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I am submitting herewithin a thesis written by Elizabeth M. Shannon entitled "NCAA Division I Women's Volleyball Player's Perceptions of Psychological Momentum." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Human Performance and Sports Studies.

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NCAA DIVISION I WOMEN'S VOLLEYBALL PLAYERS'
PERCEPTIONS OF PSYCHOLOGICAL MOMENTUM

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Degree
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ABSTRACT

The purpose of this study was to investigate NCAA Division I women's volleyball players' perceptions of psychological momentum. Due to scheduling conflicts, two subjects withdrew from participation and only four athletes were included in this investigation. All four athletes have completed at least two years of NCAA Division I volleyball at the same university. Three of the athletes were juniors and one athlete was a sophomore. All four athletes were white and ranged in age from 18 to 20 years. All of the athletes experienced the same change in the coaching staff during their college career. One athlete was a setter, one athlete was a middle hitter, and two athletes were back row specialists. All four athletes had full-ride scholarships. None of the athletes were from the same area of the United States. All of their backgrounds were similar in that they all participated in some athletic activity when they were younger. However, they began playing volleyball at different ages.

All four athletes acknowledged that psychological momentum was evident in volleyball. Each athlete has had prior knowledge about psychological momentum either by listening to the coach talk about it or briefly mentioning it as a phenomenon that occurs during sport. None of the athletes had ever discussed psychological momentum in such great detail.

The following conclusions represent the consistent perceptions that the female volleyball players had given throughout the study. Psychological momentum: a) was not a tangible concept, but it does exist; b) was a known concept, but it was not conceptually defined the same by each athlete; c) can be a team or an individual concept, but it was most effective when the whole team recognized the existence; and d) was described as a positive feeling state. In addition, psychological momentum: a) may be with either team, or with neither team, but not with both teams at the same time; b) was not effective unless one of the teams recognized the existence of momentum; and c) was related to making points, winning, and making good plays. The athlete's also perceived that a shift in psychological momentum did not necessarily mean

momentum shifted from one team to the other. Rather, it may be shifted from neither team having momentum to one team having momentum..

The results revealed that psychological momentum was related to positive feelings of intensity and adrenaline, winning points, long rallies, and matches are probable results of having psychological momentum, and recognition by the teams was crucial for psychological momentum to have an effect on the game. Though the findings of this study are not generalizable to other sports, the information gathered provides a greater understanding of athletes' perceptions of psychological momentum.

DEDICATION

I want to dedicate this thesis to my family and friends, whose love and support is the only way I made it through the year. My parents have always been there and supported me throughout everything in my life. They provided the space for me to dream and the strength for me to achieve my dreams. Their unconditional and never-ending love and support have made them the best parents I could have ever been blessed to have. I love you Mom and Dad.

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To my Father in Heaven: Thank you for giving me the tools and strength to accomplish great things in my life. I give all honor and glory to You.

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CHAPTER 1

INTRODUCTION

Different aspects of a game or match have made each situation unique; two teams evenly or unevenly matched, fans, referees or umpires, athletes, coaches, points, and one goal -- to win. One team is more talented than the other; one team makes a comeback victory. Shifts in momentum, whether positive or negative, have constantly occurred throughout games or matches. Athletes, fans, and coaches alike have noticed a difference within a game, but no one can cite exactly how, what, where, or why it occurs. One idea that has been suggested to explain these phenomena in sport is psychological momentum.

Psychological momentum has been a very difficult concept to define and study, but two consistent findings seem prevalent within the literature. The first consistent finding was in support of the bi-directional theory presented by Adler (1981). The bi-directional theory basically stated that success follows success and failure follows failure. Silva, Hardy, and Crace (1988) found their results, in singles and doubles tennis matches, to be consistent with the bi-directional themes of success following success and failure following failure. In their study, early victories in singles matches led to later victories in doubles matches, and success in the first set led to success in subsequent sets. Richardson, Adler, and Hanks (1988) also studied tennis matches, and concluded that early success led to later success in all the skill levels represented in their study. Vallerand, Colavecchio, and Pelletier (1988) compared the perceptions of elite and lower-skilled tennis players. For elite players, success followed success more frequently than for lower-skilled tennis players. Vallerand et al.'s (1988) findings focused on the different skill levels, but still supported Adler's bi-directional theory.

Another study that supported Adler's (1981) bi-directional theory, but did not involve tennis, was Gayton, Very, and Hearn's (1993) study with hockey teams. Their study indicated that the team who scored the first goal and/or the team with the highest score after the first period, was more likely to win the game than the team that did not score first, or the most, in the first period.

Another study, by Burke and Houseworth (1995), was conducted using women's collegiate volleyball players. Their study found that early success led to eventual success in volleyball matches.

Adler's (1981) bi-directional theory was also supported by studies which included both an individual and team sport. Taylor and Demick (1994) found winning players in an individual sport to have more positive events than in the team sport players, which in turn caused more positive outcomes. The team sport players indicated that team successes (positive events) within a game were immediately followed by successful (positive) outcomes.

The second consistent theme dealt with the findings regarding gender, as opposed to just ability levels. Silva, Hardy, and Crace (1988) conducted a study on tennis matches and the effect of negative and positive psychological momentum on ability with regard to gender. The results showed no significant difference between men and women in relation to the influence of psychological momentum on ability. Richardson, Adler, and Hanks (1988) also found no significant gender differences in their study of tennis matches and the effect of psychological momentum on ability. They studied men and women in two different ability levels and did not find a significant difference between the genders with regard to psychological momentum effects on ability.

Only one study found significant gender differences regarding psychological momentum. Weinberg and Jackson (1989) focused on the gender differences in tennis using both men and women athletes. Their study also supported the idea that success leads to success. The results of their study found success leads to success more often for men than women. Women and girls have not traditionally been given the same exposure nor opportunities as men and boys, and therefore carry lower expectations of success (Weinberg & Jackson, 1989). This may explain

why men and women differed in their study. Nevertheless, the findings supported Adler's (1981) bi-directional theory and focused on the gender differences.

After reviewing the literature, only two extreme conflicts were evident. The first conflict was in comparison of a topic already covered in the consistent findings. As first stated above, the majority of the articles were in support of the bi-directional theory. However, two research articles conflicted in their findings with the bi-directional theory. The first study by Shaw, Dziewaltowski, and McElroy (1992), used physical education students in a laboratory study. The focus of the study was on basketball free throws and psychological momentum. The findings indicated that positive success leads to an increase in self-efficacy (a characteristic of psychological momentum in their study), but negative success did not lead to negative (decrease) self-efficacy. The latter finding conflicted with the bi-directional theory, that negative success leads to negative self-efficacy. Silva, Cornelius, and Finch (1992) also found no effect on performance. The study was conducted in a laboratory and dealt with a motor-skill, but the performance was scored as if it were a tennis match. The results showed that the perception of winning or losing had a significant effect on mental cognition, but had no relevance to the outcome. Therefore, the study by Silva et al. (1992) found that early success did not produce success in the outcome.

The second conflict pertained to what the researchers studied. If psychological momentum is to be universal and consistent, then the research needs to focus on the same issue. The first two studies, by Gayton et al. (1993) and Weinberg and Jackson (1989), studied strictly the end results of the subjects' performances. Their definition of psychological momentum was based only upon early success leading to future success. This type of research did not include psychological orientations or perceptions of the athletes and/or observers. Gayton et al. (1993) focused on the first score and the first period score to influence future success in hockey. Weinberg and Jackson (1989) studied whether, in tennis, men and/or women came from behind more often. Richardson

et al. (1988) focused solely on the bi-directional theory in tennis, with no psychological or perceptual aspects. In contrast to looking only at performance, Miller and Weinberg (1991) studied the perception of psychological momentum on critical and noncritical game situations in volleyball. Taylor and Demick (1994) focused on precipitating events and the athlete's perceptions of their effect on game outcomes in both team and individual sports. Silva et al. (1992) used questionnaires to assess the athlete's perceptions of momentum and eventual outcomes pertinent to their motor skill performance. Vallerand et al. (1988) with tennis, Richardson et al. (1988) with tennis, Shaw et al. (1992) with basketball, Burke and Houseworth (1995) with volleyball, and Burke, Edwards, Weigand, and Weinberg (1997) with tennis and basketball, also studied perceptions of psychological momentum of the subjects involved and the eventual effect on performance. The more accurate studies were those concerned with the perception of psychological momentum and its effect on performance or outcome of a game/match. A universal focus will enable the study of psychological momentum to become more consistent.

With the wide range of studies done on team and individual sports, there are few areas left to be explored. One idea, however, that has been initiated but not completely finished is the multi-dimensional model. The multi-dimensional model is very detailed and would be difficult to incorporate completely into one psychological momentum study. Taylor and Demick (1994) used only a few elements of the multidimensional model to provide an operational definition of momentum in their study. The implications of their study were to continue studying the stages of the model. Therefore, future studies should be done focusing on more stages of the model (Taylor & Demick, 1994). The experimental studies reviewed so far by Vallerand, Colavecchio, and Pelletier (1988), Shaw, Dzewaltowski, and McElroy (1992), and Silva, Cornelius, and Finch (1992), have used athletes or college students and their perceptions, but they were conducted in a laboratory or other controlled settings and not while the actual sporting event was occurring.

Definition of Terms

The following terms are defined according to how they were used throughout the study. A few definitions were defined according to Merriam-Webster's Dictionary (10th ed.), as noted by the reference next to the term.

- **Antecedent** is defined as a preceding occurrence, cause or event. In this study, antecedent was defined as the preceding occurrence in the game/match that the athlete believes caused a psychological momentum shift.
- **Consequence** is defined as a result from a preceding action or event. In this study, consequence was used as the athlete's perception of the resulting effects of psychological momentum.
- **Effect** is defined as the result, or something brought about by a cause or an agent.
- **Perception** is defined as recognition and interpretation of sensory stimuli based chiefly on memory.
- **Psychological** is defined as the study of influencing or intending to influence the mind or emotions.
- **Psychological momentum** has no established or consistent definition. It was used in this study as the change in performance due to mental, emotional, and/or physical elements, and the effects of these elements on the outcome of the game and/or match. In this study, psychological momentum was defined differently according to each athlete's perception.
- A **volleyball game** is the first team to score 15 points being at least two points ahead.
- A **volleyball match** is the first team to win three games out of a possible five games.

Assumptions

The following assumptions were made in this study: a) each participant performed to her best ability during the match, b) each participant understood the requirements of the study and agreed to cooperate with complete honesty, c) the athletes answered the interview questions with no

prior biased knowledge, and viewed the videotape incorporating as little bias as possible, and d) the match was NCAA sanctioned and followed the rules of NCAA intercollegiate competition.

Scope of the Study

The limitations of this study included the time frame in which the research had to occur. The ability level was Division I women's collegiate volleyball. The athletes all competed at a university located in the southeastern part of the United States, but were originally from different geographical locations. The study was conducted with no control over how many games were played or the outcome of the match. The initial contact with the athletes involved obtaining information about when and where to contact the athlete, and which match contained the most psychological momentum shifts in their opinion. The selection of the athletes was based upon their playing volleyball during the fall 1997 season as well as the spring 1998 season.

The delimitations of this study included studying women's collegiate volleyball at an NCAA Division I level university. The age group was controlled using eligible collegiate student/athletes. The interview questions were based upon gaining as much information from the student athlete as possible, without limiting the responses to a quantitative style of methodology.

Significance of the Study

The results of this study should benefit coaches and athletes alike. The coaches might improve their ability to notice when psychological momentum is occurring or might occur and subsequently change the game strategy. Coaches should also be better able to identify, and thus combat, the momentum of their opponent in a game/match. The coaches should understand more about the athletes' perceptions of momentum shifts and how to use that knowledge to effectively motivate the team. The athletes might better understand what causes psychological momentum and be able to change their performance to gain advantage over their opponents. The athletes might also better understand how to stop the opponent's momentum by knowing how to shift psychological momentum. By gaining knowledge about psychological momentum, athletes and

coaches could possibly have more control over the game/match outcome by changing performance during the event when necessary.

CHAPTER 2

REVIEW OF LITERATURE

Athletes attribute their successes and failures to many things. A common phenomenon found within all sports is psychological momentum. Psychological momentum can consist of coming back from a deficit in the critical moments of a game/match, having a streak of consecutive scores or victories, and even losing a huge lead in the waning moments of a game/match. Psychological momentum can be either negative or positive. This review includes negative momentum, positive momentum, perceptions of psychological momentum, effects of momentum on the game/match outcome, effects of momentum on subsequent games or sets, and the differences of momentum effects across skill level and gender. The review of literature is organized into three categories: (a) psychological momentum studies concerning both team and individual sport; (b) psychological momentum studies concerning team sports; and (c) psychological momentum studies concerning individual sports.

Psychological Momentum Studies Concerning Both Team and Individual Sports

Taylor and Demick (1994) previewed past theories and research done on psychological momentum in sport and conducted two studies to collect data concerning precipitating events and the effect on the outcome of the competition. Elements from the multidimensional model were used to provide an operational definition of momentum: (a) precipitating events; (b) change in cognition, affect, and physiology; (c) change in behavior; (d) change in performance consistent with the above changes; (e) a coinciding and opposing change in the previous factors on the part of the opponent (for head-to-head competition); and (f) a resultant change in the immediate outcome. The purposes of this study were to provide a more theoretical framework of psychological momentum based upon past investigations and to incorporate the processes involved in psychological momentum development.

The first study by Taylor and Demick (1994) used 25 tennis players with varying degrees of ability from a Master's level psychology class. The students were asked to complete a

questionnaire and list ten events they believed would cause a change in momentum in professional tennis matches. The students were also asked to include a description of the situation when the psychological momentum shift occurred (e.g., who produced the event, score configuration, and point in the match). Only environmental (service ace) effects were used due to the difficulty in measuring internal and social effects. Five of the most frequently occurring responses were chosen out of the 32 different answers. These five responses possessed characteristics associated with the multidimensional model: (a) dramatic shot, i.e.: drop shot, ace, overhead smash; (b) breaking the serve early in the set; (c) winning the game after long deuce; (d) making an unforced error at a crucial point; and (e) not converting 15-40 or 0-40 opportunities.

Five previously taped matches from the 1990 quarterfinal and semifinal rounds of the Men's and Women's U.S. Open Tennis Championships were used to control the differences in ability level. A trained observer recorded every occurrence of the chosen five precipitating events and the situation/scoring pattern. A significant change in momentum (defined as a significant change in scoring or immediate outcome) was indicated when a run of three or more points or a service break in a game occurred. Professional players and coaches were asked to determine a significant change in momentum to ensure validity. The primary observer assessed the times where precipitating events were not evident and if it effected the immediate outcome of the game. A second independent observer was used to evaluate the first observer's investigations (95% concordance reliability).

Data from study one found an average of 30.4 precipitating events per match, across the five matches. A series of Chi-Square analyses was conducted to distinguish precipitating events between players. Winning players had significantly smaller negative precipitating events (18.7%) than losing players (68.9%), and significantly higher positive precipitating events (81.3%) than losing players (31.1%; $\chi^2 = 35.80, p < .01$). Winning players also had significantly greater

proportions of positive precipitating events resulting in positive changes in immediate outcomes (35.6%) than losing players (0.0%, $\chi^2 = 7.20, p < .01$). Winning players also had significantly lower proportions of negative precipitating events resulting in negative changes in immediate outcomes (15.0%) than losing players (54.8%, $\chi^2 = 8.09, p < .01$). No significant difference was found between charting a change in the immediate outcome of the match when a precipitating event preceded it (33.6%) and charting when no precipitating event occurred (23.2%).

Study two used twelve volunteer recreational basketball players. The subjects completed a questionnaire listing 10 precipitating events they believed would cause changes in psychological momentum in collegiate basketball games and the specific situation (time of game, who produced the event, and score configuration) in which it occurred. The researchers identified 30 different potentially precipitating events were identified and the 4 most listed responses that were consistent with characteristics found in the multidimensional model were: (a) starting player must leave the game for a negative reason such as an injury, foul trouble, or ejection, (b) scoring run of three straight baskets by one team, (c) time-out called by the opponent after a scoring run, and (d) dramatic play (slam dunk, three-point basket, fast break, steal leading to a basket, blocked shot, "prayer" shot at the buzzer). From the videotaped 1990 NCAA Men's Basketball Championships, 5 games out of the round of 16 were used to provide control in ability level between teams. A trained observer watched the 5 games and recorded all occurrences of the 4 precipitating events chosen and the scoring patterns within 5 minutes of the precipitating event.

The definition of momentum was the same as in the tennis study. If the score changed by five points during the five minutes following a precipitating event and favored the team with the scoring advantage, or the team won in overtime, a significant change was charted. The criteria of the score change was decided by a sampling of collegiate basketball players and coaches. The observer also indicated whether a significant change occurred in the outcome when no

precipitating event was evident. A second observer was used to ensure reliability of the assessments indicated by the first observer (97% agreement).

For study two, a series of Chi-Square analyses were used to determine if a relationship was evident, for winning and/or losing teams, between the precipitating events and changes in the immediate outcome of the game. The proportion of occurrences of positive and negative precipitating events showed no significant difference between the winning and losing teams. When the presence or absence of an immediate outcome change was included, a near significant change occurred ($\chi^2 = 3.37, p < .07$). Winning teams had a greater proportion of positive precipitating events leading to positive changes in immediate outcomes (36.4%) than losing teams (11.1%). A significant difference was also found when the presence of a precipitating event changed an immediate outcome (22.0%) than when an outcome did not have a precipitating event (0.0%; $\chi^2 = 4.57, p < .04$).

The purpose of exploring the validity of the multidimensional model of momentum in sport in this study was accomplished by studying whether a significant number of changes in momentum was found following precipitating events than when no precipitating event occurred. Results were found for four different hypotheses. Results related to the first hypothesis were different between studies. Winning and losing basketball players did not significantly differ in the amount of occurrences of positive and negative precipitating events. Winning and losing tennis players significantly differed in that winning tennis players had more positive precipitating events and fewer negative precipitating events than losing players. The second hypothesis was supported by the evidence in the study that only a proportion of the precipitating events had an impact in the immediate outcome of the game/match. The third hypothesis wanted to see if the occurrence of positive precipitating events led to a positive change in the immediate outcome for winning teams and players more often than negative precipitating events led to negative changes in immediate outcome. The study found a significant difference that indicated winning players

produce more positive precipitating events and fewer negative precipitating events, and they are better able to successfully act upon the positive and restrict the negative. In the basketball study, it was found that the winning and losing teams did not significantly differ in the amount of precipitating events, but rather the winning team could significantly produce a positive change in the immediate outcome more often. Therefore, the results were also consistent with the thought that it is easier for a single sport participant to cause a positive change with a positive precipitating event than a basketball team, because the momentum chain has to filter through one person as opposed to an entire team. The fourth hypothesis found supportive, yet not conclusive, evidence that a significantly greater number of changes in immediate outcome will follow precipitating events than when no precipitating events occur. The fourth hypothesis was included to rule out that immediate outcomes were effected by precipitating events only by chance. The basketball study found that a precipitating event may be necessary for an immediate outcome change to occur. The tennis study produced no significant difference between the presence or absence of precipitating events and the effect on immediate outcome changes.

Although the study was not completely conclusive because of the lack of empirical data for social or intrapersonal precipitating events, the environmental precipitating events did support the first stage of the multidimensional model. Taylor and Demick (1994) provided empirical data and partial evidence in support of the first stage (relationship between precipitating events and changes in immediate outcome) of the multidimensional model. The future studies should be focused on the following five stages and empirically proving the validity of the multidimensional model's operational definition of psychological momentum and its occurrence in sport. The implications from this research are helpful for coaches to understand and gauge when a momentum shift can occur. Taylor and Demick (1994) concluded that if coaches know the signs (precipitating events), then they may either combat the opponent's momentum shift or enhance his/her team's ability to shift momentum by performing proper precipitating events.

Burke et al. (1997) also conducted separate experiments on both team and individual sports to determine the presence of psychological momentum. Since most psychological momentum research in the 1980's and early 1990's has been focused on the powerful influence of momentum on performance and eventual success, this study was done to determine if psychological momentum truly exists or if it is an illusion in the sporting arena. The purposes of the study were to determine subjects' degree of agreement (disagreement) about the beginning and ending points of momentum, assess the antecedents of momentum (momentum starters/enders), and determine a sense of agreement about the actual definition of momentum between subjects.

For experiment one, subjects were 20 Division I varsity tennis players from Southwestern universities ($m = 12$, $f = 8$; $M = 21$ years). Subjects wrote in their own words the definition of momentum, watched a preselected 20 minute segment of a 1986 semifinal tennis match from the U.S. Open, and provided the following seven pieces of information about the situation they felt changed momentum: (a) which player just gained/lost momentum and the score of the match; (b) whether momentum was caused by good performance by the momentum player, poor performance by the opponent, or a combination of both (antecedents); (c) what events led to the start of momentum (great shot, series of errors, break of serve, etc); (d) score when momentum ended; (e) whether the ending of momentum was caused by good performance by the opponent, poor performance by the momentum player, or combination of both; (f) what events led to the end of momentum; and (g) explain the failure of momentum to occur if the subject perceived a change in momentum and it did not happen. The subjects were told to use their own perceptions of momentum since numerous shifts of momentum can occur throughout one game.

The results were divided into qualitative and quantitative analyses. The quantitative analyses for experiment one showed a lack of agreement by the subjects for both the beginning and ending momentum instances. Fifty-two reported that instances of perceived momentum beginnings accounted for 13 out of 20 tennis points. The three most agreed upon instances only

corresponded for 40%, 30%, and 25% of the time. In other words, the subjects could not agree upon which instances actually caused a momentum shift. However, the reason for momentum beginning was agreed upon 54% of the time as a result of good performance by the momentum player, a combination of good momentum player performance and poor opponent performance 40% of the time, and only poor opponent performance 6% of the time. Similar to momentum beginning points, the subjects did not agree on specific momentum ending points. They found 37 reported instances of momentum ending occurrences for 9 out of 20 points. The subjects agreed upon three most distinguishable characteristics, but only agreed on the occurrence of those characteristics 35%, 30% and 30% of the time. Poor momentum player performance caused momentum ending events 40% of the time, as opposed to good opponent performance 38% of the time, and a combination of good opponent and poor momentum player performance 22% of the time.

The qualitative analyses of experiment one were done to provide a more detailed understanding of the meaning of momentum. An inductive content analysis categorized the subjects' thoughts and ideas into similar themes or categories, and narrowed them down to 20 definitions of momentum in tennis. Subjects perceived momentum (performance-oriented) as a positive change or a positive performance by the athlete (90%). Subjects felt an increase of emotion was involved (psychologically-oriented; 10%), but not as extensively as performance-oriented occurrences. Being performance-oriented entailed taking control of the situation (60%) or being successful (30%). Psychologically-oriented aspects included increased emotion and confidence (each 5%). A deductive analysis for both the beginning and ending of momentum was conducted after the subjects identified the cause of momentum from these three categories: (a) good performance by momentum player; (b) poor performance by opponent; and (c) a combination of both good and poor play. The qualitative results indicated that the beginning of momentum in tennis was most evident as the result of a good play by the momentum player

(73%) or a poor play by the opponent (25%). The combination of good/poor play was not significant in this analysis, unlike the quantitative analysis. Burke et al. (1997) also found the ending of momentum in tennis to be perceived as caused by poor play by the momentum player and a good play by the opponent (54% and 46% respectively).

A second experiment with basketball focused on a team sport. Seventy-eight volunteer students, with organized basketball playing or coaching experience, used the same procedures as the first experiment, but viewed a preselected 27 minute video (12 minutes of actual game time) of a 1991 National Basketball Association playoff game. Forty-seven subjects have either played high school or college basketball (45 and 2 respectively). Fifteen subjects coached high school, junior high, or college basketball (11, 2, and 2 respectively). The two teams competing are referred to as Team A and Team B.

Both quantitative and qualitative analyses were conducted. The quantitative analyses indicated that 232 (M per subject = 4.2; SD = 1.9) perceived momentum beginning instances for a total of 23 basketball scores. As in the tennis experiment, a lack of agreement between the subjects' analysis of beginning momentum was evident. The top three most agreed upon momentum beginning basketball scores were used for Team A and Team B (40%, 28%, 12% and 49%, 37%, 26% concurrence respectively). The momentum change due to good performance by the momentum team was found to occur 61% of the time, a combination of good momentum team performance and poor opponent performance 35% of the time, and poor opponent team performance was 4% of the time. Subjects perceived 216 instances to end momentum across 20 basketball score changes. Again, a lack of agreement was found between the subjects as to when the three most agreed upon momentum ending instances occurred (with the same momentum beginning score) by Team A and Team B (19%, 13%, 3% and 15%, 12%, 12% concurrence respectively). Good performance by the other team was reported 40% of the time to cause

momentum ending, a combination of good other team performance and poor momentum team performance 35% of the time, and only poor momentum team performance 25% of the time.

The qualitative analyses were conducted the same way the tennis qualitative analyses was conducted. An inductive approach was used to define momentum. Definitions of momentum in basketball given by 70 of the 78 subjects. Psychologically-oriented and performance-oriented categories were used to represent the critical aspects of the definitions (51% and 49% respectively). Psychologically- oriented aspects included increased emotion (21%), self-motivation (7%), motivation via others (14%), and concentration (9%). Performance-oriented aspects included being successful (27%), unstoppable (13%), and taking control (9%). As in the first experiment, momentum was perceived to be a combination of an increase in the psychological aspect and enhanced performance ability. The researchers found 232 instances for beginning momentum and 216 instances for ending momentum. A deductive analysis was used for both categories. Both areas used the same causal attributes as experiment one. Since psychological momentum in basketball could not be determined by one specific play, the data referred to a number of plays producing momentum. The beginning of momentum was found to be a result of only good play by the momentum team 70% of the time, a combination of both good and poor play 27% of the time, and only 3% of the time for poor play by the opponent. Broken down even further, 15% of the good/poor play combinations began with an opponent's poor play instead of a good momentum team play, and 70% of the start of momentum was the result of a sequence of plays and/or crowd noise. Ending momentum was most often seen as a result of a combination of good and poor play (48%). However, the specific reason for momentum ending is unclear due to the numerous amounts of events (time-outs, 10%; end of quarter, 4%), other than performance, that occur during competition. Finally, 41 instances that occurred where momentum was perceived to begin but never happened were cited. A poor play

by the momentum team (54%) was the most mentioned reason, followed by good play by the opponent (10%), a combination of good/poor play (7%), and time-outs (15%).

The results of both experiments (Burke et al., 1997), had a lack of agreement for the starting and ending points of momentum in both an individual and team sport. Momentum starters were easier to locate (had more agreement) in both sports than momentum breakers, although basketball had a higher agreement of momentum breakers than tennis. It is concluded that finding momentum starters and momentum breakers is a highly subjective perception. If one play or sequence of plays works for one athlete, it may not work for another. In addition, for doing research, observers may not have the emotional attachment to the sport and may not understand the psychological subjectivity of a momentum shift as much as athletes. However the action cannot feasibly be stopped to assess the athlete's thoughts and perceptions if only athletes were used in the research. The second purpose of the study was concluded quantitatively and qualitatively. Both sports quantitatively revealed that a good performance by the momentum player/team was most often perceived as the precipitating event to momentum. The qualitative analysis produced the same results as the quantitative analysis, but the categories were broken down into more specific events.

The third purpose of the study found no specific definition of momentum that was in wide agreement, but did find basic agreement concerning the major parts (themes) of momentum. The dominant theme for both studies was the combination of performance enhancement with increase in emotional changes. The question remaining for the third purpose is whether the performance enhancement effects emotional increase or vice versa. Future research should be done with actual participants of the event to further indulge into momentum and the emotional influence. The implications for this research are helpful to know how to help individuals combat the good/poor performance plague that breaks momentum. Teams may also benefit by recognizing the events that may lead to a momentum break or shift. This study can help coaches learn how to handle

coaching situations that entail breaking the opponent's momentum builders by showing what events can lead to breaking momentum.

Psychological Momentum Studies Concerning a Team Sport

Miller and Weinberg (1991) studied perceived momentum by manipulating the ability of teams and the criticality of the situation. Little has been done with these two characteristics because most research has been done to link psychological momentum with game outcomes. The purposes of this study were to compare elite and novice players' perceptions of momentum, and to test the effect of momentum on performance during critical situations in which ability of the participants is controlled.

In experiment one, Miller and Weinberg (1991) distributed 175 questionnaires to 18 men's and women's volleyball teams in 5 different conferences (Southwest, Southland, Pacific Ten, Western Athletic, and Pacific Coast) during the 1988 and 1989 seasons. They also distributed questionnaires to 120 men and women students enrolled in a 1989 spring semester of beginning volleyball at a Southwestern university,. The study design was a 2 x 2 x 2 (Momentum Situation x Situation Criticality x Skill Level) MANOVA. The questionnaire consisted of four scenarios involving two volleyball teams (Team M was their team, Team N was their opponent). The scenarios had a momentum situation where a team came from 3 points down to tie or a nonmomentum situation where neither team ever led by more than 2 points in the game. In either case, a tie score situation was given either at the beginning of the first game (5-5), or at the end of the fifth game (13-13). The questionnaires were given to the athletes (expert group) at the discretion of the coach, with all participants and coaches signing a consent form. The questionnaires were given to the students (novice group) during the 8th week of class to ensure knowledge about the game, with all students and the teacher signing a consent form. The subjects were then asked to rate the degree of momentum, confidence, control, anxiety, and discouragement felt during those scenarios, and to predict the winner of the next point and the

next game. The seven scenarios were ranked on an 11-point Likert scale anchored from 1 (definitely Team M) to 11 (definitely Team N).

The results of experiment one were based upon 160 Division I players (expert) and 120 volleyball class students (novice) returning the questionnaires (280 total). A test-retest reliability was conducted using 29 students and confirmed a .883, .932, .938, and .901 congruence, for the 4 scenarios. The results were significant for the individual aspects of the questionnaire design for situation criticality, $F(7,272) = 9.538, p < .01$; momentum, $F(7,272) = 49.43, p < .01$; and skill level, $F(7,272) = 5.93, p < .01$. Significant two-way interactions were also found for situation criticality by momentum, $F(2,272) = 5.12, p < .01$; situation criticality by skill level, $F(7,272) = 5.47, p < .01$; and momentum by skill level, $F(7,272) = 6.75, p < .01$. Univariate $2 \times 2 \times 2$ (Momentum $\times$ Situation Criticality $\times$ Skill Level) ANOVAs were done on the seven independent measures located on the questionnaires. The three main significant momentum effects' results were confidence, $F(1,278) = 192.62, p < .001$; momentum, $F(1,278) = 226.65, p < .001$; and anxiety, $F(1,278) = 101.21, p < .001$. Teams coming from behind were thought to have more confidence ($M=2.96$), more momentum ($M=2.65$), and less anxiety ($M=3.87$) in momentum situations than nonmomentum situations ($M=4.47, M=4.23, M=5.08$ respectively). In addition, a momentum main effect was done for discouragement, $F(1,278) = 220.84, p < .001$, and control, $F(1,278) = 153.03, p < .001$. Teams with momentum had less discouragement than nonmomentum teams ($M=3.25, M=4.73$), and teams tying the score had more control of the game in momentum situations than in nonmomentum situations ($M=3.06, M=4.78$). Finally, similar momentum-by-situation-criticality interactions for confidence, $F(1,278) = 13.47, p < .001$; momentum, $F(1,278) = 7.58, p < .006$; anxiety, $F(1,278) = 8.96, p < .003$; and discouragement, $F(1,278) = 11.10, p < .001$ were reported. No significant difference was found with confidence, momentum, and anxiety in critical situations. However, teams coming back to tie were

significantly less discouraged ($M=3.84$) in critical situations than in noncritical situation ($M=4.14$).

The point and game outcome results significantly differed between the players' and students' perceptions. The lower-skilled (students) group predicted the team tying the score from behind to continue to win the next point, $F(1,278) = 167.63, p < .001$, and eventually the game, $F(1,278) = 114.04, p < .001$ more than the higher-skilled (players) group. In critical situations, teams that tie the score will win the match more often than in tying the score in a noncritical situation, $F(1,278) = 41.54, p < .001$. Miller and Weinberg (1991) also did a three-way (Skill Level x Situation Criticality x Momentum) interaction for point outcome, $F(1,278) = 30.66, p < .001$, and game outcome, $F(1,278) = 39.94, p < .001$. The results indicated that the lower-skilled subjects predicted the momentum team to win the next point, and game in a critical situation significantly more than the higher-skilled subjects.

Experiment two by Miller and Weinberg (1991) included data from 328 men's and women's, NCAA sanctioned college volleyball games in the 1987-88 and 1988-89 seasons between teams from the Southwest, Southland, Pacific Ten Conferences, and Texas Woman's University. The assessment was done by using games with one team coming back from at least a 3-point deficit to tie. The team that tied the score was coded with positive momentum and the team that was tied was coded with negative momentum. Criticality was proven if the tied score was done in the later third of the game (10 points and up). A t test, z test and chi-square analysis were used for every match and then again over critical and noncritical situation matches. Percentages were determined for the next 5 serves won by each team, the next 5 points won by each team, and the games won by each team after the score was tied. Since games include more than one momentum shift, the tie game in the later third of the game was used independently of any previous ties and momentum shifts.

The results of experiment two (Miller and Weinberg, 1991) indicated no significant difference, whether in a critical or noncritical situation, between serves won by the momentum and serves won by the nonmomentum teams. The *t* tests and *z* tests produced a significantly greater amount (54%) of points won by the momentum team than their opponents (46%) in noncritical situations, $t = 3.17, p < .01$. No significant difference was found in critical situations. No significant difference was found using a chi-square test between the momentum team winning games in critical ($W=54, L=55$) or noncritical situations ($W=111, L=108$) after a tie.

Momentum and nonmomentum situations were perceived differently. More specifically, both skill level groups found momentum teams to have a stronger psychological advantage (increased confidence, more momentum, and control of the game) over their opponents when coming from behind, especially in critical situations. A disagreement was found between skill level groups when momentum was associated with point and game outcome. The lower-skilled group believed the coming from behind team (momentum team) will win the next point and the game more often than the higher-skilled group. The higher-skilled group agreed the momentum team gained a psychological advantage, but did not believe it affected the performance outcome. The higher-skilled group gave neutral responses for outcome predictions while the lower-skilled group believed the momentum team had the advantage for point and game outcomes. Results revealed the momentum team had a slight advantage after a tie for the next 5 points, but only in noncritical situations. Critical situations showed no favor towards the momentum or nonmomentum teams. Game outcome results showed no significant differences concerning the momentum in critical or noncritical situations, each team had an equal chance of winning.

The implications of this study were that coaches cannot rely on momentum to carry a team to victory. No specific evidence indicates that psychological momentum directly influences or affects physical performance. This study determined that momentum exists, but as other research has found, it is hard to define when and how it occurs. Miller and Weinberg's (1991) study does

not examine the scenario of the nonmomentum team, but focuses only as the team gaining momentum to tie the game. Future research needs to be done on both the team positively improving and the team being effected negatively. Future research also needs to focus on external factors such as timeout, injury, crowd noise, bad calls, and other influential situations.

Another study was done using a controlled setting by Shaw et al. (1992) which examined both behavioral patterns and perceptions of psychological momentum in a controlled setting. The purposes of their study were to relate behavioral patterns and the perceptions of psychological momentum in a controlled setting, and to examine self-efficacy and causal attributions as factors affecting perceptions of psychological momentum.

Sixty male undergraduate students (18 to 32 years of age) enrolled in physical education classes, with little to no-more-than-high-school-level experience in basketball were randomly assigned to one of two competitive conditions: (a) repeated task success, or (b) repeated task failure. Participants were measured with four different dependent measures. Perceived psychological momentum was assessed using a questionnaire with a 7-point scale ranging from definitely me (1) to definitely the opponent (7). Reliability was measured using Chronbach's alpha, $r = .93$ and $r = .95$. Internal consistency values were similar, $r = .90$ to $r = .95$. Free throw self-efficacy was assessed with a questionnaire containing eight items. Each question (e.g. How confident are you that you can beat your opponent? and How confident are you of not losing to your opponent?) was answered in terms of responses: by 2 out of 10 free throw attempts made, by 4 out of 10, by 6 out of 10, or by 8 out of 10. Self-confidence was indicated by increments of 10% (0%-100%). Self-efficacy was determined by adding all of the confidence ratings in performing each task and dividing by the total number of questions. Reliability was mediocre, $r = .80$ to $r = .87$. The Causal Dimension Scale II was used to measure casual attributions of performance. Locus of causality, stability, personal control, and external control were all measured on a 9-point scale. Scores ranged from 3 to 27 and internal consistency ranged as

follows: locus of causality, $r = .52$ to $r = .77$; stability, $r = .57$ to $r = .78$; personal control, $r = .74$ to $r = .81$; and external control, $r = .64$ to $r = .83$. Finally, performance was objectively measured on participants' free throw accuracy by attempting 10 free throws in three sets, and scoring the total number of successful free throws. Each testing session consisted of a competition in free throw shooting between the participant and a highly skilled confederate in a gymnasium, and then followed immediately by completion of the Perceived Psychological Momentum Scale, Free-Throw Self-Efficacy Scale, and the Causal Dimension Scale II questionnaires.

Each participant and confederate was allowed a warm-up period on the same basket. The competition was controlled with success and failure being manipulated by having the confederate intentionally win or lose three straight sets of 10 free throw shots. The failure group lost by an average of 2.0 baskets while the success group won by an average of 2.9 baskets. Eight participants were replaced due to incorrectly manipulated outcomes. Three sets were used to find both attributions, based on previous set outcomes, and self-efficacy, expectations for the next set. The last test was completed as if the participant was going to compete in a fourth set with the same opponent.

A $2 \times 3 \times 7$ (Condition $\times$ Time $\times$ Response) ANOVA with repeated measures on the last two factors was conducted to determine whether manipulation affected the seven response variables differently. The two interactions found by ANOVA, condition-by-time-by-response, $F(12,696) = 1.95, p < .05$, and time-by-response, $F(12,696) = 3.31, p < .05$, indicated that success and failure were influenced differently by perceived psychological momentum, self-efficacy, causal attributions, and performance. The success group significantly increased in four categories from Time 1 to Time 2: perceptions of momentum ($M=29.71$ to $M=25.39$), self-efficacy ($M=40.35$ to $M=46.13$), locus of causality ($M=19.23$ to $M=21.77$), and personal control ($M=21.06$ to $M=22.71$). The success group also significantly increased in three categories from Time 2 to Time 3: perceptions of momentum ($M=25.39$ to $M=21.58$), locus of causality

($M=21.77$ to $M=20.55$), and personal control ($M=22.71$ to $M=21.71$). The failure group only changed in perceptions of momentum from Time 1 to Time 3 ($M=44.48$ to $M=47.76$), which showed an increase over a period of time and not instantly. The failure group only had three significant increases overall; Time 1 to Time 2 in locus of causality ($M=18.31$ to $M=20.28$), Time 1 to Time 2 in personal control ($M=18.28$ to $M=20.93$), and Time 1 to Time 2 in performance ($M=4.03$ to $M=4.59$). An increase in performance was only generated from failure and not from success.

The Pearson product-moment coefficients evaluated predictive results among momentum, self-efficacy, attributions, and performance at Time 1, Time 2, and Time 3. Cause and effect relationships were also found examining cognitive and performance variables through residual change scores. A relationship between momentum and self-efficacy was only significant in the failure group between Time 1 ($r = -.59$) and Time 2 ($r = -.41$), but not Time 3. No relationship was found in the success group. The only significant correlation for the success group were at Time 2 between self-efficacy and the locus of causality dimension ($r = .67$) and between self-efficacy and the personal control dimension ($r = .54$). No significant relationships were found between individuals' perceptions of self-efficacy and momentum, and predicted future performance. The cause and effect was examined through changes in cognitions and performance. The failure group showed the only significant association between self-efficacy and momentum from Time 1 to Time 2 ($r = -.42$) and from Time 2 to Time 3 ($r = -.41$). The failure group showed a larger decrease in self-efficacy when responsibility for failure was taken ($r = .45$). However, the success group showed a greater change toward internal attributions, consequently showing an increase in perceived psychological momentum occurred, $r = .39$. The success group showed that an increase in performance led to a subsequent increase in momentum from Time 1 to Time 2 ($r = -.50$) and to less stable success from Time 2 to Time 3 ($r = -.39$). Shaw et al. (1992) found that the failure group showed an increase or maintenance of self-

efficacy and psychological momentum, even though they lost, when an increase in the number of free throws made (Self-efficacy: Time 1 to Time 2, $r = .60$ and Time 2 to Time 3, $r = .42$; momentum: Time 1 to Time 2, $r = .60$ and Time 2 to Time 3, $r = -.41$).

Shaw et al. (1992) provided results that supported and opposed previous research. This study provided results of perceptions of momentum in a manipulated, controlled laboratory setting, but did not examine the much needed research on momentum in an empirically supported motivational setting. Shaw et al. (1992) supported previous research that performance accomplishments increase self-efficacy, but performance failure does not decrease self-efficacy when unstable attributions were made (e.g. insufficient effort, adverse conditions or physical limitations). Failure, in this study, was attributed to internal, unstable, and personally controllable causes which oppose past research associating it with stable, uncontrollable causes. Additionally, performance did not change over time for the success group, but increased from Time 1 to Time 2 for the failure group. Performance actually decreased in the success group with the increase in participants' perceived psychological momentum and self-efficacy. This research, for optimal relevancy, needs to correspond the self-efficacy and perceived psychological momentum measures to the performance measure.

Future research still needs to be done to empirically support the optimal definition of psychological momentum. Maybe social-cognitive characteristics (outcome expectations, cognized goals, and internal standards) could be lumped into the behavior pattern of psychological momentum. If psychological momentum could be studied more in behavioral psychology before applied to sport, a more operational definition could be developed and applied to sport. Shaw et al. (1992) suggested that sport encompasses too many different areas to define psychological momentum as well as account for manipulation of ability, internal and external influences, objectivity of participants' perceptions, and differences in the sport itself (team vs. individual).

Gayton et al. (1993) used psychological momentum as the added advantage obtained in an athletic contest when initial success influences future success, led by an increase in momentum. Previous research was also restricted to individual sports. The purpose of this study was to examine if psychological momentum can be evident in team sports.

Gayton et al. (1993) conducted two studies to examine the evidence of psychological momentum in team sports. The first study operationally defined psychological momentum as scoring the first goal in the hockey game. Data were gathered from the results of all the American Hockey League teams in the 1988-89 season to determine if a relationship was found between the first score of the game and the game outcome. The second study was operationally defined as outscoring the opponent in the first period of the game. The data were collected from the 1974-1987 Stanley Cup Final Play-off games to determine a relationship between the highest scoring team in the first period and the game outcome.

The first study obtained a phi correlation of .33 (corrected $\chi^2 = 120.96, p < .0001$) for the relationship between the first score and the game outcome with 339 out of 510 (66.5%) games won by the team that scored first. The second study obtained a phi correlation of .45 (corrected $\chi^2 = 20.65, p < .001$) for the relationship between the highest scoring team in the first period and the game outcome with 72.5% of the 51 games won by the team with the highest first period score. Data from both studies are consistent with the hypothesis set forth for each study. The team that scores first gains psychological momentum to win the entire game, and the team with the highest first period score gains psychological momentum to win the entire game.

Gayton et al. (1993) concluded that psychological momentum is evident in team sports. The results indicated that the team with the highest score in the first period or the team that scores first (early success) will result in an increased probability of success at the end of the game (winning). Gayton et al. (1993) approached the idea of equal ability by using championship teams in study two and proves that with equal ability, early success proves to increase probability of success at

the end of the game. This study did not take into account psychologically-oriented aspects of the players, just performance-oriented aspects. Future research should investigate the emotional standpoint as well as the physical aspect. Implications from this research will help coaches prove that early success in games or matches will increase the probability of game success. By having early success, psychological momentum is gained over the opposing team and will help in continuing the success of the team.

Burke and Houseworth (1995) reviewed past research of psychological momentum in athletic events providing evidence that momentum was determined by early points of a game, or early game victories in a match. It was said that the person who gained early momentum will be the victor. The purpose of this study was to determine if momentum could be quantified by using charts and questionnaires, and tracking when and how momentum was perceived by players and coaches throughout a match.

Fifty-seven subjects were used in this study. The players (48 women) and coaches (c=9) were from four Midwestern colleges playing a one day, round-robin volleyball tournament. Each player and coach participated with the knowledge of having to complete a post-game questionnaire.

Two different instruments were used to collect the data. A pilot study was done prior to the experiment to ensure effectiveness and validity of the measurement instruments. The first instrument was a structural charting system. The charting system was used to determine the game flow throughout the events of the game. A horizontal line was used as a beginning point and a game flow line was moved up one graph for a side out (gaining possession of serve) and two graphs for a point from the original horizontal line. Team 1 was located above the horizontal line, and team 2 was located below the horizontal line. The second instrument used was a questionnaire given to the players and coaches. The questionnaire was designed to determine how the players and coaches perceived the game flow or momentum shift.

The structural charting system was done during the three game, round-robin tournament for each team. Two or more observers were present to clarify and confirm the game events were charted accurately. Immediately following each match, both teams (players and coaches) were administered the questionnaire. A regression analysis was performed to check the possible coincidence of the team's perception of momentum scores and the structural charting systems' scores. The multiple regression analysis was done after each match and at the conclusion of the entire tournament. A Scheffe post-hoc analysis was done to see if perceived momentum scores (dependent) could be attributed to score/side-out ratio scores (independent) and where scores differed. A 95% level of confidence was selected, using .05 as alpha for all analyses.

The multiple regression analysis showed a significant correlation between the momentum surveys and the game event and point/sideout ratio scores ($F = 119.7, p < .05$) for the entire tournament. There was a significant positive relationship, using a zero order correlation, between game event and point/sideout ratio scores for the entire tournament. The analysis of variance showed a significant difference between team momentum scores ($p = .05$). Team A had the highest of all four teams with PM scores of 10.7, 6.6, and 15.2 for matches 1, 2, and 3 respectively. The descriptive data showed percentages of the least (officials' calls) and the most (warm up prior to the match) influential, external factors of the match flow.

Burke and Houseworth (1995) concluded there was a significant existence of a perceived momentum or game flow by the players and coaches. Strong relationships between the questionnaires and the structural chart analysis were evident. A significant correlation between when the players' and coaches' feel a momentum shift, or groove, and the existence of a game event, big play, or point/sideout occurrences was indicated. This research could increase the use, by coaches, of structural charts to evaluate when a momentum shift occurs throughout a game, and allow the coach to make changes during the match. The research supported the idea that the team to win the first game wins the match. However the validity was questionable because the

teams were not evenly matched in ability. The survey questionnaire strengthened the precompetitive preparation model of momentum because the pregame warm-up and prior practices influenced the match momentum of the players. The strengthening of other research, because of these research results, proved that future studies of momentum in volleyball should examine external stimuli, include various ages and gender of the players, and match the skill levels of the teams. The implications for this research are helping coaches and players understand when and how momentum changes occur. Furthering this knowledge may change pregame warm-ups, practices, and increase the players' chances to maintain composure during a momentum shift.

Psychological Momentum Studies Concerning an Individual Sport

Silva et al. (1988) have reviewed past research on psychological momentum and attempted to further the understanding of psychological momentum. Positive psychological momentum in past research was defined as success leading to future success and negative psychological momentum was failure leading to future failure. Research is now focusing on more related issues of momentum like positive inhibition, success leading to loss of momentum and possible failure; and negative facilitation, failure leading to gaining of momentum and possible success. The purpose of this study was to determine the extent psychological momentum affects women and men collegiate tennis players and the outcome of their performance.

Archival data was obtained from the 1981-82, 1982-83, and 1983-84 seasons of a Division I women's and men's collegiate tennis team. The analyses covered 924 matches ($m=531$, $f=393$) using a code (Win = 1, Lose = 0) for singles and doubles match outcomes, singles set outcomes, and singles tie-breaker outcomes. The four aspects studied were positive momentum (winning following winning; WW), negative momentum (losing following losing; LL), positive inhibition (losing following winning; WL), and negative facilitation (winning following losing; LW). Regression analyses were done to determine if singles match outcomes predicted doubles match

outcomes, and if winning a set (whether the first or second set) has effect on subsequent sets.

Chi-square analyses were used to generate conditional probabilities and a separate analysis was done for each gender with the alpha level set at .05 for all analyses.

Regression analysis for men and women with singles match outcome predicting doubles match outcomes was significant ($F(1,408) = 44.41, r = .313, r^2 = 9.8\%, p < .001$; and $F(1,319) = 55.09, r = .384, r^2 = 14.7\%, p < .001$ respectively). The chi-square analysis was significant for men ($\chi^2(1) = 38.88, p < .001$) and women ($\chi^2(1) = 45.62, p < .001$) with positive momentum leading the way. The probability for men after winning or losing the singles match to win or lose the doubles match occurred 74.6% of the time for positive momentum (WW), 54.0% for LL (negative momentum), 43.0% of the time for LW (negative facilitation), and 25.4% of the time for WL (positive inhibition). Women demonstrated that 73.0% was positive momentum, 67.0% was negative momentum, 33.0% was negative facilitation, and positive inhibition occurred 27.0% of the time. The data showed that singles match outcomes related to doubles match outcomes with gender difference not affecting psychological momentum. Positive momentum appeared to be the most influential in affecting performance. Significant differences were found for singles set momentum affecting set and match outcomes. The chi-square analysis found no gender differences in the psychological momentum effects (Men, $\chi^2(1) = 262.18, p < .001$ for set one and $\chi^2(1) = 275.88, p < .001$ for set 2; Women, $\chi^2(1) = 224.35, p < .001$ for set one and $\chi^2(1) = 198.19, p < .001$ for set two). The conditional probabilities in men's singles matches for set 1 indicated positive momentum occurred 90.4% of the time, negative momentum 79.6%, negative facilitation 20.4%, and positive inhibition 9.6% of the time. Set 2 indicated positive momentum occurred 91.5%, negative momentum 80.0%, negative facilitation 20.0%, and positive inhibition 8.5% of the time. The conditional probabilities for women's singles matches in set 1 were positive momentum 93.2%, negative momentum 82.2%, negative facilitation 17.8%, and positive inhibition 6.8% of the time. Set 2 indicated positive momentum occurred 91.3%, negative

momentum 80.2%, negative facilitation 19.8%, and positive inhibition 8.7% of the time (Silva et al., 1988).

Significant differences were revealed for set-set outcome, tie-breaker momentum, tie-breaker-match outcome, and tie-breaker-set outcome. The regression analysis for men ($F(1,529) = 142.38, r = .461, r^2 = 21.2\%, p < .001$) and women ($F(1,389) = 117.86, r = .482, r^2 = 23.2\%, p < .001$) indicated positive and negative psychological momentum affected outcome the most. When participants were not evenly matched by ability, positive momentum was the strongest force affecting the outcome. When participants were evenly matched, preceding sets did not provide significant psychological momentum effects. The finding was true across both genders. Tie-breaker momentum was explored to grasp a more micro perspective of the momentum phenomenon. The regression and chi-square analyses were significant by gender and showed that positive and negative psychological momentum occurred at the same level for both men and women. Tie-breaker-match outcome was significant for both regression analyses (set 1 and set 2). Singles match outcome for set 1, $F(1,69) = 30.14, r = .551, r^2 = 30.4\%, p < .001$ and set 2, $F(1,60) = 33.68, r = .600, r^2 = 36.0\%, p < .001$ positively related to the tie-breaker outcome with winning predicting winning and losing predicting losing. Tie-breaker-set outcome in set 1 was a significant predictor of set 2 outcome, $F(1,69) = 7.86, r = .320, r^2 = 10.2\%, p < .01$. Again, winning predicts winning and losing predicts losing.

Three seasons of Division I level competition of men's and women's tennis matches were examined. The study attempted to determine if the four manifestations (WW, LL, WL, LW) were effective in each situation (e.g., singles to doubles matches) and if gender was an issue in momentum effects. In every situation, victories in initial sets predicted victories in subsequent sets and/or matches. Positive psychological momentum was also found to be the most operative manifestation. Momentum effects did not vary according to gender, but Silva et al. (1988) found

creating and sustaining momentum in skill performance when the players were equally competent in skill level was difficult.

The research conducted by Silva et al. (1988) indicated how difficult it is to capture the true definition and effect of psychological momentum. The study showed coaches and players that victories and defeats can be affected by momentum, by providing more empirical data proving early successes lead to future successes and early defeats lead to future defeats. The authors suggested a need for more research to be done on various sport activities and not specifically on tennis. Future investigations need to research and clearly define the mechanisms that underlie the perceptions of momentum.

Richardson et al. (1988) focused the next research along the same lines as the 1988 research done by Silva et al. (1998), but eliminated the ability differences. The purpose of the study was to determine if winning a particular game in the first set (and subsequent sets) predicted later success in the match, if ability levels influenced the presence of psychological momentum, and if men and women experienced psychological momentum the same way.

Subjects were 119 tennis players that were classified into either A-level (N=57 men, N=0 women) or B-level (N=35 men, N=27 women) by the USTA standards. The National Tennis Rating Program places players into the A-level if they can (a) place power and spin on the balls, (b) have an outstanding shot to control a game, (c) regularly hit winners or force errors, (d) execute lobs, drop shots, half volleys, and smashes, and (e) competitively include different strategies and styles of play. B-level players can successfully (a) achieve stroke dependability and direction on ground strokes, (b) execute lobs, overheads, approach shots, and volleys, and (c) consistently place the first serve. Data was collected from three USTA-sanctioned tennis tournaments consisting of 163 matches total (N=356 sets), during the summer of 1987. The tournament consisted of the best two out of three sets, single elimination, regulation scoring, a twelve-point tie breaker, required an entry fee, and awarded trophies to first and second-place

finishers. Competition for men's A-players consisted of 235 sets, men's B-players 57 sets, and women players 64 sets. All players were informed of participating in a USTA-sponsored research program prior to competition. At the beginning of the game, all players signed his/her name, skill level, gender, and round of play. After each odd game, players reported the scores of the previous games played. Ten players were randomly selected throughout the tournament to fill out an additional set of questions: (a) What do you believe was the turning point in this match and why do you think this occurred?, and (b) What types of physical and/or mental preparations do you use prior to and during competition? All data were analyzed using separate chi-square tests for games won, ability levels, and gender. Richardson et al. (1988) used the definition of psychological momentum in terms of winning or losing games in the first set, the results of the remaining sets in comparison, and the probability of winning the overall match due to early success.

The results of the study showed no significant difference between genders. Only A-level players were used in this finding because the women had no B-level players. No significant difference was found across skill levels either. Men's A-level players did not experience any more or less psychological momentum than men's B-level players. Significant predictors of success within a tennis match for A- and B-level players were found. Winners of Game 1 in the first set won 115 matches out of 163 possible. Therefore, 70.5% of the players winning the first game in the first set won the match. In acceptance with the bi-directional theory, these results show that success in Game 1 leads to success in Game 2, which leads to success in Game 3, et cetera. Psychological momentum, in terms of later success relevant to early success, increased as a result of game-by-game success. An inequity of ability was discovered. Only 30 of the 163 matches lasted 3 sets. In the other 133 matches, 217 sets ended in a 6-0, 6-1, or 6-2 score. When the study extended to competitive matches (those involving nine or more games), games 8, 10, and 11 were significant predictors of winning the match, with Game 4 in the second set being the

highest probability factor of winning the match. In the follow-up interviews, 50% of the 60 players perceived no turning points or effects of psychological momentum in the match. Those who did believe there was a turning point listed such reasons as holding or breaking the service, winning a long game, becoming more assertive in play, gaining or losing consistency in a favorite shot, taking extra time between points or games, and thinking positively about his/her own skills.

Richardson et al. (1988) identified problems previous research had also encountered, i.e., psychological momentum has a very personal, subjective point of view. Players' abilities are very hard to equate to assess psychological momentum in an evenly played match. Caution is advised to those coaches who seem to predict certain games or sets as necessary to gain a psychological edge over the competition. As the research shows, every situation is different and turning points are determined upon the length and competitive evenness of the match. Psychological momentum needs to be defined to cover all individual beliefs if future research is to have benefit to coaches and players alike. Inconsistency among players and coaches' perceptions make generalizing momentum effects on physical performance very difficult.

In contrast to the first two studies, Vallerand et al. (1988) did not use actual performers or experienced researchers to record archival data. Three hypotheses were construed and the subjects were used as the observers of the event. The intent was to gain a better understanding of the social perception and the determinants of spectators' social perceptions of sport events. The purposes of this study were to examine if players coming back from a deficit have greater levels of psychological momentum than the opponent, to examine if players' experience in the sport affects their perception of psychological momentum, and to examine if the score configuration and experience variables have an effect on performance.

Of the 44 subjects, ranging in age from 14 to 44 years ($M=22.5$ years), twenty subjects ($m=20$, $f=20$) had a high degree of tennis experience and 24 subjects ($m=10$, $f=14$) had little or no experience in tennis. A mixed study design, 2×2 Score Configuration (momentum pattern-no

momentum pattern) x Tennis Experience (high-low), was used. Subjects were provided with a questionnaire containing two hypothetical scenarios about Robert and Luc (tennis players). The first scenario described one tennis player winning four games in a row to come from behind and tie the games at five all, and the other scenario was tied five all with no one player being dominant. Conditions were set up in a counterbalanced order so the no-momentum group would see no obvious advantage of one player over the other, and the momentum group would see an advantage one player has over the other. After the subjects read the scenarios, they were asked to answer questions that were rated on a 7-point scale ranging from 1 (definitely Robert) to 7 (definitely Luc) with 4 being the midpoint (neither of them). Nine variables, out of the 12 rated by subjects, were used to measure the perception of psychological momentum: (a) who has the momentum?; (b) who unfolds more energy?; (c) who demonstrates more synchronism?; (d) who seems to be more energetic?; (e) who seems to be the most confident?; (f) who demonstrates or manifests the most control?; (g) who seems to be the most motivated?; (h) who seems to be the most discouraged? (these scores were reversed on the last item); (i) and who seems to progress most toward victory? The other three questions were predictions of the players' performance made by the subjects: (a) according to you, who will win the first set?; (b) who will win the second set?; (c) who will win the match? At the end of the questionnaire, personal questions were asked about the subjects to verify the level of tennis experience, tennis knowledge, primary sport activity, gender, and age (Vallerand et al., 1988).

Four preliminary analyses were conducted. The first series of analyses dealt with the nine questions concerning psychological momentum. Cronbach alpha values of .95 (no-momentum conditions) and .93 (momentum conditions) were used. The results revealed that the content of the questionnaire was evaluated using a valid scale. The second analysis used a 2 x 2 x 2 (Gender x Score Configuration x Tennis Experience) ANOVA on the three performance variables and the psychological momentum scale. No significant gender interactions or effects were evident (all

$F_s < 1.20$). The third analysis dealt with the two conditions and the effect of order when being compared with all dependent variables. No pattern for order was obtained. The final series of analyses assessed the difference between subjects' experience levels in tennis. Experienced subjects ($M=4.46$) had significantly more experience in tennis than inexperienced subjects ($M=1.35$), $t(44) = 20.52, p < .001$. Experienced subjects also had more years ($M=6.7$ years) of playing experience than inexperienced subjects ($M=0$). The analyses were used to assess the differences of perception due to experience level.

Results of a 2×2 (Score Configuration x Tennis Experience) analysis of variance revealed a significant affect for score configuration, $F(1,40) = 32.54, p < .0001$. Both experienced and inexperienced subjects perceived more psychological momentum when the momentum pattern was present ($M=46.52$) than when it was not present ($M=35.88$). Analyses using 2×2 (Experience x Score Configuration) ANOVAs revealed that experienced and inexperienced subjects believed Luc (come from behind player to tie 5 all) would win the first set more often when a momentum pattern ($M=4.84$) was shown than when no pattern ($M=3.75$) was evident. However, a stronger belief was shown by experienced players ($M=4.58$) than by inexperienced players ($M=3.95$), $F(1,40) = 4.51, p < .04$. No significant difference was shown between experienced ($M=3.79$) and inexperienced ($M=3.70$) players concerning nonmomentum pattern conditions ($t < 1$). The analyses with the second-set variable revealed no significant effects between experienced and inexperienced subjects. All subjects believed Luc, in a momentum pattern ($M=4.30$) would win the match more often than in a nonmomentum pattern ($M=3.81$). 2×2 (Tennis Experience x Score Configuration) ANCOVAs, with the scores on the psychological momentum scale used as the covariate, were computed for each of the three performance inference variables. The results indicated the subjects perceived psychological momentum led to enhanced performance. The covariate was highly significant for the first-set

and the match variables, $F_s(1,39) = 13.44, p < .001$, but not for the second-set variables, $F = 1.92, p < .18$.

Vallerand et al. (1988) set out to prove some of the hypotheses found in the antecedents-consequences model of psychological momentum. Results provided support that the relationship between score configurations and the subject's level of experience in the sport (tennis), would influence the perceptions of psychological momentum and the performance outcomes. More specifically, the study found that coming from behind to tie a match at a crucial moment affects the observers' perceptions of psychological momentum. This provided support for the model's situational variable (coming from behind) influence on psychological momentum perceptions. Additionally, experienced and inexperienced subjects did not show a difference in psychological momentum perceptions. Even though all the subjects perceived momentum, experienced subjects perceived more psychological momentum in the momentum pattern condition than inexperienced subjects. The results of the 9-item PM scale showed that the variables represent a homogenous set of items that could be used to assess PM state levels in future research in the sport field situation (not just laboratory studies). A very important summarization of the performance inference variables results led to an explanation of linking psychological momentum with positive performance results by experienced players. More specifically, experienced players were more likely to link psychological momentum variables to performance to explain the control of random events. Experienced players have a need to control a game/match, and therefore place momentum as the reason for their increase in performance. This need for control may bias the presence of psychological momentum in research.

Many factors have influenced, created, and hindered research. Vallerand et al. (1988) provided a valid scale to assess psychological momentum state levels in future research. However, because psychological momentum remains to be a very subjective matter, research is hindered by not being able to clearly define psychological momentum. Athletes continue to find

reasons and explanations for why teams/individuals can come back and win, or lose a huge lead in critical situations. Psychological momentum has been, and will continue to be the scape goat. Empirical data has yet to be found to prove the existence of psychological momentum, but research continues to discover more avenues to explore for future research. With so many variables entailed in the concept of psychological momentum, plenty of research is yet to be done.

Weinberg and Jackson's (1989) study took a whole new approach to psychological momentum research. This study attempted to determine if women's ability to come back in a match has been affected by the increase in women's roles and attitudes in competitive sport since Title IX was passed. The purpose of this study was to determine if gender differences still exist today in the ability to reverse psychological momentum and come from behind in a tennis match.

Data from 67,000 United States Tennis Association matches (best two out of three sets) from the years 1984-1986 was compiled. The matches consisted of professional men's and women's singles, professional men's and women's doubles, junior boy's and girl's singles, junior boy's and girl's doubles, senior men's and women's doubles, and senior men's and women's singles. USTA defined a professional as someone on the tennis tour earning money from tennis; juniors are defined as competing in USTA sanctioned tournaments; and seniors are defined as competing in USTA sanctioned tournaments and are at least 35 years of age. Coming from behind was defined as losing the first set in a best two out of three set match.

The differences in gender and the percentage of matches won after losing the first set were analyzed by z tests ($\alpha = .01$). Three different analyses were done between genders. The first analysis was done to investigate men's-women's differences within similar levels (e.g., pro singles only for men and women). No significant difference was found in the professional or senior categories. Men had a 2% advantage of coming back from a loss over women. The junior category had a significant difference in the singles ($m = .12\%$; $f = .08\%$) and doubles ($m = .15\%$;

f=.12%) with men coming from behind more significantly than women. No data showed women coming back more often than men. The second set of analyses found the percentages of men and women across levels (e.g., pro-singles vs. junior- and senior-singles). Men across all levels had significantly more come back victories than women of all levels. The only three categories with significant differences compared men's junior singles (12%) vs. women's pro singles (14%), men's senior singles (09%) vs. women's junior singles (08%), and men's junior doubles (15%) vs. women's pro doubles (19%). The final analysis investigated which level had more come from behind victories combining men and women. Professionals ($M = 17\%$) came from behind more significantly than juniors ($M = 12\%$) and seniors ($M = 9\%$). These results show senior tennis players have a tougher time coming from behind to win than professionals and juniors.

Weinberg and Jackson's (1989) study did not provide total support of earlier research. Men still came from behind more often than women, but the differences were not as large in percentage as the earlier research. Women did not come back more often than men in any inter-level analyses. Only a few instances across levels of play showed women coming from behind more often than men of other levels. In reality, no concrete conclusions can be made from this study because psychological and emotional aspects were not taken into consideration. However, the findings showed an increase in women's ability to come from behind (reverse psychological momentum) than in previous years. Additionally, concepts dealing with psychological momentum and level of ability were revealed. The research showed professionals were more likely to come from behind, followed by juniors and then seniors. Professionals have more motivation and desire to come from behind (money, status) than juniors and seniors. In the same sense, juniors have more stamina than seniors to come from behind. Seniors may not have the desire to play harder to come from behind than their younger counterparts. When studying psychological momentum, researchers need to focus on level of ability and the motivation the subjects have to come from behind. Future research also needs to define the actual components

of psychological momentum such as thoughts, emotions, recognition of the onset and termination of momentum, and reinforce the definition with empirical data. Until this is done, coaches and athletes cannot incorporate coping techniques and strategies dealing with psychological momentum in sport.

Because of the difficulty conceptually defining psychological momentum, Silva et al.(1992) did a laboratory study with the intent clarifying and defining momentum so it can be more effectively applied in field studies. The purpose of the study was to examine the existence, magnitude, and potential effects of psychological momentum upon performance in a controlled circumstance.

Subjects were 116 (m=58, f=58; M=19.35 yrs.) university physical education activity class students. Each man and woman subject was paired with another subject of the same gender (58 pairs). The subjects were asked to place an X in each circle located on a line (predetermined maze) as quickly and accurately as possible. The subjects started at the beginning and worked their way toward the end of the maze and completed as many X's within 15 seconds. All X's with the lines not crossed or not within the circle's boundaries, were considered an error. Each participant would go against his/her partner. The task was scored as a tennis match (each maze completed is considered a game) with the winner having to win six games to win a set, and two out of three sets to win a match. The performance score was the total number of circles filled in minus the total number of errors. The experimenter collected and scored the mazes immediately after the time limit expired, and provided false feedback to the subjects concerning the winner and the score.

Prior to testing, the researcher determined which competitor would win and by how much. The margin and pattern of winning the games and sets varied to eliminate the possibility of obvious patterns. Following the match, each subject was asked to complete a questionnaire containing questions concerned with self-perceptions of performance in the contest (e.g. Did you

ever feel like you had winning momentum? and Did you ever feel like you had losing momentum?). Subjects responded on a scale from never (1) to often (10). Other questions were answered in a yes-or-no format (e.g. Did you ever have the feeling like you were going to lose the best two of three games? and Did you ever feel at any time that you were simply unstoppable and that there was no possibility that you would lose the game or the best two out of three?). A regression analysis was used to examine if set outcome was a predictor of subsequent game performance (Silva et al., 1992).

The subjects' self-perceptions of performance in the contest were assessed. With regards to winning or losing a certain game, 66% of the subjects felt they were going to win and 71% felt they were going to lose a game. With regards to rating oneself 1 to 10 (1 being no desire and 10 being maximum desire) for the amount of desire to beat the opponent, a mean response of 7.16 (SD=2.18) showed a high response desire to win a contest. Subjects were also asked by how many points they need to score or lose by before determining the outcome (1-3 points, 4-10 points, more than 10 points). Data showed subjects needed to lose (71.6%) 4-10 points before they could not beat their opponent or win (73.2%) by 4-10 points before they could beat their opponent easily, and supported a hypothesis that point differences are influential to create positive and negative momentum conditions. A significant main effect for momentum conditions was computed ($F = 55.64, p < .01$). The subjects responded to the question "Did you ever feel like you had winning momentum?" on a scale from never (1) to often (10). The positive momentum group had a mean response of 7.22 (SD=2.01) and the negative momentum group was 4.67 (SD=1.65). Subjects also responded to the question "Did you ever feel like you had losing momentum?" with the positive group scoring a mean of 4.10 (SD=2.15) and the negative group 6.38 (SD=2.08).

An ANOVA ($p > .05$) was computed to compare psychological momentum conditions for overall mean performance scores and overall mean error scores, and found no significant

differences. A separate ANOVA was conducted for each set to determine if the winner of the first set (positive momentum) had less errors and higher performance scores than the opponent (negative momentum). No significant difference in performance or error scores was found ($p > .05$). A regression analysis revealed that subjects' perceptions of momentum, as well as actual momentum did not significantly ($p > .05$) influence performance. Regression analyses were also done to determine if success in late games in the first set led to success in early games of the second set, and if late success in the second set led to early success in the third set. No significant predictor of performance was found ($p > .05$). Subjects felt they had either positive or negative psychological momentum (depending upon the situation), however it did not effect the outcome of performance. Therefore, data showed an inconsistency between perceived momentum and actual performance outcome.

Silva et al. (1992) believed a laboratory study, with increased internal validity, would provide a greater understanding and construct of psychological momentum. The study examined psychological momentum and measured it on the cognitive, or perceptual level and the resulting performance outcome. The results of the study proved the perception of winning or losing did produce a significant effect on the subjects' cognition. However, the difference in cognition did not prove strong enough to effect the performance outcome of the subjects nor predict the performance for future games or sets.

Research has yet to empirically prove the existence of psychological momentum. Silva et al. (1992) believes a laboratory study will ultimately help the field study of psychological momentum. The least amount of influences and distractions apparent when studying momentum, the easier it is to break down the concept. However, laboratory studies do not incorporate the true psychological involvement of the participants in an actual sport situation. Psychological momentum has too many influences in each sport to provide one single definition and concept. Something is evident in the sporting arena that influences athlete's emotional, mental, and

physical ability and researchers will continue examining the existence of psychological momentum and its effect on performance, and performance and its effect on psychological momentum to solve the mystery.

CHAPTER 3

METHODOLOGY

The purpose of this study was to investigate NCAA Division I women's volleyball players' perceptions of psychological momentum. More specifically, this research addressed each athlete's perception of: a) psychological momentum, b) psychological momentum in volleyball (i.e. the phenomenon of an individual and/or a team), c) the causes and ending points of psychological momentum, and d) the effect of psychological momentum on the immediate performance and/or the outcome of the game/match. This chapter provides the participants' rationale, research procedures, and research evaluation procedures. What follows is the development of each of these ideas.

Description of Participants

The athletes involved in the study were from one NCAA Division I women's collegiate volleyball team (n=4) in the southeastern United States. The coach (Appendix A) and players (Appendix B) were informed of the nature of the study and signed informed consent statements prior to the study. The athletes participating had played in the match viewed prior to the second interview and had participated in the spring 1998 season.

Rationale

I chose psychological momentum as the purpose of my study because it is a frequently mentioned concept in sport by athletes, coaches, and spectators alike. The concept is still not well defined despite the frequency of the use of the phrase psychological momentum. In this study, I used an NCAA Division I collegiate women's volleyball team because most previous studies have worked with individual sports. The collegiate athletes were better able to articulate thoughts and perceptions about psychological momentum and were more accessible than other age groups. Volleyball is a stop-and-go sport and was easier to analyze than a continuously played sport like basketball or soccer.

Procedures

The interview questions were developed to best retrieve the athletes' individual perceptions and thoughts with as little bias as possible. All interview questions were reviewed by a group of graduate students (n=4) in sport studies to ensure logical validity between the interview questions and the purpose of the study. Forty-seven percent of the questions from all the interviews were in one hundred percent agreement by all of the graduate students. Seventy-five percent agreement was found by all the graduate students for forty-three percent of the questions from all the interviews. The remaining ten percent of the questions were in fifty percent agreement by all of the graduate students. The questions in the remaining ten percent were changed or deleted within the interviews to accomplish the purpose of the study.

Pilot testing was conducted prior to initiating the study for the researcher to develop better interviewing techniques. The interviews were evaluated by experienced qualitative researchers not directly involved in the perception aspect of the study. The pilot testing enabled the researcher to learn better probe techniques to facilitate conversation with the subjects.

A bracketing interview was also conducted with the investigator by an experienced qualitative researcher using the interview questions. The researcher was given each of the three interviews used in the study so that any researcher biases toward the topic area could be identified. The two main biases that were identified during the bracketing process were related to the interview process and the interpretation process of the information. I had a tendency to interpret the information to fit a pre-determined theme and not in relation to what may actually be presented by the participants. I also learned how to phrase the interview questions to probe for individual perceptions instead of searching for pre-determined answers. In addition, I was able to identify which questions were not beneficial in obtaining the necessary information for the study and improved the questions to probe for relevant material pertaining to the purpose of the study.

The pilot testing and bracketing interview enabled me to restructure the interviews and interview procedures, and to create a less biased atmosphere. Due to the knowledge gained through the pilot testing and bracketing interview, I was able to take greater precautions during the interview process and throughout the data analysis to facilitate an environment that relayed the athletes' perceptions.

A videotaped volleyball match and interviews were used to accomplish the purpose of this study. The athletes chose matches during the fall 1997 season that they felt included psychological momentum. One match was consistent with all the athletes and was viewed by all the athletes prior to the second interview. I personally viewed the chosen match on videotape, used in the second interview, and had prior knowledge about the events and possible occurrences of psychological momentum throughout the match. The prior knowledge enabled me to recall the specific references the athletes made about certain events in that match. The prior knowledge also enabled me to understand the athletes' references and perceptions.

The study was conducted at an NCAA Division I southeastern university. Following approval of the head coach to approach these athletes (Appendix A), all athletes read the procedures prior to participating in the study (Appendix B). The researcher conducted the first interview to gain demographic information and initial ideas and thoughts about psychological momentum (Appendix C). The athletes individually viewed the videotape of a previously determined volleyball match from the fall 1997 season prior to the second interview. Athletes provided individual perceptions during the second interview and provided further information regarding individual perceptions of psychological momentum throughout the match (Appendix D). A final interview was conducted to ensure validity of previously given answers and provided additional thoughts about ideas given by other athletes in the study (Appendix E). The athletes were given the opportunity to change, elaborate, or add any additional information at this time.

The athletes were debriefed at the end of each interview, and were provided with final thoughts about the entire study during the last interview.

After all of the interviews were completed and transcribed, themes from all the participants were documented and compared to other athletes' perceptions to find consistent themes of psychological momentum. The themes were documented from the individual transcripts using the athlete's selected pseudonym at all times. Transcription of the interviews was done by the investigator. Once the themes were identified, the transcripts were reviewed again to make sure each theme was represented correctly by the athletes' descriptions of psychological momentum occurrences. Three qualitative researchers were used to validate theme identification. The validation provided confirmation of my thematic organization of the data, and the meeting helped me better explain or change themes that I had missed or misrepresented.

CHAPTER 4

THE ATHLETES

The Athletes as a Group

Due to scheduling conflicts, two of the initial six participants withdrew from the study. Thus, only four athletes completed the entire interview process and were included in this investigation. All four athletes had completed at least two years of NCAA Division I volleyball at the same university. The athletes were all white and ranged in age from 18 to 20 years. Three of the athletes were juniors and one athlete was a sophomore. All four athletes experienced the same change in the coaching staff during their college career. One athlete was a setter, one athlete was a middle hitter, and two athletes were backrow specialists. All four athletes had full-ride scholarships. None of the subjects were from the same area of the United States. All of their backgrounds were similar in that they all participated in some athletic activity when they were younger. However, they began playing volleyball at different ages.

Each athlete was represented throughout the study by a pseudonym they chose prior to any of the interview sessions. A pseudonym was also chosen for any family members, coaches, teammates, or universities mentioned during the interviews and the university the athletes attended was referred to as Tech U.

The Athletes as Individuals

To better understand the views and beliefs of each athlete, an introduction to each person was provided. The introductions included interests, values, sport experiences, coaches, influences, idols, and their transition to college athletics.

Jamie

Jamie lived in the Western part of United States and was interested in horse back riding, being with her family and friends, and hanging out. She loved to roller blade, hike, go outdoors, and also enjoyed many things that did not have anything to do with volleyball. Jamie valued her faith, teammates, and hard work. She believed friendship in sport was very important

and stated “ but I mean, for awhile, it was really rough and that’s the only reason I stayed around.”

Jamie started competitive/organized sport at the age of six or seven (gymnastics). Gymnastics was her favorite sport growing up because her sister also participated. “And um, you know, I enjoyed....I enjoyed just rough housing. I was a rambunctious little kid.” She also had one older brother who played baseball. Jamie enjoyed soccer and tennis, but they bored her while she was growing up. She didn’t make cheerleading one year, so she tried out for volleyball and fell in love with the sport. Jamie started playing volleyball as a freshman, but also tried track and soccer in high school. She has played seven years of volleyball total. Jamie doesn’t remember the exact time she decided to pursue volleyball at the college level. She said it just happened. She decided on Tech U. because she got along pretty well with the team and coaches. She liked the area, but really liked the school.

Jamie’s dad was her biggest influence in sports while she was growing up. She never had any sport idols. She looked up to people, but didn’t have anyone in sport to model and emulate. Jamie’s favorite coach was a real Christian man. He made the team work hard and pushed her beyond what she thought she could do. Her least favorite coach was controlling of the player’s actions off the court and made the team believe she was their friend, but really was not. “She was just our coach and I think you should separate those two things. I don’t think they should ever cross, especially at the college level.” Her relations with her current coaches were just strictly coach/player. Jamie did not consider the coach as her friend, but just as a coach. However, she did have respect for the knowledge he had about coaching volleyball.

Jamie’s best memorable sport experience was a state championship victory her senior year of high school when she was on the same team with her best friend. This team was one of the tightest knit teams on which she has ever played. Her worst memorable sport experience was

losing a college volleyball match to a team they were not supposed to beat, but her team “played like absolutely crap,” which was very disappointing to Jamie.

Jamie’s transition to college was probably the hardest thing she thought she’d ever have to do in her whole life. She stated, “Because I was near break....suicidal I swear....because I was in a really deep depression....um, I didn’t think I was ever going to get out.” She was really close to her parents and family and was so far from home, not having any fun, doing badly in school, and she missed her parents and family. Jamie said that she “took every day as a day in itself and tried to see something good in every day, whether it be flowers or something blooming.” With the help of God she got through it.

Rita

Rita lived in the Midwestern part of the United States. She was interested in history and enjoyed roller blading, staying in shape, and watching popular sitcoms. She was quite proud of not ever drinking, which was something she held strong within herself. She valued being honest, straight forward, and not talking behind people’s back. She believed friendship in sport was very important. Rita believed her team had gone through a lot of hardships and indicated that “the friendship’s what’s kept us....most of us here.” She believed a person needed a friend or a close friendship on the field.

She first experienced organized or competitive sport about first grade. She played in many sports while growing up, including soccer, powder puff football, softball, t-ball, track and field, basketball, and volleyball. Her best sports were basketball and soccer. She started dabbling with volleyball in eighth grade, but became serious about it in high school when she made the varsity team as a freshman. Rita expressed that track conflicted with club ball, “and then our basketball team sucked so I quit. And I stuck to volleyball.” She did research on the odds of getting a scholarship for volleyball and other sports and found volleyball had the most scholarships available. She had known since she was a kid, that she would obtain some kind of scholarship to

college. Rita chose Tech U. because of the gorgeous campus and area, it was a dry campus, and she liked the school. "We have the opportunity to have our own tutors, have our own trainers, have our own academic staff to help us....which was really important."

The people who influenced Rita in sport were her mom, dad, brother, and sister. The whole family was quite athletic. Rita idolized Michael Jordan, Michael Johnson, and Dennis Rodman. Rita's favorite coach was an awesome man. He yelled at her and pushed her so much harder than she had ever been pushed; but he was also someone she could talk to personally off the court. Her other favorite coach was a high school coach who taught her everything about the middle position in volleyball. She was a person that made Rita work very hard, but also facilitated her love for the game. Her worst coach didn't appreciate her hard work or her performance statistics, which were better than other players on her team. This coach did not like Rita's northern attitude and made her feel badly about herself as a person. She basically killed Rita's love for the game. Her relationship with her new college coaches was a coach/player relationship. She did what the coach asked her to do and did not indulge in a close friendship with the coach. "But I'm just one of those people....tell me what to do and I'll do it."

Her best memorable sport experience was her senior year in high school. Rita played against a school with an All-American. She described the player "...and like, she was 6'2" as an outside hitter and I'm 5'10" as a middle blocker. I blocked her like eight times in a row." Rita had about 30 kills that game as well. Rita indicated that her worst sport experience included her entire freshman and sophomore years in college, "probably just the coach and our....our record." Rita did not have a difficult transition into college athletics due to her experience in club ball. She was never homesick and looked at college as just another stage in her life. The different culture is something to which she is still adjusting after three years.

Sally

Sally lived in the northwest part of the United States. She liked the outdoors, hiking, camping, rafting, taking her dogs to the park to play, and mountain biking. She valued her family very much. She also valued her close friendships, her boyfriend, her school, and her education. Sally felt friendships in sport were very important to help each other during the hard times. She had played tennis with her dad since she was in about fourth grade, but first experienced competitive tennis in seventh grade. Sally played pretty much every sport she could when she was growing up. She tried softball, tennis, soccer, track, and basketball. "I never did swimming. I was never very good at that." Her favorite sport was tennis and volleyball. Tennis was her best sport, but as she got older she liked volleyball more, and explained "partly because my dad pushed me so much in tennis....it kind of made me want to really not do that....go that route." Her dad was her biggest influence, especially for tennis, but she played most sports just to get involved. She played volleyball because her friends played. She played softball because it was the only sport available in the little leagues, and she ran track because she was a fast sprinter. She never really had any idols, but she did like Andre Agassi in tennis. "I liked him....I just....it was when I was little, I had a crush on him. I thought he was cute; he was wild so I thought he was cool."

Sally's favorite coach was her high school varsity coach. He was very helpful getting her ready for college, was a good friend to her, and also taught in the high school. He was not the most knowledgeable coach in the world, but he was personable, very helpful, and a very good friend. Her best coach was her club coach. He took the team further than they thought they would go. He was a very hard and demanding coach, but knowledgeable about defense and what the other team was going to do, and he had lots of experience since he played volleyball throughout his life. Sally had pretty good relations with her current coaches. The best relationship was with Tanya, an assistant coach. "Well, they're all pretty new right now so it's kind of hard to like, really know them very well."

Sally's best memorable sport experience occurred during her sophomore year when they won their first conference game in two years. The game was at home and they were not supposed to win. It was an exciting match finished in five games. Sally's worst experience in sport was when she decided to quit tennis and focus on volleyball. She decided to play volleyball in college during her junior year and quit tennis after her junior year season. She chose Tech U. because it was something new. "I wanted to go far away, just 'cause I'd never left....I mean I've left my home state, but I've never moved." She liked the fact that Tech U. had a lot of support for women's athletics and the team was really nice. Her transition to college life was difficult because she was so far away from her family and boyfriend back home. Sally's roommate had similar circumstances, so they helped each other through the hard times. Balancing academics and athletics wasn't as difficult. She explained that she did better when she was busy and had lots of things to do. She stated:

But like during season, there's so little time. Like, I would work on like, my homework on the bus, or on the plane, or um, at night when I get home from practice. I'm too tired to do anything else so I just study.

Shannon

Shannon was from the southeastern part of the United States. Her main interest was sports. Because of her participation in sports, she had always felt that she had limited time to get interested in anything else. She liked the outdoors, being on a boat, relaxing, and working with people. She indicated that she enjoyed working with little kids who still aren't influenced in a negative way, and working with the older people because they appreciate the company. Shannon shared that she valued her family and believed people should respect others. She expressed, "That's a strong value of mine---be appreciative." She was an only child, so family connections were very important to her. She also indicated that she valued trust. "If you can't trust the people around you, that you love....you just....you sort of end up being by yourself." Friendships have been very important to her, and her parents have been her greatest friends. She felt a struggle in

her life was fitting in with people in big groups aside from a team setting because she never had a group of friends, or a close friend, to turn to growing up.

Shannon first experienced sport around the age of six. She participated in gymnastics, soccer, softball, and was always the girl who could do more pull-ups and run around faster than the boys. Her favorite athletic event was softball. Shannon played basketball, softball, and volleyball in high school. She always wanted to play football, and enjoyed kickball because that was what was played during recess. However, softball was her best sport while she was growing up.. Shannon first started playing volleyball in eighth grade. She would go in before school with other youths and play for about thirty minutes. Her aunt and uncle encouraged her and coached her, and influenced her to try out for volleyball in high school. Shannon didn't decide to go to college for volleyball until her senior year of high school "because that was the only sport that I could go to Tech U. and play". She always thought she would continue playing softball, but an injury prevented her from playing softball at the next level.

Shannon's biggest influence concerning sports was her family. Both sides of her family had athletes and so she "always looked up to....like, um....my family members." She liked Jackie Joyner Kersee because she was female, and she was so wonderful. She idolized Michael Jordan and Dennis Rodman. She liked Rodman even way back when he was with the Pistons, because when she played basketball, all she could do was rebound. She respected the talents of athletes more than their off-court lives when she considered them her idols.

Shannon indicated that she believed there were many different types of coaches. Her only bad experience with a coach was her first college coach. She shared that she liked to be able to relate to a coach personally and learn the sport from that coach. "But I'm the kind of person that doesn't have a favorite, or single out anything...I'm just so indecisive about things. I feel like, I don't see why I need to narrow it down to just one single thing." Her relationship with her current coaches was pretty good. She liked to be able to have small talk with her coaches. Her

head coach was more the type of coach to just get down to business, but the assistant coaches were all friendly and she was able to talk to them easily.

Shannon's best memorable sport experience was a "buzzer beater" during her high school senior year of basketball. She recalled not paying attention in the huddle and hearing exactly what she was supposed to do. Somehow she made it out to the three-point line and threw up the last second shot. "That was....that was probably my most, you know, 'cause there's always a time you want to win the game." Her worst sport experience was the same year in softball. The last game of the season she was playing outfield, a line drive went over her head, and she missed it. They lost the game.

Shannon did not have a difficult time adjusting to college since it was so close to home. However, not being with her parents all the time was difficult. Her roommate didn't help her difficult situation during the preseason struggles nor the adjustment to college life. Her roommate was depressed and slept all the time. Balancing academics and sports was hard for the first semester because of all the extra time required for both areas. However, Shannon indicated she is better adjusted now and manages her time with a daily planner. She felt keeping her grades up was very important. "And I have to get my grades up because I don't want to get in trouble for having lousy grades." She indicated she was comfortable with college and could not imagine how difficult it was to adjust to college her first year.

CHAPTER 5

RESULTS

Themes were developed by using each athlete's perception and combining them into overall concepts. The themes were documented from individual transcripts using the athlete's selected pseudonym at all times. Three qualitative researchers were used to validate theme identification. This chapter presents two major themes and the individual perceptions the athletes gave regarding those themes. The themes included the concepts of psychological momentum and the identification and control methods of psychological momentum. Many sub-themes were presented under the two major themes.

Concepts of Psychological Momentum

This section includes detailed information, given by the athletes, about the concepts of psychological momentum and include: a) definition, b) causes, c) ending points, d) shifting momentum, e) maintaining momentum, and the f) crowd factor. The athletes' perceptions concerning whether the concept of psychological momentum is an individual or a team phenomenon is also included. In order to understand the athletes' perception of the concepts of psychological momentum, it is best to start with the athletes' definition.

Definition

For some of the athletes, it was difficult to pinpoint the exact words to describe the psychological momentum concept. All four athletes believed the concept of psychological momentum occurred in sport, but never thought about putting the concept into words. None of the four athletes had the same initial idea, or definition, of psychological momentum. However, when more questions about their perceptions of psychological momentum were discussed throughout the interviews, intensity was the main concept found in their descriptions.

Jamie's actual definition of psychological momentum was intensity.

The intensity of it...just intensity. I don't know. Volleyball's such a momentum sport...I mean if there is any sport there's momentum, I think it's at the top of the list...because

whoever has the most intensity and who has everything going for them is going to win, you know.

Rita had no idea at first how to define psychological momentum, but she eventually described the concept as adrenaline. When given the scenario of being ahead thirteen to two, and then all of a sudden being behind fourteen to thirteen, she stated "the idea of momentum was the adrenaline rush." When describing the concept with regard to the scoring scenario, Rita stated, "...you break down the game and...when you get close to that point, the adrenaline goes up." Rita later indicated that one way to help a team maintain momentum was to "keep a...high intensity practice...and scrimmages in practice are key. That's definitely one way to keep the intensity up and keep people fighting for positions."

Sally presented a more descriptive definition, rather than a one-word definition. Her idea of psychological momentum was, "...having what's inside of you---your desire to go, your desire to win. Like---wanting to play and wanting to win." Sally talked about psychological momentum occurring at the beginning of a match or throughout close matches. The team would get pumped up and excited at the beginning, but she believed it would be hard to, "keep up the intensity" when playing a team that was not very talented.

Shannon also provided a short description with her idea of psychological momentum.

Well---I don't know, but I know that when I'm in a good mood or excited or pumped up for a game, that I can jump higher, I'm faster, I'm more aware, I'm ready to do anything, and I want to be there. But when I'm in a sluggish mood, it's like---I don't want to do this, I can't even get the ball anyway, I'm not even going to try.

She believed intensity and adrenaline are components of the upside, or positive side, of psychological momentum, and the downside, or negative side, was being psyched out. Her intensity was dependent upon her mood during the game. Shannon believed momentum "occurs every point. I think it's apparent everywhere."

Causes of Momentum

The causes of momentum do not necessarily shift momentum from one team to another. There may be a point in time when neither team has the momentum. In that case, the cause creates momentum for one team, but does not necessarily take it away from the other team. The instances shared by the athletes described causing momentum for their team.

Despite the variety in the athlete's initial ideas of psychological momentum, their overall ideas were similar concerning what causes psychological momentum. The athletes were asked on four different occasions to give their idea about what causes psychological momentum. When the first question was asked to obtain their initial thoughts and ideas, Jamie and Shannon both stated a good or bad play. Jamie also noted that consistent focus is a possible cause of the momentum shift. "Focus. ...know what's going on the whole game. Never get like---sidetracked." Rita stated it was the fear of losing or the fear of the next day at practice. "We hear it at the next day of practice."

The second question was directed toward specific examples from volleyball matches. This approach was used to allow the athlete to pinpoint exact plays, or situations, that they felt had caused psychological momentum. This time, Sally and Jamie mentioned that winning a long rally helped their team gain the momentum. "Something happened---I went back to serve...I served it where [coach] told me to and I got a couple of aces...and that just set us off." Jamie thought that "little things can set off and keep the plays going." Another example to support Jamie's idea of small things keeping the plays going, was one of their teammates. Rita remembered her teammate Suzy, "hitting very consistently...just putting balls away out of nowhere." Suzy increased her intensity and picked up the rest of the team because of her playing ability. Shannon did not remember specific plays, but mentioned, "talking smack" (e.g. degrading statements regarding the opponent's ability) caused her to play better and helped her attain the momentum.

In other words, Shannon was talking about how verbal expressions, aimed at causing the opponent to lose focus, could increase her desire to play better.

The third question used the word 'attain' to refer to the causes of psychological momentum. Attaining momentum occurred when neither team had the momentum already. Most of the athletes had a different idea when asked how to attain psychological momentum. Rita did not believe momentum could be attained at any one specific time. She stated "One big play comes with another big play with another big play...but you want that first play to change the momentum, and that's the key to...get everyone's confidence." Even though a big play can help spark momentum, Rita believed an athlete could not control when that big play was going to occur.

You can't just---I mean it just happens. I mean, you have no control if someone's going to hit into my block or...you just do what you're---you've been trained to do for the past ten years of your life...and that's what I do. And hope to God we win.

Jamie referred to her teammates who helped her attain psychological momentum, and not a specific play. "If my teammates are not as excited...then my psychological momentum's not going to get anywhere because I need my team." Shannon reiterated that a good play, or continuous good plays, would help attain psychological momentum. More specifically, Sally stated that an outstanding play or winning a long rally could help her attain psychological momentum. Sally also believed it was important for a team to come out at the beginning of a game or after a timeout and win the first point to get the early edge on attaining the momentum. She stated:

Everyone's all pumped up at the very beginning of the match. What we try to do is we try to get---be the first person to five and then the first person to eight...which kind of makes us play better at the beginning---which would make us---let us start off with the momentum, which helps a lot.

The final scenario the athletes were given about attaining psychological momentum, was to assume they were the coach and to state the things that could be done to help their team attain

psychological momentum. The overwhelming response from the participants was to be positive.

Shannon stated:

Keep everybody in a positive frame of mind and...I think we did visualization...I think that's a good way to get just mentally focused. And once you're focused and realize the same goal or goals, I think that's a good way to attain [psychological momentum]...by doing all of those things, then you'll...the good plays will start and the good playing will begin.

Rita believed a coach should show the confidence he or she has in the athlete in order for the athlete to gain the confidence necessary to play well and help gain the momentum. "I think, if the coach has confidence in you, then you have confidence in yourself." She also stated that a timeout during the game helped the team refocus on gaining the momentum. Sally supported the idea of confidence and believed a coach should continually be more positive than negative. Jamie thought a coach should know each player individually and stated that "Psychological momentum has a different effect on everybody. Some players are motivated different ways." She felt that knowing the players could promote team cohesion and greater confidence in one another.

Ending Points

The athletes were asked on two different occasions, what would cause them to lose or end the psychological momentum. The first question asked their perception about how psychological momentum could end. Three of the athletes suggested that some type of bad play would help lose, or end, psychological momentum. Jamie stated a 'stupid play' could end the momentum.

A stupid play. Like, all we need to do is free ball the ball over the net because we had a broken play, and somebody doesn't get it over the net. Something really stupid like that.

Shannon stated that momentum was "just a big circle." A team could have a good play or the opponent could have a bad play in order to gain the momentum. On the other hand, a team could have a bad play or the opponent could have a good play in order to lose the momentum. Sally stated a team could lose psychological momentum when

you start losing. You get in a rut you know...and it's hard to get out of. You just kind of think--- oh we're down two games, we might as well lose the last one, you know. You just

kind of get in a rut...or sometimes like---the coach yells at me. ...but um...I think it's hard when you're losing to keep up that psychological momentum.

Rita was the only one who did not believe a play could end psychological momentum. "I don't think really anything could end it...until you win...or lose." She felt momentum was gained or lost at the end of the game as opposed to momentum being gained or lost throughout the game.

The second question asked the athlete what a coach could do to cause the team to lose the momentum. All the athletes stated the coach could yell or scream at the team and get angry with them, which could contribute to the team losing momentum. More specifically, Jamie and Shannon both stated the coach could lose the momentum by not maintaining the positiveness or even keel it took to help the team win. Rita stated a coach could

throw chairs at them. You think I'm kidding, I've had coaches do that. Just get really upset. Just...just like---when they're---the faces they make, their body language. I mean you can tell. I mean, it's not something they say, it's their body language. And you're just like---you know that they're just like...man, it's hopeless. I think that's a big key---the way they react to certain things.

Sally plainly said the coach could "call the wrong kind of play...yell at one player really hard...or if he yelled at the whole team."

Shifting Momentum

Most of the athletes had mentioned a big play could cause and/or help lose the momentum. When asked if a big play or consecutive plays caused the momentum shift, three out of the four athletes believed consecutive plays caused the shift. Sally stated the comparison clearly and said:

I don't think it's just one play where you can tell you have the momentum. A lot of times it will go back and forth, but I think after...like if you get the ball and you get...like...a point, and maybe another point, then you do...you can tell you have the momentum. And I mean, I don't ever think it's just a specific play that someone does. I mean that will get you all excited, but you could easily just turn around and lose it if you don't keep that up.

Shannon reported that one play could both start and stop the momentum, but the momentum may not shift to the other team because of the play. She stated "When you come up to a bad play, it's like hitting a brick wall. I think you still might have [momentum], but I think a play can stop the

momentum.” Rita responded that a shift in momentum, whether from one play or consecutive plays, “could affect some people on my team...but it usually doesn’t affect the whole team unless it’s like crunch time.” Momentum may shift, but the effect it has on the team is determined by the situation or the timing of the shift in the game.

The next question asked the athlete to state their perception of the biggest play to shift momentum in volleyball. The answers were very similar for all four athletes. The answers included a big block, a great dig, huge kills, and a big play. Sally stated the first play of a game or after a timeout was the biggest play. “That first play, I think, is the biggest momentum...like...whoever wins it at least gets the first momentum shift of the game.” Shannon believed there was more than just one possibility that was considered the biggest play. She stated, “a block that goes straight down...or somebody gets...a full arm kill...or like an ace.” She also believed a solid effort from an athlete that was not the star of the team could spark a momentum shift.

Rita’s idea of the biggest play was when she would “block someone hard core. I think blocking’s got momentum written all over it. That could change the momentum of any game.” Jamie also felt blocking was the big play to shift momentum. “For me it’s when I get a block because I’m small. So when I block somebody, it’s kind of like...well you suck if you hit it in my block, you know.” However, Jamie felt her team could handle the big plays, for or against her team, because “I think as we’re getting more mature...we’re getting to be a better team so that doesn’t really affect us very much anymore.” She continued to say her team is letting “a big play...affect us more and...when they get a big play, have it affect us less.”

Maintaining Momentum

The athletes were asked on three different occasions how to maintain momentum. The idea of maintaining momentum was that the team did not keep the momentum, but they did not shift the momentum back to the other team. The first question pertained to the athlete’s perception

about maintaining momentum throughout the game. Jamie emphatically stated "Focus. ...know what's going on the whole game. Never get like...sidetracked." Jamie also stated that "keeping the momentum is just keeping the ball in...because eventually they're going to screw up."

Sally did not believe one play could maintain momentum just as one play could not prevent the team from obtaining the momentum. She stated:

If you get the ball and you get like...a point, and maybe another point, then you do...you can tell you have the momentum. I don't ever think it's just a specific play that someone does. I mean that will get you all excited, but you could easily just turn around and lose it if you don't keep that up.

Along the same lines, Sally commented that the team needed to "keep playing at that high level. You just have to maintain your level of play in order to maintain the momentum." Shannon stated the team has to just "continue to have...good playing." Shannon, Rita, and Sally all believed that consistent playing and keeping the ball in could help their team maintain momentum because the other team would eventually make the errors. Finally, Rita shared the emphasis Jamie had with her answer when she remarked,

Just don't be stupid. Don't make stupid errors. Don't try to do something you know you're not capable of. You know...like---do a three-sixty in the air and try and hit the ball or something, you know. Just something stupid, which---it happens you know. Something you've never done before that you just do out of the blue because you're...you're not thinking. Keep your head in the game the whole time.

The athletes agreed on another idea that missing serves could hinder the team from maintaining the momentum. They believed that when their team had the momentum, missing a serve could lessen their chances of keeping the momentum. Sally stated "When we're trying to keep the momentum, not missing a serve is a big thing. When we have it and we miss a serve...I mean that's huge."

The second question concerned how the team could maintain the momentum between games. The question was asked under the assumption that the team won the previous game, but the match was not over. Jamie stated the team needed to keep positive conversation in the huddle and

maintain the confidence level of the team high. Rita agreed that maintaining the confidence level helped, but she did not think "there's anything to do. ...it's how you start out the next game." Shannon stated a different approach and said to "try to pump each other, you know...little hoot and holler in the huddle." Sally mentioned "it's hardest in between games ...you have a little bit of time off and you just come back and...it's like a brand new game." Basically, the athletes felt that talking and remaining positive could help their team maintain momentum for the next game.

The third question asked for the athlete's perception about how a coach could help a team maintain momentum. Three of the four athletes related the same ideas of positive reinforcement, even keel, and encouragement. Shannon stated a coach could help maintain momentum by "just continuing with positive reinforcement." Sally agreed that more positive remarks than negative remarks from a coach was a factor and to "just keep---keep encouraging." Jamie supported the idea that positive reinforcement and encouragement from the coach helped, but staying "even keel" and not allowing their emotions to get too high or too low would help more. Rita was the only one that stated a coach needed to "keep---like---a high intensity practice...and keep people fighting for positions" to help maintain momentum. She did not allude to maintaining momentum throughout a game or match, but rather to maintaining the momentum within a team during practice which could, in turn, carry over to the matches.

Crowd Factor

One idea mentioned that could affect psychological momentum, either in attaining, maintaining, or losing the momentum, was the crowd factor. When asked if the crowd could help cause or end a momentum shift for a team, only Shannon stated it could often affect her personally. She explained:

I have to admit in the back of your head when they're making fun of you---you know, big butt---goofy freshman...you lose train of thought on volleyball. It's not focused where you need to be. Therefore, that...they may result in a play that wasn't up to par. It may result in a momentum change.

Jamie, Rita, and Sally all stated that they could not hear the crowd, or did not pay attention to what was said. Only in certain situations could a crowd affect them. It would only affect Jamie if "they threw tomatoes at me...or something like that." Rita stated a crowd could have an affect when someone was going back to serve.

Say you're going back to serve, and it's like all noisy and stuff. Right there is when you block out everything and...you know...you got to get your serve in. That's all I think about because that's like---the only important thing to me at the time.

Sally didn't mind if the crowd was loud, but "when they're degrading then---yeah...it does kind of get to me." All three admitted that a crowd could affect a team, even their team, either positively or negatively. They believed obnoxious crowds could affect an opposing team negatively, while loud, supportive crowds could help build the home team's momentum.

Individual vs. Team Phenomenon

All four athletes may have shown different definitions and perceptions about some psychological momentum concepts, but all four athletes agreed that psychological momentum was both a team and an individual phenomenon. One athlete mentioned it was an individual aspect first, and then it affected the team. Others said it was a congruent phenomenon.

Rita described how psychological momentum could affect both an individual and the team from a positive viewpoint during an actual game. Her idea was that if one person on the team found a weakness on the opponent's team, her entire team could use that information to work together. Rita also thought a big play from one player on the team was usually followed by another big play. The team feeds off of one another's good plays and strategies in order to win. She further explained:

Well you can see it when you're playing in a game, like...like um---for me---like I make a big play, it helps me out. But then also the rest of the team is affected by it because then, you know, the next play for some---it usually works this way, but it's another good play. If it's like a huge play, it's just like, it affects the team. Like a block can, you know, just change the whole momentum of a game. Or an ace, you know, screws up one person's passing on the other team, and then you just ace...you just keep serving that person---everyone on the team,

and then you just keep---I mean, just little stuff affects everyone I guess. That's how I've always been taught, and that's how I've always learned to---from other people like---like say Suzy hit it like---cross court and she got a kill...and like, I'd probably aim for the same spot just because I'm thinking---you know---well hey, it worked for her. So then you start thinking of what's going to work.

Jamie described psychological momentum as being both an individual and team phenomenon, but from a perspective of losing momentum and not gaining momentum. She felt it should not be only an individual phenomenon in a team sport, but a lot of times it is. Jamie explains:

I think it could be both...but our sport, it shouldn't be individually. I mean you should share it with your team, you know...I mean if you think---you could get excited you know...I mean, we're one unit, we're not individuals on the court. We used to be my freshman year, and that's why we lost because one person thought they had such good momentum and the rest of us were like---I didn't see it. ...I mean we are individuals so...um, each individual makes the team I guess so...when I do something wrong, I---I don't know---it affects me first and then it will affect everybody else...it first affects you and then---individually...then it'll spread to the team.

Jamie also spoke about the team's affect on her and said, "If my teammates are not as excited...then my psychological momentum's not going to get anywhere because I need my team." She also mentioned that if a teammate has messed up continuously in passing, she would encourage her and ask the teammate to move up so she could pass for her. "They don't have to worry about the little things [like passing]...which can make their better part of the game go down also."

Shannon described psychological momentum from a positive perspective of gaining momentum and a negative perspective of losing momentum.. She believed individuals influenced the team more than the team could influence the individual and explained:

I think the team phenomenon is based on um, every individual's coming together. So I think that, you know---congruent. Is that a good word? I think they go together. Because if one person is down and not trying, then you'd be like 'God!' you know. It's so annoying to me anyway to think that... 'God, I haven't done it the past three times---I must not be able to do it.' I would lose the momentum within myself to...or sometimes I'll say well, I haven't done it yet so I need to try harder. You'll bring the entire team down. But if one person runs, you know, hustles their butt off and gets the ball up, you'd be like, 'Wow she's really giving it her

all. I should probably give that much too.' I think individuals influence the team. I feel like I do have...influence people. I think I have an effect on the team.

Sally also agreed that psychological momentum was an individual and a team phenomenon. Her viewpoint was from a mental standpoint as opposed to describing physical situations. In other words, her idea of psychological momentum was a mental phenomenon as opposed to something that can be done physically. She stated:

I think everyone has to have it within themselves in order for the whole team to have it. It's hard if there's someone on the team who doesn't...just doesn't care if we win or lose---just wants to get out of there. Um, I...I think everyone needs to have it, and then as a team you need to have it too---as a goal to win, you know. But yeah, I think it's an individual thing first off.

Thus, all four athletes agreed that individuals affected or influenced the team, and vice versa.

Identification and Control

This section includes detailed information about how the team and the opponents recognized psychological momentum. It also includes coaching strategies to shift momentum to their team or prevent the shift to the opponents' team.

Recognition of Own Team's Momentum

Psychological momentum may not be an effective motivator if the team does not recognize when momentum was in their favor. The athletes were asked if they recognized when their team had the momentum and if they could tell when their team lost the momentum. The athletes alluded to an increase in playing ability and positive plays when the momentum was in their favor. Sally specifically mentioned one way to tell whether her team had the momentum was when there was excitement by the team on the court after winning a few points. She expressed, "You can tell by either getting a few points in a row, or if everyone's excited. ...when we have it, we are always like---really excited and everyone always comes into the middle." Shannon also mentioned that when her team came into the middle of the court and celebrated, she could tell they had the momentum. "That's when we...everybody's arms are in the air and voom, we're all-

--you know---high fiving. ...that's what I think makes it fun---is celebrating." Jamie basically stated that "watching the hustle" was an indicator that her team had the momentum. When the team hustled beyond their normal potential, then the team felt they had the momentum in their favor.

However, the reverse was true when the team did not have the momentum. The team was not celebrating and coming to the middle, and the hustle was not there. Shannon said more talking was done, but with an urgent tone when the team lost the momentum. "Verbally it'd be like, we got to pick it up, let's get a sideout, let's get the momentum back, let's get this back." She went on to say that her team would "try harder physically, because you want the momentum...momentum can carry you a long way in addition to physical."

Opponent's Recognition of Momentum

The athletes talked about how their team recognized when they had, or didn't have, the momentum. It is just as important to recognize what the opponent's reaction to momentum as it is to recognize your own team's reaction about the momentum. How the opponents have reacted to losing or gaining the momentum is discussed in this section. Once again, momentum would not do a team any good if the opponent does not recognize it.

Body language and verbal communication were two main factors noted in recognizing the opponent's level of momentum. The verbal communication must be noticed on the court since it is impossible to listen to what the teams say in the huddles. Rita talked about the opponent's body language as well, but she focused more on their conversation. "You can hear them too--- what they're saying, and when they get frustrated. I listen a lot to what the other team's saying...and see what [their coach] is saying." Rita spoke about the body language her team showed when they did not have the momentum and how the opponents can recognize and use that

to their advantage. She said opponents could take advantage of noticing the lack of momentum very easily.

Body language. I mean our body language sucked. We were just like, gosh---you know. You can see our faces going like [cringe]. So I mean, I don't think it was that noticeable 'cause they never carried away with it, you know---they never got...I mean if they would have noticed, they could have just kept picking 'em, picking us apart, but they didn't. ...because when we see a weakness, and you just keep doing the same thing over and over and over again. But they kept doing like, different stuff. I guess...maybe they just didn't realize it.

Rita stated how their own body language could give it away, and Shannon stated how they could take advantage of the same knowledge about their opponent:

They would sluff back to their positions or sometimes they would all bring it in and be like---come on, you know...with the exasperated encouragement...like forced encouragement.

Thus, psychological momentum may not have an impact on a team or their opponent if the momentum is not recognizable in the team's words or actions.

Coaching Strategies

A coach can do many things to help his/her team keep the momentum, or shift the momentum back to their team. The athletes mostly mentioned timeouts and substitutions as strategies coaches used to shift the momentum.

Timeouts can be used to break the concentration of the other team or to share strategy with the team. Strategy can include such things as certain plays to run, or certain places to serve the ball. When her team is losing the momentum, or has yet to gain the momentum, Rita stated that a coach would wait a couple of plays and then call a "timeout, or like substitution---but it's usually a timeout." She stated that her coach would let the team try to work through the problem, but would call the timeout if they hadn't gotten the momentum back. Rita goes on: "Same with the other team, they'll do the---if we're...just flying high, the coach will call a timeout." However, Rita believed it was not the actual timeout that did the trick. Rita said:

he'll tell us like, our shots...like certain shots we can use that'll be a definite kill...just kind of calm us down...but it's the play after the timeout that decides if it was effective or not. You gotta come out and get that---that kill. You can't come out and shank a ball. You know once you come from a timeout, you gotta get that sideout.

Jamie also believed a timeout helped her team shift the momentum back in their favor. She stated that "we always get sideout or a point after our coach calls timeout. This always happens to us because he's a good coach like that...and he always knows what to say." She felt that even though the timeouts were not always constructive, the team knew they had to get the sideout, and they usually did. Sally felt a coach should probably give some kind of play to run that would emphasize the strengths of her team and capitalize on the weaknesses of their opponent. She also believed a team could get the momentum back after a timeout. "Just coming out at the beginning of the game, or after a timeout and winning that point can sometimes get you started."

Shannon felt a coach normally called a timeout to "catch your breath... but the coach has been planning out and has like a specific play or strategy." Shannon stated the plays usually worked after a timeout and that "gives you a little momentum to ride on." All four athletes believed timeouts or substitutions were the two most used strategies a coach used to help his or her team shift the momentum back in their favor.

Definition

Intensity
Adrenaline
Desire to go, desire to win
Good mood, excitement, pumped up

Initial Causes

Big play
Consistent focus
Fear of losing
Level of sport
Wanting to play
Good or bad play

Ending Points

Stupid play
Winning or losing
Good or bad play
Coach yelling at athlete(s)

Greatest Impact

End of a game or match
Big play (block, ace, power hit)
Close games or match

Attaining Psychological Momentum

Timeout
Winning long rally
Big play
Teammates
No control, just happen
Encouragement/Positiveness

Individual vs. Team Concept

Both
Congruent
Individual first, then affect team

Maintaining Psychological Momentum

Encouragement
Continuous good plays
Focus—not sidetracked
Stay even keel
High intensity practices
No stupid errors
Keep the ball in play

Big Play vs. Consecutive Play Effect

Consecutive plays more effect on
psychological momentum
More mature---having good play affect
more and bad play affect less
One big play usually comes with another---
but first big play is goal
One big play---good or bad

Crowd Factor in Matches

Crowd can be a good factor
Do not hear the crowd---block them out
Rude and degrading gets to me---but usually
don't recognize it
Can flip negative crowd around to motivate
you to beat them

Biggest Play to Shift Momentum

A block because I'm small
Digging good hitters
Pack in the face
Huge kill to the three-foot line
Block that goes straight down
First play of the game
A dig where someone exerts every last
energy they have
A non-starter comes through with amazing
play or solid effort.

Figure 6.1. Psychological Momentum Concepts

The overall themes of psychological momentum are summarized in Figure 6.2 and are discussed as they relate to the review of literature. The precursors to psychological momentum include the feelings of positive intensity, attitude, reinforcement, and encouragement. The potential results of psychological momentum include winning points, long rallies, and games/matches as possible settings in which psychological momentum could occur. The crucial components of psychological momentum are exemplified by the crucial aspects of team and individual interdependence, teammates, and recognition of psychological momentum.

Not all of the studies reviewed for this thesis applied specifically to the data collected by the investigator. Due to the uniqueness of this study, only research that applied to this study was compared with the results. Even though only one previous study was conducted using volleyball, Miller and Weinberg (1991), the other studies were relevant to the findings collected in this study as well.

The research conducted by Taylor and Demick (1994), which found winning players in tennis had more positive precipitating events leading to a victory than negative precipitating events, was supported by the athletes in this study. The athletes in the present volleyball study stated that the momentum shift has more impact on the game or match if it occurs at crucial times of the game that allows the team to score a chunk of points, or if it occurs toward the end of the game or match. If psychological momentum occurs at the end of the match and is positive, the team is more likely to win. If it occurs at the end of the game and is negative, the team is more likely to lose. Shannon stated:

I think the impact...well, I guess towards the end 'cause, you know---I mean if the score's tied or close, and you're good or, if your good or bad play wins or loses a match, then that's an entire momentum swinger I think.

Overall Themes of Psychological Momentum

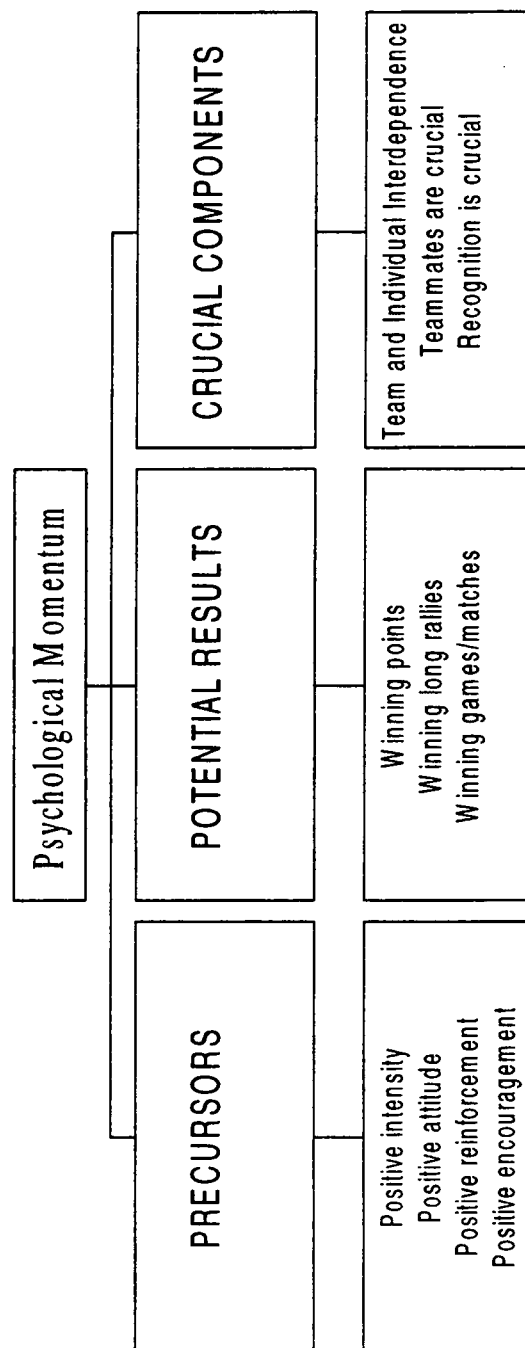


Figure 6.2. Overall Themes of Psychological Momentum

The research by Burke et al. (1997) focused on the concept of psychological momentum and the degree of agreement (or disagreement) in the starting and ending points of psychological momentum in tennis and basketball. Psychological momentum has no clear definition and people differ in their perceptions of when it starts and stops (Taylor & Demick, 1994; Burke et al. 1997). The volleyball players responses in the present study are consistent with the findings by Taylor and Demick (1994) and Burke et al. (1997). Rita's comment that "...there is not just one starting and stopping point..." illustrates this concept.

The female volleyball players in the present study support the findings of Shaw et al. (1992) that performance accomplishments increase self-efficacy, but performance failure does not decrease self-efficacy. Most athletes stated that the maturity of the individual and team allow negative plays to affect them less, and positive plays to affect them more. Only Shannon stated that the negative plays were significant in her individual psychological momentum, or lack thereof. These athletes also revealed that the individual is most likely to be picked up, or supported, by the team and not let any negativity affect their future play.

Gayton et al. (1993) used a team sport to study whether early point success led to later game success. Burke and Houseworth (1995) investigated both early points leading to winning the game and early game victories leading to winning the match. Richardson et al. (1988) studied the effects of winning the first game on winning the match. All three of these studies stated that early success, either in points or in games, led to future success in either games or the match. The data in the present study did not support the idea that early success led to a victory in the game or match, but rather early success led to an increase in psychological momentum. Sally stated it best by saying:

I think the first play of the game is a big one because you're both coming in, don't know how the other team's going to play at all. I mean I'm not saying first play measures how good the teams are, but if you're serving and you get that first point, then you're already ahead and it's easier to keep running off of that then to already be losing and have to, you know, come back.

I mean it's only a point, but it's still---that first play, I think is the biggest momentum...like... whoever wins it at least gets the first momentum shift of the game.

None of the athletes believed that the first few points would guarantee a victory in the game, but it could help to gain the momentum early to have a better shot at winning. All of the athletes stated that each game in and of itself, did not affect the outcome of the match either. One game should not affect the next game, or the next game, and so forth. Rita stated,

I don't think there's anything to do. It's when you start the next game---it's how you start out the next game. You can't let that affect you, you know, how you played one game affect the next game. Like...I can't explain it...it's just---it's a new game. That's what's cool about volleyball.

The perceptions of the athletes in this study support the idea that psychological momentum is a very difficult concept to define. Lots of perceptions and factors are involved and every individual is different from the next. The next chapter will discuss the implications this study could have for athletes and coaches in volleyball as well as other sports.

CHAPTER 7

SUMMARY AND IMPLICATIONS

The purpose of this study was to investigate NCAA Division I women's volleyball players' perceptions of psychological momentum. Due to scheduling conflicts, two subjects withdrew from participation and only four athletes were included in this investigation. All four athletes have completed at least two years of NCAA Division I volleyball at the same university. Three of the athletes were juniors and one athlete was a sophomore. All four athletes were white and ranged in age from 18 to 20 years. All of the athletes experienced the same change in the coaching staff during their college career. One athlete was a setter, one athlete was a middle hitter, and two athletes were back row specialists. All four athletes had full-ride scholarships. None of the athletes were from the same area of the United States. All of their backgrounds were similar in that they all participated in some athletic activity when they were younger. However, they began playing volleyball at different ages.

All four athletes acknowledged that psychological momentum was evident in volleyball. Each athlete has had prior knowledge about psychological momentum either by listening to the coach talk about it or briefly mentioning it as a phenomenon that occurs during sport. None of the athletes had ever discussed psychological momentum in such great detail.

The following conclusions represent the consistent perceptions that the female volleyball players had given throughout the study.

1. Psychological momentum was not a tangible concept, but it does exist.
2. Psychological momentum was a known concept, but it was not conceptually defined the same by each athlete.
3. Psychological momentum can be a team or an individual concept, but it was most effective when the whole team recognized the existence.

4. Psychological momentum was described as a positive feeling state.
5. Psychological momentum may be with either team, or with neither team, but not with both teams at the same time.
6. A shift in psychological momentum did not necessarily mean momentum shifted from one team to the other. It may be shifted from neither team having momentum to one team having momentum.
7. Psychological momentum was not effective unless one of the teams recognized the existence of momentum.
8. Psychological momentum was related to making points, winning, and making good plays.

The results revealed that psychological momentum was related to positive feelings of intensity and adrenaline, winning points, long rallies, and matches are probable results of having psychological momentum, and recognition by the teams was crucial for psychological momentum to have an effect on the game. Though the findings of this study are not generalizable to other sports, the information gathered provides a greater understanding of athletes' perceptions of psychological momentum.

Implications

The data collected from each athlete's perception showed that each athlete was different. Not every athlete has the same passion, drive, or motivation as another athlete. Implications from this research are valuable to coaches and players. Psychological momentum was defined in many different forms and supported when concerning outcome, success leading to success, and certain perceptions of when and how it occurred. Coaches and players may value in the research by knowing how to use momentum effectively and how to combat the opponent's momentum. The research also provided a means for which athletes can explain the "comeback," "hot hand," and

other momentum related phenomenons. The information from this study can be utilized by both athletes and coaches.

Psychological momentum exists in some form in sport. Positive reinforcement and encouragement were two main ways to help teammates become motivated to make the plays necessary for possible attainment of psychological momentum. One person could affect a team negatively, but one person may not be able to lift an entire team up from being negative. A team sport is a total team effort and not a group of individual players. The athletes felt psychological momentum may affect an individual first, but could have an effect on the entire team.

A coach's knowledge that each athlete is different, and understanding how they become motivated could help in team cohesion. Better team cohesion could produce better attitude and desire, thus improving the level of play. A higher level of play could produce the plays necessary to obtain the psychological momentum resulting in a possible victory. A coach identifying when the momentum is lost, or when the team feels they have lost momentum, will be better able to help the team get back in the rhythm of regaining momentum. Some ideas mentioned in this study include positive reinforcement, encouragement, timeouts, knowing the weaknesses of the opponent and using it to the coach's advantage by calling a play that will work, and utilizing the strengths of one's own team.

Perhaps this study can stimulate research about psychological momentum. Such knowledge could make coaches and players more aware of a phenomenon that is ever present and important in sport. The research in this review also poses many questions and problems. Psychological momentum has no clear definition for people to use. It is such a subjective concept, researchers cannot find a universal idea or definition for both team and individual sports. Momentum may occur in a single event or a series of events, and may also occur at different levels or degrees for

each individual athlete. Momentum may occur for one person, but not affect the other people on his/her team, and therefore has no significant effect.

Psychological momentum was a phenomenon that could not occur without a precursor. Precursors are considered elements that lead to attaining psychological momentum. Studies need to be done as to the effects of precursors (i.e., coach's pep talk, teammate's pep talk, motivational video) on psychological momentum. Although psychological momentum and winning points, rallies, and matches are not directly linked to one another, studies need to be done to investigate the possibilities of having momentum when winning is not the end result. While several models and research studies are available on psychological momentum, additional research needs to be conducted to develop a better understanding of the complex psychological phenomenon.

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APPENDICES

APPENDIX A

COACH'S INFORMED CONSENT

April, 1998

Dear (coaches name):

The purpose of this letter is to request the cooperation of your volleyball team to participate in my study. I am doing a qualitative study for my master's thesis at The University of Tennessee, Knoxville. The purpose of the study is to investigate the athlete's perception of psychological momentum in women's collegiate volleyball. I am requesting your permission to contact your athletes as possible participants in the study. I am also requesting the use of a videotape of a fall 1997 volleyball match in which the athletes felt psychological momentum was most evident. The exact match will be determined after the first interview based upon each athletes' decision.

Participation in the study would require three different interview times. The first interview will be a brief 45 minute introduction and information gathering session about each participant. The second interview will last approximately one hour and will involve recollection of psychological momentum occurrences. The athletes will view a videotape of a match from the 1997 fall season prior to the second interview. The final interview is a brief 30 minute overview about the information gathered and a summary of the findings. Enclosed is a copy of the interview questions. Individual consent by the athletes to participate in the study will be requested at the first interview time. Each athlete will be informed that the study is voluntary and confidential, and the athlete may withdraw from the study at any time. A pseudonym will be selected by each athlete to ensure confidentiality. No physical, emotional, nor psychological risks are involved in the study. The athlete will also understand that there is no effect on team participation or standing because of her participation in the study. Neither the team, nor a specific individual will be identified in the study. The study will help further the research about psychological momentum and its effects/ consequences on athletics. By understanding the complexities of psychological momentum, coaches and athletes alike may eventually know how to use and combat its effects.

Psychological momentum is a common phenomenon spoken about by athletes and coaches alike. Further research exploring the details of psychological momentum is greatly needed. By understanding more about psychological momentum, hopefully coaches can better utilize coaching techniques during a match. If you would be willing for your team to participate, please complete the questions at the bottom of this letter, and return in the enclosed envelope at your earliest convenience. Please keep a copy of this letter in your files for future reference if needed.

At the conclusion of the study, I will send you a summary of the results. Thank you for considering my request and I am looking forward to working with you and your athletes.

Sincerely,

Elizabeth M. Shannon
M.S. Candidate

Patricia A. Beitel
Faculty Advisor

I have read the purpose of the study and understand the methods which will be used to obtain information regarding psychological momentum. I give permission for you to approach the athletes of my team to take part in your study regarding the psychological momentum research.

Coach's Signature _____ Date _____

Number of Team Members Available _____

Office Phone Number _____

APPENDIX B

ATHLETES INFORMED CONSENT

I, _____, hereby volunteer to participate in a qualitative research study that examines the athlete's perception of psychological momentum in Division I women's collegiate volleyball.

I understand that the study will consist of three different interview sessions. I understand that the interviews will be audiotaped to ensure the reliability of the documented answers. I understand I will select a pseudonym to be used in the entire study to ensure confidentiality. The first interview will consist of demographic information and initial thoughts about psychological momentum. The first interview will last approximately 45 minutes. The second interview session will last approximately one hour. The interview will consist of an interview regarding thoughts and perceptions of the occurrences of psychological momentum from a volleyball match watched prior to the interview. The volleyball match will be from the fall 1997 season. The final interview will last approximately 30 minutes and will be a clarification of the data collected as well as a summary of the results.

I understand that participation in this study will be completely voluntary and confidential. I will not be punished or suffer any consequences on the team as a result of taking part in this study. If at any time I do not wish to complete this study I may withdraw, and my questionnaires will be destroyed.

I understand that participation in this study does not involve any physical, emotional, nor psychological risks. I understand that I am under no obligation to answer the questions or participate in the viewing of the video of the volleyball match in the second interview.

I understand that participation in this study will contribute to the research about psychological momentum and its effects/consequences on athletes. By understanding the complexities of psychological momentum, coaches and athletes alike may eventually know how to use and combat its effects.

SIGNATURE _____ DATE _____

PLEASE PRINT NAME _____ DATE _____

Contact for Information:

Elizabeth M. Shannon
M.S. Candidate

Patricia A. Beitel, Ed.D
Faculty Advisor

APPENDIX C

Pre-Study Interview Questions

Gender

Age

Year in School

Collegiate Volleyball Experience: _____ years

Total Volleyball Experience: _____ years

1. Tell me about yourself
 - a. Where is your hometown?
 - b. What are your interests?
 - c. What do you value?
 - d. How important are friendships in sport to you?
2. Tell me about your sport experience
 - a. When did you first experience competitive/organized/informed sports?
 - b. What were your favorite athletic activities when you were young?
 - c. What was your best sport growing up?
 - d. When did you first play volleyball?
 - e. What were your sports in high school?
 - f. Who influenced you playing sports?
 - g. Do/did you have any sport idols? Who and why?
 - h. Describe your favorite/best coach growing up.
 - i. Describe your most memorable sport experience (good or bad).
3. Tell me about your transition to college sports
 - a. When did you decide to play volleyball at a college level?
 - b. Why did you choose this university?
 - c. Describe your relations with the coaches.
 - d. How hard was it to adjust to college life?
 - e. How do you manage time between sport and academics?
4. Give me your idea of psychological momentum.
5. Give me your idea of the causes of psychological momentum.
6. Give me your idea of when psychological momentum ends.
7. Tell me when you think psychological momentum has the greatest impact on a game.
8. Do you think psychological momentum occurs in every game/match. Why or why not?
9. Do you believe psychological momentum is necessary to win a game/match?
Why or why not:
10. Are shifts in psychological momentum an individual, or an entire team phenomena?
11. If psychological momentum shifts effect the entire team, can one player cause the shift or does it take more than one player?
12. Can the team affect the individual?
13. If you had messed up a play or a couple of plays, what are some things that would bring you out of a loss of momentum?
14. What do you think about these interview questions? Would you change any of the questions in this interview?
15. What do you think about the interview procedure? Would you change any of the procedures used in the interview? Is there anything you would add to the interview?

APPENDIX D

Post Video Interview Questions

1. Now that you have refreshed your memory about the match, when did psychological momentum shift affect you personally? The entire team?
2. What specific events caused psychological momentum shifts? (e.g., kill, ace serve) Any external events other than a play? (e.g., crowd, coach)
3. How would you maintain psychological momentum between games if you won the previous game?
4. How would you attain psychological momentum between games if you lost the previous game?
5. Was the psychological momentum shift recognizable by your opponent? By your team? How could you tell?
6. If the coach and/or athlete recognized the shift in psychological momentum shift, what was done to try and prevent the momentum shift? (e.g., timeout)
7. What prevention methods actually stopped the momentum? (e.g., sideout, timeout)
8. Did the shift of momentum have an effect on the outcome of any of the games?
9. Do you think it would take one big play or consecutive plays to obtain or lose the momentum?
10. Out of all the big plays in volleyball, what is the biggest play to shift the momentum?
11. Let's say you messed up a play, would you be concerned about how it affected your teammates?
12. Reflecting on the entire match, is there anything you want to mention that I did not cover?
13. What do you think about these interview questions? Is there anything you would add or change to the questions and/or procedures used in this interview?

APPENDIX E

Final Interview Questions

1. I reviewed our first two sessions and documented what was covered. You may listen to the tapes and/or read your transcripts. Is there anything you would like to change, elaborate, or add to your interviews? Will you please read over the summary to check if my interpretations are accurate and true?
2. Could you win without psychological momentum? Could you give me an example?
3. Could you lose with psychological momentum? Could you give me an example?
4. What could make you attain psychological momentum?
5. What could make you maintain psychological momentum?
6. What could make you lose psychological momentum?
7. As a coach, what could you do to help your team attain psychological momentum?
8. As a coach, what could you do to help your team maintain psychological momentum?
9. As a coach, what could you do to help your team lose psychological momentum?
10. Does the crowd have an effect on you or your team during a game/match?
11. Do you have a greater awareness of the psychological momentum concept? How so?
12. How do you think this knowledge will benefit you in volleyball?
13. How was this study beneficial to you?
14. Overall, is there anything you would change or add regarding the interview sessions, procedures, or questions?

Thank you for your participation and support in my study. I appreciate the time and effort you have given me and for your cooperation

VITA

Elizabeth Maureen Shannon was born in Louisville, KY on February 5, 1974. She is the daughter of Mr. and Mrs. Dallas Shannon of Lodi, WI. She will be married to Mr. Brian Myers on July 10, 1999 in Terre Haute, IN.

She graduated from Avon High School in Avon, IN, in 1992. She attended Indiana State University where she was a student athlete in women's volleyball for two years and track and field for five years. She obtained her Bachelor's Degree in 1997 with a major in Physical Education and a minor in Psychology. In 1998, she received her Master of Science, with a major in Human Performance and Sports Studies, from the University of Tennessee, Knoxville.

Elizabeth is currently employed with Spartanburg School District 5 in Spartanburg, SC. She teaches physical education to K-4th grade students at River Ridge Elementary and Duncan Elementary. She is coaching 7th-8th grade girl's basketball at D.R. Hill Middle School, and girl's varsity/jr. varsity soccer at Byrnes High School in Spartanburg.