The Role of Cognitive and Somatic Anxiety in Athletic Performance

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Abstract

Anxiety is made up of a mental (cognitive) component and a physiological (somatic) component. Prior research has indicated that the relationship between somatic anxiety and performance is curvilinear (i.e., as anxiety increases, performance increases to a point then begins to decrease as anxiety continues to increase). However, prior research has also indicated that the relationship between cognitive anxiety and performance is negatively linear (i.e., as anxiety increases, performance decreases). This study investigates whether these findings are able to predict athletic performance. Twenty-three starting collegiate athletes from Division III football, women's basketball and men's basketball teams were tested for somatic anxiety (measured blood pressure and heart rates) and cognitive anxiety (self-report questionnaire) during leisure time and 10 to 45 minutes prior to a collegiate competition. Athletic performance was assessed by the appropriate coaching staff. Linear regression analysis was used to determine that there is actually a significant positive linear relationship between cognitive anxiety and performance for basketball players, while no other significant findings were determined across sport or type of anxiety. This research may benefit the field of sport psychology, contributing both to players and coaches, by suggesting effective stress management strategies.

The Role of Somatic and Cognitive Anxiety in Athletic Performance

Each person reacts to sports in a different way. Bobby Knight throws chairs and turns fire engine red after a bad call. Michael Jordan cries after a great victory, blessing everything and everyone in his life. With multi-million dollar sporting events such as the Superbowl, the World Cup or the Olympics, it is obvious as to why the discipline of sports science is a rapidly growing field, leading to increased responsibility being placed upon the shoulders of the sports psychologist (Gowan, 1979; Bakker, Whiting & van der Brug, 1990).

So how do those Michael Jordan's of the world perform under such intense pressures or the Lance Armstrong's find the endurance to complete days of biking in extreme weather? Many successful athletes consult sport psychologists for help to better cope with these stressors and anxieties that are seen throughout their preparation and their performance (Jones, 1995). Theories of how exactly these anxieties affect performance are based on theory and educational research from clinical psychology that assumes that athletes and their performances are no different than simple cognitive tasks experimented upon in years past (Jones, 1995). Recent research has suggested that this anxiety-sport performance relationship is actually a complex phenomenon that deserves to be researched in its own situational context rather than to assume the relationships based on previous theories are correct. Problems have arisen in the dilemmas surrounding such examination including the concepts and methods in which one needs to base evaluation.

Anxiety is defined by Worchel and Goethals (1989) as the uncertainty in how to cope with stress. That is, when one feels that she or he does not have the capacity to deal with stress or that the stress is overwhelming. Components of anxiety include fear,

anger, increased heart and perspiration rate, trembling, and being mentally off-balance, each of which is directly involved with the autonomic nervous system creating arousal (Worchel & Goethals, 1989). Therefore, anxiety is experienced when approaching or perceiving stress which is rooted in an increased state of arousal. This anxiety (arousal) may produce a positive or a negative affect, including drive, fear, motivation, pressure, excitement, exhilaration, etc.

This form of anxiety, also known as cognitive anxiety, is defined as the mental component of anxiety. It is caused by negative expectations about success or by negative self-evaluation (Craft, Magyar, Becker, & Feltz, 2003). In other words, cognitive anxiety is the fear from anticipated consequences of failure (Hardy & Parfitt, 1991). This cognitive anxiety is generally measured with self-report questionnaires; however, there is one main critique that should be considered. Martens (1995) warned that by using self-report, the subject may answer according to what is socially desirable. That is for example, a football defensive lineman may not want tell a female experimenter that he is extremely nervous or that he is extremely excited. Rather, he is more likely to say that he is "average" feeling on every question.

Another type of anxiety, known as somatic anxiety, is the physiological component of anxiety. It is caused directly by stimulation or arousal of the autonomic systems. In other words, somatic anxiety is the component that reflects the perceptions of the psychological stress to the physiological response (Craft et al., 2003). Somatic anxiety is generally best measured using blood pressure and heart rate measures. It is important to note however, that the systolic reading of blood pressure is the more reactive measure. It is the measure that responds to situations, while the diastolic reading of

blood pressure is a "health" reading. It is the measure that responds to how well blood is moving through the arteries during the heart's relaxation period (American Heart Association, 2004). Therefore, for this study, systolic readings will be the only measure used in addition to heart rate due to both measures being immediately reactive to situations.

Anxiety and Performance: The inverted-U hypothesis

Prior research by Yerkes and Dodson (1908) showed that the physiological arousal and performance relationship was initially based on the inverted-U hypothesis. The inverted-U hypothesis refers to arousal on the x-axis and performance on the y-axis. Yerkes and Dodson (1908) examined the ability of mice to discriminate between stimuli of differing brightness as a function of differing intensities of electric shock. Based on this design, they proposed that heightened arousal enhanced performance to a certain point, and after this point was reached, if arousal continued to increase then it became detrimental to performance.

Anxiety and Performance: The multidimensional approach

Martens et al. (1995) expanded on the inverted-U from Yerkes and Dodson to include a multidimensional approach in which they looked at the relationships between cognitive anxiety and performance in addition to somatic anxiety and performance (inverted-U). They found that a strong negative linear relationship exists between cognitive anxiety and performance. That is to say that as cognitive anxiety increases, performance decreases in a linear fashion. They also found that the relationship between somatic anxiety and performance was a less power, curvilinear relationship where both lower and higher levels of somatic anxiety were detrimental to performance.

Athletes and Arousal

Every athlete approaches competitions with varying degrees of arousal. Within each athlete, differences in arousal will occur. Arousal is defined by Gould and Krane (1992) as "physiological activation or autonomic reactivity" (p. 120). According to Malmo (1959), arousal runs along a continuum from deep sleep to extreme excitement and is best defined as a blend of general physiological and psychological activation or in other words, a form of motivations construct that represents the intensity level of behavior (performance) (Landers, 1980). Sport psychologists Males and Kerr (1996) state that as an athlete approaches a game, referred to as the precompetitive period, they are at their highest stress level, and that in this time, an athlete will experience a wide span of emotions which produces a precompetitive affect. This affect is known in laymen terms as anxiety.

Athletes and Somatic Anxiety: Application of the inverted-U hypothesis

One main assumption of the inverted-U is that for every type of behavior there exists an optimum level of arousal, usually of moderate intensity, that produced a maximum performance (Jones, 1995). This link has been described in several different variations, such as the relationship between stress and performance, arousal and performance, and anxiety and performance (Hardy & Parfitt, 1991). In these variations, they found that moderate levels of arousal were generally associated with better performance than too little arousal or excessive arousal. For example, when an athlete has a very low state of arousal, s/he may be too drowsy to perform, or on the other end of the spectrum, when an athlete experiences a very high state of arousal, s/he may choke, thereby hindering performance. According to Yerkes and Dodson (1908), the rise to

optimal performance, as well as the decline to detrimental performance is a gradual one, forming a very symmetric "U" shape, a curvilinear relationship. The inverted-U hypothesis also implies that if an athlete has surpassed optimal performance and is beginning this decline, any intervention breaking the decline will return the athlete to the optimal performance.

Athletes and Cognitive Anxiety: Application of the Multidimensional Approach

Martens et al. (1990) found that when applied to sports, the multidimensional anxiety theory predicts that the cognitive and somatic anxiety will differentially influence athletic performance. They argued that somatic anxiety is a conditioned response to entering a performance arena, so it should disperse once performance begins. In addition to this, since cognitive anxiety reflects negative concerns about the consequences of failure, it should only change when the subjective probability of success changes. Based on these two proposals, Martens et al. (1990) predicted that cognitive anxiety should remain high and fairly stable during the time prior to competition, while somatic anxiety peaks later. Cognitive anxiety, to note, should be the principal influence upon performance and this influence should be negative. Klavora's (1977) work was supported with this finding by Martens and colleagues (1990) which found that athletes with moderate levels of anxiety performed the best overall and scored the most points. In contrast, the high-anxiety players performed the worst.

Predicting Athletic Performance

Terry and Youngs (1996) indicated that the ability to predict performance from the multidimensional approach was stronger for "open" sports, which deal with greater interaction between opponents and less environmental control (e.g., football, basketball),

than it is for "closed" sports which are more individualized (e.g., golf, archery). Findings have also shown that the less experienced and non-elite performers will experience a steady increase in anxiety right up to and even during performance, whereas, experienced and elite performers demonstrate a similar pre-event increase, but then a reduction just prior to and during performance.

By using "open" sports and experienced athletes, the two relationships between cognitive anxiety and performance and somatic anxiety and performance can be assessed. Klavora (1977) found support for the inverted-U hypothesis in both male and female high school basketball players. A range of optimal state anxiety was found in this study where the best athletic performance was observed.

It is important to note that recent research from sports psychologist has found a third possible dimension. The Competitive State Anxiety Inventory-2 (CSAI-2) originally developed by Martens, Burton, Vealey, Bump and Smith (1982, 1990) was designed to measure cognitive and somatic components. However, during the intense work done in verifying validity on the scale, the third dimension of self-confidence evolved. Antecedents of cognitive anxiety, and also those of self-confidence, are hypothesized to be factors of which are in the environment and are related to an athlete's expectations of success/failure, including the perception of one's own ability or that of his or her opponent. Antecedents of somatic anxiety are thought to be of shorter duration and are comprised mostly of conditioned responses to stimuli (e.g., pre-competitive warm-ups, field/court change, etc.) (Gould, Petlichkoff & Weinberg, 1984; Martens et al., 1990). Findings by Jones, Swain and Cale (1991) imply that the antecedents of anxiety and confidence are a function of gender. The concluded that indicators of cognitive

anxiety and self-confidence in females were associated with personal goals and standards, however in males they were associated with interpersonal comparison and winning. Hanton and Jones (in press) have thus far found that these antecedents also vary across sports.

In regards to cognitive anxiety and performance, this study will look to see if, in fact, the negative linear relationship proposed by Martens et al. (1990) holds true for athletes. However, with somatic anxiety and performance, this study will look to see if in fact the inverted-U hypothesis proposed by Yerkes and Dodson (1908) does hold true in reality when applied to athletes. To see if in fact there is a significant difference across genders, gender will be examined to see if females show a correlation between personal goals and performance or if males show a correlation between interpersonal comparison and performance.

In this study, starting college basketball and football players, also referred to as experienced athletes, will have their somatic anxiety and cognitive anxiety evaluated while they are in a quiet, relaxed situation, then again ten to forty-five minutes prior to a competitive game to obtain any individual measures. The same measures were then taken again immediately following competition. After having ample time to review performance coaches will assess the participants' performances during that competition.

Methods

Participants

This experiment was conducted with 23 participants, 16 males and 7 females. Participants were all collegiate athletes of Hanover College's football (11 males) and basketball (5 males, 7 females) teams who were considered to be starters on tested game

day(s). Participants were between the ages of 18 and 22. The sample was composed of 94 % of Caucasian males, 6 % other males and 100 % of Caucasian females.

Materials

Anxiety as a somatic response is traditionally measured through physiological indexes with the two best measures being blood pressure and heart rate (Gould & Krane, 1992). Blood pressure is the force of blood against the walls of the arteries during relaxation and contraction, respectively. It is recorded as two numbers, systolic (upper or first reported) and diastolic (bottom or second reported). Normal blood pressure is 120/80; however, athletes generally have lower resting blood pressure and heart rate measures but will show a greater rise during exercise (Niedfelt, 2005). The reasoning behind this is that because blood pressure is measured as the force of blood against artery walls, those in better shape will have stronger hearts, thus allowing for a stronger push of blood. For example, a champion weight lifter will have a blood pressure of 400 over 320 when he does a leg press lifting his maximum amount of weight (Tanaka, Bassett, & Turner, 1996). Experimenters used an Armron Automatic Inflate Blood Pressure/Heart Rate machine with a standard and an extra-large cuff to measure baseline and game day blood pressures and heart rates.

While taking the game day blood pressure, experimenters asked participants the same six questions asked for a baseline reading that were designed to measure cognitive anxiety (e.g., “How nervous do you feel right now?”). Participants were asked to respond using a 5-point scale with one corresponding to “not at all” and five corresponding to “extremely”. Questions were based on the Competitive State Anxiety Inventory-2

(CSAI-2) from Martens, et al. (1990) but were modified so that they could be used in the time slots allotted per individual coaches.

Measures of player performance were based on position (e.g., "How well did this person play based on position?") in order to get a fair assessment of the player's performance. Judges were asked to respond using a 7-point scale with one corresponding to "unsatisfactory" and seven corresponded to "outstanding". The last item on the measure was an optional, open-ended question asking for any other information on the player's performance that the coaches or captains felt would be helpful, and was obtained for possible discussion purposes only. Coaches were also asked their gender and years coaching to get a sense of how well they understand the sport and positions they were being asked to evaluate.

Procedure

After obtaining permission from the coaches and captains for use of their teams and their selected players, participants were contacted by e-mail and invited to participate. No incentive was offered. One hundred percent of participants who were contacted agreed to participate. Participants were tested at a time when they were not very active and filled out an Informed Consent form. A blood pressure and heart rate reading were then taken to assess the participants' baseline level of somatic anxiety, as well as the six-item questionnaire to measure cognitive anxiety on a baseline level. Ten to forty-five minutes before the competition, the starting participants were asked to fill out their measures of cognitive anxiety and were tested to measure their pre-game blood pressure and heart rate. All pre-game and post-game measures were taken at the team's home field or court. To be considered a starter for football, athletes were all seniors due

to the only game day available for testing being Senior Day (where all seniors will start or play a majority of the game). However, to be considered a starter for basketball, players averaged more than 20 minutes per game (half of a college game). Football players were measured during only one game, but basketball players were measured on three occasions to improve the reliability of the measures. After thoroughly reviewing game film the day after the game, coaches filled out the Measure of Player Performance. Coaches filled out the surveys alone in the privacy of their own offices or rooms without discussing their evaluations with the other coaches. A Debriefing Form was sent to each participant via his or her campus mail.

Results

Reliability

To test the reliability of the questions used to assess cognitive arousal on Questionnaire 1, as well as the reliability between the coaches' assessments based on the position of the player, we used the Cronbach's α statistic. For the cognitive anxiety questions, two questions were reversed. The analysis of the questions assessing cognitive arousal produced $\alpha = .63$, while the analysis for the coaches' assessments produced $\alpha = .69$. While these scores were not optimal, the internal reliability of both measures was considered to be acceptable. All 6 questions measuring cognitive anxiety were included , as well as the assessments of all 3 coaches.

The Effect of Arousal on Performance

To test whether the mean measures of somatic arousal could predict performance, we used the average of the differences between resting and pre-game measures for correlations between the average systolic measure, the average heart rates, and the

average assessment of the all the players' performance based on the coaches' assessments of their positions. Analysis of the correlation between the average systolic measure and the performance assessment produced a correlation of $r = .12$ ($p > .05$, $n = 23$), with a $p > .05$. For the relationship between average heart rate and performance, the correlation was $r = .01$ ($p > .05$, $n = 23$). The correlation between cognitive anxiety and performance was found to be $r = .27$ ($p > .05$, $n = 23$). Thus, no relationship was found to exist between either somatic or cognitive anxiety and performance.

To test whether there was a relationship between the measures of anxiety and performance within the different sports, we looked at the correlations between the average anxiety measures and the average assessments within each sport. For football, no relationship was found between the measure of somatic anxiety as systolic blood pressure and performance, with $r = .24$ ($p > .05$, $n = 11$), or average heart rate and performance with $r = -.23$ ($p > .05$, $n = 11$). Likewise, no relationship was found between the measure of cognitive anxiety and performance for the football players, either, as $r = .03$ ($p > .05$, $n = 11$). For basketball, no relationship was found between either measure of somatic anxiety and performance, with the correlation between the average systolic blood pressure measures being $r = .44$ ($p > .05$, $n = 12$) and the correlation between the average heart rates measure and performance being $r = .19$ ($p > .05$, $n = 12$). However, when examining a scatter plot of the correlation between somatic anxiety and performance, the presence of this relationship is suggested (*Figures 1 and 2)*. Furthermore, when we tested the correlation between measure of cognitive anxiety and performance, we found a significant positively linear correlation, with $r = .76$ ($p = .00$,

n = 12) Therefore, as cognitive anxiety increased for the basketball players, their performance increased as well (*see Figure 3)*.

Discussion

This study researched the effects of cognitive and somatic anxiety on athletic performance. Although the findings are inconsistent with those of Yerkes and Dodson (1908) as the results did not indicate an inverted-U relationship between somatic anxiety and performance, as well as those of Martens et al. (1990) as the results indicated no presence of a negative linear relationship between cognitive anxiety and performance, some findings were upheld by the catastrophe theory (Fazey & Hardy, 1988; Hardy, 1990; Hardy & Parfitt, 1991). Whereas the findings from Yerkes and Dodson and Martens, et al. apply to performance in general, the catastrophe theory applies directly to the study of athletic performance.

Two parts of the catastrophe theory state that when somatic anxiety is high, a negative correlation is predicted between cognitive anxiety and performance, and when somatic anxiety is low, a positive correlation is predicted between cognitive anxiety and performance (Hardy et al., 1988, 1990, 1991). In addition to this, Hardy et al. (1988, 1990, 1991) predict that when cognitive anxiety is low, there is a gentle inverted-U relationship between somatic anxiety and performance, and when cognitive anxiety is very high, performance will improve as somatic anxiety increased to a critical threshold, after which, further increases in somatic anxiety will result in a catastrophic drop. Regarding their prediction about the gentle inverted-U between somatic anxiety and performance when cognitive anxiety is low, no statistically significant results were found,

although examining a scatter plot might indicate the presence of this relationship, which the experimenters believe will become more apparent with a larger sample size.

The findings of this study were supported by those of Hardy and colleagues (1988, 1990, 1991), based on the positive linear correlation that was found between cognitive anxiety and performance among the basketball players. It can be assumed, based on the design of this study that the participants were tested while their measures of somatic anxiety were more towards the lower end of the range of their somatic anxiety.

The sample size and homogeneity of this experiment are obvious limitations, those of which future research should mend. With a larger sample size, more significant results might have been reported (e.g., the relationship between cognitive anxiety and performance amongst football as well). Using a wider range of sports would increase the sample size as well as decrease homogeneity, all while improving the ability to generalize the findings across populations. Martens et al. (1995) notes that a caution with using self-report questionnaires is social desirability within answers. Experimenters suspect that with a larger sample size thereby requiring more researchers, the possibility of lineman answering on the lower end or average area of cognitive anxiety may possibly be reduced because they will not feel the "pressure" to answer according to what media stereotypes assume they should be feeling. Therefore, significance could be found in the overall relationship between cognitive anxiety and athletic performance, outside of basketball specifically.

Regarding the design of this study to measure football and to some degree basketball, specific limitations were observed. The first being that taking pre-game measures might not, in fact, be an accurate assessment of pre-game anxiety for football

players, as the starters (assuming players do not play both offense and defense) do not know for sure if they are going to start until after the coin toss. Thus, pre-game anxiety might not be at its highest until after the coin toss.

As this study measured the participants before the coin toss, an inaccurate assessment of pre-game anxiety might not have been observed. For basketball, measures were taken during pre-game warm-up while athletes still had time for a pre-game pep talk and introductions of starting players to the fans. For future research, it would be advisable to measure football players after the coin toss and basketball players after the introduction however, the chance that this could occur without any disruption of normal game processes might prove to be unfeasible. Furthermore, adding any disruptions closer to the normal pre-game process that close to kick off or tip-off might produce inaccurate measures of pre-game anxiety as the process of taking the measure would most likely increase anxiety in itself. In addition to these general limitations with football, this study experienced time constraints because the particular game for which the measures were taken, happened to be Senior Day, and this distanced the time of testing from the start of the game even further due to the Senior Day ceremonies that took place before kick-off.

In conclusion, although the results did not support the hypotheses that there is an inverted-U relationship between somatic anxiety and athletic performance or a negative linear correlation between cognitive anxiety and performance, the results did indicate that there is a positive linear correlation between cognitive anxiety and athletic performance for basketball players. Results were supported by the findings of Hardy et al. (1988, 1990, 1991) that were stated in the catastrophe theory. Implications of this study consists of refuting the findings Yerkes and Dodson (1908), and Martens et al. (1990) in that their

findings do not apply to athletic performance. As cognitive anxiety was found to have a positive correlation with performance, it indicates that better performance can be predicted by increasing cognitive anxiety.

It is important for athletes to mentally focus on the game, allocating the majority of their mental resources to thinking about the competition and how they will perform. The role that mental focus plays on performance is illustrated by the analysis of the open-ended question provided on the coaches' assessment questionnaire. One particular response to this type of question for a player who played poorly was, "I feel outside factors affected her ability to focus on the game." This plays an important role where the self-confidence that various psychologist have discovered comes into play in that it is a function of gender and has a significant impact on anxiety and athletic performance (Gould, Petlichkoff & Weinberg, 1984; Martens et al., 1990, Jones, Swain & Cale, 1991; Hanton & Jones, in press). By specificity in therapy, female athletes who have low cognitive anxiety may be advised to setting personal goals that are attainable for each individual. However, for male athletes who have low cognitive anxiety, mini-goals may be encouraged through proper therapy where each goal is a "win," thereby increasing cognitive anxiety in regards to the gender specificity. This would increase athletic performance as well as, reliable prediction of such.

Along with cognitive therapy to improve the self-confidence of the specific gender, motivations also may be altered in accordance. For example, a female athlete's motivation may be linked to obtaining personal goals. Therefore, therapy that targets these motivations by increasing desire for achieving these goals could prove to be beneficial. For example, if a female athlete's sole motivation is to prove herself to her

parents through her good performance and being accepted by them, then group therapy could prove to be helpful in the parents expressing their acceptance and praise, in turn, increasing the cognitive anxiety of the athlete because she now knows that her motivations become obtained goals with each good performance. The same holds true for a male athlete in that his motivation is to achieve "wins," thus, therapy could prove to be beneficial for male athletes as well.

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Figure 1. Relationship between average systolic measures and performance for basketball.

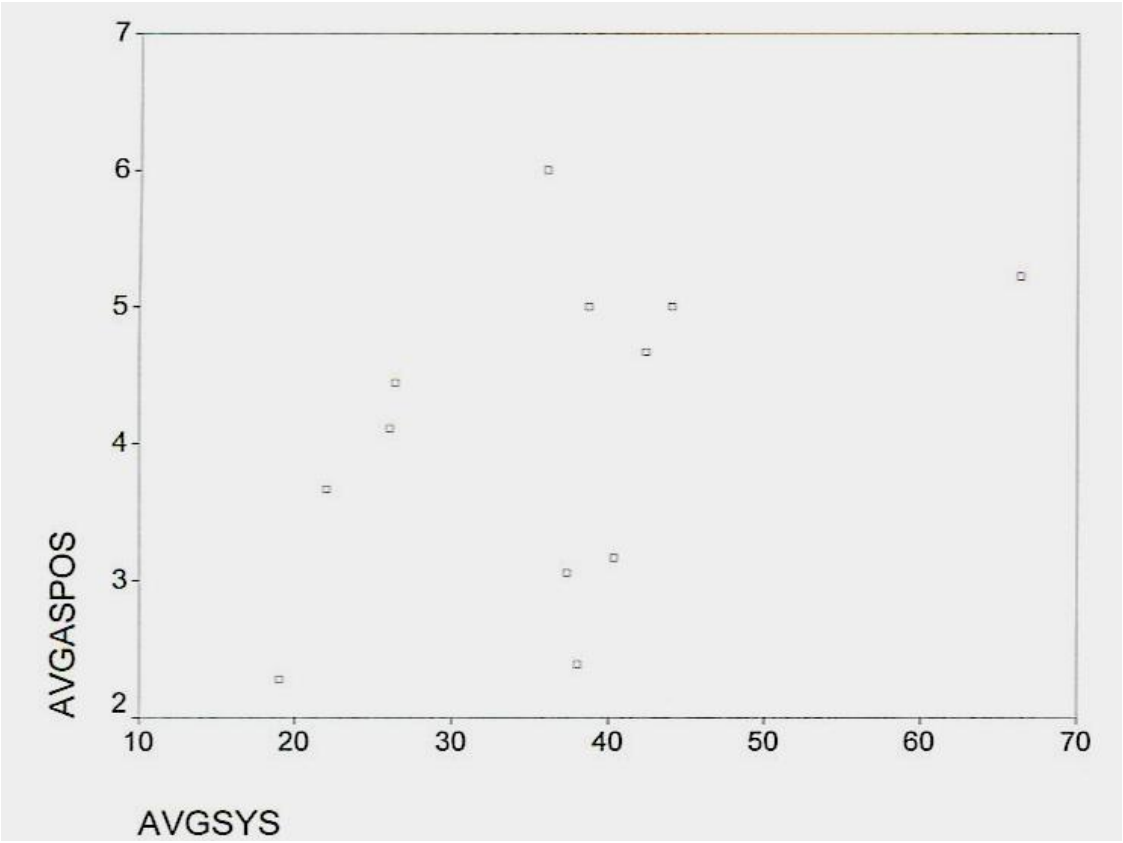


Figure 2. Relationship between average heart rate and performance for basketball.

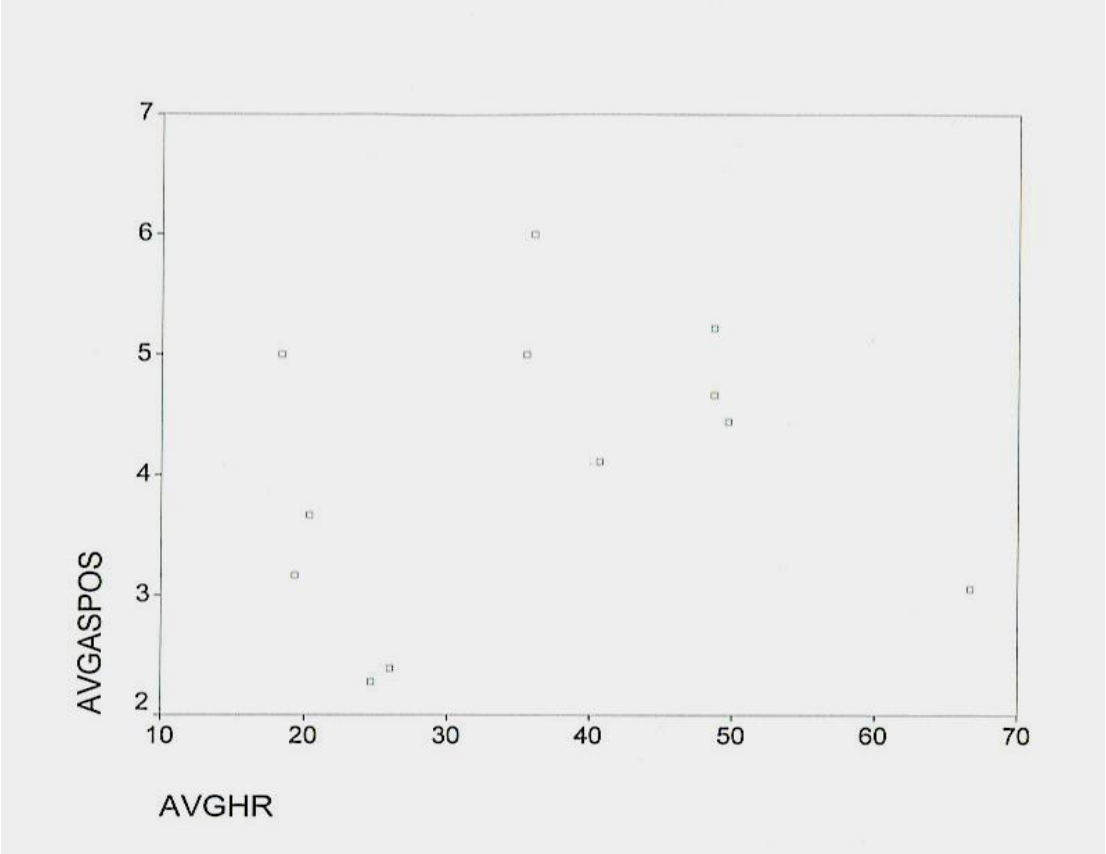
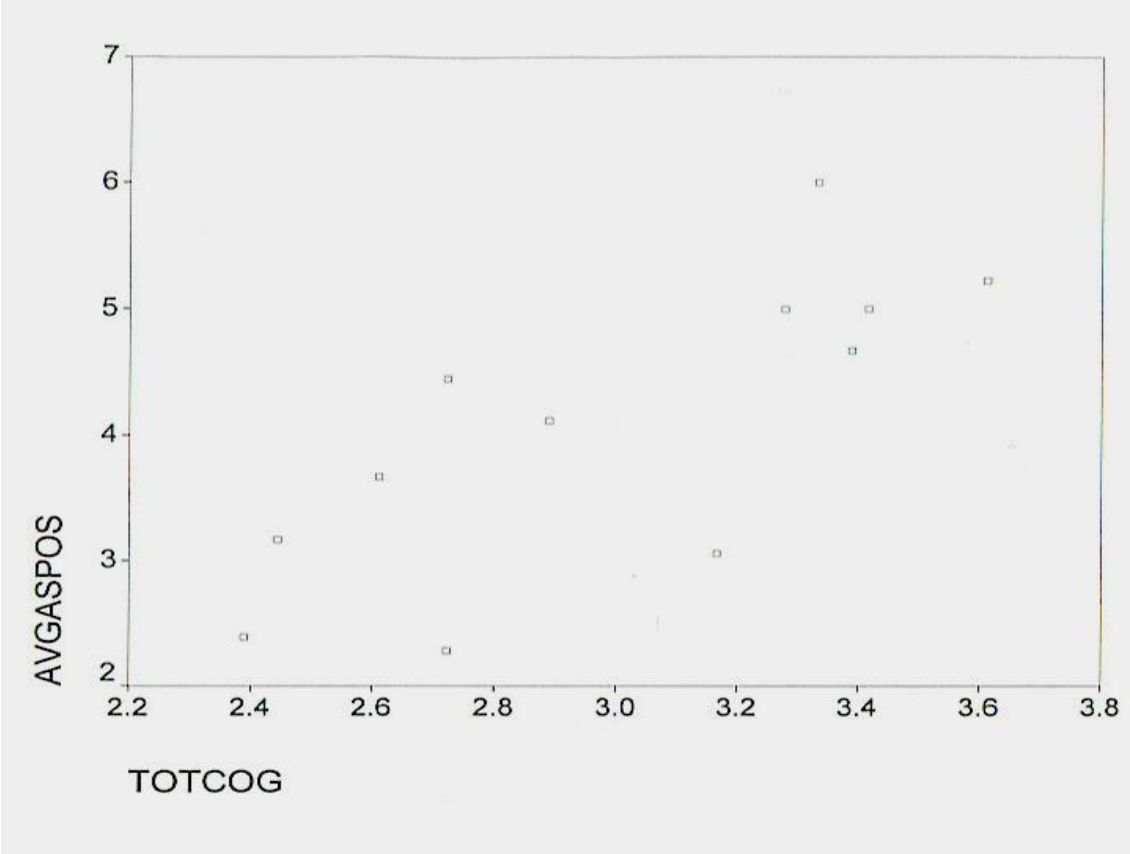


Figure 3. Correlation between cognitive anxiety and performance for basketball.



Informed Consent

You are being asked to participate in a study conducted by Ashley Bridges and Brandon Knight for our Independent Study in psychology. We are examining factors that influence sports performance, so your participation in this study could be beneficial to athletic teams in the future. In this study, we will measure your blood pressure twice: once at rest and once on game day roughly 10 minutes prior to your performance. During the second blood pressure reading, you will be asked six brief questions regarding how you are feeling. Following analysis of the game film, two coaches and one other team player will be asked a few questions regarding your performance. This experiment will take approximately 5 to 10 minutes of your time. The experimenters will be present throughout the entire experiment if you have any questions, comments or concerns. There are no known or possible causes of harm to anyone involved in this study. Participation in this study involves no known risks beyond those of everyday life. Your identity in this study will be treated as confidential. The results of the study may be published for scientific purposes but will not give your name or include any identifiable references to you. You are free to choose whether or not to participate in this study. There will be no penalty or loss of benefits if you decide not to participate. If at any time throughout the study you decide to discontinue your participation you may. However, extra credit (if offered by your instructors) will not be given without completion of this study.

_____	_____	_____
Participant Name (Printed)	Date	Participant Name (Signed)

Questionnaire 1

Gender: M F
Age: 18 19 20 21 22
Ethnicity: _____
Sport: _____
Position: _____
Years Playing Position: _____

At Rest:
Blood Pressure _____ Heart Rate _____

Pre-Game:
Blood Pressure _____ Heart Rate _____

Post-Game:
Blood Pressure _____ Heart Rate _____

On a scale of 1 to 5 (1-not at all, 5-extremely), please answer the following questions about yourself at this point in time as honestly as possible:

1. How nervous do you feel right now?
   Baseline 1 2 3 4 5
   Pre-Game 1 2 3 4 5
   Post-Game 1 2 3 4 5

2. How relaxed do you feel right now?
   Baseline 1 2 3 4 5
   Pre-Game 1 2 3 4 5
   Post-Game 1 2 3 4 5

3. How excited do you feel right now?
   Baseline 1 2 3 4 5
   Pre-Game 1 2 3 4 5
   Post-Game 1 2 3 4 5

4. How jittery do you feel right now?
   Baseline 1 2 3 4 5
   Pre-Game 1 2 3 4 5
   Post-Game 1 2 3 4 5

5. How restless do you feel right now?
   Baseline 1 2 3 4 5
   Pre-Game 1 2 3 4 5
   Post-Game 1 2 3 4 5

6. How calm do you feel right now?
   Baseline 1 2 3 4 5
   Pre-Game 1 2 3 4 5
   Post-Game 1 2 3 4 5

Instructions for Questionnaire 2

Coaches-

We will need THREE of you to fill out a *separate* questionnaire for each player. The coaches we need are as follows:

Coach 1 Name
Coach 2 Name
Coach 3 Name

We need for you to give a FAIR, ACCURATE and UNBIASED assessment of each player's performance that was chose for our study. The list of players is attached with their corresponding participant number, which can be found in the upper left hand corner of each Questionnaire. Each coach needs to take a packet (either "A," "B," or "C").

For example: John Doe is assigned participant number "1."
You will fill out A1 for him if you have the packet of "A's."

Please make sure that you fill out the assessment *after* you have had sufficient time to review their performances (after game film, after meetings, etc.) of each game. We would like for you to be in separate rooms while filling out each questionnaire in order to prevent biased assessments.

There are two questions, one to assess performance based on position the other based on ability. There is also an *optional* open-ended question at the end. Please feel free to write anything you wish here that you feel may contribute to our study. All evaluations and comments will be kept *fully confidential* so we again encourage you to be as thorough as possible.

When you are finished, please return all slips to the folder provided. They do NOT have to be in any order at all. We will pick up the completed Questionnaires at a time that is decided upon between all of us. Thank you so much for all of your help and time. Your participation in this study will be very beneficial in the area of athletic performance and anxiety levels. Thank you again.

If you have any questions, comments or concerns while filling out the surveys or anytime after, please feel free to give either of us a call at the numbers listed below.

Ashley Bridges: 812-866-XXXX (home) or XXX-XXX-XXXX (cell)
Brandon Knight: 812-866-XXXX (home) or XXX-XXX-XXXX (cell)

Questionnaire 2

Gender: M F

For Coaches:
Years Coaching: _____

1. Given this person's position, how well do you feel they performed?						
Unsatisfactory: Did not fulfill responsibilities			Satisfactory: Did everything they were supposed to			Outstanding: Went above and beyond what was required
1	2	3	4	5	6	7

2. Given this person's ability (their potential), how well do you feel they performed?						
Unsatisfactory: Not coming close to realizing their potential			Satisfactory: Tried hard, but could have given more			Outstanding: Gave it everything they had
1	2	3	4	5	6	7

OPTIONAL: Open-ended, please feel free to include any information or data that you feel is important to our study.

Debriefing

Thank you again for your participation in this study. Previous research involving stress and performance led us to hypothesize that stress and athletic performance have a strong relationship. Anxiety is divided into two categories for this study, somatic (e.g., blood pressure, heart rate) and cognitive (e.g., thoughts, feelings). The relationship between somatic anxiety and athletic performance is that of an inverted "U" curve, whereas, for cognitive anxiety, a negative linear relationship has been found. The research led us to conclude that stress can be very beneficial up to a maximum point, after which it becomes detrimental. Your contributions from our study are greatly appreciated and very worth-while, as it is our hope that our results will have a significant impact on future athletic competitions through various stress management techniques

Any questions you may have regarding the reason for this research, reasons for your participation, your rights as a participant or any additional questions, comments or concerns, please contact the following:

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Please do not discuss this study with other potential participants until the semester is over. If people know what we're testing before the study begins, they may respond differently, jeopardizing our results.

As soon as the results from this study are available, you can read about them by selecting "2004-2005 Senior Thesis Projects" at the following website (after the end of March):

http://psych.hanover.edu/resframe.html

Again, thank you for your time and participation in this study. It is greatly appreciated.