least the process of CM in prompting perceptions of PM is considerably more complex than that of IM.

Co-participants in this study were more likely to perceive positive PM when they performed *within* their capabilities. This theme was characterized by co-participants' descriptions of *doing what we usually do*. Specifically, they described a desire to play in a manner they knew from previous experience to be successful rather than attempting to force IM by doing other things, which one described as "playing outside of oneself." This result appears to contradict previous research with soccer players that indicated an increase in confidence and resulting positive perceptions of PM could lead players to "trying something special" (Jones & Harwood, 2008, p. 63).

In addition to focusing on performing in a way they knew to be successful, the present co-participants described the importance of *balancing effort and playing within capabilities*. Previous research has suggested that maximizing effort is a key component of maintaining positive perceptions of PM (Jones & Harwood, 2008, p. 65). This appears contrary to the findings of the present study that suggest that achieving an optimal balance of effort contributes to better performance and creates or maintains positive perceptions of PM. These athletes seemed to appreciate the difference between providing enough effort to be able to impact performance in a positive manner and trying too hard, which would be counterproductive. Taken together, the findings of these two studies highlight a potential difference between IM and CM by suggesting that athletes may attempt something special, *the big play*, in order to perceive IM or employ a number of strategies over an extended time (CM), such as *doing what we usually do*,

going back to basics, and *balancing effort and playing within capabilities*, to facilitate successful performance and experience PM.

Previous quantitative research has operationally defined PM in terms of series of successful outcomes or the impact of winning on subsequent performance in a variety of sports, including competitive tennis, racquetball and ice-hockey games (Gayton & Very, 1993; Iso-Ahola & Mobily, 1980; Silva et al., 1988). Results of these studies have indicated that set one outcome predicted set two outcome in tennis and racquetball (Iso-Ahola & Mobily, 1980; Silva et al., 1988), and successful first period play in ice-hockey predicted final game outcome (Gayton & Very, 1993). The findings of the current study appear to be consistent with such results in that co-participants appeared to use a sequence of early successes in performance to build CM. They also associated early success with feelings of control within a competition, which in turn prompted them to play the way they were used to playing (i.e. style, rhythm, and tempo) and produce better performance and positive PM.

Perceived or real outcome success has also been shown to be an important factor impacting perceptions of PM (Eisler & Spink, 1998; Miller & Weinberg, 1991; Vallerand et al., 1988). For example, Eisler and Spink (1998) found that participants reading a hypothetical volleyball script where a “team” came from behind to tie by scoring five consecutive points, perceived that team to have significantly higher PM compared to a team scripted to lead by no more than one point at any time in the match. The present research suggests that CM may be one possible explanation for those perceptions. However, the present study also demonstrated that PM can result from internal as well as external indicators, suggesting that the scripts approach used by earlier researchers may have provided a notion of PM that does not fully capture the complexity and individual nature of the phenomenon. Athletes in the present study perceived

both IM and CM when their performance was not necessarily reflected in the score line; for example, when they felt relaxed and fluid or when they observed PM in others. Thus, it is possible that the use of outcome or score-line as a sole indicator of the presence of PM could be a limiting factor in previous research (Gayton & Very, 1993; Gilovich et al., 1985; Iso-Ahola & Mobily, 1980; Koehler & Conley, 2003; Silva et al., 1988; Vergin, 2000). It is recommended that future researchers consider a broader spectrum of possible antecedents of performance that could evoke athletes' perceptions of PM, either positively or negatively.

The present study also revealed that *thinking momentum* was a sub-theme of *internal indicators* of PM. Specifically, co-participants described feelings of invincibility and of "being unstoppable" when perceiving PM in a positive manner. Participants in Jones and Harwood's (2008) study also described feelings of invincibility and attributed them to an increase in confidence that stemmed from perceptions of positive PM. Increased confidence, or self-efficacy, is a change in cognition included in the MD model of PM as a component of the momentum chain leading to perceptions of PM (Taylor & Demick, 1994). Increased confidence is also present in the AC model of PM as a result of the performer perceiving progression towards his or her goal (Vallerand et al., 1988). Mack and Stephens (2000) found that increased confidence accompanied perceptions of positive PM during a basketball-shooting task. Thus, the present results appear to add to the growing evidence showing that confidence, or self-efficacy, is an important component of athletes' perceptions of PM.

Previous research revealed that for a performer to perceive positive PM the performer's opponent must perceive negative PM (Taylor & Demick, 1994). However, more recent research (Jones & Harwood, 2008) suggests that the actions of an opponent can serve as a trigger for an athlete's perceptions of PM (Jones & Harwood, 2008). The findings of the present study appear

to be consistent with the latter results by suggesting that observations of the behaviors and expressed emotions of an opponent may serve as an external indicator of the performer's PM, not necessarily the PM of the opponent.

The encouragement of teammates, coaches and spectators have been identified as factors that might contribute to the development and maintenance of an athlete's PM (Jones & Harwood, 2008). The findings of the present study supported this notion as coaches, teammates, and the crowd were included among the external indicators of PM. In particular, co-participants described perceiving positive PM when they identified behaviors in their teammates that suggested they were experiencing positive PM, such as seeing them clapping and cheering, or "providing energy off the bench." Additionally, co-participants identified a noisy crowd as being an indicator of positive PM. These findings suggest that athletes may establish perceptions of PM based on the encouragement of those around them. Such results would appear to have practical implications for teammates, coaches and spectators interested in positively impacting athletes' perceptions of PM. In the following section, these and other practical implications are suggested.

Practical Implications

The results of this study offer several practical implications for athletes, coaches, and sport psychology practitioners wishing to enhance the quality of sporting performance and participants' perceptions of positive PM. It should be noted, however, that PM appears to be a phenomenon that is experienced in an individualistic manner for each athlete. Therefore, the following recommendations may not dramatically contribute to the experiences of all athletes, including those in sports not represented in the current study. In order to facilitate the experience of positive PM,

Athletes might:

- Identify aspects of their performance that they can control in order to help them perceive positive PM, and perhaps more importantly, learn *how* they can control these aspects during competition.
- Practice specific strategies that contribute to perceptions of positive PM during competition. For example, practicing changing the pace of play at certain times to establish control of the game tempo prior to their competition.
- Recognize that although score-line is a legitimate indicator of their PM, it is by no means the definitive or only indicator.
- Use pre-competition warm-ups purposefully to capitalize on the early parts of performance, rather than ‘easing-in,’ to promote early success perhaps helping to create earlier perceptions of positive PM.
- Understand that although one “big play” may result in perceptions of PM, PM can also be created through a more systematic approach to performance. Therefore, athletes should be discouraged from trying to force the big play, but recognize techniques and strategies they can use during competition to build their own PM.
- Provide encouragement to teammates throughout competition, both when the team is experiencing positive PM and negative PM.

Coaches might:

- Consistently remind their athletes to play within their limits and not try to force a big play.
- Instruct their players to go back to basics when they need to perform more successfully or when they perceive PM to be negative.

- Constantly remind athletes that they can create momentum purposefully.
- Provide encouragement to athletes in situations where they may be perceiving either positive PM or negative PM.
- Develop specific strategies to assist athletes in controlling the rhythm and tempo of performance.
- Develop practice activities/situations that allow athletes to “practice how they play,” thus allowing athletes to practice for the development of PM rather than waiting for it to emerge in competition.
- Remind athletes that they will likely perceive positive PM and negative PM throughout an entire competition, especially against tough opponents that present a high level of resistance.
- Remind athletes to approach every game in the same manner regardless of the quality of opponent. While it may be more difficult to perceive positive PM against a lesser opponent, it remains an opportunity to implement strategies successfully creating perceptions of positive PM.

Sport Psychology Consultants can:

- Help athletes understand that perceptions of PM are only perceptions and teach them cognitive restructuring techniques for minimizing or countering internal indicators of negative PM.
- Consistently remind athletes that one “big play” against them is just one play, and remind athletes to not allow such plays to take on a more significant meaning than is needed.

- Direct athletes' attention to the process of performance and the control of aspects of performance that are under their control. Develop focus cues the athlete can use when attention drifts towards PM, rather than on aspects of performance that produced the perceptions of PM.
- Help athletes appreciate the concepts of controlling rhythm and tempo by encouraging them to focus on both during practices and in a purposeful pre-competition warm-up.
- Help athletes to recognize indicators of negative PM and understand the specific mechanisms for counteracting such perceptions.

Suggestions for Future Research

The results of this study have substantiated and extended some of the findings of previous research. In addition they offer a greater understanding of athletes' experiences of PM and provide a strong platform from which to further examine the mechanism of this phenomenon and the impact that it can have on performance. Due to the obvious complexity of PM, future research should continue to examine the experiences of athletes and the impact that PM has on their performance. While this study examined the experiences of volleyball, basketball, soccer, and tennis players, future research might include a wider variety of team and individual sports. The differences between IM and CM may also be a focus of future research in order to examine the way in which each impacts athletes' perceptions of PM. A greater understanding of these complexities may inform applied practices and help sport psychology practitioners develop more effective mental training interventions.

It is also recommended that future researchers place the athlete at the center of the research process. With regard to experiencing PM during performance, athletes are the experts

and researchers should consider them the primary resource for future investigations of PM. A final suggestion is for future research to examine athletes' perceptions of PM during actual competition. While this may be a lofty goal due to the likely intrusion of research methods on performance, such research may help provide a more sophisticated understanding of how athletes perceive PM when it matters most. Future researchers might alternatively examine PM in competition by simulating actual performance scenarios or allowing athletes to revisit recent performances using video replay.

Conclusions

The descriptions of the current co-participants demonstrated that they perceive PM to be a very real concept that influences their sport experience. In addition to being prompted by instantaneous events, PM can emerge as the result of conscious efforts of athletes to improve various aspects of their performance during a competition. Finally, while score or outcome markers appear to be the most salient external indicators of PM, perceptions of positive PM are also possible in the absence of such markers.

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Appendices

Appendix A - Comprehensive Examination

Comprehensive Examination

Greg Young

Committee Member – Dr. Joe Whitney

University of Tennessee

Introduction

The purpose of this paper is to explore possible connections that exist between psychological momentum and other areas of classic sport psychology literature. In particular this paper will focus on aspects of psychological momentum that may influence, or indeed be influenced by self-efficacy theory, the various proposed theories relating to arousal in sport performance, and achievement goal theory. It is my intention that this exploration of psychological momentum, through various aspects of existing literature regarding these established theories, will provide further insight into the mediating factors of what is considered to be a somewhat subjective phenomenon that can be difficult to understand and is often elusive (Cornelius et al., 1997, p. 78)

Psychological Momentum and Self-Efficacy

Self-efficacy is concerned with judgments of how well one can execute courses of action required to deal with prospective situations (Bandura, 1982). In other words, self-efficacy is the perception of one's ability to perform a task successfully relating to a specific situation. The term self-efficacy is often used interchangeably with self-confidence. However, self-confidence can be referred to as a construct that is more trait-like or more state-like dependent on the manner in which it is referenced (Vealey, 2001). This is in contrast to self-efficacy that is entirely based upon situational components and how an individual appraises his or her capabilities to successfully complete a task (suggesting that it is entirely state dependent). Self-efficacy was originally a contribution to the social psychology literature, but has since become a valuable and integral component in the study of performance in sport psychology.

It is generally recognized that high levels of perceived self-efficacy positively impact the performance of tasks. This is due to several mediating factors relating to the thoughts, emotions,

and actions of individuals during performance. Self-efficacy becomes a very important aspect when an athlete is placed into a competitive situation that requires high levels of performance and the execution of specific skills in order to be successful.

For an individual's perceptions of self-efficacy to be formed/alterd there must be an appraisal of the environment, including fellow actors/opponents, and the task requirements. If a performer feels that he/she has the resources available to successfully deal with the situation or task then it is likely that the performer will perceive a high level of self-efficacy, leading to behaviors and actions that may positively impact performance. Contrary to this, if a performer does not feel that they can perform in the constraints of the environment or task then they are likely to perceive lower levels of self-efficacy and thus display behaviors inconsistent with those required to complete the task successfully.

The importance of perception is also true for psychological momentum. Psychological momentum is based upon the individual's interpretation of the situation in which they find themselves. Specifically, performers may recognize instances during performance that they identify as precipitating causes of the onset of psychological momentum (that may be either positive or negative in nature) (Vallerand et al., 1988). In order for a perception of psychological momentum to occur, the performer must appraise the precipitating events (antecedents) as an important aspect of their performance. That is to say that the same precipitating event during performance may result in an alteration of psychological momentum for one person, but not for another (Taylor & Demick, 1994). If a precipitating event is not recognized by a performer as a factor that may influence psychological momentum, then the event is disregarded. If the event is appraised to be important to performance then it will impact the perceptions and feelings of the

performer relating to self-efficacy and psychological momentum, and ultimately behaviors relating to performance.

The antecedents-consequence model of psychological momentum proposed by Vallerand and colleagues (1988) suggests that psychological momentum refers to a perception that the performer is progressing towards his or her goal. These perceptions are subjective and are entirely dependent on the individual that holds them, suggesting that perceptions are by no means rooted in objectivity that may include results (Vallerand et al., 1988). This may also be true for self-efficacy. According to Bandura's (1982) framework, an important source of self-efficacy is that of previous or past performance. This may not necessarily mean a previous event in the current performance (described as a precipitating event in the antecedents-consequence model) as it may include previous performances that have occurred well before the present performance. Previous performance, or enactive attainment (Bandura, 1982), provides the most influential source of self-efficacy information, as it can be based on authentic experiences that the performer has actually had. Previous successes in performance will heighten perceptions of self-efficacy while repeated failures will lower it. Previous success that occurs during performance may also help to foster perceptions of psychological momentum (Burke et al., 2003). If the performer perceives the precipitating event to be of importance then this will produce a change in their self-efficacy. For example, if the event is appraised as successful (which may or may not include outcome success) then there will be a shift towards an increased perception of self-efficacy. Appraising performance in this subjective manner is an important aspect of self-efficacy as people are influenced by how they read their performance successes rather than by the successes per se (Bandura, 1982). This increase in self-efficacy interacts with other situational, contextual, and personal variables, to influence perceptions of psychological

momentum, generally with an increase in self-efficacy contributing to a more positive perception of psychological momentum. The perception of psychological momentum may also be influenced by self-efficacy as performers exhibit a collection of successful performances that can be “chunked” together to form a larger block of success that can include several precipitating events impacting perceptions of self-efficacy and in turn psychological momentum (Duda & Treasure, 2006).

An additional factor relating to previous performance and its impact on psychological momentum that may contribute to increased perceptions of both self-efficacy and psychological momentum is pattern recognition. Specifically, performers that have a lot of experience in competition are more able to recognize potential precipitating events that may influence self-efficacy and psychological momentum. It is suggested that expert performers are better prepared to recognize these triggers due to better articulated schemas that have been influenced by numerous performances (Allard, Graham, & Paarsalu, 1980). As expert performers hold these well-developed schemas they are more likely to appraise and interpret situations as being related to psychological momentum and self-efficacy (Vallerand et al., 1988). As a result, experts are able to execute more sophisticated and rapid information processing in a more efficient manner that leads to the subsequent use of more effective cognitive and behavioral responses to the situation, or indeed to the perceptions of momentum currently held by the performer (Taylor & Demick, 1994). The utilization of such a strategy would suggest that experts, or to a lesser extent individuals with greater experience, would differ in ability from novices by being able to recognize, initiate, maintain and disrupt psychological momentum during performance (Taylor & Demick, 1994). Particularly, it would be hoped that experts would maintain perceptions of positive momentum and be able to counteract negative momentum by activating the necessary

schemas when confronted with a recognized precipitating event. The performer's ability to recognize cues from specific situations due to previous experiences is likely to influence perceptions of self-efficacy. In particular it would be logical to suggest that having recognized and experienced a precipitating event previously would lead to a greater perceived level of self-efficacy, due to an understanding of the requirements of the task, and indeed any previous success that may have occurred in the undertaking of the same task in a prior performance.

A second important source of self-efficacy is verbal persuasion. This is often a common practice of teachers, coaches, and fellow players to influence the self-efficacy of an athlete. The goal of verbal persuasion is to get people to believe that they possess capabilities that will enable them to achieve what they seek (Bandura, 1982). Verbal persuasion can also be used in such a manner that the performers themselves provide verbal statements in an attempt to increase self-efficacy. This method is termed *self-persuasion* and is considered a variant of self-talk used to enhance concentration (Weinberg & Gould, 2006, p. 334). This is considered a method of positive self-talk as it is intended on increasing energy, effort, and positive feelings towards performance in an attempt to increase perceptions of self-efficacy (Weinberg & Gould, 2006, p. 380).

The multidimensional model suggests that momentum is not considered a force that is always present; in fact the absence of psychological momentum is considered the normative state of competition. It is posited that momentum can only be perceived when a precipitating event occurs (Taylor & Demick, 1994). The projected-performance model of psychological momentum (Cornelius et al., 1997) elaborates on this notion of psychological momentum not being a normative state by suggesting that psychological momentum (both positive and negative) is nothing more than a label assigned when performance deviates from what would be considered

a mean level (Cornelius et al., 1997). As such, performance that may be above the level usually expected for an athlete would be given the label of *positive momentum* with performance to the contrary being labeled as *negative momentum*. This model of psychological momentum suggests that these labels are often misused if they are attributed magical powers that determine the outcome of events (Cornelius et al., 1997). An interesting connection between this model of psychological momentum and self-efficacy may be the use of these labels by coaches, and indeed athletes, when employing self-talk strategies. For example, if an athlete is performing well and having success during competition that may be slightly above the level expected, a coach may choose to tell that player that he is experiencing momentum (phrasing the statement “you’re on a roll”, for example). The use of this term, although described in the projected performance model as merely a label (Cornelius et al., 1997), may be a useful tool in increasing a performer’s perceptions of self-efficacy with the intention of raising performance, or in this case maintaining it, at a high level leading to continued success. Conversely, if a player appears to be playing below the level that would be expected and feeling that the momentum of the competition is with their opponent (i.e. experiencing negative momentum), a coach may use a similar tactic by employing verbal persuasion to increase the performer’s level of perceived self-efficacy. This may be accomplished by explaining to the athlete that the momentum they perceive to be against them is not a factor in the outcome of the competition, but rather just a descriptive phrase used to label that their opponent is performing to a slightly higher level than they would have expected. If this were the case, then the projected performance model of psychological momentum would suggest the opponent will soon drop back down to a mean level and that the feelings of negative momentum, that are simply part of the natural variations of performance, should diminish. Reminding the athlete that these labels are not magical

determinants of performance outcome may increase self-efficacy and have a positive influence on their play.

Perceptions of self-efficacy also play an important role in performance regarding the overcoming of obstacles that may be present during competition. Individuals with high levels of perceived self-efficacy are more likely to undertake and perform assuredly tasks that they judge themselves capable of succeeding at as well as exerting greater effort in an attempt to overcome the challenge that may accompany such tasks (Bandura, 1982). In addition to this individuals that have serious doubts about their capabilities in performance, therefore low self-efficacy are likely to slacken their efforts or give up entirely.

The likelihood to persevere also has implications when considering psychological momentum. If an athlete is faced with what they perceive to be negative momentum those with low levels of self-efficacy are likely to reduce their efforts during performance (Bandura, 1982). This will most likely lead to continued failure in performance. Repeated failure will result in lowered self-efficacy and continued perceptions of negative momentum (that will most likely continue to perpetuate in a cycle). Conversely, an individual with high perceptions of self-efficacy, when faced with similar perceptions of negative momentum will show a greater resilience and persevere through the performance in an attempt to disrupt these negative perceptions of momentum thus leading to future success. This is described as negative facilitation, suggesting that following failure there will be an increase in momentum and this initial failure will increase the probability of future success (Silva et al., 1988).

Summary

Self-efficacy and perceptions of psychological momentum appear to have several overlapping factors. While it is recognized that self-efficacy appears as a mechanism in some

models of psychological momentum (Cornelius et al., 1997; Taylor & Demick, 1994), there appears to be some areas in which perceptions of psychological momentum act as a mechanism for self-efficacy. It is important to note that high levels of perceived self-efficacy are not solely responsible for increases in or the maintaining of successful performance. The individual must possess the ability and relevant skills required to overcome the task, with self-efficacy and perceptions of psychological momentum acting as mediating factors in performance.

Psychological Momentum and Arousal

Arousal and its effect on performance is a subject that is of great interest to coaches, athletes, and sport psychology consultants. Defined as a combination of psychological and physiological activation in a person, it refers to the intensity of these feelings during a particular moment (Weinberg & Gould, 2006, p. 78). To do complete justice to the existing literature on the topic of arousal and performance in this paper would be a very difficult and somewhat unwarranted task requiring an extensive review of literature spanning over half a century of work. However, some basic underlying findings of the literature are indeed helpful to understand arousal as a mechanism of performance. The following statements serve as such.

1. A high level of arousal is essential for optimal performance in gross motor activities involving strength, endurance, and speed.
2. A high level of arousal interferes with performances involving complex skills, fine muscle movements, coordination, steadiness, and general concentration.
3. A slightly above average level of arousal is preferable to a normal or sub-normal arousal state for all motor tasks (Oxendine, 1970).
4. Arousal is not automatically associated with either pleasant or unpleasant events (Weinberg & Gould, 2006, p. 78).

Of particular interest is the relationship of arousal and performance. This is clearly an area of interest due to the numerous conceptual models that have been proposed to help understand how arousal may influence or facilitate performance. These conceptual models include drive theory (Spence & Spence, 1966), 'Inverted-U' hypothesis (Landers & Arent, 2001; Yerkes & Dodson, 1908), the individualized zone of optimal functioning (Hanin, 1997), the multidimensional model of arousal, catastrophe theory (Hardy, 1990), reversal theory (Kerr, 1997), and cue utilization theory (Easterbrook, 1959). In this section I will attempt to understand how psychological momentum fits into some of these conceptual models and how it impacts, or is impacted by these theories of arousal and performance.

The antecedents-consequence model (Vallerand et al., 1988) has placed no importance on the importance of physiological arousal. The model does however include changes in perceptions and feelings that includes *energy* (Vallerand et al., 1988). This notion of energy may include physiological responses that reflect greater levels of arousal, but it is unclear whether this is the intention of the authors. However, the multidimensional model (Taylor & Demick, 1994) suggests that arousal is the most important phase of establishing, maintaining, and disrupting momentum. It is suggested that the change in physiological arousal is a result of the changes in cognition occurring after a precipitating event is judged as salient in the multidimensional model. This change in arousal can also influence these cognitive changes as an individual may become aware of his changing physiological state thus influencing consequent self-efficacy (Bandura, 1982), motivation, and attentional focus (Nideffer, 1976). These physiological states may include, but are not limited to, changes in heart rate, respiration, perspiration, and feelings of adrenaline. The direction in which psychological momentum occurs is contingent on these shifts

in both direction and magnitude. Additionally, the manner in which these changes are appraised by the individual dictate the effect that will influence psychological momentum.

In order for an individual to perform to his or her optimal level there must be a shift towards the optimal level of physiological arousal required for both the individual and the task that is being undertaken. Oxendine (1970) suggests that there are various levels of arousal that are desirable for specific tasks within sport performance. For instance, a football lineman is said to need an arousal level of five, while a field goal place kicker requires only to be at level one (on a scale of 1 to 5, with zero being a normal everyday state) (Oxendine, 1970). If athletes are not physiologically primed to do so, meaning to be at the required level of arousal, then they cannot perform to their optimum level (Oxendine, 1970; Yerkes & Dodson, 1908). It is suggested that in order for perceptions of positive psychological momentum to occur, the individual must produce or maintain a shift towards the optimal level of arousal for the task that may facilitate consequent performance in positive manner (Taylor & Demick, 1994). Conversely, changes in arousal that direct the performer away from an optimal level will most likely result in changes that facilitate perceptions of negative momentum by impeding optimum performance.

This notion of an optimal level of arousal facilitating perceptions of positive momentum, with non-optimal arousal diminishing these perceptions (and in some cases producing perceptions of negative momentum) is consistent with the inverted-U hypothesis (Landers & Arent, 2001; Yerkes & Dodson, 1908). This model suggests that there is a optimal point of arousal which facilitates performance, with anything falling below this point being classified as under-arousal and anything past this point being over-arousal. This model suggests that arousal follows a bell-curve and that the exact midpoint of the curve is the optimal point. The optimal

point of the inverted-U hypothesis appears to be somewhat rigid suggesting that it is a point that may resist alteration when influenced by situational and other contextual factors.

Due to the notion of certain tasks requiring different levels of arousal for optimal performance (Oxendine, 1970) it can be suggested that the inverted-U hypothesis may not necessarily be the best fit when considering the impact of arousal on psychological momentum. It has been suggested that experiencing a high level of psychological momentum implies that an athlete is very aroused (Vallerand et al., 1988). This suggests that different tasks may be more prone to experiences of psychological momentum. For example, based on the work of Oxendine (1970), it is suggested that a task such as cycling may be more susceptible to perceptions of psychological momentum due to high levels of arousal associated with peak performance. However, it could be argued that it is the perceptions of the individual athlete and the manner in which performance is appraised in combination with arousal and situational variants that dictates potential perceptions of psychological momentum. This notion would seem to be consistent with the multidimensional model of psychological momentum that suggests an interaction between cognitive changes, affective changes, and physiological changes, including arousal in the second stage of the model (Taylor & Demick, 1994).

This individualized approach to arousal and performance is more closely linked to the individualized zones of optimal functioning proposed by Hanin (1997). This model suggests that athletes have a zone of arousal in which they perform at their best, rather than a single point as suggested in the inverted-U model. The model allows a greater degree of flexibility and variation dependent on the situational constraints of the task and the individual involved. The use of a bandwidth of optimal performance to replace a point of optimal performance allows performers to have a zone of optimal functioning at low, mid, or high levels of arousal.

To further consider that arousal level is more dependent on situational elements and the appraisal of performance by an individual when influencing psychological momentum rather than by the task alone, it is important to take into account the script or context in which the performance is occurring. For example, making three steals in a basketball game while winning by a considerable margin is less likely to produce psychological momentum due to low levels of arousal, as the performer may not appraise the situation as a precipitating event that can trigger perceptions of psychological momentum. However, the same event in a game that is tied going into the final minutes would most likely be accompanied by high levels of arousal and be perceived as positive momentum by the athlete.

Reversal theory proposed by Kerr (1997) provides some interesting considerations when connected with psychological momentum. Much like the manner in which psychological momentum is perceived in the antecedents-consequence (Vallerand et al., 1988) and multidimensional model (Taylor & Demick, 1994), reversal theory states that arousal level is based on the perception of the individual. That is not to suggest that arousal only exists if the athlete perceives it, rather that reversal theory is based upon how the athlete interprets the changes in arousal relating to performance. This is an important notion, as it is not how much arousal is felt but how it is interpreted, as well as allowing a fluctuation from moment to moment regarding how it is interpreted. Reversal theory states that arousal can be interpreted as in a positive or negative manner. Low levels of arousal can be seen as either boring (negative) or relaxing (positive) with high levels being seen as unpleasant anxiety (negative) or pleasant excitement (positive) (Kerr, 1997). It may be posited that if an athlete perceives their arousal to be a positive state then they may be more susceptible to feelings of positive psychological

momentum. Conversely, if they perceive their arousal to be a negative factor then they may become more likely to perceive negative psychological momentum during performance.

Summary

According to the multidimensional model (Taylor & Demick, 1994) arousal plays a very important role in fostering perceptions of psychological momentum. In order for individuals to perform to their optimal level they must be primed to do so. The inverted-U hypothesis of arousal considers this optimal level to be a single point on which individuals must establish themselves to perform at their peak (Yerkes & Dodson, 1908). Additionally, it is suggested that physiological activation or arousal must shift towards this optimal level in order for positive psychological momentum to occur (Taylor & Demick, 1994). Later modifications to this notion suggest that this optimal performance falls within a bandwidth of arousal that may be at varying levels due to the nature of the task and situational considerations (Hanin, 1997). This model may be considered closely related to psychological momentum as situational characteristics must interplay with physiological factors to influence perceptions of momentum (Taylor & Demick, 1994). A final link is that of interpretation. Precipitating events must be appraised as important to the overall performance in order to influence perceptions of momentum. This notion is also present in reversal theory, which suggests the performer can positively or negatively interpret arousal. It is logical to assume that a performer who interprets high levels of arousal to be pleasant excitement would be more susceptible to perceptions of positive psychological momentum.

Psychological Momentum and Achievement Goal Theory

Considered to be the psychological construct that energizes, directs, and regulates achievement behaviors, motivation is of particular interest to athletes, coaches, and sport

psychology professionals. Dictated by the direction and intensity of effort, motivation plays a vital role in the behaviors emitted by athletes during performance. Direction refers to what the athletes seek out to do, the attraction to a specific task or to a particular opponent. The intensity of effort refers to the amount of effort that is put forth in a specific situation and is of particular interest in situations that may not appear to be favorable for an athlete (e.g. while losing).

One particular theory of motivation that is of interest in this case is achievement goal theory (Nicholls, 1984). Achievement goal theory assumes that achievement goals influence achievement beliefs and direct subsequent decision-making and behavior in achievement contexts. Achievement goals are the purpose of striving towards an outcome set out by an individual that are usually designated before the commencement of performance. Achievement beliefs underpin the reasons for selecting achievement goals, and are likely to influence strategies related to the approach of the task, avoidance strategies, and levels of engagement throughout the activity (Roberts, Treasure, & Conroy, 2007, p. 4). With these integrating factors in mind it is important to understand that present is the assumption that all performers are intentional, rational, goal-orientated individuals that choose to act in a certain manner (Roberts et al., 2007, p. 4). The major consideration regarding achievement goal theory is that individuals desire to demonstrate competence in performance and avoid demonstrating incompetence regarding ability. This directs the overall goal of achievement goal theory and is the major driving force behind behavior in performance contexts.

Competence can be separated into two differing contexts, the first being an undifferentiated concept that does not separate ability and effort. This may be done deliberately or may be the result of an inexperienced individual not being able to distinguish between these two contributing factors. This undifferentiated concept of ability is also referred to as task-

involvement. The second classification is the differentiated concept of ability that does see effort and ability as two separate entities. This is also referred to as ego-involvement. The goal orientation of task-involvement is to develop and display mastery of a task, including learning and improvement. The demonstration of ability is self-referenced in this case and is subject to appraisal from the performer internally. Ego-involved athletes base their goals around ability when compared and referenced against others. That is to say the main goal is the outperformance of others. For ego-involved athletes with high ability the motivation is to display this superiority to others while exerting the minimum amount of effort. If the ability of the ego involved athlete is low, then they are likely to fail in outperforming their opponent and will subsequently demonstrate maladaptive achievement behaviors such as avoiding the task/challenge, not persisting, applying little effort, and in some cases dropping out (Roberts et al., 2007, p. 5).

The notion of persistence becomes very important when relating achievement goal theory to perceptions of psychological momentum. Specifically, when an athlete perceives themselves to be in a situation that they are experiencing perceptions of negative momentum, that is to say they perceive that the momentum is with their opponent, the goal orientation of the athlete plays an important role in the manifestation of subsequent behaviors and ultimately the outcome/success of future performance. If an athlete is experiencing perceptions of negative momentum and they are ego-involved athletes, particularly those with low ability, then they are less likely to persevere with performance in order to dig themselves out of a perceived hole. Athletes that are task-orientated, and are dedicated to mastery of the task are more likely to

persevere in the presence of perceived negative psychological momentum.⁴ Task-involved individuals are more likely to develop specific strategies to counteract negative momentum when compared to ego-involved athletes that are more likely to believe that they can preserve and disrupt these perceptions by ability alone. It is important to note that these goal orientations are subject to change and can fluctuate depending on how the individual perceives the performance of the task to be progressing. However, the predisposition to task or ego-involvement does become somewhat enduring over time.

With the understanding of adaptive behaviors being demonstrated by task-involved athletes during difficult periods of performance, i.e. instances where they may perceive momentum in a negative manner thus hindering performance, it is important to identify how this may influence the potential disruption of these perceptions. Negative facilitation is a mechanism that suggests that following failure there will be an increase in momentum and the prior failure will result in an increase in performance leading to future success (Silva et al., 1988). This process may be triggered by the motivational involvement of the task-involved athlete who is dedicated to improvement and perseverance in demonstrating mastery of the task. This is unlikely to be the case for ego-involved athletes (low ability) that wish to show dominance over an opponent.

Contrary to the notion of negative facilitation is positive inhibition. This is a mechanism in which a performer becomes successful fostering perceptions of positive momentum which leads to a decrease in motivation leading to subsequent failures in performance (Silva et al., 1988). This may present a potential problem for athletes that are ego-involved with high levels of ability. These athletes, due to their high level of ability are likely to experience success during

⁴ This may also be the case with hi-ability ego orientated athletes as they are individuals that seek out competitive encounters and wish to demonstrate superiority over opponents.

performance. This can potentially be accompanied by perceptions of positive momentum. As the athlete is ego-involved they wish to demonstrate their ability over an opponent with as little effort as possible. This can lead to the athlete 'easing-off' during performance due to low levels of motivation, leading to subsequent failures (caused by either themselves or by opponents good play). This may contribute to perceptions of negative momentum by acting as a precipitating event and influencing self-efficacy during performance.

A final consideration regarding achievement goal theory and psychological momentum is control. The need for control is an integral part in an individual's understanding of his or her world. This plays an important role in understanding the motives for achievement for an individual in the sporting context. Both the antecedents-consequence (Vallerand et al., 1988) and multidimensional models (Taylor & Demick, 1994) of psychological momentum stress the importance of control. Vallerand and colleague's model (1988) states that the critical psychological variable that will determine whether psychological momentum is perceived is the degree of perceived control inherent in the situation in combination with the need for control of the individual. This belief in personal control plays an integral role in one's sense of competence (Vallerand et al., 1988). Vallerand, et al. (1988) state that individuals that tend to see everyday situations as under their control, or desire to be in control should be more likely to perceive control in a sporting situation and therefore be subject to increase levels of perceived psychological momentum. It can be assumed that individuals with ego-orientation especially those with high ability (and thus generally high perceptions of self-efficacy) have a great desire for personal control. This comes from the motivation to demonstrate superiority over their opponent. If this is indeed the case then it could be expected that ego-involved athletes are more likely to have perceptions of psychological momentum. This may be in either a positive or

negative manner. This may present issues in performance for an ego-involved athlete, as earlier stated, perceptions of negative momentum may lead to maladaptive behaviors while perceptions of positive psychological momentum may lead to positive inhibition. For task-involved athletes perceptions of negative momentum may more likely lead to negative facilitation, while positive perceptions will continue to grow as positive by demonstrating control and mastery of the task.

Summary

Achievement goal theory (Nicholls, 1984) and psychological momentum clearly display overlapping components. Understanding the achievement goals of the individual could potentially be an indicator of how the athlete will react (specifically the behaviors they will exhibit) when confronted with perceptions of positive and negative psychological momentum. Due to the motivation to display task mastery and the increased likelihood to display adaptive behaviors when faced with negative momentum, it could be suggested that although ego-involved individuals are more likely to perceive psychological momentum, as they desire higher levels of control (Vallerand et al., 1988), task orientated athletes are better equipped to maintain or disrupt positive and negative momentum respectively. Additionally, the antecedents-consequence and multidimensional models of psychological momentum both place emphasis on the importance of control during performance as a strong influencing factor that alters cognitive appraisal of the situation thus influencing perceptions of momentum.

Conclusion

The purpose of this paper was to explore possible connections between psychological momentum and other areas of classic sport psychology. It is clear that there are several overlapping considerations and links that exist not only between psychological momentum and each individual area explored, but also across each of these areas, as identified and supported by

relevant literature from each topic. The connections and logical suggestions presented herein have strengthened my understanding of the mechanisms of psychological momentum and have enhanced my own personal views of how the phenomenon may manifest in athletes.

Appendix B – Informed Consent
Athletes' Experiences of Momentum: An Existential Phenomenological Investigation

I would like to invite you to participate in a research study examining your experiences of momentum in your sport.

If you agree to participate in the study, I will schedule a convenient time to conduct an interview with you. I anticipate the interview will take between 30 and 90 minutes. The time frame can be adjusted based on your availability and at your convenience. The interview will be audio-taped and transcribed. I might contact you again to ask follow-up questions after looking at your interview. I will then attempt to identify the major interview themes and write them up in a paper. You will have an opportunity to review the themes and let me know if they describe your experience accurately. You will be asked to provide a pseudonym (or have one provided for you) to ensure your identity remains confidential.

Participation in this study will give you an opportunity to share specific situations that stand out for you regarding your experiences of momentum in your sport. Your data will be stored securely and will be made available only to persons helping with the study unless you specifically give permission in writing for me to do otherwise. All persons will treat your interview as strictly confidential. No reference will be made in oral or written reports that could link you to the study. The results of the study should provide a greater understanding of how athletes experience momentum in their sport and may be helpful for athletes, coaches, and mental training experts.

My faculty advisor, the research team assisting me in thematizing your interview, and I are the only ones who will have access to your audiotape. It will be kept in a locked file cabinet in Room 344 in the HPER building until after the data have been analyzed, at which point the audiotape will be destroyed. The interview transcript will be kept in a locked file cabinet for three years and then destroyed.

Your participation in this study is voluntary. If you decide to participate, you may withdraw from the study at any time without penalty. If you withdraw from the study before the interview is completed the data will be returned to you or destroyed. By signing this form you acknowledge that the procedures of this study have been fully explained to you and that all of your questions have been answered. However, you may ask me any additional questions at any time.

If you have any questions about the institutional review process at the University of Tennessee you may contact the UT Office of Research (865-974-3466). If you would like to schedule an appointment to meet with a mental health professional you may contact the UT Counseling Center (865-974-2196)

(Printed Name of Participant)

(Signature of Participant)

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Appendix C - Confidentiality Statement: Transcription Agency

By signing below, I agree to keep any information pertaining to the interview transcripts of the study *Athletes' Experiences of Psychological Momentum: An Existential Phenomenological Investigation*, conducted by Greg Young, confidential.

Name of Transcription Agency:

Name of Transcriber:

Signature of Transcriber:

Date:

Appendix D - Sample Field Note

Jessica (Interview 3)

Jessica seemed very comfortable and relaxed talking about her experiences. I got the feeling she was a bit apprehensive about the process coming in but after understanding exactly what I was looking for I think she enjoyed talking about her performances. She seemed very positive about momentum and thought it was a big deal in her performance. She mentioned a couple of times about how she is relatively quiet on court in comparison to other players, this is reflected in her personality, as she is not shy but really tries to articulate in a thoughtful manner what she is trying to say. I felt that the points she raised seemed to flow nicely. I think a couple of times I might have directed questioning a bit, although I thought that my questions would help her unpack a little bit. Maybe something I need to check up on. I see some similarities to interview one, maybe that is due to the nature of the games of tennis and volleyball. Perhaps there will be a disconnect between these two and the other team sports?? I think things went really well, she seemed to enjoy talking and didn't appear to be distracted by anything – hopefully everything else goes this smoothly!!

8.5 out of 10

Appendix E - Confidentiality Statement: Research Group

As a member of the UT College of Nursing Phenomenology Group, by signing below, I agree to keep any information discussed regarding interview transcripts of the study *Athletes' Experiences of Psychological Momentum: An Existential Phenomenological Investigation*, conducted by Greg Young, confidential.

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Appendix F - Description of Thematic Structure for Co-Participants

Dear Participant,

Thanks for participating in an interview for my study entitled “*It Can Start From Anything*”: *An Existential Phenomenological Investigation of Athletes’ Experiences of Psychological Momentum*.

Below is an explanation of the Thematic Structure that is pictured in the attached PDF. The Thematic Structure is intended to capture the experiences of all the players that participated in this study. **I am interested in your feedback** and would like to know whether this structure accurately describes **your** experience of momentum in your sport. One thing to bear in mind is that I interviewed basketball, volleyball, soccer and tennis players, so the diagram is of a generic sport competition (no specific ball is shown). Please let me know if anything is missing or needs to be changed!

- The arrow in the center represents momentum, notice it goes both ways referring to the way you experience momentum in both a positive and a negative way. Also notice the arrow grows thicker at the positive end showing that momentum is building and moving forward. The arrow is split into two and shows the two ways in which athletes’ talked about momentum. Firstly, that momentum could switch or happen instantly (*Instantaneous Momentum*) with one big event (e.g. a dunk, a goal, breaking serve, fierce kill). Secondly, that momentum could be created or built more deliberately (*Created Momentum*) by doing certain things within the performance that you know help to build momentum, such as going back to basics and concentrating on simple skills, controlling the rhythm and tempo of the game, and playing with a lot of effort without “trying too hard”.
- The opponent in blue represents *Resistance*. This resistance represents a certain level of competition that you require to be able to experience momentum. This is usually down to how you view your opponent. For example, are they traditionally strong, have you played them before, is it a school rival, or a big game? In other words, you wouldn’t really experience momentum the same way if you played a middle school team and beat them really easily compared to playing a talented rival that was one of the best in the country!!
- The name on the back of the player in the Orange and White shirt represents how you experience momentum personally (*Internal Indicators*). That is to say what is it inside of you that others might not be able to see or feel that let you know that you are experiencing momentum? These include thoughts related to momentum such as feeling confident, and feeling like you are unstoppable or everything was going your way. They also include ways in which you felt momentum physically and included high adrenaline,

high energy (bouncing around, feeling light, energized, like you were flying) but also feeling like the things you were doing were relaxed and fluid (think the opposite of playing 'tight'). The number 5 is the number of indicators of momentum that I found!

- The Scoreboard represents how you recognize momentum from things outside of yourself (*External Indicators*). These include winning and losing, how successful you are executing your skills (e.g. shooting, serving, passing, blocking), and also being able to see momentum in others like your teammates, opponents, coach, and the crowd. The score on the board (4-2) can be present in all of the sports!
- The crowd (and the banner in the crowd) represents an *Awareness of Momentum* that you have but you are not directly focusing on. In other words much like the crowd at your games, you know momentum is there and can feel it doing something, but you are focusing on other things and playing your game not specifically and directly trying to alter it.
- And finally the context or arena in which this is all occurring is *Competitive Performance*. This is shown using the stadium roof. Just like when you play your games this is where everything takes place!!

VITA

Greg Young was born July 25, 1983 to his loving parents Allan and Joan Young, in North Shields, England. He has an older brother, Steven. Greg attended Berry College, GA in 2001 for his undergraduate studies, graduating with a Bachelor of Science Degree in Health and Physical Education –Teacher Preparation, while achieving All-America honors as a soccer player. Greg also earned his K-12 GA Teaching Certificate and ESOL Certification while attending Berry. He attended The University of Tennessee in 2006 and completed his Masters Degree in Sport Studies with a concentration in Sport Psychology and Motor Behavior. Greg continued his studies at The University of Tennessee and graduated with a Doctor of Philosophy Degree in Kinesiology and Sport Studies with a specialization in Sport Psychology and Motor Behavior on May 12, 2011.