An Analysis of Factors Contributing to Anxiety in Athletic Performance:

A Synthesis of the Research Literature

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Table of Contents

Abstract

The purpose of this synthesis was to first investigate factors associated with cognitive and somatic anxiety among athletes. Secondly, this synthesis aimed to investigate the relationship between cognitive and somatic anxiety and athletic performance. An exhaustive review of the literature yielded ten studies that were relevant to this review. Six studies examined self-confidence in relationship to anxiety; two studies examined anxiety in relationship to age and experience; two studies examined anxiety in relationship to incentives; one study examined the effects of coaching style on anxiety; and one study examined anxiety in the presence of an audience. The relationships between self-confidence and performance show a positive linear trend and the relationship between somatic anxiety and performance show a curvilinear trend. Further research is needed in order to determine if anxiety can be a positive thing for some athletes. Additional research is also needed to exam continuing changes in athlete anxiety and how they can control this anxiety to improve their performance.

Introduction

Chapter 1

Athletes all around the world at every level of competition have been admired and idolized for what they accomplish on the playing stage or during the game they have excelled in. Fans of all ages strive to be just like these gifted athletic figures and often imagine in their backyards or on school grounds catching the big pass or making the final shot just as the buzzer sounds for the end of the game. However, watching the big game on television or listening to it on the radio does not allow anyone except for the athlete to feel the immense amount of pressure that is usually hanging on their shoulders. Hundreds of thousands and sometimes millions of eyes scrutinize every move a superstar makes. The feelings that those fans share for that player sometimes hangs on a thin line which separates two distinct platforms, love and hate. This outrageous amount of pressure has led every athlete at one point or another to try methods and strategies that can help them cope with the anxiety that goes hand and hand with playing sport.

Anxiety is defined as a feeling of worry, nervousness, or unease resulting from an imminent event that the athlete faces (Boniecki, Phillips, Schlenker & Schlenker, 1995). The influence of anxiety on performance has received considerable attention in sport psychology. Given the enormous popularity of sports in the United States today, and the fact that competitive athletes are under a great deal of pressure to succeed, it's only normal that some would experience anxiety both prior to/and during their performance. Not wanting to disappoint their teammates, coaches, family members and fans, it is very understandable why some athletes are likely to experience elevated anxiety levels (Boniecki, Phillips, Schlenker & Schlenker, 1995). Of course, it is not only high level, professional athletes who experience anxiety; college, high

school and youth sport athletes can also succumb to the pressures of competition (Boniecki, Phillips, Schlenker & Schlenker, 1995). While it is thought that high levels of anxiety can hinder athletic performance, less is known about the factors which cause athletes to experience performance compromising anxiety levels (Silva, 2002). In general, anxiety has been viewed negatively because it is believed that all types of anxiety will impair an athlete's performance.

Coping consists of psychological and behavioral efforts to master, reduce, or tolerate the importance of a dangerous or unpleasant condition (Folkman & Lazarus, 1985). Athletes and researchers have now begun to focus their attention and their efforts on the coping strategies involved with dealing with anxiety during an athletic performance. The feeling of anxiety that is associated with sport performance results from many different factors including an audience presence, dispositional self-confidence, performance expectations, and task characteristics (Wang, 2004). Although many of the studies done have unearthed these factors as contributing to the feelings of anxiety, there is a gap in literature and research on what coping strategies are best suited for athletes to use in these moments.

Choking is a term used by many sports psychologists that refers to the performance decrements of athletes under pressure circumstances (Baumeister, 1984). In a sports or game setting these moments where an athlete can either choke or succeed happen often at the end of games with not much time left on the clock. An example could be a penalty shootout after the overtime session of a soccer contest or even the moment a basketball player steps to the free throw line with no time left on the clock but with a chance to win the game by a slight margin. Many researchers have stated that an inability to cope with this pressure may cause the athlete to choke in the moment or not succeed (Wang, 2004). Research has been done to determine which

types of coping strategies athletes put to use to help ease the pressure felt during the intense game defining moments.

Two of the most popular coping strategies utilized by athletes are the approach and avoidance styles. An approach style of coping refers to the typical use of coping strategies that direct cognitive and behavioral efforts toward reducing the intensity of the stress. The avoidance coping style is the typical use of coping strategies that direct the activity away from the threat related stimulus (Anshel & Weinberg, 1999). Athletes when using the approach coping strategies are likely to and will shift their focus from the performance demands in front of them to instead problem solving and resolution of the problem (Wang, 2004). Avoidance coping however should be thought of as when the athletes looks to physically or mentally distance themselves from the situation in front of them that is considered the stressor (Wang, 2004).

Statement of the Problem

The causes of performance inhibiting anxiety can be varied, ranging from sport-specific situations to more general types of anxiety an athlete faces in their personal life. Furthermore, anxiety can be expressed and / or exhibited via cognitive and or somatic symptoms. Determining strategies to alleviate the debilitative effects of anxiety on the sports performance of high school athletes will be the focus of review for this synthesis paper.

Research Questions

The following research questions were explored in this synthesis project:

1. What coping methods can diminish the debilitative effects that anxiety has on the sports performance of an athlete?

2. Are there any proven strategies through research based data that have been considered successful for high school athletes when dealing with somatic and or cognitive anxiety?

3. What are some of the symptoms that athletes face when experiencing the effects of anxiety during their sports performance?

4. What is the difference between the approach coping style and the avoidance coping style that are two of the most popular styles of coping with anxiety?

Purpose

The purpose of this synthesis project is to review the literature on strategies that can be used to diminish the debilitative effects of anxiety (cognitive and somatic) on the sports performance of high school athletes.

Definitions

Cognitive anxiety. Cognitive anxiety refers to the mental component of general anxiety caused by negative expectations or negative self-evaluation. Cognitive anxiety symptoms include self-doubt, concerns over not doing well, and an inability to concentrate (Silva, 2002).

General anxiety. General Anxiety is defined as a state of apprehension, uncertainty, and fear resulting from the anticipation of a realistic or fantasized threatening situation, often impairing physical and psychological functioning (Burton, 1988).

Somatic anxiety. Somatic anxiety refers to the physiological component of general anxiety and is responsible for muscular tension, shortness of breath, sweating, frequent urination, and increased heart rate (Silva, 2002).

Limitations

As a result of reviewing the literature, one limitation was worth noting. While the synthesis is focused on the factors that influence athlete anxiety, the author recognizes that anxiety alone cannot fully account for an athlete's success or failure. In many instances, athletes can control their anxiety, but there are times when it is out of their control.

Delimitations

The following delimitations were used in this synthesis:

1. Articles that examined the effects of cognitive and/or somatic anxiety on performance outcomes in sport for youth athletes and players.

2. Articles that dealt with the athletic performance of high school athletes.

3. Articles that were research based and from the time period of 1995 to 2009 were included in this study.

Chapter 2

METHODS

The purpose of this chapter is to review the methods used to identify strategies that can be used to diminish the debilitative effects of anxiety (cognitive and somatic) on the sports performance of high school athletes. The studies collected for this synthesis were located using the online databases, SportDiscus, and Academic Search Complete and Science Direct, from the College at Brockport Drake Library. Criteria for selection of articles included that: (1) The article was published in a peer-reviewed, professional research journal; (2) The article addressed factors relating to anxiety and performance; and (3) The article was published since the year 2000.

Articles and research studies were found using keywords related to the statement of problem such as "anxiety and athletic performance". These keywords resulted in a total of 109 citations. Five articles were retained for inclusion for this paper. Next, the phrase "competitive anxiety" and sport performance was entered into both databases and produced a total of 176 citations (*Academic Search Premier: 54, SportDiscus: 122).* Out of the 176 citations many were considered too old to use for this paper so therefore six articles were considered appropriate to use.

Out of the twelve articles that were considered promising ten of these studies were research-based and published in reputable peer-reviewed journals, e.g., *Journal of Personality and Social Psychology, Journal of Sport and Exercise Psychology, Journal of Personal and Interpersonal Loss, The Sport Psychologist, Anxiety, Stress and Coping.* All ten studies were quantitative in nature and involved the statistical analysis of numerical data. The exhaustive

literature search yielded 10 studies that met all of the criteria for inclusion. Of the 10 studies

which all assessed athlete performance, six focused on self-confidence; two focused on how age

and experience affect anxiety; and two additional studies focused on how reward systems can

affect anxiety; and one study each studied how coaching style and the presence of and audience

can affect anxiety

The main portion of this project revolves around the effects that both cognitive and

somatic anxiety have on the athletic performance of high school athletes. All of the participants

in each study were considered to be a part of a high school or youth sports program in which

situations would arise that would allow for the inclusion in this paper. A critical mass of 1,917

participants were used as a part of the critical mass of this synthesis. Subjects must have met the

criteria of participating in a team sport at a youth level of high school to the beginning of college.

Both males and females were included in the studies however there were many more males than

females in the articles that met the criteria for inclusion. Specifically 1,100 males were

participants and 817 females were participants in the studies included for this synthesis.

Chapter 3

THE LITERATURE REVIEW

The purpose of this chapter is to review the literature on strategies that can be used to diminish the debilitative effects of anxiety (cognitive and somatic) on the sports performance of high school athletes. Specifically, the following topics will be addressed, Self-Confidence, Age and Experience, Reward Systems, Coaching Style, and Presence of an Audience.

Self-Confidence

Self-confidence is a variable that greatly influences anxiety. Avrimidas, Avrimidas and Pollman (2007), examined the psychological components of cognitive and somatic anxiety as well as self-confidence in 20 competitive swimmers and 20 lifesavers from a local high school swimming club who volunteered to participate. The participants completed the Sport Anxiety Scale (SAS) and the Competitive State Anxiety Instrument (CSAI-2) questionnaires before a training session and the CSAI-2 again before a competition. The SAS was used to measure the participant's cognitive and somatic trait anxiety and the CSAI-2 was used to measure self-confidence as well as cognitive and somatic state anxiety levels. Questionnaires were administered approximately 20 minutes before the training session and 40 minutes before the competition.

Following the data collection, an analysis of variance using a MANOVA was conducted to show if there were differences in the intensity of anxiety between the swimmers and lifesavers. Next, an ANOVA was also used to reveal effects between swimmers and lifesavers. The MANOVA showed significant main effects between swimmers and lifesavers for sport (p<.001) and condition (p<.001), but not for interaction. (p<.332) The ANOVA revealed that for

sport there were significant differences between lifesavers and swimmers for cognitive anxiety (p<.001), and somatic anxiety (p<.001), but not for self-confidence (p=.39). Based on the data, the authors concluded that lifesavers had lower levels of cognitive and somatic anxiety than swimmers (Avramidis et al., 2007). The authors also conclude that both lifesavers and swimmers experience high levels of somatic anxiety (p<.001) and less self-confidence (p<.001) during competition than in training, therefore cognitive anxiety approached significance (Avramidis et al., 2007). It was found that cognitive and somatic state-anxiety was normally higher and self-confidence lower, before a competitive event than in a training session. Generally, lifesavers were found to have lower levels of cognitive and somatic anxiety than swimmers, which is likely to be associated with their trait-anxiety levels.

Biddle and Ntoumanis (2000) studied 356 British Pre-University athletes (223 males and 133 females) and examined how coping strategies in sport relate to differences in levels of anxiety intensity. To assess a sport related stressful experience, anxiety intensity, anxiety direction and coping strategies participants completed the Mental Readiness Form-2 (MRF-2) questionnaire as well COPE inventory for sport questionnaire. The COPE had participants answer questions to measure their coping ability, which were measured on a 5-point Likert scale ranging from 1. "I didn't do this at all" to 5. "I did this a lot". The MRF-2 was used to measure the intensity of cognitive and somatic anxiety symptoms.

To examine the effects of intensity and direction of anxiety on coping, 2 MANOVA's were conducted. The cognitive MANOVA showed that individuals with high level cognitive anxiety intensity were associated with behavioral disengagement and venting, which proved cognitive anxiety to be significant at the (p<.01) level, where as individuals with low level cognitive anxiety demonstrated less disengagement and venting. The somatic MANOVA

showed high somatic anxiety level individuals were more likely to show increased effort and less likely to show behavioral disengagement and venting. Biddle (2000) states, athletes with positive perception of their own anxiety have an easier time using effective coping strategies. These results prove that somatic anxiety was statistically significant at the ($p<.01$) level for this study. The author concludes that high levels of anxiety were associated with behavioral disengagement and venting.

Similarly, Burton (1988), used a multidimensional measure of anxiety and a more sensitive performance measure to evaluate the relationship between anxiety, self-confidence and performance. Participants included 98 swimmers which were then classified into two groups: Sample 1 consisted of 15 male and 13 female high school swimmers from the All County swim team and Sample 2 consisted of 31 male and 39 female swimmers who were chosen at the 1982 National Sports Festival in Indianapolis. To measure self-confidence and anxiety of the meet, participants from Sample 1 completed the CSAI-2 on three different occasions: (a) an early season invitational, (b) a midseason section dual meet and (c) the All County Championships. Participants from Sample 2 completed the CSAI-2 on two different occasions: (a) following a practice session 2 days before a competition and (b) within one hour before their most important race of the meet.

The authors concluded that the results from this study show that anxious swimmers do swim slower than swimmers who are less anxious. Performance times increase as anxiety increased and performance times decreased as self-confidence increased. When testing the inverted-U relationship with performance, cognitive anxiety showed a negative linear trend ($t=3.87$, $p<.0002$), somatic anxiety showed a positive linear trend ($t=-4.93$, $p<.0001$) and self-confidence showed a curvilinear trend ($t=2.03$, $p<.05$). The authors also concluded that in

Sample 1 self-confidence was found to be statistically significant (p<.02) and in Sample 2 Cognitive anxiety was found to be statistically significant (p<.02) when related to athlete performance.

Leung, Liu, and Zeng (2008) assessed 96 varsity athletes (69 males and 27 females) from a College Prep School on the East Coast of the United States. To assess competitive anxiety and self-confidence participants were required to complete the Sport Competitive Anxiety Test (SCAT-A), CSAI-2, the Trait Sport-Confidence Inventory (TSCI) and the State Sport-Confidence Inventory (SSCI). The CSAI-2 and SSCI were taken prior to scheduled competitions whereas the SCAT-A and the TSCI were completed during a practice session exactly one week before the first two tests were given.

These four questionnaires produced three anxiety variables, which were competitive trait anxiety, competitive state anxiety and somatic state anxiety and three confidence variables, (i.e. state self-confidence, trait sport-confidence and state sport confidence). Pearson product-moment correlation analysis was then conducted among the 6 variables (See Appendix B). Lueng's results show a statistical significance (p<.01) between self-confidence and performance. Lueng's findings stated that athletes with high cognitive state anxiety also have high somatic state anxiety, which make these athletes express a low level of self-confidence. Also athletes that possess a high level of competitive trait anxiety also express a low level of state sport-confidence and trait sport-confidence. Athletes who had high levels of competitive trait anxiety during a practice day also possess high cognitive and somatic state anxiety on competition days. Lastly the authors stated that athletes with a high level of trait sport-confidence during a practice day express high state sport-confidence on competition day.

Based on these findings it was determined that the more self-confidence an athlete has the lower his or her cognitive and somatic anxiety will be. Athletes with high levels of cognitive and somatic anxiety have a much harder time coping during competition and often show behavioral disengagement and venting.

Age and Experience

 Age and experience was another variable identified as having an effect on anxiety. In a study identifying major psychological factors that affect ice hockey performance by Bognar, Fugedi, Geczi, Sipos & Toth (2009), the author examined 52 male Hungarian hockey players, twenty-seven of which were under the age of 18 and twenty-five of which were over the age of 18. Specifically, the researchers wanted to determine if athletes under the age of 18 demonstrated different anxiety levels than athletes above the age of 18. To assess cognitive and somatic anxiety and performance CSAI-2 questionnaires were filled out by all players during training camp and before the opening rounds of international matches.

Independent t-test were utilized to assess whether age groups differences exist on any of the anxiety variables (i.e. state, cognitive, somatic anxiety). Data analysis yielded statistically significant differences in cognitive and trait anxiety (p<.05) Results of the t-tests showed that State Anxiety of the adult team players was found to be significantly lower in adult team players over the age of 18 (t=2.334 (50), p=.024) and players under the age of 18. Independent t-tests of the CSAI-2 showed significantly lower Cognitive anxiety (t=2.890 (50), p=.006) and Somatic Anxiety (t=2.323 (50), p=.024) in adult national team players over the age of 18. The authors concluded that players above 18 years of age are able to recognize their own optimal arousal

zone and can better manage unexpected events, than players under the age of 18. Players who were under the age of 18 had higher anxiety levels than players over the age of 18.

In an additional study by Smith, Smoll, Cumming & Grossboard (2007) the authors assess levels of cognitive and somatic anxiety among male and female youth sport participants. Specifically, the researchers wanted to determine if the age and experience of athletes have an effect on cognitive and somatic anxiety. This study consisted of 1038 participants, 540 males and 498 females from 9 to 14 years of age. The sample was then split into two age groups, 9 to 11 year olds (n=484) and 12 to 14 year olds (n=554). The SAS-2 was used to measure the cognitive and somatic state anxiety level of the participants.

To assess the influence of the variables from the SAS-2, a MANOVA and ANOVA was used. The MANOVA showed statistical significant effects for age (p<.001), gender of athlete (.001) and age X gender interaction (p<.05) when compared to anxiety and performance. An ANOVA was then used and showed statistical significance (p<.01) that the older age group had higher anxiety levels than the younger group. Testing also showed that older athletes and girls exhibited greater worry during performance than younger athletes or boys (f=9.01, p<.005). The author concluded that athletes who are older often demonstrate higher levels of cognitive and somatic anxiety than athletes who are younger do. Children ages 9 to 11 were found to demonstrate low levels of cognitive and somatic anxiety, whereas children in the 12 to 14 years old group demonstrated increases to their cognitive and somatic anxiety levels.

Reward Systems

Bell and Hardy (2009) conducted a study to examine the effects of utilizing three different attentional foci of athletes under conditions of anxiety. Specifically, researchers wanted

to determine how the use of financial incentives would influence a golfers anxiety levels. Thirty-three male golfers (age 15 to 59) were split into three groups of eleven: (a) internal focus group, (b) proximal external focus group and (c) distal external focus group. The internal focus group was told to focus on the motion of their arms during the swing and had to repeat the phrase wrist hinge to promote the internal focus. The proximal external focus group focused on the position of the clubface through the swing. The distal external focus group was told to focus on the flight of the ball only after it had left the clubface. Players handicaps were used to make sure players were equally distributed across each of the three groups.

Golfers were then told that they would be videotaped and a PGA professional would then analyze the tape. The videotaping was used to enhance the participant's cognitive anxiety. Participants were also told that they would have a chance of winning financial incentives depending on their location on the leader board. The financial incentive was used a source of stress and worry for the golfers. To assess cognitive and somatic anxiety with and without videotaping and with financial incentives, participants were asked to fill out CSAI-2 questionnaires and then measured their anxiety using a two way ANOVA. It was found that in all three focus groups cognitive anxiety was statistically significant (p<.001) when financial incentives were introduced. Bell and Hardy (2009) concluded that when adding financial incentives to a golfer, their cognitive and somatic anxiety would increase.

Chamberlain and Hale (2007) also performed a second study to examine relationships between intensity and directional aspects of competitive state anxiety. Specifically, the researcher compares cognitive and somatic anxiety as well as self-confidence when adding a financial incentive to a golfer's performance. This study used 12 experienced undergraduate male golfers from an English Pre-University ranging from 17-19 years of age. Each golfer

completed the CSAI-2 questionnaire on two separate occasions to assess anxiety intensity, anxiety direction and performance.

During the first session the participants had to putt alone in a testing area with only the experimenter present. Scores would not be told to the other participants and would only be used to place individuals onto a team. This process was designed to induce a low level of anxiety. The second session occurred the next day and the golfers had to perform a further putt. Golfers were split into three teams and each team member had to compete against one member of the other two teams. The winning team would then be awarded a thirty-dollar cash prize. The researcher predicted that the financial incentive would create moderate anxiety for the golfer. The third session occurred later in the day and each golfer was told that they would compete against all others for a cash prize of fifty-dollars. Golfers had to putt in front of an audience going head to head against the other competitors for a financial prize, which was predicted to induce a higher level of anxiety.

Results of ANOVA and post hoc tests supported the predications that were made of increase anxiety during the 3 sessions. The relationship between cognitive intensity and performance was described by a negative linear equation (f=9.76, p<.01). The relationship between somatic anxiety and performance showed a curvilinear relationship (f=5.06, p<.05). The relationship between self-confidence and performance showed a positive linear relation (f=6.9, p<.05). These results demonstrated that as cognitive anxiety increases, performance decreases and when self-confidence increase performance increases as well. These results show that cognitive anxiety is statistically significant (p<.01) in relationship to performance. The authors concluded that with the addition of a financial prize each golfer's anxiety levels would increase.

Both articles by Bell and Hardy (2009) and Chamberlain and Hale (2007) showed that participant's cognitive and somatic anxiety increase when adding a financial cash reward. Both articles also demonstrated that cognitive anxiety is statistically significant when compared to performance.

Coaching Style

The only study to compare coaching style and anxiety by Cumming, Smith and Smoll (2009) measured athlete anxiety when comparing mastery level coaches to untrained coaches. The study used 37 coaches and 216 athletes (117 boys and 99 girls) between the ages of 10 and 14. Coaches were split into two groups: the control program group and the intervention program group. Coaches in the experimental group were trained and attended workshops on behavioral guidelines on coaching behaviors and their effect on athletes (Cumming, 2009). Each week, both groups conducted two, 1-hour practices and one game per week. Athletes had to receive permission from their parents to participate in the study. To assess their cognitive and somatic anxiety and the degree a coach had on performance, participants filled out questionnaires for the SAS-2 during the study.

Results of date analysis indicated that athletes with the experimental group coaches decreased in cognitive and somatic anxiety and worry from preseason till late season. Athletes in the control group all increased in cognitive and somatic anxiety as well as worry from the preseason till late season. The authors concluded that untrained coaches' athletes tend to show higher levels of anxiety than trained coaches athletes. It also demonstrated that motivational coaching can result in lower anxiety for athletes.

Presence of an Audience

The presence of an audience was investigated on investigated competitive anxiety levels during balance beam performance in gymnastics. Participants were eight female Belgian gymnasts from two different gymnastics teams. The gymnasts had 3 to 10 years of experience, trained up to 24 hours a week and performed a balance beam routine on three separate occasions. The routines were performed during a training session in the participants own gym, then again in the same gym but during the competition period in February and lastly, during a competition between the two teams at a neutral site. (Cottyn, Clerq, Pannier, Crombez & Lenior, 2006).

To assess cognitive and somatic anxiety as well as self-confidence and self-report, heart rate monitors were used during each of the three routines to measure heart rate frequencies. To make sure the gymnasts were not uncomfortable the watch was taped to their back.

Results show that heart rates were elevated most during competition. Training session one had slightly higher heart rates than training session two. Data analysis indicated significant correlation's between anxiety and self-report at rest (rs=.48, p<.05), before routine (rs=.45, p<.05) and during the routine (rs=.60, p<.01). Significant negative correlation was observed between self-confidence and self-report at the end of a routine (rs=-.41, p<.05). This indicates that the retrospective self-report scale score has a cognitive component. The authors concluded that even though there was an increase in heart rate during the competition session, because cognitive anxiety remained low, no decreased in performance was observed (Cottyn, 2006).

Summary

Of the ten studies reviewed for this synthesis, six addressed the relationship between competitive anxiety and self-confidence related to sport performance. Two studies addressed

how age and experience relate to athlete performance and two studies also addressed how reward systems or financial incentives have an effect on athlete performance. Coaching style and presence of an audience were also factors that affect athlete performance and were investigated.

Cognitive and somatic anxieties are two important predictors of athletic performance. In fact, all 10 of the studies reviewed in this synthesis addressed cognitive and somatic anxiety in relationship to athlete performance. For example one author states that highly anxious subjects are more likely to hurt their performance during competition than those who are less anxious (Chamberlain, 2007). Research has shown that cognitive anxiety will have a greater debilitating effect on performance than somatic anxiety.

In six out of the ten studies, cognitive anxiety was found to be statistically significant when compared to improving performance. In 2 of the 10 studies somatic anxiety was found to be statistically significant when compared to improving performance and in 3 out of the 10 studies self-confidence was found to be statistically significant when compared to improving performance.

CHAPTER 4

Discussion and Recommendations for Future Research

The purpose of the research synthesis project was to determine which factors influence athlete anxiety. After reviewing the literature there were five anxiety factors discussed: (1) Self-Confidence, (2) Age and experience, (3) Reward Systems, (4) Coaching Style and (5) Presence of an audience. After an exhaustive review of 10 studies, all five of the anxiety factors have been shown to influence an athlete's anxiety level during a competitive event.

Six of the studies included in this review examined how the self-confidence influences athlete anxiety. All six of these studies had participants fill out questionnaires at different times during the season. Questionnaires were examined to see if athlete's anxiety increased or decreased from a training session to a competition at different times during the season. All four authors found that self-confidence plays a huge role in athlete anxiety. Most athletes that demonstrate high levels of cognitive and somatic anxiety often have very low self-confidence. On the other hand athletes that demonstrate high levels of self-confidence are found to have lower levels of anxiety and can cope with competitive situations easier. Self-confidence was found to be statistically significant in 3 studies.

Two of the studies included in this review examined how athlete age and experience affect athlete anxiety. Both studies used questionnaires to help measure the participant's anxiety levels. The findings presented in these two articles had different results, but the age groups that were tested were very different. The first articles by Bognar (2009), found that athletes who were older had lower anxiety levels and more self-confidence. The second article by (Smith)

found that athletes who were younger demonstrated lower anxiety levels. The reason that these test found different results was because of the age groups that were tested.

Bognar (2009) tested professional hockey players on a U18 hockey team, as well as players over the age of 18. It was found that players over the age of 18 had lower levels of cognitive and somatic anxiety and demonstrated more self-confidence. Older athletes tend to have more experience and have easier times coping with competitive situations. Players under the age of 18 still showed higher levels of anxiety and lower levels of self-confidence. In the article by Smith (2007), they test athletes ages 9 to 11 and 12-14. It was found that the older group from 12-14 demonstrated higher levels of cognitive and somatic anxiety than athletes in the 9 to 11 group. Children in the 9 to 11 group were more worried about having fun and just playing, while children in the 12-14 group focused more on the results and the importance of winning the game.

Two of the studies included in this review examined how reward systems can affect athlete anxiety. Both studies focused on financial rewards with golfers. Both studies used the CSAI-2 questionnaire to compare anxiety levels during a shot with no financial incentives and then again during a shot with financial incentives. Both studies found that when athletes are given a financial incentive to the golfer that performs better, that their cognitive and somatic anxiety levels would increase. Athletes who performed without financial incentives had demonstrated very low anxiety levels.

One study addressed how coaching style can affect an athlete's anxiety. If a coach is trained in their sport and motivates their athletes, then athlete anxiety has a better chance of remaining low.

One study also addressed how the presence of an audience can affect athlete anxiety. Gymnasts used heart rate monitors to measure heart rate, and the author concluded that even though heart rates went up, because cognitive anxiety remained low performance was not affected.

Throughout the completion of the literature review, it was clear that the design of each study may have had an effect on the outcome of the research. The most significant factor was the tool used to measure anxiety. Six of the ten studies used the CSAI-2 anxiety questionnaires to test athlete anxiety levels. However, the other four studies used different anxiety questionnaires to measure athlete anxiety.

Another variable that has to be considered is the type of sport the athletes participated in. Athletes were involved in both team and individual sports like golf, swimming, gymnastics, hockey, soccer and rugby. Level of participation is another variable that has to be taken into account. The participants from the high school level were primarily members of a varsity level sport, so there were few differences there. At the collegiate level, and club level there were significant differences in participation level. Participants ranged from development clubs for Professional, Pre-Division I to Pre-Division III athletes.

As a result of the vast differences in the study designs, there are several recommendations that should be made for future research. First, use one standardized anxiety questionnaire test on samples of high school, college and club levels. Second, examine the factors that increase anxiety to a certain point which performance is negatively affected. Third, examine continuing changes in anxiety so that we could help athletes control anxiety and improve performance through appropriate interventions.

In summary it is clear that increased levels of cognitive and somatic anxiety do influence athlete performance. The findings from the literature review also suggest that anxiety levels can decrease in athletes with the help of coaches, experience and the environment. Research has shown that cognitive anxiety will have a greater debilitating effect on performance than somatic anxiety. Further research is needed in order to determine if anxiety can be a positive thing for some athletes. Additional research is also needed to exam continuing changes in athlete anxiety and how they can control this anxiety to improve their performance.

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Appendix A: Article Grid

Author	Title	Source	Purpose		Methods & Procedures	Analysis	Findings	Recommendations
C. Robazza L. Bartoli	Perceived impact of anger and anxiety on sporting performance in rugby players	Robazza, C., & Bortoli, L. (2007). Perceived impact of anger and anxiety on sporting performance in rugby players. *Psychology Of Sport & Exercise*, 8(6), 875-896.	The purpose of this study was explore the effects that anxiety has and the debilitating effects of trait anxiety symptoms on rugby players. The author used a study designed to bring out the regular symptoms of anxiety and anger in specific situations that the players go through during game scenarios.	Athletes complete assessments at training facility in groups of five or less. Completed both the CTAI-2 and the STAXI	Frequency and scatter plots as well as box m-tests were used		Anger and anxiety symptoms actually are facilitative to the athletes performance	High level athletes experience lower levels of somatic and cognitive anxiety when compared to lower level athletes
C. Peres F. Cury J. Famose P. Sarrazin	When anxiety is not always a handicap in physical education and sport	Peres, C., Cury, F., Famose, J., & Sarrazin, P. (2002). When Anxiety Is Not Always a Handicap in Physical Education and Sport: Some Implications of the Defensive Pessimism Strategy. *European Journal Of Sport Science*, 2(1), 1.	The purpose of this study was to review how previous research has indicated that failures in sport and educational contexts are related to high anxiety and low self-estimates of ability. The author wants to use this previous research to come up with a defensive strategy that individuals may use to cope with sporting events and the anxiety associated with them.	Studies were selected by doing an exhaustive review of research related to the topic of the defensive pessimism strategy. If a study met the standards that would be addressed for the review then the study would be included in the report. An assumption was taken from each of the studies about the effects of using the defensive pessimism strategy and applied to the research report and was included in the conclusion at the end of the paper.	Previous research indicates that failures in sport and educational context are related to high anxiety and low self-estimates of ability		Defensive pessimism is the best strategy for an athlete to use to adapt to the anxiety associate with their goals related to a sporting event	Future research should be conducted to understand more fully the effect role of the defensive pessimists effort and the costs and benefits of the strategy during sport contexts
J.Wang D. Marchant T. Morris	Coping style and susceptibility to choking	Wang, J., Marchant, D., & Morris, T. (2004). Coping style and susceptibility to choking. *Journal of Sport Behavior,* 27(1), 75-92.	The purpose of the study was to examine the relationship between the coping styles and the chances that the athletes "chokes" due to the pressure of a high moment in a game scenario. The authors talk about how many athletes can	Complete competitive state anxiety inventory\n\nTake 20 free throws in two groups\n\nResults recorded	The score for the low pressure and high pressure conditions were simply the number of shots that were made for each participant out of the twenty shots that were taken for each round. A differential score was also calculated to determine the level of change if any for the performance between the two		Participants experienced a decline in performance overall during high pressure conditions. Both	Athletes need to develop a range of coping strategies that works best for them and benefits them

		Retrieved from https://brockport.idm.oclc.org/login?url=http://search.proquest.com.brockport.idm.oclc.org/docview/2158793 28?accountid=269 85	relate to or have experienced choking under pressure in competitive sports. Therefore it is important to establish if there is a relationship between certain coping strategies and the susceptibility of choking.		conditions. A performance differential score was used to determine whether a approach coping style or a avoidance coping style was more effective towards performance during the high pressure condition.	avoidance and approach style coping had influencing effects of the athletes	the most during high pressure situations
M.H. Anshel	Qualitative validation of a model for coping with acute stress in sport	Anshel, M. H. (2001). Qualitative validation of a model for coping with acute stress in sport. *Journal of Sport Behavior, 24*(3), 223-246. Retrieved from https://brockport.idm.oclc.org/login?url=http://search.proquest.com.brockport.idm.oclc.org/docview/2158684 68?accountid=269 85	The purpose of this study was to propose a model for coping during a stressful game situation in a sports competition. The model that was created consisted of four steps that were supposed to address the acute stress experienced by athletes during a competition. The author describes the importance of the study by mentioning how the stress felt by athlete's results in reduced psychological and physiological functioning.	Private interviews with research in the assistant coaches office	A deductive content analysis was done to gather and analyze the data. A DCA consists of assigning the athletes statements into predetermined categories, dimensions, and interrelationships based on theoretical or conceptual grounds.	Coping consist of a series of thought, emotions, and actions that can be identified by the athlete	Find method for coping with these stressors that fits the needs of the athlete
Michel Nicolas Patrick Gandreau Veronique Franche	Perception of Coaching Behaviors, Coping, and Achievement in a Sport Competition	EBSCOhost	Shows the effect of supportive coaching leading up to a competition	Coping strategies Prospective design with 80 athletes	Task oriented coping was a significant mediator for sport achievement	Highlights the role of supportive coaching behaviors in the effective stress management during sports	Use supportive coaching behaviors two days before a competition and three hours after a competition

James Rumbold David Fletcher Kevin Daniels	A systematic review of stress management interventions with sport performers	Sheffield Hallam University	Identify and evaluate the psychosocial interventions used to manage a component of the stress process in competitive sport performers	Systematic reviews based on identifying appropriate studies previously reported, settled on 63 research papers to include in the review	Table that describes all of the study characteristics of the interventions used in each paper	Relaxation strategies and techniques worked 70% of the time and had a positive effect on 61% of the anxiety states	Study found that a combination of relaxation techniques and mental imagery worked the best and that 9 out of 10 studies were effective in reducing state anxiety
Jozsef Bognar Gabir Geczi Geza Vincze Attila Szabo	Coping Skills, Motivational Profiles, and Perceived Motivational Climate in Young Elite Ice Hickey and Soccer Players	Research Gate	Compare coaching strategies between the two sports to see the effect it had on the players and their perceptions about their role on the team	Perceived Motivational Climate in Sport Questionnaire And a Sport Motivation Survey	Each player on the team has an important role and this support can often help a player through any situation on the ice or field	Punishment for mistakes and unequal recognition had a negative effect on the players, need to develop coachabilty in young players	Psychological characteristics are considered essential determinants for athletic performance and success, coaching plays a major role in this viewpoint from a players perspective
Nikos Ntoumanis Stuart Biddle	Relationship of Intensity and Direction of Competitive Anxiety with Coping Strategies	The Sport Psychologist	Examine how coping strategies in sport relate to the differences in levels of anxiety intensity and the effect this has on facilitating or debilitating performance	Questionnaires where athletes recall and describe a recent sport related experience, asked to report the coping strategies they used during this time	Blocking of distractions and prioritizing tasks were the two best strategies	Found that athletes with positive perceptions of their anxiety levels were able to use the coping strategies effectively	Further research should examine the influence of additional variables on anxiety and coping strategies

Yuri Hanin	Coping with Anxiety in Sport	Coping in Sport	Examined how anxiety centered coping in sport affected the characteristics that the individual felt	ICC program offers alternative approach for solving anxiety related symptoms	Athletes are not only dealing with competition anxiety but also performance related emotions that are both negatively and positively toned	Coping in sport should focus on emotion performance relationship rather than each separately	Future research should focus on anticipatory coping and the role of change and change management in coping