PRE-COMpetition anxiety contagion among collegiate male volleyball players

A thesis submitted in partial fulfillment of the requirements
For the degree of Master of Science in Kinesiology

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Acknowledgement

Thank you Dr. Galli, for your tireless efforts in helping me strive for perfection.
Dedication

This thesis is dedicated to my parents, John and Karen Baxter, for always guiding me towards my dreams.
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ABSTRACT

PRE-COMPETITION ANXIETY CONTAGION AMONG COLLEGIATE MALE VOLLEYBALL PLAYERS

By

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Master of Science in Kinesiology

Emotional contagion refers to the tendency to “catch” the emotions of others (Hatfield, Cacioppo, & Rapson, 1994). The purpose of this study was to explore anxiety contagion in a team sport setting. Specifically, whether anxiety contagion exists, the influence of team role on perceived anxiety contagion, and whether sport-confidence predicted the amount of anxiety contagion perceived. Eleven players and two coaches from an NCAA Division I men’s volleyball team retrospectively completed the State-Trait Anxiety Inventory (STAI) in reference to their best performance in order to establish their individual zone of optimal functioning (IZOF; Hanin, 2000), and again two days and one hour prior to a competition in reference to how they felt at that moment. Seven of the 13 participants recorded scores below their IZOF prior to competition. Semi-structured interviews with participants were conducted within one hour post-competition. Players were asked to rank various interpersonal factors that affected their game anxiety on a 1 (very little) to 10 (very much so) scale. Results suggest anxiety contagion prior to the game did exist. Coach anxiety was the top ranked factor perceived to influence anxiety. Self-confidence was not a significant predictor of anxiety contagion perceived. Results reveal a need for coaches to monitor their anxiety to not affect players’ IZOF.
Chapter 1

Introduction

After five years as a volleyball player, one year as a coach, and countless hours in a cramped locker room during pre-game, I wondered if - as players and coaches - our moods spread to one another. Since anxiety level is linked to performance (Hanin, 1980), investigating anxiety contagion, the idea that anxiety is contagious, becomes important because (a) athletes experience anxiety at all age levels and skill ranges, (b) anxiety effects athletes’ performance outcomes (Hanin, 1980), and (c) this anxiety may be contagious among teammates.

Anxiety: Types, Symptoms, and Pre-competition

It is human nature to experience bouts of anxiety from time to time, but how athletes deal with that anxiety may affect their outcomes. Anxiety can be divided into two components: state and trait anxiety. Trait anxiety is how anxious a person is in general, their everyday life (Weinberg & Gould, 2007). State anxiety, a temporary and ever changing mood, breaks down into two groups: cognitive and somatic (Weinberg & Gould, 2007). Cognitive state anxiety refers to the level of worry or negative thoughts one has with regard to a specific situation, while somatic state anxiety refers to the physiological responses the body has to nervousness and how they are interpreted by the individual (Weinberg & Gould, 2007). Somatic responses can include an increase in heart rate, perspiration, and shallow breathing. Pre-competition cognitive and somatic state anxiety represents the level of worry or doubt a player has just prior to their game or match. For the purpose of this study, the focus will be on cognitive and somatic state anxiety.
Anxiety and Performance

An extensive amount of research has been conducted on the effect that state anxiety levels have on performance within the athletic domain (Yerkes & Dodson, 1908; Seward, 1956; Weinberg & Gould, 2007). The first of these theories was the Drive Theory (Seward, 1956). Drive was defined as “excitatory state produced by homeostatic disturbance” (Seward, 1956). Psychologists observed a positive linear link between arousal and athletic performance in well-trained athletes (Spence & Spence, 1966). For example, a runner with higher arousal will run a faster time than when she has lower arousal. However, this idea is rarely supported in sports that require finesse movements; such as golf or basketball (Martens, Vealey, & Burton, 1990). A more recently supported theory is the Inverted-U hypothesis which was derived from Yerkes-Dodson’s 1908 ideas view arousal as being intertwined with state anxiety. Hardy’s Catastrophe Model, which also correlates arousal with anxiety up to an optimal point, prior to becoming detrimental to performance. Arousal is a state of alertness both mentally and physically. Anxiety is the physiological or psychological reaction when a threat is perceived (Weinberg & Gould, 2007). According to the Inverted-U, athletes need to have a moderate level of arousal, or performance will suffer. This theory has more research support (Weinberg & Gould, 2007); however it lacks the ability to account for individual differences between athletes. These theories suggest sports psychologists believe that there is one optimal anxiety point that applies to everyone.

One of the more recent theories is Hanin’s (1980) Individualized Zones of Optimal Functioning (IZOF). The IZOF is a globally utilized theory in regard to anxiety and performance (Woodcock, Cummings, Duda, & Sharp, 2011). According to the IZOF,
athletes have a zone of optimal state anxiety levels in which their best performance occurs. In a study done by Raglin & Morris (1994), the research found that female college volleyball players had specific anxiety levels for optimal functionality. These levels were categorized by player IZOF. This zone was found by taking players scores from the State Trait Anxiety Inventory (STAI) in regards to their “best game,” then adding and subtracting four anxiety units from the “best game” score (Hanin, 1980; Raglin et al., 1994). The researchers used Spielberger's (1966) state-trait anxiety inventory (STAI) to measure the state anxiety of players. Raglin et al. (1994) identified players zone of optimal functioning utilizing a STAI questionnaire in regards to their best performance they have ever had. Zones were identified by finding players STAI scores in terms of their “best performance” they have had and adding and subtracting four anxiety units to it (Hanin, 1986; Raglin et al., 1994). The researchers observed that different players had their best performances when they landed consistently in their optimal zones. Woodcock, Cumming, & Duda (2011) observed support for the application of IZOF framework as cross-country runners perceived better emotional regulation following an IZOF intervention that had athletes closely revisit a previous experience and reevaluate it from an emotionally removed position.

_Emotional Contagion_

Emotional contagion is defined as “the phenomenon whereby an emotion initiated by an individual extends to other individuals who are in his or her proximity as a certain time” (Larousse, 2006, p. 256). Research on emotional contagion suggests that the contagion takes place at an unconscious level, transferring a certain emotional state from one person to another (Dimberg, Thunberg, & Elmehed, 2002). Other research on
contagion found positive links between workers’ emotions and coworkers’ emotions (Barsade, 2002). Gonzalez, Castillo, & Swinkles (2002) found that of the 25 emotions tested, anxiety was perceived to be the ninth most contagious. Most contagion research has been done within the business world, with little attention towards the athletic domain (Volmer, 2012; Apitzsch, 2009; Anghel, 2010). Of the few athletic-emotional contagion studies, none have focused on competitive state anxiety, during the pre-performance period, which would have implications for athletes’ and teams’ performance (Anghel, 2010; Apitzsch, 2008; Volmer, 2012).

**Self-Confidence**

Self-confidence is defined by sports psychologists as the belief that one has the ability to perform a desired skill or behavior (Weinberg & Gould, 2007). Similar to anxiety, self-confidence can be looked at as both state and trait. Self-confidence can have a multitude of positive influences on the athlete including: facilitating concentration, increasing effort, gain psychological momentum, and better performances (Weinberg & Gould, 2007). Jones and Swain (1995) observed that confidence can lead to a more positive interpretation of anxiety, along with arousing more positive emotions.

**Study Purpose**

The purpose of this study is to explore the interpersonal effects of an individual’s pre-competition cognitive (mental) and somatic (physiological) state anxiety levels on their teammates’ anxiety. Studies on emotional contagion have been performed, but rarely within the realm of team sport athletics and none focused on anxiety (Anghel, 2010, Apitzsch, 2008, Volmer, 2012). Since competitive anxiety can have an effect on
performance (Jones, 1995; Woodman & Hardy, 2003), it seems important to investigate whether anxiety experienced by individual players can spread to their teammates. Thus, this study will explore the interpersonal effects of anxiety within a team, and determine whether a contagion effect exists. Knowing this information can assist a coach or sport psychologist with the anxiety contagion effect, and inform efforts to help prevent negative effects of anxiety on performance. Four questions will be addressed: (a) Do athletes perceive an anxiety contagion from teammates and coaches? Hypothesis: Yes, due to the close proximity in the locker room as well as players relationships with one another. (b) What affects an athlete’s ability to get into IZOF? Hypothesis: perceptions of teammates’ anxiety will influence athletes’ level of anxiety. (c) Does team role have an effect on the amount of anxiety contagion that is perceived. Hypothesis: Players and coaches roles on the team will be a significant predictor of the amount of anxiety perceived as contagious to team members. (d) Does self-confidence play a role in the amount of anxiety contagion perceived? Hypothesis: Self-confidence is a factor for how much anxiety is perceived by the participant. Specifically the higher the self-confidence, the lower the players perceived anxiety contagion and vice versa.
Chapter 2

Review of Literature

*Stress, Arousal, and Anxiety*

In this section, the theoretical constructs of stress, anxiety, and arousal are discussed in depth. Often times the terms stress, anxiety, and arousal are used interchangeably, when in fact they are distinct.

**Stress**

High level sports are stressful by nature, and the competitive surroundings they present place psychological demands on athletes (Jones, 1995). Stress is defined as an imbalance of physical or psychological demand compared to the ability of the performer to respond and failure to meet the demand has serious consequences (McGrath, 1970, p. 20). Stress has been conceptualized as a process consisting of four sequential stages (McGrath, 1970). The first stage, environmental demand, is brought on by external factors, and occurs when a demand is placed on an individual by his or her surroundings. This demand can either be physical or psychological in nature and will require a coping behavior (McGrath, 1970). An example of environmental stress may be an athlete who has to make a time on a running test or the whole team will be punished. In the next stage, individual perception, the individual perceives demand placed upon themselves. Stage two varies from person to person because individuals have different innate levels of trait anxiety (Spielberger, 1966). Stage three of the stress process examines the stress response of the individual. These responses include both physical and psychological. If the demand of the stressor is viewed with fear or as a threat, it may increase the person’s level of worry and increase his or her state anxiety. However, if the stress is viewed as
non-threatening, worry and state anxiety levels will remain constant (McGrath, 1970).

The final stage is behavioral consequence. In relation to the stage three stress responses, this is how the individual actually behaves under the stress. Stress may increase performance by increasing effort, or decrease performance by decreasing motor ability and concentration (McGrath, 1970).

**Arousal**

Arousal is defined as the level of activation within the individual, and may be psychological, physical, or both depending on the situation (Gould, Greenleaf, & Krane, 2002). Arousal takes place on a continuum scale that ranges from low levels (i.e., a sleeping state), to highly aroused levels (i.e., a frenzied state) (Weinberg & Gould, 2007). Individuals on the high end of the spectrum have increased rates of heart beat, perspiration, and respiration (Weinberg & Gould, 2007). It is important to note that arousal levels are not predicted by positive or negative situations. A person in a coma has low arousal levels, but so does an individual getting a restful night’s sleep. High arousal is gained when winning a championship with players being excited by the victory, but it can also be attained when one witnesses a horrific accident due to the horror of the scene (Gould, Greenfield, & Krane, 2002). Arousal is interpreted differently based on an individual’s current state (Apter, 1982).

Arousal can be measured in a multitude of ways. These include and are measured by: heart rate levels (pulse), breathing rates (breathes per minute), and perspiration (skin conductivity measures on a voltage meter). Arousal can also be seen and measured in a qualitative manner by examining an individual’s perception of arousal, through interview
questions. These methods of measuring arousal are known as self-report scales (Weinberg & Gould, 2007).

*Anxiety*

The interpretation of arousal may cause an individual to experience anxiety. When an individual doubts his or her ability to deal with stressful situations, anxiety is present (Hardy, Jones, & Gould, 1996). Weinberg & Gould (2007) state that anxiety “is a negative emotional state characterized by nervousness, worry, and apprehension,” (p. 78). However, other research suggests that not all anxiety is interpreted as a negative. In fact, successful athletes have the ability to view anxiety as being an asset (Humara, 1999). *Trait anxiety* refers to the individual’s personality; it is described as an individual’s normal preferences or perceptions overall, trait anxiety is not situation specific. These traits are predisposed to the person, to perceive non-threatening situations as being a threat, and then respond to them with unnecessarily high state anxiety levels (Spielberger, 1966, 17). *State anxiety* is a “right-now” feeling, as it is constantly changing moment to moment, situation to situation (Weinberg & Gould, 2007). Spielberger (1966) describes it as an emotional state of anxiety, a moment that brings about thoughts of worry and activation of the somatic factors associated with worry (Spielberger, 1966, p.17).

Two types of state anxiety symptoms are cognitive and somatic. Cognitive state anxiety is a temporary worry level affected by thoughts, while somatic state anxiety levels are how physiological changes are being perceived based on new situations that are presented to an individual (Weinberg & Gould, 2007). Cognitive anxiety examines the amount of negative thoughts that one is experiencing, both somatic and cognitive state anxiety levels will be examined in this study. Researchers have investigated the stress
responses of athletes during pre-competition time; it has been observed both cognitive and somatic anxieties play a role. Research also has shown state anxiety to be the appropriate measure of pre-competition anxiety, due to its momentary nature (Martens et al., 1990).

Competitive anxiety is experienced as a result of participation in competition. Competitive anxiety is influenced by players’ interpretation of their anxiety (Weinberg & Gould, 2007). Players can view anxiety as a positive contributing factor to their performance, or anxiety can be viewed as debilitative for performance (Jones, 1995). Other factors that have shown to influence competitive anxiety include: performance level (Jones, Hanton, Swain, 1994; Guillen & Sanchez, 2009), level of competitiveness (Jones & Swain, 1992), gender of the participant (Perry & Williams, 1998), amount of playing time the player receives (Guillen & Sanchez, 2009), as well as the performance itself (Jones & Swain, 1992). Guillen & Sanchez (2009) found mental and physical preparedness to be the largest predictor of competitive anxiety.

**The Anxiety-Performance Relationship**

Sport psychologists have sought to understand and explain the nature of the relationship between anxiety, arousal, and performance. The search for an explanation has led to the development of multiple theories of competitive anxiety and arousal (Weinberg & Gould, 2007).

The aptly named Drive Theory hypothesized a positive linear correlation between player’s arousal levels and performance levels. The theory basically states that as players became more aroused, their performance increases (Spence & Spence, 1966). The theory was developed by Zanjonc (1965) who demonstrated that a performer’s arousal level
rises when an audience is present which corresponds with a subsequent improvement in performances. Although, the Drive Theory has support for performance that involves gross motor movements, little correlation has been found with fine motor tasks (Weinberg & Gould, 2007). The aspects absent in the theory are a major reason why the Drive Theory has very little support (Martens, Vealey, & Burton, 1990).

As the flaws with the Drive Theory became more evident, researchers directed their attention to the Inverted-U Hypothesis, to explain the performance anxiety relationship (Landers & Arent, 2001). The Inverted-U Hypothesis, earlier termed the Yerkes-Dodson (1908) Effect, found that the Drive Theory was appropriate up to a certain point. According to the Inverted-U, arousal and performance are positively related; however, if a player becomes overly aroused the effect on performance is negatively linear (Yerkes-Dodson, 1908). This rise and fall in performance level gives the hypothesis its graphical shape and appropriate name. Easterbrook, (1959) created a variation of the Inverted-U, the Cue Utilization Hypothesis, in which he suggested that the reasons for the inverted-u relationship between arousal and performances are related to the performer’s attention levels at different levels of arousal. Research has been found to support both of these theories (Arent & Landers, 2003).

Another model related to the Inverted-U, is the Cusp Catastrophe Model (Hardy, 1990, 1996). The Inverted U and Catastrophe models both predict positive correlations between arousal and performance up to an optimal mid-point, however, after this midpoint, the two theories differ (Gould & Krane, 1992). Weinberg & Gould (2007) state that unlike the inverted-U’s steady decline, the Catastrophe Model depicts a sharp drop after the point of over arousal is reached. The Catastrophe Model states that athletes
with high levels of state anxiety will pass the optimal level, and the results will be a “catastrophic decline in performance” (Hardy & Fazey, 1987, p.9). However, if the athlete has low levels of worry, the arousal and performance that results will follow more of an inverted-U pattern (Hardy, 1990). Researchers are not sure if the Inverted-U or Catastrophe Model are individual specific, or that everyone’s optimal point of performance always happens at a midway point of arousal (Hardy, 1990; Gould & Udry, 1994).

As Gould and Udry (1994) argued, the Inverted-U and the Catastrophe Model do not account for individual differences in performers. The Reversal Theory tries to explain these individual differences and how they occur. Kerr’s (1990) Reversal Theory contains two major differences from the previous models mentioned. First, the theory posits that everyone experiences arousal and anxiety, but not everyone interprets them in the same way (Kerr, 1997). Second, this theory suggests that athletes have the power to quickly change their views of arousal from positive to negative or vice versa. The theory gives a quality answer to individual differences, but does not have much research support at the present time (Weinberg & Gould, 2007).

Performance under pressure deals with in-performance anxiety and performance effects. Two major theories of choking have been developed and examined; The Explicit Monitoring Theory and the Distraction Theory. The Explicit Monitoring Theory states that pressure makes performers pay too much attention to the process of a movement and it effects the movement outcome. Masters (1992) found that the way the performer learned the skill had an effect on the autonomy of the movement. Performers who learned how to putt implicitly, without boundaries or rules, were less likely to experience
disruption of the motor movement learned when pressure is applied. While participants who learned to putt explicitly, with knowledge of the rules, were more likely to lose the automaticity of the movement when put in a pressure situation. The reasons for pressure having an effect have tried to be resolved in the Distraction Theory; a distracting environment that takes the performer's attention away from the task at hand can have negative effects on performance as has been seen in previous research (DeCaro, Thomas, Albert, & Beilock 2011; Wine, 1971). Beilock & Carr (2001) found that later in learning; players who are trained in a dual task environment will actually become accustomed and therefore will not be affected by pressure.

Hanin (1980) developed a theory that accounted for differences in individual’s optimal performance levels of anxiety. The Individual Zones of Optimal Functioning (IZOF) was developed by examining ski jumpers, divers, rowers, and gymnasts’ and their levels of anxiety prior to competitions in which they performed well (Hanin, 1980). Hanin found that the athletes varied in the reported levels of anxiety prior to good performances; with some performing best when highly anxious and others best performances occurring with low levels of competitive anxiety (Hanin, 1980). A correlation was found between these different optimal levels and the specific task the athlete had to perform. For example, rowers who were the pace setters performed best with lower levels of anxiety (Hanin, 1980). An applied IZOF study featuring female volleyball players found that of the nine participants, two performed optimally while in a low IZOF level, four found the most playing success at a moderate anxiety level, and three performed their best with high levels of anxiety during pre-competition (Raglin et al., 1994).
Raglin et al., (1994) examined the level of perceived match difficulty in relation to players’ optimal zone. Prior to “easy” matches only two of the nine participants were in their optimal zones, while seven of nine players were in their optimal zones prior to a “difficult” match (Raglin et al., 1994). The IZOF has been supported in other studies, including application of the IZOF within athletic consultation (Gould & Tuffey, 1996; Woodcock, Cumming, & Duda, 2011). The IZOF concept can prove helpful to coaches as well, possibly assisting player’s into their optimal zones as well as keeping them there (Weinberg & Gould, 2007; Hanin & Stambulova, 2003; Robazza & Bortoli, 2003).

Raglin et al. (1994), showed that female college volleyball players have an Zone of Optimal Functioning (IZOF), while athletic success proved not to be significant with players whom fell within their zone, match difficulty was a factor for the players to enter their IZOF. Raglin et al. (1994) found that of his nine team members, just two fell within their IZOF prior to an easy match, while seven were in their IZOF prior to the difficult match. Raglin et al. (1994) did not account for player experience in his research. Experience has been found to have the strongest relationship to performer’s anxiety levels Gould, Petchikoff, & Weinberg (1984), the older the athlete, the lower the cognitive anxiety level. Possible attributions for this correlation include previous arousal exposure and having dealt with the arousal in the past providing confidence. Similar anxiety observations were made in swimmers and tennis players (Perry & Williams, 1998; Jones, Hanton, & Swain, 1994).

Anxiety and Self-Confidence

Jones & Swain, (1995) noticed that athletes’ self-confidence levels relate to their emotions. That is, the higher the confidence, the greater the activation of positive
emotions. Jones & Swain, (1995) also examined confidence levels directly relating to anxiety. Athletes who had higher levels of confidence, tended to see anxiety as more positive than a negative (Wiggens & Brustad, 1996). Thus, research should take an account of individual’s self-confidence levels, since it correlates directly with competitive anxiety.

Athletes in individual sports tend to have lower reported levels of self-confidence and more anxiety than athletes in team sports. Kirby & Liu (1999) found this same trend while comparing team and individual sport athletes. Higher anxiety has also been seen in figure skaters during pre-competition, Hardy, Mullen, & Martin (1997), attributed this to the lack of other individuals to take responsibility for failures.

*Emotional Contagion*

“Emotional contagion is the phenomenon whereby an emotion initiated by an individual extends to others” (Larousse, 2006, p. 256). Emotional contagion refers to a person’s tendency to “catch” the emotions of surrounding persons (Hatfield, Cacioppo, & Rapson, 1994). Two identified parts within emotional contagion have been examined. “Emotional comparison,” which involves the brain doing purposeful mimicry, and “primitive emotional contagion,” which is automatic nonverbal mimicry along with feedback (Hatfield et al., 1994). Emotional contagion may be sparked by verbal tones or selected words, body language, or facial patterns (Dinberg, Thunberg, & Elmhead, 2000). Contagion has been explained by four different processes: “conscious cognitive process, conditioned responses, unconditioned responses, and mimicry and feedback” (Hatfield et al., 1994). Like many other contagion researchers, Barsade (2002) utilized college students and a confederate in an attempt to spread contagion. His study revealed that
participants who interacted with the positive confederate had signs of an increase in their own positive moods over time, and subjects who interacted with a negative confederate, showed signs of a more negative mood.

Results from a study with college students showed that emotional contagion was evident no matter the person’s relationship (Kimura & Yogo, 2008). In order to find which relationship of college students yielded the greatest emotional contagion, Kimura (2008) compared friends, junior (younger students), senior (an older student), and acquaintances. Friends showed the highest scores of emotional contagion, allowing the authors to state that relationship factors had an influence on emotional contagion.

Gonzales, Castillo, and Swinkles (2002) research revealed that of the twelve interpersonal relationships that participants were questioned on, close friends carried the most perceived contagion, with parents, and dating partners coming next. In sports, team leader emotions are especially contagious, it is important for captains and coaches to watch their emotions to help reach desired outcomes (Volmer, 2012). However, Volmer (2002) only examined emotions in two groups, positive and negative, the study does not cover specific emotions (i.e. happy, sad, or anxious).

Previous research on emotional contagion examined happy and sad emotion transfers (Kimura et al., 2008; Elfenbein et al., 2007; Barsade, 2002). However, the Gonzales, Castillo, and Swinkles (2002) study asked participants to rank what they perceived as the twenty most contagious emotions. The top five most perceived contagious emotions were happiness, excitement, sadness, anger, and fear. Both happiness and sadness were viewed by the subjects as highly contagious (Gonzales et al., 2002). Gonzales, Castillo, and Swinkles (2002) had participants label what emotions
were in their top ten that they considered most contagious, 46% of participants had anxiety in their top ten. Overall, it came in as the ninth most perceived contagious emotion as determined by participants. Takahashi et al. (2005) investigated whether anxiety had contagious qualities towards people around the anxious individual. The research showed significant positive correlations while comparing anxiety and autonomic reactivity, suggesting the possibility of anxiety from one individual spreading to others.

*Measuring Emotional Contagion*

Team emotion recognition accuracy (TERA), is the ability of teammates to recognize the emotions of one another (Elfenbein, Polzer, & Ambady, 2007). Elfenbein et al., (2007) observed TERA to have positive correlation with team members on both positive and negative emotions. This was examined using the qualitative method of personal interviews. The Emotional Contagion Scale ECS: (Doherty, 1997) is a measure of emotional contagion, and examines contagion susceptibility of four emotions, happiness, sadness, anger, and love, while anxiety is absent from the assessment. Emotional contagion studies conducted outside of the sports setting commonly utilize the use of confederates and the ECS (Barsade, 2002). Research examining contagion within sports has taken on a qualitative perspective on the research (Elfenbein et al., 2007). Elfenbein et al. (2007) found that TERAs four negative emotions were able to predict poorer performances, and a similar pattern within positive emotions and quality outcomes within the workplace.

*Summary*

Whereas anxiety refers to stress is an imbalance of perceived demand and perceived ability, and arousal is the activation response of the body and how the
individual perceives it. The IZOF anxiety model describes that individual players have optimal levels of state anxiety in which their best performances occur. Other factors have been shown to have an effect on anxiety levels, including an individual’s self-confidence. Emotional contagion is the transfer of mood states from one individual to another and has been seen within sports, social groups, and the workplace.

Previous research on competitive anxiety has revealed that anxiety has an effect on players’ performances. A variety of emotions may be contagious among people with a variety of interpersonal relationships. The present study in order to determine if competitive anxiety contagion exists, to what extent does pre-game interactions allow it to happen, and if it influences players’ arousal level. The knowledge brought about by this study may reveal the need to develop techniques to contain pre-game competitive anxiety.
Chapter 3

Method

Participants

Participants consisted of 11 (\(M_{\text{age}} = 20\) years) male I volleyball players on a Division I National Collegiate Athletics Association (NCAA) volleyball team. The sample included five starters and six non-starters, with an average playing experience of 2.6 collegiate seasons. Coaches (n=2) average age 30.5 years old and average college coaching experience 6.5 collegiate seasons, were recruited from the CSUN team. Participants were on the active roster for the university. Players and coaches were recruited at a team meeting, where the study and protocols were presented.

Measures

State-Trait Anxiety Inventory (STAI) (Spielberger, 1983)

Spielberger’s (1983) State Trait Anxiety Inventory (STAI) (Appendix D) is a globally utilized tool for the assessment of anxiety and will be used to measure pre-competition individual’s cognitive and somatic anxiety. Concurrent validity of the STAI Anxiety Scale and the Anxiety Scale Questionnaire (ASQ) along with the Manifest Anxiety Scales (MAS) have positive correlations of .73 with the ASQ and .85 with the MAS (Spielberger, Reheiser, Ritterband, Sydeman, & Unger, 1995).

IZOF studies have utilized the STAI successfully, by finding athletes IZOF based on STAI scores (Hanin, 1986). The STAI has been utilized in many IZOF studies because of a correlation found between the IZOF and scores on “best performance” STAI (Raglin et al., 1994). The STAI consists of 40 items, however since this study examined only
state anxiety, only these 20 questions from the STAI were examined on the test that viewed player’s cognitive and somatic state anxiety levels. Intensity levels for each question (e.g., “My heart is racing,” “I feel nervous”) measured on a scale from ‘1’ (not at all) to ‘4’ (‘very much so’). STAI scores range from 20-80, higher scores indicate higher anxiety (Spielberger, Gorsuch, & Lushene, 1970). Test retest reliability coefficients ranged from .65 to .75 during a two month interval (Spielberger et al, 1983). Spielberger (1989) found sizeable evidence indicating the construct and concurrent validity of the STAI scale.

State Sport Confidence Inventory (SSCI)(Vealey, 1986)

Vealey’s (1986) State Sport Confidence Inventory (SSCI) (Appendix E) is a sport specific measure of athlete’s self-confidence. The SSCI consists of 13 items that are scored on a nine point Likert scale. Questions compare players to “the most confident athlete they know.” For example “Compare the confidence you feel right now in your ability to execute the skills necessary to be successful to the most confident athlete you know.” The SSCI has been validated along with the Competitive Orientation Inventory (COI), results showed the SSCI demonstrated consistency at .95; re-test reliability, concurrent and content validity has been established for young adult athletes (Vealey, 1986; Martin & Gill, 1991).

Interview Guide

Interview Guide (Appendices B and C) - Questions were directed at measuring the athletes self-perceived causal anxiety attributions (e.g., internal, external, contagion, situation, and opponent). The researcher responsible for giving the interviews had
knowledge in proper interviewing techniques. After training, mock interviews were conducted to pilot test the questions and interviewers technique, searching for bias or leading questions, none were found. All interviews were finished within one hour from the end of the match. Data provided by participants in Open-Ended Interviews are rich and full with qualitative data (Turner, 2010). Questions examined anxiety attributions during pre-competition of that day’s match. The researcher asked participants to rank how much each of several different factors (i.e. crowd, rejection, fear of failure, fear of injury, letting your teammate down, letting your coach down, teammates anxiety level, coaches anxiety level, and the perceived level of the opponent) affects their personal anxiety levels. Questions were answered on a Likert Scale from one to ten, with one meaning ‘not at all’ and ten meaning ‘very much so.’

Procedures

Approval from the International Review Board (IRB) was obtained before the study began. In compliance with IRB requirements, participants were informed of the nature of the study. Potential participants were recruited during a team meeting on the California State University, Northridge campus. Due to the nature of this study some deception was implemented in order to answer the research question. Players and coaches were not informed that the study was examining anxiety contagion until after data collection. After an explanation of the study along with the test procedures, players who agreed to participate were asked to sign informed consent forms (Appendix A) (15 minutes). After predetermined practices the researcher administered the STAI. Participants completed all STAI testing and interview sessions in the men’s volleyball team room, within Redwood Hall on the California State University, Northridge campus.
The STAI was delivered at the same time intervals Martens, Burton, Vealey, Bump, & Smith (1990) found appropriate for the Competitive State Anxiety Inventory-2 (CSAI-2) (Martens, Vealey, & Burton, 1990). Post competition assessments of pre-competition state anxiety have found low similarities with responses, more so if the player’s performance levels are higher, the recall ability is lower (Annesi, 1997). Other research has found that a five day recall of both the STAI ($r=0.93$) and CSAI-2 ($r=0.94$) were significantly correlated to actual pre-competition levels of anxiety (Wilson, et al, 2000).

The first STAI, examining players’ optimal anxiety, was given five days prior to one of the team’s matches (10 minutes). This initial STAI was filled out in regards to how the player felt prior to their best competition, giving the researcher the players IZOF range, their best game score plus and minus four anxiety units (Hanin, 1986). A second STAI test was given two days prior to competition (10 minutes). The second STAI was given for the researchers to find a baseline score prior to their actual pre-competition. Players answered questions in regards to the match in two days. A pre-competition STAI was given just one hour prior to the same competition (10 minutes) along with Vealey’s (1986) State Sport Confidence Inventory questionnaire (SSCI) (10 minutes). The last STAI was given to obtain players feelings just prior to the match. After the match had taken place post-competition interviews were administered using a causal anxiety attributions interview questions within one hour of the end of the competition (5 minutes).

Interviews were audio recorded, and done so in entirety immediately following the competition. Researchers used direct dictation to transcribe their data (Thomas,
Hayton, & Maynard, 2007). The ethnographic nature of these interviews yielded quality data to help answer our research questions, ergo simple note taking would not yield the sufficient data needed for qualitative research (Bailey, 2008). Deception was utilized; players and coaches were not informed that the study was specifically examining anxiety contagion to help avoid leading players in their answers. This is another reason why ethnographic interviews were deemed appropriate, due to the need for the interviewee to respect and trust the interviewer. Due to the deception once all the data was collected and analyzed a debriefing form was sent to all participants (Appendix F).

Data Analysis

In order to answer the questions of whether anxiety contagion existed in a pre-game setting, and what factors effect athlete’s ability to enter their IZOF, qualitative analysis was performed using inductive content analysis modeled after research by Scanlan, Ravizza, and Stein (1989). Questions included: “can you identify when a teammate is nervous?” “If you can identify a teammate’s anxiety level, do you do anything about it?” “Does their anxiety level have an effect on your anxiety level?” These questions searched at finding if anxiety contagion existed in pre-competition settings. Players were questioned about each of the following factors (crowd, rejection, fear of failure, fear of injury, letting your teammate down, letting your coach down, teammates anxiety level, coaches anxiety level, and the perceived level of the opponent) to uncover which factors contributed the most to the athletes anxiety level. Interview responses were transcribed and analyzed by author for validation. After transcription, the analysis searched for raw themes in the interview responses to gain understanding on what participants said. First, themes were identified from raw data in regards to each interview
question. Next the quotes were coded and sorted into one of the appropriate determined data themes utilizing like-terms coding. Finally, personal participant checks were used for validation; the researcher had follow up sessions with certain participants to ensure what he interpreted the player’s words to mean, were indeed what the athlete intended.

Quantitative analysis used descriptive statistics, to determine which players fell outside of their IZOF when comparing their best performance score with the pre-game STAI score. Since this study examined state anxiety, only these 20 questions from the STAI were examined. Each player and coach IZOF was calculated utilizing this score by adding and subtracting four anxiety units to find the zone (Hanin, 1980; Raglin et al., 1994). Players were asked if they felt that their arousal was in their IZOF prior to the match.

To better understand if the individual’s role on the team had an effect on the amount of anxiety contagion that was perceived descriptive statistics and an independent samples t-test were used comparing player role (starter or non-starter) with amount of anxiety contagion reported along with examining specific open ended questions in which players were asked to explain why they gave the anxiety factor the score they did.

To understand if self-confidence played a role on the amount of anxiety contagion that was perceived, players’ ratings of anxiety contagion for both coaches and teammates, were analyzed with their scores on the SSCI using multiple regression calculations. SSCI scores were the independent variable while contagion factor scores were the dependent variable. To find if player self-confidence was a predictor of either coach or teammate contagion or both that were perceived from participant.
Chapter 4

Results

This study was guided by four questions: (a) Do athletes perceive an anxiety contagion from teammates and coaches? (b) What affects an athlete’s ability to get into IZOF? (c) Does team role have an effect on the amount of anxiety contagion that is perceived? (d) Does self-confidence play a role on the amount of anxiety contagion perceived?

The first research question examined whether anxiety contagion is present in a pre-competition setting. Post-match interview questions revealed that ten out of the 12 participants were able to identify when they have an anxious teammate. One player could identify an anxious teammate some of the time, and another player said they couldn’t identify if they had a teammate that was nervous. The data revealed that one player or 9.11% of the participants were never able to identify a teammate’s anxiety. Out of the ten who indicated that they can always identify if a teammate is nervous, all ten responded that they try to do something about it (try to calm down or excite the teammate they’ve identified). Eight players (72.7%) felt that their teammate’s anxiety had an effect on themselves and their anxiety level, two said maybe, and two said it has no effect on them.

The second research question focused on the factors that had the greatest effect on the athletes’ ability to get into or stay within their IZOF. Player IZOF was determined by adding and subtracting four anxiety units from their “best performance” STAI (Hanin, 1986, Raglin et al., 1994), for example, if athlete “X” scored a 34 on their “STAI,” their IZOF would be in the 30-38 range. When compared with the STAI participants took two days prior to the competition, scores revealed that six of the players were not in their
IZOF, with two being over aroused and the other four being under aroused as seen in table 2b. These six had a mean score of 3.42 for teammates anxiety contagion and 5.0 for coach anxiety contagion. When the IZOF was compared with the pre-game STAI, five players were found outside their IZOF, with all five under aroused. These five had a mean score of 3.7 for teammate anxiety contagion and 4.0 for coach anxiety contagion. The interviews revealed similar numbers, when asked if they were in their optimal zone prior to the match selected six players stated that they were lower than their IZOF as seen in table 1. Coaches had similar results, with both coaches scoring lower than their IZOF during the pre-game STAI. One coach was in his IZOF during the two day test with the other below his IZOF. The interview questions revealed that out of the ten possible causes of anxiety the participants were questioned about teammate’s anxiety ($M = 3.95$, $SD = 1.68$) came in as the sixth most influential factor, while coaches’ anxiety was the number one perceived cause anxiety for our participants ($M = 4.91$, $SD = 2.23$). Table 2a has the ten factors in order from highest perceived effect to lowest.

The third research question concerned the relationship between team role and the amount of anxiety contagion perceived. Utilizing like terms coding, the researcher matched responses that were similar in context, from the coach anxiety and player anxiety factor questions (Creswell, 2007). Questions examined if a player or coaches role on the team affected the amount of anxiety contagion that was perceived by participants. Within the two questions that specifically examined the aspect of anxiety contagion, a trend was found with the players who felt that teammates and or coaches anxiety was a factor on their own anxiety. Some players felt that if the other person had a large team
role in terms of stature (coach, captain, starter, etc.) that they were more likely to catch their anxiety.

TEAM ROLE AND TEAMMATE ANXIETY CONTAGION
(31% of participant’s responses identified team role as a factor)

“It’s up there, if it’s a senior or a captain for sure.”

“If it’s someone I look up to (their anxiety) has an effect.”

“If it’s someone in the starting line up or a captain.”

TEAM ROLE AND COACH ANXIETY CONTAGION
(31% of participant’s responses identified coach role as a factor)

“It’s a hierarchy effect; coaches are on a different level.”

“Why are they nervous? They need to be leading us”

This question was also addressed using an independent samples t-test that compared a player’s role on the team (i.e., starter versus non-starter), on the amount of anxiety contagion that they perceive from other players and coaches, numbers derived from questions seven and eight in the post-match interview. As seen in Table 3, starters answering the player contagion question revealed relatively low perceived contagion effect from teammates anxiety \( (M = 3.3, SD = 2.28) \), while bench players perceived a stronger effect from teammates nerves on their own \( (M = 4.5, SD = .8) \). Starters answering the coach contagion question revealed relatively low perceived effect \( (M = 3.8, SD = 2.77) \), while non-starters again perceived a stronger effect \( (M = 5.83, SD = 1.47) \). However, player anxiety contagion was not significant in relation to player role \( (p > .05) \) \( (F = 16.93, p = .003, t = 1.21) \) explaining that player role starter or non-starter did not play a factor in the amount of anxiety contagion the player perceived from teammates. Player’s role was not significant when concerned with coach anxiety
contagion that was perceived ($p > .05$) ($F = 2.80$, $df = 10$, $p = .13$, $t = 1.56$) explaining that coach anxiety contagion was perceived similarly regardless of player role, starter versus non-starter.

The last question examined the relationship between confidence and anxiety contagion. The SSCI scores for all of the participants were relatively high ($M = 94.54$, $SD = 5.12$). On a scale from one to ten, player contagion scores ($M = 3.95$, $SD = 1.68$), were nearly a full point less than coach contagion ($M = 4.91$, $SD = 2.32$). Exposing coach anxiety contagion, as having a greater effect on participant’s own anxiety levels compared with player anxiety contagion. Two multiple regressions with SSCI scores (self-confidence) as the predictor and player anxiety contagion scores with coach anxiety contagion scores as the dependent variables was conducted to test whether self-confidence levels predicted anxiety contagion. As shown in Table 4, the results of the SSCI and player contagion regression did not predict athlete contagion ($df = 10, R^2 change = .224$, $p = .14$). Similarly, the SSCI scores did not predict coach contagion ($df = 10, R^2 change = .05$, $P = .51$).
Chapter 5
Discussion

The purpose of this study was to explore the interpersonal effects of volleyball player’s pre-competition state anxiety on their teammates’ anxiety using the STAI, SSCI, and interview sessions. The researcher set out to answer the following questions: (a) Do athletes perceive an anxiety contagion from teammates and coaches? (b) What effects an athletes’ ability to get into their IZOF? (c) Does team role have an effect on the amount of anxiety contagion that is perceived? (d) Does self-confidence play a role in the amount of anxiety contagion perceived?

The first research question addressed was: Do athletes perceive an anxiety contagion from teammates and coaches? The researcher hypothesized that anxiety contagion did exist during pre-game interactions, due to players’ relationships and proximity to one another in the locker room. In our sample of 11 collegiate volleyball players and two coaches, existence of anxiety contagion was observed, with the majority n=11 (84.6%) of the participants saying they could identify a teammate’s anxiety. Of those who could identify a teammate’s anxiety, eight (66.67%) said it had an effect on their own anxiety levels. This result is consistent with Gonzales et al.’s, (2002) study, which found anxiety to be the ninth most contagious emotion. Contrary to previous research that suggests emotional contagion takes place at an unconscious level (Dimberg, Thunberg, & Elmehed, 2002), many of our participants felt that they could identify it.

Of the seven participants who found themselves outside of their IZOF during pre-game testing, all seven were below their optimal zone, meaning majority of the team was under aroused. Of the six players who were inside their IZOF at pre-game, four had the
lowest identified IZOF zones on the team. Perhaps the teams overall low arousal levels had a contagion effect on these players which kept them in their ideal zone. Or the opposite may be the explanation players with the lower IZOF had a contagion effect on their teammates, lowering the team’s pre-game arousal levels. Another explanation could be that since the both coaches and four of the five starters tested scored lower than their IZOF on the pre-game STAI, this allowed the low IZOF players to get in their zone, while lowering the rest of the team’s arousal. These results stay consistent with our interview results, which found role on team has an impact on the amount of anxiety contagion that is perceived to take place.

The second research question explored what factors most affected an athlete’s ability to get into their IZOF on game day. The researcher hypothesized that teammate’s anxiety levels would play a significant role in athlete’s pre-game anxiety relative to their IZOF. Out of the ten causes of anxiety that explored, teammate’s anxiety came in as the sixth largest factor among all participants, $M=3.9$, compared with the mean score for players outside of their IZOF perceived teammate contagion was similar $M=3.7$. Coaches’ anxiety resulted as the number one cause of anxiety for our participants $M=4.9$ and came in higher for players outside of their IZOF optimal to two day scores $M=5$.

Table 2b shows players who fell outside of their IZOF and the wide variety of things that these players attributed this to. For example participant three gave coach and teammate anxiety contagion a score of one, stating either has little or no effect, but they assigned a score of seven to match importance. While participant nine who fell outside of his IZOF on both the two day and pre-game test, gave coach anxiety contagion an eight and was his highest anxiety causing factor. It is important to understand that although coach and
teammate anxiety contagion were not always the number anxiety causing factor, they were only assigned a score of one from one participant. Both factors are being perceived by players and coaches as anxiety causing and in some cases, enough to take players out of their IZOFs. If coaches and players are unable to regulate their anxiety, it may have detrimental effects on the anxiety level of their players and teammates. Player anxiety can have a direct effect on player performance if they are outside of their IZOF (Hanin, 1980). As a result, it is reasonable to state that coach anxiety level can have an indirect effect on the performance of their players outside of skills and tactics.

The third research question concerned the relationship between role on the team and the amount of anxiety contagion that was perceived by others on the team. It was predicted that the anxiety of higher profile team members and coaches would be more contagious than the anxiety of others on the team. The results from the interview were consistent with the researcher’s hypothesis. Players and coaches whom were considered to have crucial team roles (i.e. captain, head coach, senior, starter), were perceived to be more contagious with their anxiety. This is consistent with the previous research done by Volmer (2002), who found that in sports, team leader positive and negative emotions are especially contagious; it is important for captains and coaches to watch their emotions to help reach desired outcomes. These results could be derived from the expectations of people in these roles from their teammates and players. If team leaders are perceived as being nervous or apathetic it can cause worry or lethargy in others.

There were no differences in the amount of player anxiety contagion perceived from starters versus non-starters, with non-starters perceiving significantly more anxiety contagion from teammates. This could be attributed to players’ locus of control, players
feel that they have more control of the game outcome. There was also no significance, however, between player role and the amount of coach anxiety contagion that was perceived. Thus coaches’ anxiety did not have a significantly different effect on their players based on player role. This may be caused by the fact that coaches have a direct effect on all of their players and player successes—whether they play in the match or not.

The final research question, showed no relationship between participants’ level of self-confidence as measured by the SSCI, and the amount of player and coach anxiety contagion that they perceived. Research has revealed a positive correlation between higher levels of self-confidence and a greater activation of positive emotions (Jones & Swain, 1995). However, previous research has not addressed whether self-confidence levels predict emotional contagion. The results of this study suggest that anxiety contagion, and perhaps emotional contagion, affect everyone regardless of their confidence levels. Jones and Swain, (1995) observed self-confidence directly relating to anxiety, and other emotions experienced. However, this research did not take into account the effect that self-confidence had on emotional contagion.

Limitations

Despite adding to professionals; knowledge of anxiety contagion in team sports, the limitations of this study should be noted. The study focused on identifying how contagious anxiety was for players, however, there is no current scale for measuring anxiety contagion. Doherty’s (1997) Emotional Contagion Scale does measure emotional contagion, but is limited to five basic emotions: sadness, fear, anger, happiness, and love. Players were asked questions about events that had taken place two to three hours earlier, player recall and retention is a possible limitation in any of the research questions.
Another limitation of this study is the relatively small sample size. With the focus of the research being centered on just one competition, player STAI, SSCI scores, along with their interview answers may have been skewed based on the opponent.

*Future Research*

Future research is needed to determine the extent to which pregame anxiety level carries over to the beginning of the actual game. A study like this would need approval to test the athletes during the competition, however testing player’s anxiety within a game setting would be difficult to gain review board approval for ethical purposes. This study identified some factors that played a role on player and coaches’ anxiety levels; however, the responses were given in terms of the factors raising their anxiety levels. It would be beneficial for future research to identify factors that are able to lower anxiety (e.g., others’ ability to control their anxiety). Given the small sample size, replication of this study with a larger sample would be beneficial; this could be implemented utilizing all the teams at a university regardless of gender or team sport. Also, development of an emotional contagion scale which accounts for anxiety would allow researchers to utilize more of a quantitative approach when measuring anxiety contagion.

*Practical Implication*

The existence of anxiety contagion in a pre-match setting has implications for coaches and players. If players can “catch” the anxiety of a teammate and different players have different optimal levels of anxiety, their IZOF, it behooves coaches to arrange player’s lockers in the locker room according to those whom have similar IZOFs. The players themselves may benefit from being made aware that their anxiety is visible to
their teammates. If players had this knowledge, perhaps it would be easier for them to regulate how they are displaying themselves to their teammates during a pregame setting.

Conclusion

The results revealing that a coaches’ anxiety had the highest impact on player anxiety levels have large ramifications for coaches and leaders, inside and outside of a sports setting. Coaches need to be more self-aware of their own anxiety level, rather than just taking a pulse of the team’s anxiety. Knowing that their own anxiety can sway player’s anxiety levels means the coach needs to find ways to help regulate his or her own anxiety. Coaches may also be able to use this knowledge to get players into his or her IZOF, by identifying if the player is too low or too high on the IZOF and interacting with them in the opposite manner. For example, if a player operates best with a medium IZOF and they appear to be at high level of arousal, the coach could utilize an interaction in which they are addressing the player in a very calm manner. Finally, the research suggests coaches need to be aware of their anxiety and arousal levels even when they are in the presence of a player that has high levels of self-confidence.
References


doi: 10.1080/10413209808406388


Table 1

*Means and Scores for Player’s STAI*

<table>
<thead>
<tr>
<th>#</th>
<th>S/NS</th>
<th>Experience</th>
<th>&quot;Best Game&quot;</th>
<th>IZOF Pre-Game</th>
<th>2 days</th>
<th>Optimal-2 day</th>
<th>Optimal-Pregame</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>4</td>
<td>22</td>
<td>18-26</td>
<td>23</td>
<td>23</td>
<td>-1</td>
</tr>
<tr>
<td>2</td>
<td>NS</td>
<td>1</td>
<td>29</td>
<td>25-33</td>
<td>32</td>
<td>33</td>
<td>-4</td>
</tr>
<tr>
<td>3</td>
<td>S</td>
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<td>41</td>
<td>37-45</td>
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<td>36</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>NS</td>
<td>2</td>
<td>40</td>
<td>36-44</td>
<td>40</td>
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<td>-28</td>
</tr>
<tr>
<td>5</td>
<td>NS</td>
<td>3</td>
<td>30</td>
<td>26-34</td>
<td>26</td>
<td>28</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>5</td>
<td>39</td>
<td>35-43</td>
<td>33</td>
<td>35</td>
<td>4</td>
</tr>
<tr>
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<td>NS</td>
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<td>45</td>
<td>41-49</td>
<td>41</td>
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<td>-9</td>
</tr>
<tr>
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<td>S</td>
<td>5</td>
<td>47</td>
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</tr>
<tr>
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<td>2</td>
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<td>40-48</td>
<td>38</td>
<td>38</td>
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</tr>
<tr>
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<td>NS</td>
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<td>44</td>
<td>40-48</td>
<td>23</td>
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<td>8</td>
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<tr>
<td>11</td>
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<td>2</td>
<td>33</td>
<td>29-37</td>
<td>35</td>
<td>35</td>
<td>-2</td>
</tr>
</tbody>
</table>

Note. S (Starters), NS (Non-starters)

Table 2a

*Means and Standard Deviations for Possible Anxiety Causing Factors (n=11)*

<table>
<thead>
<tr>
<th>Rank</th>
<th>Factor</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coaches Anxiety</td>
<td>4.9</td>
<td>2.2</td>
</tr>
<tr>
<td>2</td>
<td>Letting Coaches Down</td>
<td>4.8</td>
<td>1.9</td>
</tr>
<tr>
<td>3</td>
<td>Match Importance</td>
<td>4.7</td>
<td>1.8</td>
</tr>
<tr>
<td>4</td>
<td>Letting Teammates Down</td>
<td>4.7</td>
<td>2.7</td>
</tr>
<tr>
<td>5</td>
<td>Fear Failure</td>
<td>4.4</td>
<td>2.4</td>
</tr>
<tr>
<td>6</td>
<td>Teammates Anxiety</td>
<td>3.9</td>
<td>1.6</td>
</tr>
<tr>
<td>7</td>
<td>Level of Opponent</td>
<td>3.9</td>
<td>1.5</td>
</tr>
<tr>
<td>8</td>
<td>The Crowd</td>
<td>3.3</td>
<td>0.9</td>
</tr>
<tr>
<td>9</td>
<td>Letting Parents Down</td>
<td>2.4</td>
<td>1.8</td>
</tr>
<tr>
<td>10</td>
<td>Fear of Injury</td>
<td>1.5</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Possible anxiety causing factors were rated on a scale 1 (not at all) to 10 (very much so).
<table>
<thead>
<tr>
<th>Player STAI scores and Anxiety Factor Interview numbers</th>
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</thead>
<tbody>
<tr>
<td><strong>IZOF</strong></td>
</tr>
<tr>
<td>18-26</td>
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</tr>
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<td>53-57</td>
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<tr>
<td>57-61</td>
</tr>
</tbody>
</table>

STAI score range is 20-80, lower scores reflect lower state anxiety, scores with higher values reflect higher state anxiety.

STAI Optimal is the players optimal state anxiety level for ideal performance.

IZOF is player Individualized Zone of Optimal Functioning, plus and minus 4 points from Optimal STAI to get the range.

Opt-2 day and Opt.- Pre are the difference in STAI scores from the different time they were taken.

The 10 anxiety causing factors from the crowd through perceived level of opponent, were ranked by the players by how much each effected their anxiety levels on a scale from 1 no effect to 10 greatly has an effect.
Table 3
Team Role and Anxiety Contagion Perceived Mean and Standard Deviation

<table>
<thead>
<tr>
<th></th>
<th>Starters</th>
<th>Non-Starters</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>PAC</td>
<td>3.3</td>
<td>2.28</td>
<td>4.5</td>
<td>0.87</td>
</tr>
<tr>
<td>CAC</td>
<td>3.8</td>
<td>2.77</td>
<td>5.8</td>
<td>1.47</td>
</tr>
</tbody>
</table>

Note. PAC (Player anxiety contagion), CAC (Coach anxiety contagion)

Table 4

Regression Analysis for Self-Confidence Predicting Player Anxiety Contagion (n= 11)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
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</thead>
<tbody>
<tr>
<td>PAC</td>
<td>1.444</td>
<td>1.119</td>
<td>0.473</td>
</tr>
</tbody>
</table>

*p > .05

Regression Analysis for Self-Confidence Predicting Coach Anxiety Contagion (n=11)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAC</td>
<td>0.079</td>
<td>0.817</td>
<td>-0.035</td>
</tr>
</tbody>
</table>

Note. PAC (Player anxiety contagion), CAC (Coach anxiety contagion)

*p > .05
Appendix B: Statement of Informed Consent for Research Participants

California State University, Northridge
CONSENT TO ACT AS A HUMAN RESEARCH PARTICIPANT

Pre-Game Anxiety Contagion in Male Volleyball Players

You are being asked to participate in a research study. Participation in this study is completely voluntary. Please read the information below and ask questions about anything that you do not understand before deciding if you want to participate. A researcher listed below will be available to answer your questions.

RESEARCH TEAM*

Researcher:
Jeff Baxter
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PURPOSE OF STUDY
The purpose of this research study is to explore the pre-competition state anxiety levels of players and coaches compared to their given optimal levels of anxiety and find out the reasons for any possible change.

SUBJECTS

Inclusion Requirements Players
You are eligible to participate in this study if you are:
Inclusion criteria:
- A player on the active roster for the CSUN men’s volleyball team.
- Between the ages of 18-23 years old.
- Not utilizing a red shirt year.
- Cleared to play by the a certified athletic trainer.

Inclusion Requirements Coaches
You are eligible to participate in this study if you are:
Inclusion criteria:
- Coach participants must be on team’s bench during competitions.
- No age restrictions on coach participants.

Time Commitment
This study will involve approximately 50 minutes of your time.
PROCEDURES
The following procedures will occur for both player and coach participants: First, you will be asked to read and sign this form (5 minutes). Second, you will be asked to fill out a questionnaire (10 minutes). Third, will be asked to fill out the same questionnaire again at a later date (10 minutes). Fourth, you will be asked to fill out the same questionnaire a third time, as well as an additional questionnaire prior to a match (15 minutes). Finally, following the same match, you will be asked a few interview questions, coaches interview questions are a slight variation from players questions but will take the same amount of time to complete. (5 minutes).

RISKS AND DISCOMFORTS
For both players and coaches: The possible risks and/or discomforts associated with the procedures described in this study are minimal if any. Questionnaire involves answer questions of one’s self awareness of confidence and anxiety. Time constraint may be a discomfort as well as boredom being a possible discomfort.

This study involves no more than minimal risk. There are no known harms or discomforts associated with this study beyond those encountered in normal daily life. To minimize risk and discomfort, both player and coach participants can refuse to answer any question on any questionnaire or during the interview that makes them uncomfortable. Also participants can choose to stop their participation at any time.

BENEFITS
Subject Benefits
Both players and coaches will not directly benefit from participation in this study.

Benefits to Others or Society
The hope of this study is to help better understand athletes and coaches’ anxiety levels in team sports pre-game, how they change and what they are effected by.

ALTERNATIVES TO PARTICIPATION
The only alternative to participation in this study is not to participate.

COMPENSATION, COSTS AND REIMBURSEMENT
Compensation for Participation
You will not be paid for your participation in this research study.

WITHDRAWAL OR TERMINATION FROM THE STUDY AND CONSEQUENCES
You are free to withdraw from this study at any time. If you decide to withdraw from this study you should notify the research team immediately. The research team may also end your participation in this study if you do not follow instructions, miss scheduled visits, or if your safety and welfare are at risk. The withdrawal of your participation from the study will have no impact on your participation as a member of the Men’s Volleyball team at CSUN.

CONFIDENTIALITY
Subject Identifiable Data
All identifiable information that will be collected about you will be removed and replaced with a code. A list linking the code and your identifiable information will be kept separate from the research data.
Data Storage
All research data will be stored on a laptop computer that [is password protected or has encryption software.]
The [audio recordings] will also be stored in a password protected laptop then transcribed and erased as soon as possible.

Data Access
The researcher(s) and faculty advisor named on the first page of this form will have access to your study records. Any information derived from this research project that personally identifies you will not be voluntarily released or disclosed without your separate consent, except as specifically required by law. Publications and/or presentations that result from this study will not include identifiable information about you.

Data Retention
The researchers intend to keep the research data for approximately 3 years and then it will be destroyed.

IF YOU HAVE QUESTIONS
If you have any comments, concerns, or questions regarding the conduct of this research please contact the research team listed on the first page of this form.

If you have concerns or complaints about the research study, research team, or questions about your rights as a research participant, please contact Research and Sponsored Projects, 18111 Nordhoff Street, California State University, Northridge, Northridge, CA 91330-8232, or phone 818-677-2901.

VOLUNTARY PARTICIPATION STATEMENT
You should not sign this form unless you have read it and been given a copy of it to keep.
Participation in this study is voluntary. You may refuse to answer any question or discontinue your involvement at any time without penalty or loss of benefits to which you might otherwise be entitled. Your decision will not affect your relationship with California State University, Northridge. Your signature below indicates that you have read the information in this consent form and have had a chance to ask any questions that you have about the study.

I agree to participate in the study.

___________________________________________________  __________________
Participant Signature  Date

___________________________________________________
Printed Name of Participant

___________________________________________________  __________________
Researcher Signature  Date

___________________________________________________
Printed Name of Researcher
Appendix C: State-Trait Anxiety Inventory (STAI Y-1) (Speilberger, 1980)

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>I feel calm</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>I feel secure</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>I am tense</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>I feel strained</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>I feel at ease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I feel upset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>I am presently worrying over misfortunes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>I feel satisfied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I feel frightened</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I feel comfortable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I feel self-confident</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I feel nervous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>I am jittery</td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>I feel indecisive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>I am relaxed</td>
<td></td>
<td></td>
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<tr>
<td>16</td>
<td>I feel content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>I am worried</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>I feel confused</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>I feel steady</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>I feel pleasant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix D: State Sport-Confidence Inventory SSCI (Vealey, 1986)

State Sport-Confidence Inventory (Vealey, 1986)

Think about how confident you feel right now about performing successfully in the upcoming competition.

Answer the questions below based on how confident you feel right now about competing in the upcoming contest. Compare your self-confidence to the most confident athlete you know. Please answer as you really feel, not how you would like to feel. Your answers will be kept completely confidential. How confident are you right now about competing in the upcoming contest? (Circle number)

1. Compare the confidence you feel right now in your ability to execute the skills necessary to be successful to the most confident athlete you know.

   Low | Medium | High
   ---|---|---
   1 2 3 4 5 6 7 8 9

2. Compare the confidence you feel right now in your ability to make critical decisions during competition to the most confident athlete you know.

   Low | Medium | High
   ---|---|---
   1 2 3 4 5 6 7 8 9

3. Compare the confidence you feel right now in your ability to perform under pressure to the most confident athlete you know.

   Low | Medium | High
   ---|---|---
   1 2 3 4 5 6 7 8 9

4. Compare the confidence you feel right now in your ability to execute successful strategy to the most confident athlete you know.

   Low | Medium | High
   ---|---|---
   1 2 3 4 5 6 7 8 9

5. Compare the confidence you feel right now in your ability to concentrate well enough to be successful to the most confident athlete you know.

   Low | Medium | High
   ---|---|---
   1 2 3 4 5 6 7 8 9

6. Compare the confidence you feel right now in your ability to adapt to different game situations and still be successful to the most confident athlete you know.

   Low | Medium | High
   ---|---|---
   1 2 3 4 5 6 7 8 9
7. Compare the confidence you feel right now in your ability to *achieve your competitive goals* to the most confident athlete you know.

8. Compare the confidence you feel right now in your ability to *be successful* to the most confident athlete you know.

9. Compare the confidence you feel right now in your ability to *consistently be successful* to the most confident athlete you know.

10. Compare the confidence you feel right now in your ability to *think and respond successfully during competition* to the most confident athlete you know.

11. Compare the confidence you feel right now in your ability to *meet the challenge of competition* to the most confident athlete you know.

12. Compare the confidence you feel right now in your ability to *perform consistently enough to be successful* to the most confident athlete you know.

13. Compare the confidence you feel right now in your ability to *bounce back from performing poorly and be successful* to the most confident athlete you know.
Appendix E: Interview Guide (Players)

Causal Anxiety Attributions Interview Questions

**Personal Standardized Open-Ended Interview**

1. What was the attitude like inside the locker room during pre-game?

2. Where do you think that you fall on the IZOF chart prior to your best competitions?

3. Where do you believe that you landed on the IZOF chart prior to tonight’s competition?

4. What are some of the reasons why you \textit{were/were not} in your optimal zone for the match?

5. Can you list some factors that change your IZOF levels during pre-game (2 hours before the match)? What influences your anxiety level throughout the process of practices and pre-game?

6. Why do you think that anxiety and nerves are a factor for you? Why do you think that anxiety and nerves are not a big factor for you?

7. Can you tell when a teammate of yours is nervous? If so what do you do, if anything?

8. Also why do you think they are nervous?

9. Does their high anxiety level affect their performance?

10. I am going to list ten possible sources that cause athletes anxiety. You tell me one a scale of 1 to 10, how much each one affects your level of anxiety and explain why you gave it the rating you did. (1 little or not at all and 10 causes you a lot of anxiety).

   1. Performance anxiety- How nervous are you performing in front of a crowd?

   2. Fear of rejection- Letting your teammates down.

   3. Letting your parents down

   4. Letting your coach down

   5. Fear of failure- Afraid that you might not accomplish your teams goal and may lose the game.

   6. Fear of Injury- Afraid that you may get hurt in the match you are about to participate in.

   7. Others around you- you sense teammates or a teammate as nervous and it affects your anxiety level.

   8. You sense your coach or coaches are nervous and it affects your anxiety level.

   9. The importance of the match.

   10. The perceived level of the opponent.
Appendix F: Interview Guide (Coaches)

Causal Anxiety Attributions Interview Questions (COACH VERSION)

*Personal Standardized Open-Ended Interview*

1. What was the attitude like inside the locker room during pre-game?

2. Where do you think that you fall on the IZOF chart prior to your best competitions as a coach?

3. Where do you believe that you landed on the IZOF chart prior to tonight’s competition?

4. What are some of the reasons why you *were/were not* in your optimal zone for the match?

5. Can you list some factors that change your IZOF levels during pre-game (2 hours before the match)? What influences your anxiety level throughout the process of practices and pre-game?

6. Why do you think that anxiety and nerves are a factor for you?
   
   Why do you think that anxiety and nerves are not a big factor for you?

7. Can you tell when a player of yours is nervous? If so what do you do, if anything?

8. Also why do you think they are nervous?

9. Does their high anxiety level affect their performance?

10. I am going to list ten possible sources that cause athletes anxiety. You tell me one a scale of 1 to 10, how much each one affects your level of anxiety and explain why you gave it the rating you did. (1 little or not at all and 10 causes you a lot of anxiety).

   1. Performance anxiety- How nervous are you coaching in front of a crowd?
   
   2. Fear of rejection- Letting your athletics department down.
   
   3. Letting your AD’s down
   
   4. Letting your players down
   
   5. Fear of failure- Afraid that you might not accomplish your teams goal and may lose the game.
   
   6. Others around you- you sense your players or a player are nervous and it affects your anxiety level.
   
   7. You sense your team or players are nervous and it affects your anxiety level.
   
   8. The importance of the match.
   
   9. The perceived level of the opponent.
Appendix G: Debriefing Form

Participant Debriefing Form

Due to the nature of this study some deception was implemented in order to answer the research question. The actual research question asked if anxiety contagion was present within a volleyball team prior to a competition.

Emotional contagion is defined as “the phenomenon whereby an emotion initiated by an individual extends to other individuals who are in his or her proximity as a certain time” (Larousse), 2006, p. 256). Studies on emotional contagion have been done, none within the realm of team sport athletics using a measure of anxiety. Research on contagion has found positive links between co-workers emotions (Barsade, 2002). Further research done by Gonzalez, Castillo, & Swinkles (2002) found that of the 25 emotions tested, anxiety was perceived to be the ninth most contagious. This study explored whether anxiety contagion is a factor within members of your volleyball team.

Research has revealed that athletes have a zone of optimal state anxiety levels, where their best performances occur. Female college volleyball players had specific levels of optimal functionality levels, as they were categorized into groups of low, medium, and high anxiety levels (Raglin, 1994). Studies have also shown that emotions of coworkers, family, and friends can be contagious to those around them. Volmer (2012) found a large contagion effect between team leaders and their subordinates. “Leaders influence team members; individual mood, group tone, and teams performance.” Emotional contagion occurs with the transfer of a certain emotional state from one person to another (Dimberg, Thunberg, & Elmehed, 2002)

This study hypothesized and examined anxiety levels as being contagious between teammates and coaches during pre-game interactions.

Thank you for your participation in the research project! All of the information you provided has added to the richness of the study. As mentioned in your “Consent to Participate” sheets all of the information you provided will remain anonymous.

Jeffrey Baxter
California State University, Northridge
Kinesiology Graduate Program