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Examining Anxiety and Achievement Goal Theory in Physical Activity Settings

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EXAMINING ANXIETY AND ACHIEVEMENT GOAL THEORY IN PHYSICAL ACTIVITY SETTINGS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Kinesiology

by
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B.S. Louisiana State University, 2013
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ABSTRACT

In the United States (US), a majority of adults do not meet the recommended guides of physical activity despite the many benefits. One benefit of activity is the reduction of anxiety. Although there is robust evidence demonstrating the anxiolytic effects of physical activity, the mechanism is not fully understood. Some psychological explanations are related to a lack of confidence in one's ability. Because of this, Achievement Goal Theory (AGT) may be a viable framework to explain the anxiolytic effects of physical activity. The focus of this dissertation is to examine the efficacy of AGT as a mechanism and to explore settings and sources of anxiety that may prevent individuals from being active.

The first study employed a correlational design, and the focus was to investigate the relationships among concepts of AGT, perceived competence, competence valuation, and state anxiety and how the interactions among these constructs affect future participation. College students (N=531) enrolled in activity classes completed surveys related to these constructs. Based on the results of this study, AGT is a suitable framework to explain how activity can reduce anxiety. Regarding state anxiety, climate is important to consider, and instructors should create mastery-approach climates to reduce symptoms of anxiety. To increase intentions to participate, competence valuation was the best predictor. The results from this study reveal the importance of promoting an environment that is supportive to one's needs and to encourage self-referenced goals.

The second study used the Critical Incident Technique (CIT) via an electronically delivered questionnaire on a sample of college students (N=122). The focus of this study was to examine physical activity settings that invoke anxiety and to target sources of anxiety within these settings. The settings individuals perceived as anxiety-producing included sport, credit-

based classes, and leisure-time activity settings such as workout facilities. The core, underlying source of anxiety in all settings was fragile self-beliefs.

The findings from this study confirm AGT as a framework to guide the investigation of the relationship between anxiety in physical activity. These studies demonstrate the importance of creating supportive environments to reduce anxiety and increase future participation in physical activity.

CHAPTER 1: INTRODUCTION

One of the most alarming health concerns in the United States is the lack of physical activity. There is plentiful evidence that regular, and even intermittent, bouts of physical activity are associated with prevention of chronic ailments such as cardiovascular disease, diabetes, and certain types of cancers (Warburton, Nicol, & Bredin, 2006). In addition, participating in physical activity is associated with many psychological and social benefits including increased quality of life and improved social relationships (Bize, Johnson, & Plonikoff, 2007; McNeill, Kreuter, & Subramanian, 2006). Because of the known benefits of physical activity participation, the Centers for Disease Control and Prevention (CDC) recommends that adults accumulate a total of 150 minutes of moderate-intensity aerobic activity every week; however, only about 20% of American adults meet this standard (CDC, 2017).

Being physically inactive may also contribute to the development of mental health problems including anxiety (Strölhe, 2009). Anxiety, the most common mental health problem in the United States, is an undesirable psychological construct defined as an individual's reaction to a stressful situation (Spielberger, 1966). When an individual perceives a stressful situation negatively, symptoms of anxiety will surface. Common symptoms of anxiety include unpleasant feelings, changes in cognitions, and behavior changes such as avoiding situations that are anxiety-producing (Craft, Magyar, Becker, & Feltz, 2003). Most individuals can overcome these stressful situations they may face, but when the anxiety starts to affect behavior negatively, the individual may be diagnosed as having a clinical level of anxiety. In the United States, about 20% of the population suffer from anxiety at clinical levels (Kessler, Chiu, Demler, & Walters, 2005).

Physical activity has been examined as a possible treatment for reducing the symptoms of anxiety. There is consistent evidence that physical activity can be used as a treatment for reducing anxiety in non-clinical as well as clinical populations for both adults and children (Biddle & Asare, 2011; Conn, 2010, Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991; Rebar et al., 2015; Wipfli, Rethorst, & Landers, 2008). However, the mechanism explaining the anxiolytic effects of physical activity is not fully understood and many of the proposed mechanisms have not been fully supported. In achievement settings, anxiety typically arises due to a lack of confidence which can be attributed to feelings of incompetence or concerns about one's ability (Endler, 1997). Many of the previously proposed hypotheses to explain how physical activity can reduce anxiety are centered around self-beliefs. Because of this, achievement goal theory (AGT) may be a suitable theoretical framework to guide research designed to further the understanding of the relationship between anxiety and physical activity.

AGT is a dominant social-cognitive theory used to guide efforts to understand differences in individual motivation (Roberts, Treasure, & Conroy, 2007). AGT acknowledges the purposes of goals that help to direct behavior. This theory assumes that every individual enters an achievement setting with the goal of demonstrating competence (Nicholls, 1989). McClelland (1951) purported that achievement behavior not only includes demonstrating competence but also concentrating on avoiding failure. Because of this, Elliot (1997; 1999) added negatively-valenced goals to AGT. In addition, Ames (1992a) asserted that situational factors also play a role in the individual differences in achievement behavior. How an environment is structured can influence how an individual behaves. Based on AGT, the motivational climate refers to the environment created by significant individuals in a learning environment (Ames, 1992a).

Roberts (1986) was one of the first researchers to consider the relationship between anxiety and achievement goals. He argues that adopting different goal orientations can make an individual either more or less likely to experience anxiety. A person with the goal of outperforming others is more likely to experience anxiety in an achievement setting because of the emphasis on externally-referenced success (Ntoumanis & Biddle, 1998). In these achievement settings, success is based on outperforming others and uncertainty about the probability of success can lead to heightened levels of anxiety (Eisenbarth & Petlichkoff, 2012). On the other hand, individuals who are focused on personal mastery are not as susceptible to anxiety because of their internally-referenced definition of success (Ntoumanis & Biddle, 1998). Also, the outcome of these goals is more controllable.

As previously mentioned, the anxiolytic effects of exercise are well-established in the literature (Rebar et al., 2015; Wipfli et al., 2008). What is not as clear are the factors that prevent individuals with anxiety from being physically active despite the known benefits. The focus of this dissertation is to gain a better understanding of the relationships among anxiety, physical activity, achievement goals, and motivational climate and how the interaction among these constructs impacts intention to be physically active. More research is needed to examine anxiety using AGT as a framework as a guide. For example, many studies examining anxiety and AGT have not used the 2x2 framework incorporating approach and avoidance dimensions that are consistently related to anxiety. Using the expanded model could be advantageous when examining anxiety due to the negative valence associated with the avoidance-framed goals. In the first study, a correlational design was used to explore the relationships among these constructs with the goal of establishing AGT as a mechanism to explain the anxiolytic effects of physical activity. More specifically, the focus of this study was to explore the relationship

between motivational climate, state anxiety, and intentions to continue to be physically active. The second study was qualitative in nature and explores different physical activity settings that are anxiety-provoking and strategies that can be employed to alleviate anxiety. With the results from this study, a clearer picture of barriers that prevent individuals who experience anxiety in physical activity settings from being active can be identified, and informing practitioners about ways to create environments in which all individuals feel safe to participate in physical activity.

CHAPTER 2:EXPLORING THE RELATIONSHIPS AMONG ACHIEVEMENT GOAL THEORY, STATE ANXIETY, AND INTENTIONS TO BE PHYSICALLY ACTIVE

There is consistent evidence that participating in physical activity is associated with reductions in anxiety (Biddle & Asare, 2001; Petruzzello et al., 1991; Rebar et al., 2015; Wipfli et al., 2008). The mechanism explaining this relationship, however, is not well understood. Some of the proposed explanations are related to a lack of confidence about one's skills (Endler, 1997). Because of this, Achievement Goal Theory (AGT) may be an advantageous framework to use to explore this relationship. AGT characterizes the reasons individuals behave (i.e. the goals they choose to adopt) in an evaluative setting, and one of the main tenets is that everyone enters an achievement setting with the goal of demonstrating competence (Nicholls, 1989). In the first conceptualization of this theory, Nicholls (1989) contends that individuals are predisposed to adopt task or ego goal orientations based on individual differences.

Individuals who adopt task-oriented goals are focused on mastering a task or improving upon their own performance. On the other hand, individuals who adopt ego-oriented goals define success as outperforming others (Nicholls, 1984). One of the most important tenets of Nicholls's dichotomous framework of AGT is that the goal orientations are orthogonal, meaning it is possible to have varying levels of both task and ego orientations, and there are certain outcomes associated with adopting different orientations. For example, a person adopting an ego orientation is more likely to experience anxiety because of the emphasis on externally-referenced success (Ntoumanis & Biddle, 1998). Conversely, individuals who adopt task-oriented goals are not as susceptible to anxiety because of their internally-referenced definition of success (Ntoumanis & Biddle, 1998). Also, the outcome of task oriented goals is more controllable than the focus of ego oriented goals.

The relationship between achievement goals and anxiety, however, may not be that simple; perceived competence plays a role in this relationship as well. Perceived competence refers to an individual's opinion of their ability to successfully perform a task. Competence is an innate psychological need that serves as the basis of achievement behavior (Elliot & Dweck, 2005). In the dichotomous framework of AGT, perceived competence acts as a moderator (Elliot & Church, 1997). For example, Abrahamsen and colleagues (2008) reported that perceived competence modulated the relationship between achievement goals and anxiety in their sample of elite athletes; the authors concluded that if an individual's perception of competence remains high, individuals are less likely to experience anxiety with ego oriented goals (Abrahamsen, Roberts, & Pensgaard, 2008). However, if an individual adopts an ego orientation and has low perceptions of competence, there are likely to be negative consequences (Elliot, 2005). Task oriented goals, on the other hand, are associated with low levels of anxiety regardless of an individual's level of perceived competence (Li & Chi, 2007).

Competence valuation may have an impact on this relationship. Competence valuation refers to level the importance an individual places on performing an activity well and is linked with intrinsic motivation (Harackiewicz & Manderlink, 1984). The more competence valuation a person places on the activity, the more likely the individual will use higher forms of self-determined motivation (Mouratidis, Vansteenkiste, Lens, & Sideridis, 2008). Competence valuation can also have negative impacts on a person's behavior. For example, if an individual places a high level of competence valuation on their performance and is worried that he or she may not perform well, this person may self-handicap their competence valuation to protect his or her self-esteem (Elliot et al., 2000).

Historically, motivational theories have been rooted in an approach/avoidance framework, McClelland (1951) conceptualized that individuals enter settings with the goal of either approaching success or avoiding failure. Based on this work, Elliot (1997) postulated that individuals may also enter an achievement setting with the goal of avoiding incompetence. Elliot's (1997,1999) expanded model of AGT takes both an individual's focus (demonstrating competence or outperforming others) and the valence (approach or avoidance) of the goal into consideration. In the expanded model, there are four different goals that individuals can adopt. First, mastery (also known as task)-approach goals are described as successfully mastering a task or improving upon one's previous performance; these goals are accepted as the optimal goal because they combine a more desirable definition of success (personal mastery) and positive valence (Elliot & McGregor, 2001). Next, mastery-avoidance goals are negative in valence due to the underlying fear of failure and success is defined as avoiding doing worse than previously or not losing one's skill (Elliot, 1999). Then, performance (also known as ego)-approach goals define success through normative comparison; individuals with performance-approach goals will try to outperform everyone else in the achievement setting. Finally, performance-avoidance goals focus on avoiding normative incompetence or failure (Elliot, 1997).

It is advantageous to use the expanded model to examine the anxiolytic effects of physical activity because of the inclusion of the negatively-valenced avoidance goals. Avoidance-framed goals have robust relationships to anxiety in a variety of samples and settings when compared to the approach goals (Cury et al., 2003; Morris & Kavussanu, 2009; Sideridis, 2008). It is also important to note that perceived competence is characterized as an antecedent in the 2x2 framework of AGT. Individuals with high perceptions of competence are likely to

adopting approach-framed goals and individuals with low perceived competence are expected to adopt avoidance-framed goals because of the underlying fear of failure (Elliot, 2005).

From a situational perspective, the climate created by significant leaders, termed motivational climate, may also impact an individual's level of anxiety in achievement settings. In fact, Abrahamsen and colleagues (2008) reported that the motivational climate may actually be more influential on anxiety than goal orientations. Similar to achievement goals, motivational climate originated as a dichotomous construct consisting of mastery and performance climates. Mastery climates are environments in which the leader promotes self-referenced improvements for everyone, while performance climates are environments focused on norm-referenced comparisons (Ames, 1992b). In this conceptualization of motivational climate, mastery climates are associated with positive outcomes including low levels of anxiety. Conversely, there is evidence that performance climates can be linked with more undesirable constructs including anxiety (Harwood, Keegan, Smith, & Raine, 2015).

Since four different goal orientations have been proposed, a dichotomous framework of motivational climates may not be sufficient to describe possible environments. Because of this, Guan (2015) proposed four different motivational climates. The first climate, mastery-approach, is a created climate in which teacher emphasizes learning and understanding and encourages each individual to perform to the best of his or her ability. Next, a mastery-avoidance climate is described as a promoted climate in which the significant leader encourages not performing worse than before or not losing ability (Guan, 2015). Then, a performance-approach climate is an environment in which the teacher emphasizes competition and praises only those who are the most successful. Finally, a performance-avoidance climate is associated with avoiding incompetence or doing worse than others in the class (Guan, 2015). Because an expanded model

of motivational climate has only recently been proposed, there is a lack of research using this model.

In one of the only intervention studies examining motivational climate and anxiety, Yoo (2003) found that as performance (in this case, tennis skill) increases over time in a mastery climate, anxiety decreases. Individuals in the mastery climate condition were not threatened by social comparison and found the task challenging in self-referent terms and thus were less likely to report anxiety. Again, perceived competence may play an important role in this relationship. In this study, individuals with low perceptions of competence showed increases in their levels of anxiety and, as a result, decreased performance (Yoo, 2003). In the performance climate condition, anxiety increased which led to impaired performance for individuals with low perceived competence. Individuals in the performance climate condition with high perceived competence showed stable levels of anxiety and performance throughout the intervention (Yoo, 2003). It is also important to consider whether experiencing anxiety in a physical activity setting may prevent an individual from participating in the behavior again. Because of this, intention is also important to consider. Intention refers to one's determination to participate in the activity in the near future (Rhodes & Yao, 2015). Intention is often seen as the most proximal precursor to behavior in a variety of motivational theories (Rhodes & Yao, 2015). Also, Da Silva and colleagues (2012) determined that individuals who report higher levels of anxiety were less likely to intend to be physically active.

This study builds on achievement goal literature by applying the 2x2 framework of motivational climate and achievement goals to examine relationships among perceived competence, state anxiety, and intentions to continue in an activity through a correlational design. First, this approach may help to explain the anxiolytic effects of physical activity; as

previously mentioned, AGT may be a practical theoretical framework to describe this relationship. By using a correlational design it may be possible to explain how constructs based on AGT, such as motivational climate, explain how physical activity can decrease anxiety and increase intentions to continue being physically active. Next, examining these relationships can provide insight into how high levels of anxiety in achievement settings may constrain individuals from future participation in the activity. For example, adopting avoidance-framed goals or perceiving an avoidance-framed climate coupled with low perceived competence could be a source of anxiety that may prevent people from participating in physical activity despite the consistent evidence that physical activity can reduce anxiety. Most of the previous research focuses on the negative outcomes of anxiety but fails to examine whether increased anxiety due to perceptions in a particular climate leads an individual to avoid being physically active. The purpose of this study was to examine the relationships among motivational climate, state anxiety, and intentions to be physically active while controlling for perceived competence and goal orientations. The following hypotheses were tested:

H1: Perceptions of a mastery-approach climate, independent of competence valuation, goal orientations, and perceived competence, would be negatively related to state anxiety and positively related to intentions to continue the activity.

H2: Perceptions of a mastery- or performance-avoidance climate would be positively related to state anxiety and negatively related to intent to continue the activity.

Method

Participants

For this study, 531 participants (73.3% females, 25.8% male, .9% unreported) were recruited from college activity classes at a large university in the Southeast United States including: aerobic dance, bootcamp, golf, jogging, tai chi, tennis, and weight lifting. The number of participants from each activity class is displayed in Table 2.1. The ages of the participants ranged from 18-36 years ($M = 20.71 \pm 1.9$ years). Participants were mostly upperclassmen [215 (40.5%) seniors, 116 (21.8%) juniors, 89 (16.8% sophomores), 107 (20.2%) freshmen, and 4 (.8%) unreported]. IRB approval was granted for this study, and each participant gave consent before participating.

Table 2.1. Activity class distribution.

Activity class	Number of participants	Percentage
Aerobic dance	77	14.5%
Bootcamp	16	3%
Golf	73	13.75%
Jogging	150	28.25%
Tai Chi	51	9.6%
Tennis	80	15.07%
Weight training	84	15.82%

Instrumentation

Goal orientations. To assess goal orientations using the 2x2 framework, the Achievement Goal Questionnaire for Sport (AGQ-S) was used (Conroy, Elliot, & Hofer, 2003). The AGQ-S consists of 12 questions, three for each goal orientation, describing ways that individuals strive to demonstrate competence or avoid incompetence. Participants were asked to

think about the way they felt about the activity class they were enrolled in and then respond to a 7-point Likert-type scale. For example, mastery-approach goal orientations were assessed with prompts such as, “It is important for me to master all aspects of my performance.” Next, mastery-avoidance goals were evaluated with stimuli such as, “I’m often concerned that I may not perform as well as I can perform.” Performance-approach goals were measured by prompts such as, “It is important to me to do well compared to others,” while performance-avoidance goals were evaluated by questions such as, “I just want to avoid performing worse than others.” This instrument is a valid and reliable way to measure approach-avoidance achievement goals (Conroy et al., 2003).

Competence Valuation. Elliot and colleagues’ (2000) two-item competence valuation measures will be used to assess this construct. Competence valuation was assessed through questions such as, “I care very much about how I do on this activity.” Participants responded to these questions on a 7-point Likert scale (1=strongly disagree to 7= strongly agree). These items have shown appropriate levels of reliability and validity (Elliot et al., 2000).

Perceived competence. Perceived competence was assessed through the Intrinsic Motivation Inventory (IMI)- perceived competence scale (McAuley, Duncan, & Tammen, 1989). Participants responded to five questions including, “I think I am pretty good at this activity” and “After participating in this activity, I feel pretty competent” on a 7-point Likert scale from one (strongly agree) to seven (strongly disagree). This scale has shown appropriate levels of validity and reliability (McAuley et al., 1989).

Perceived motivational climate. Perceptions of the climate were assessed using Guan’s (2015) Perceived Motivational Climate Questionnaire in Physical Activity Settings

(PMCQPAS). This instrument assesses climate using the 2x2 framework is comprised of 12 questions, three questions evaluating each of the four motivational climates. For each question, the individual is asked to respond based on the prompt, “In this class, my instructor...” on a 7-point Likert scale (1-Not at all true to 7- Very true). Perceived mastery-approach climates were assessed with questions such as: “...is happy when we are improving after showing some effort,” while perceived mastery-avoidance climates were assessed with questions such as: “...tells us it is important that we don’t look worse than others.” Also, questions indicative of performance-approach climates were: “...gives special treatment to those students who do best” and questions suggesting perceived performance-avoidance climate were: “...tells us it’s important to join in activities so we don’t look unskilled,” for example. This questionnaire has exhibited appropriate levels of reliability and validity in physical activity settings (Guan, 2015).

State anxiety. An adapted version of Thill and Cury’s (2000) state anxiety scale was used to evaluate state anxiety. This scale consists of four items (“When I think about participating in this class, I am apprehensive about making mistakes, I experience unpleasant feelings before this class”, etc.). The participants responded to each question on a 5-point Likert scale ranging from 1 (Don’t agree at all) to 5 (Agree completely). This scale has shown appropriate levels of validity and reliability (Thill & Cury, 2000).

Intentions. A three-item measure adapted from Chatzisarantis, Biddle, and Meek (1997) was used to assess an individual’s intentions to continue participating in the activity after the class ends. The items include: “After this class is over, I intend to participate in this activity again.” Participants responded to these items on a 7-point Likert scale from (1-Very unlikely to 7- Very likely).

Physical activity. The last question from Godin and Shephard's (1985) Leisure Time Exercise Questionnaire was used to assess self-reported physical activity. The participants responded to the prompt, "Considering a 7-day period, during your leisure-time, how often do you engage in any regular activity long enough to work up a sweat?". The participants selected often, sometimes, or never/rarely (Godin & Shephard, 1985).

Procedure

This study took place during a regularly scheduled class period during the last two weeks of the semester, after a motivational climate had been established. Before the questionnaires were distributed to the participants, the researcher asked the instructor of record to leave the room, and then the researcher provided a brief overview of the study. In this overview, the participants were encouraged to answer honestly and were assured that their instructors would not see the responses and the answers they gave would not affect their grade in the class. The questionnaires were distributed and were collected anonymously; the names were not recorded on the instruments.

Data Analysis

Data were analyzed using SPSS statistical software. After checking for outliers and missing data, descriptive statistics including means, standard deviations, and Cronbach alphas for each variable were examined. Next, a correlation matrix was used to examine bivariate relationships among the variables. Finally, two blocked regression models were used to test the hypotheses based on the models (shown in Figure 2.1 and 2.2). Achievement goals, competence valuation, and perceived competence were entered in the first block, followed by motivational climate to predict state anxiety in the first model and intention to be active in the second model.

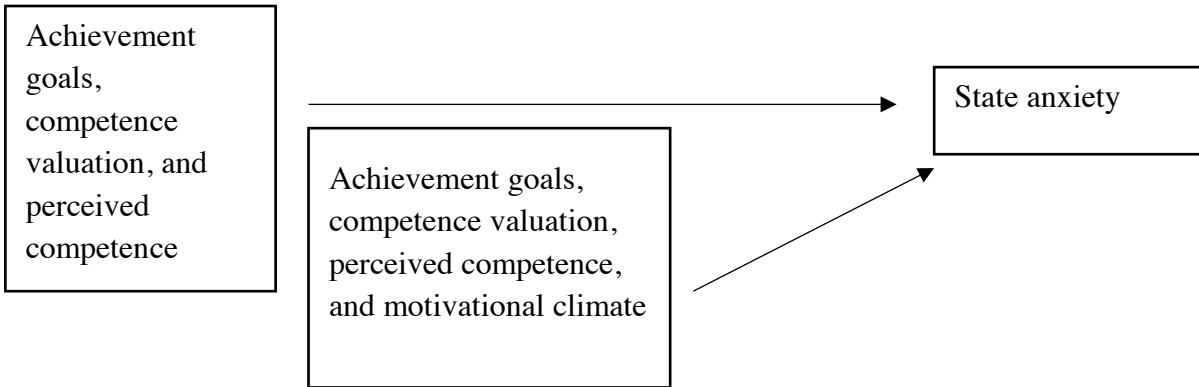


Figure 2.1. Regression model predicting state anxiety.

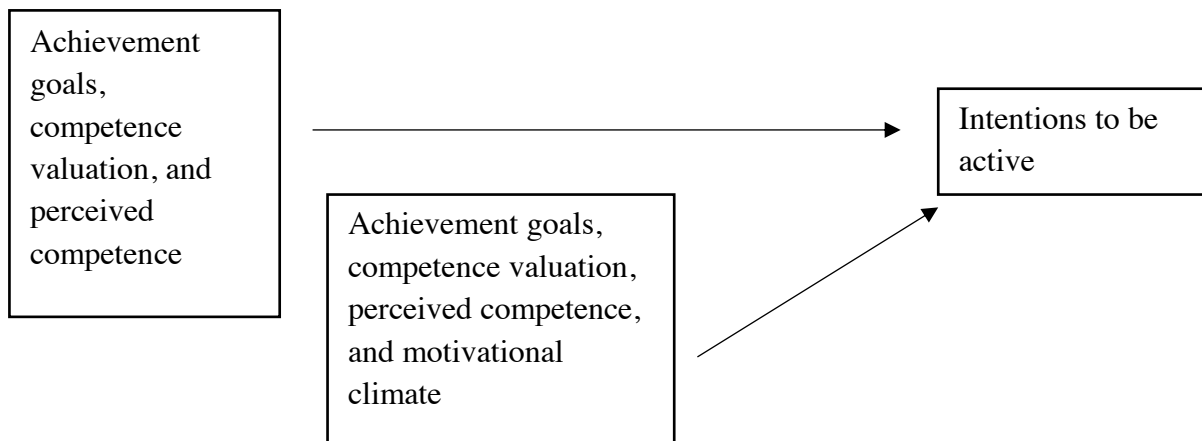


Figure 2.2. Regression model predicting intentions to be active.

Results

Descriptive statistics, including means, standard deviations, and Cronbach's alpha coefficients for each variable are displayed in Table 2.2. All of the variables assessed demonstrated appropriate levels of internal consistency, ranging from .71 to .92 (Cronbach, 1951). Next, bivariate correlations were run to assess relationships among variables, and the results are displayed in Table 2.3. It is important to note that due to the large sample size in this study, correlational coefficients of a very small magnitude were statistically significant. The

inferences based simply on significance should be considered within the context of practical significance of the percentage of shared variance. According to Hinkle, Wiersma, & Jurs (2003), .0-.3 correlation coefficients are considered small, .5-.7 are perceived as moderate, and .7 and higher are considered large correlations.

Table 2.2. Descriptive statistics

Variable	<i>M</i>	<i>SD</i>	α
Mastery approach goal (1-7)	5.56	1.11	.87
Mastery avoidance goal (1-7)	3.94	1.55	.86
Performance approach goal (1-7)	4.15	1.66	.90
Performance avoidance goal (1-7)	4.23	1.66	.89
Competence valuation (1-7)	5.27	1.23	.86
Perceived competence (1-7)	5.45	1.19	.89
Mastery approach climate (1-7)	5.91	1.26	.84
Mastery avoidance climate (1-7)	2.71	1.42	.82
Performance approach climate (1-7)	1.89	1.13	.79
Performance avoidance climate (1-7)	1.93	1.09	.75
State anxiety (1-5)	1.93	.78	.71
Intention (1-7)	5.23	1.70	.92

Bivariate correlations are presented in Table 2.3. There is a pattern of positive associations among the four dimensions of achievement goals, with the relationships being of small magnitude with the exception of the large relationship between performance approach and performance avoidance goals. Mastery Approach goals demonstrated a moderate to strong positive relationship with competence valuation. Mastery avoidance goals and performance

approach goals were also positively associated with competence valuation, but those relationships were small. Perceived competence was positively associated with both competence valuation and mastery approach goals.

Next, regarding perceived climates, it is important to note that most participants in this study perceived a mastery approach climate. Looking at the means for the four possible climates, the mean for perceiving a mastery approach climate was almost two-and-a-half units above the midpoint of the possible scores compared to about a point or more below the midpoint for the other three climates (mastery avoidance, performance approach, and performance avoidance). When examining relationships related to perceived climates, perceptions of a mastery climate had small negative associations with the perception of a performance climate. Perceptions of a mastery avoidance climate displayed a moderate relationship with perceptions of a performance avoidance climate. Perceptions of a performance approach climate were also associated at a moderate level with perceptions of performance avoidance climate. Mastery approach goals had a small positive relationship with perception of a mastery oriented climate, but no other relationships among goals and perceived climate were evident.

The relationships between achievement goals, competence valuation, perceived competence, and perceptions of the climate with anxiety and intention are the central concern in this study. Mastery approach goals, competence valuation, perceived competence, and perception of a mastery approach climate, as expected, were negatively related to anxiety, while mastery approach goals, competence valuation, and perceived competence were positively related to intentions to be active in the future. These were also anticipated relationships among these variables.

Table 2.3. Bivariate correlations among variables.

	MApG	MAvG	PApG	PAvG	CV	PC	MApC	MAvC	PApC	PAvC	SA
MAvG	.31**	1									
PApG	.28**	.39**	1								
PAvG	.15**	.40**	.76**	1							
CV	.61**	.20**	.26**	.1*	1						
PC	.36**	-.21**	.06	-.1*	.45**	1					
MApC	.27**	.04	.09*	.07	.24**	.22**	1				
MAvC	-.00	.09*	.12**	.15**	.05	.01	-.00	1			
PApC	-.11*	.04	.07	.04	-.11*	-.11*	-.29**	.4**	1		
PAvC	-.13**	.09*	.08	.08	-.07	-.04	-.11*	.61**	.52**	1	
SA	-.17**	.24**	.10*	.20**	-.18**	-.39**	-.18**	.13**	.15**	.12**	1
Int	.35**	.06	.09*	-.03	.58**	.34**	.14**	-.07	-.14**	-.13**	-.21**

Note. MApG= mastery approach goal, MAvG= mastery avoidance goal, PApG= performance approach goal, PAvG= performance avoidance goal, CV= competence valuation, PC= perceived competence, MApC= mastery approach climate, MAvC= mastery avoidance climate, PApC= performance approach climate, PAvC= performance avoidance climate, SA= state anxiety, Int= intention.

* $p < .05$, ** $p < .01$.

Regarding physical activity, participants indicated whether they were often, sometimes, or never/rarely physically active. In order to examine how study variables varied according to self-reported physical activity levels, these responses were used to create a categorical variable. Since there were few responses of “never/rarely”, these responses were combined with the “sometimes” responses to create two groups: “never/rarely/sometimes” referred to as less active and “often” now referred to as more active. There were 272 in the less active group, 247 in the more active group, and 12 did not respond. Means are reported in table 2.4.

MANOVA was used to test for group effects based on physical activity level for perceived competence, goals, competence valuation, intention, and perceptions of the climate. The MANOVA yielded a significant effect (Wilks’ Lambda = .959, $F(2, 528) = 10.95$, $p < .001$). Univariate follow-ups (ANOVAs) indicated that mastery approach goals [$F(1, 517) = 16.56$, $p < .001$], competence valuation [$F(1, 517) = 49.78$, $p < .001$], perceived competence [$F(1, 517) = 16.02$, $p < .001$], state anxiety [$F(1, 517) = 16.61$, $p < .001$], and intentions [$F(1, 517) = 9.606$, $p = .002$] varied according to physical activity level. As would be expected, more active individuals reported lower levels of anxiety, higher levels of mastery approach goals, perceived competence and competence valuation and stronger intentions to be active.

Next, the hypotheses were tested using regression models; the regression model predicting state anxiety is presented in Table 2.5. In the first step of the model, competence valuation, perceived competence, and the four achievement goals were used to predict state anxiety. In this step, 19% of the variance was explained (adjusted $R^2 = .199$, $F(6, 524) = 21.7$, $p < .001$). The adjusted R^2 was used since there were many predictors in the regressions and due to the large sample size. Based on the first regression, perceived competence and mastery approach goals were negative predictors of state anxiety ($B = -.184$, $p < .001$; $B = -.8$, $p = .029$, respectively).

Table 2.4. Group means for physical activity.

		MApG	MAvG	PAPG	PAvG	CV	PC	MApC	MAvC	PAPC	PAvC	SA	Int
Low PA	M	5.37	4.02	4.09	<i>4.36</i>	5.1	5.11	5.81	2.68	1.92	1.91	<i>2.05</i>	5.02
	SD	1.17	1.50	1.60	1.61	1.16	1.22	1.34	1.39	1.19	1.06	.80	1.69
High PA	M	5.76	3.81	4.16	<i>4.07</i>	5.45	5.81	6.00	2.73	1.86	1.92	<i>1.77</i>	5.48
	SD	1.03	1.60	1.74	1.72	1.28	1.04	1.12	1.45	1.07	1.10	.72	1.67
Total	M	5.56	3.92	4.13	4.22	5.26	5.44	5.90	2.70	1.89	1.91	1.92	5.24
	SD	1.12	1.55	1.67	1.67	1.23	1.19	1.27	1.41	1.13	1.08	.78	1.69

Note. Italics indicates significance at $p < .05$; Bold indicates significance at $p < .01$.

In addition, mastery and performance avoidance goals were significant predictors of state anxiety. For every unit increase in anxiety, there is a .085 predicted increase in mastery avoidance goals and a .061 unit increase in performance avoidance goals.

Next, the hypotheses were tested using regression models; the regression model predicting state anxiety is presented in Table 2.5. In the first step of the model, competence valuation, perceived competence, and the four achievement goals were used to predict state anxiety. In this step, 19% of the variance was explained (adjusted $R^2 = .199$, $F(6, 524) = 21.7$, $p < .001$). The adjusted R^2 was used since there were many predictors in the regressions and due to the large sample size. Based on the first regression, perceived competence and mastery approach goals were negative predictors of state anxiety ($B = -.184$, $p < .001$; $B = -.8$, $p = .029$, respectively). In addition, mastery and performance avoidance goals were significant predictors of state anxiety. For every unit increase in anxiety, there is a .085 predicted increase in mastery avoidance goals and a .061 unit increase in performance avoidance goals.

In the second step, adding the perceptions of the climates improved the model slightly, as 20.4% of the variance was explained (adjusted $R^2 = .204$, $F(6, 524) = 14.6$, $p < .001$). In the final model, perceived competence, mastery avoidance goals, and performance avoidance goals remained significant predictors of state anxiety ($B = -.176$, $p < .001$; $B = .81$, $p = .001$; $B = .06$, $p = .039$, respectively). Of the climates, only mastery approach climate was found to be a significant predictor of state anxiety. For every unit increase in state anxiety, there is a .053 decrease in perceptions of a mastery approach climate.

The same model, reported in Table 2.5, was used to predict intentions to be physically active, reported in Table 2.6. In the first step, achievement goals, competence valuation, and

perceived competence were used to predict intentions; in this model, 34.5% of the variance was explained (adjusted $R^2 = .345$, $F(6, 524) = 47.62$, $p < .001$).

Table 2.5. Regression analysis predicting state anxiety.

	Unstandardized coefficients		Standardized coefficients		
	B	SE	Beta	t	p
Block 1					
MApGoal	-.08	.04	-.11	-2.2	.0*
MAvGoal	.09	.02	.17	3.53	.00**
PApGoal	-.00	.03	-.01	-.09	.93
PAvGoal	.06	.03	.13	2.13	.03*
CV	-.02	.03	-.03	-.66	.51
PC	-.18	.03	-.28	-5.8	.00**
Block 2					
MApGoal	-.06	.04	-.09	-1.7	.09
MAvGoal	.08	.02	.16	3.40	.00*
PApGoal	-.01	.03	-.01	-.23	.82
PAvGoal	.06	.03	.13	2.07	.04*
CV	-.02	.03	-.03	-.59	.56
PC	-.18	.03	-.27	-5.6	.00**
MApClimate	-.05	.02	-.09	-2.0	.04*
MAvClimate	.05	.03	.1	1.94	.05
PApClimate	.03	.03	.04	.91	.36
PAvClimate	-.01	.04	-.02	-.34	.73

Note. Block 1: $R^2 = .199$, adjusted $R^2 = .19$, standard error = .70; block 2: $R^2 = .219$, adjusted $R^2 = .204$, standard error = .69; * $p < .05$, ** $p < .001$

Based on this model, competence valuation was found to be the only significant predictor of intention.

Table 2.6. Regression analysis predicting intentions to be physically active.

	Unstandardized coefficients		Standardized coefficients		
	B	SE	Beta	t	p
Block 1					
MApGoal	-.02	.07	-.01	-.28	.78
MAvGoal	-.07	.05	-.01	-.14	.89
PApGoal	.01	.06	.01	.09	.93
PAvGoal	-.08	.06	-.08	-1.38	.17
CV	.78	.07	.56	11.93	.00**
PC	.12	.06	.08	1.85	.07
Block 2					
MApGoal	-.04	.07	-.03	-.53	.6
MAvGoal	.00	.05	.00	.07	.94
PApGoal	.01	.06	.01	.24	.81
PAvGoal	-.07	.06	-.07	-1.27	.21
CV	.78	.07	.56	11.91	.00**
PC	.12	.06	.09	1.96	.05*
MApClimate	-.03	.05	-.02	-.48	.63
MAvClimate	-.6	.05	-.05	-1.11	.27
PApClimate	-.05	.07	-.03	-.76	.45
PAvClimate	-.06	.08	-.04	-.78	.44

Note. Model 1: $R^2=.353$, adjusted $R^2= .345$, standard error= 1.37; model 2: $R^2= .362$, adjusted $R^2= .35$, standard error= 1.37. * $p<.05$, ** $p<.001$

For every unit increase in competence valuation, there is a .778 increase in intention. After adding the perceptions of the four climates in the second step, the variance explained increased to 35% (adjusted $R^2 = .35$, $F(6, 524) = 29.57$, $p < .001$). Competence valuation remained significant ($B = .78$, $p < .001$), and perceived competence was found to be a significant predictor of intention in the final model ($B = .12$, $p = .05$). It is important to note that the model did not improve with the addition of the perceived climates in the final step, and perceptions of the climate were not predictors of intention.

Discussion

The purpose of this study was to examine relationships among achievement goals, perceived motivational climate, perceived competence, competence valuation, state anxiety and intentions to continue in college physical activity classes. Based on the results, the first hypothesis was partially supported. As predicted, perceptions of a mastery approach climate were negatively related, at a weak level, to state anxiety; and predicted state anxiety in the regression model. Perceptions of a mastery approach climate did not predict intentions at a significant level in the regression model, but there was a small negative relationship between these constructs. The more a teacher or coach stresses principles of a mastery-approach climate (self-improvement and skill mastery), the less likely the student may experience anxiety and the more likely the student may continue participating in the activity. Since no study has used a 2x2 framework to assess perceptions of motivational climate as they relate to anxiety, this is a novel finding. However, similar findings have been found for perceptions of a mastery climate using the dichotomous framework (Boyce et al., 2009; Harwood et al., 2015). Fortunately, a vast majority of the students, independent of the activity or instructor, observed a mastery-approach climate in this study.

The second hypothesis was also partially supported; mastery-avoidance and performance-avoidance climates were positively, albeit very weakly, related but did not significantly predict state anxiety. Although it was not hypothesized, perceptions of a performance-approach climate were also significantly related to state anxiety. Based on these findings, having a leader who stresses not losing ability, avoiding normative incompetence, and praises only the most skilled students may produce higher levels of state anxiety. Again, since this is the first study to include the 2x2 framework of motivational climate, this is a new finding to the existing literature. The findings from this study concerning the relationship between anxiety and climates where normative comparisons and avoiding failure are emphasized are similar to findings for performance climates when the dichotomous framework was used (Boyce et al., 2009; Harwood et al., 2015). Regarding intentions to continue the activity, perceiving either a performance-approach or performance-avoidance climate was significantly related, at a weak level, with lower intentions to engage in the activity in the future. Based on this discovery, teachers should apportion attention to all of his or her students' skill learning in order to promote adherence to the activity. Although there was little variability in the perceptions of climate, perceiving a mastery avoidance or either of the performance climates has negative consequences including increased state anxiety and a decreased likelihood of continuing the activity.

Although motivational climate was the main focus of this study, achievement goals were more influential predictors of state anxiety and intentions to continue the activity. As established in other studies, the avoidance-framed goals displayed stronger relationships with increased levels of state anxiety than the approach-framed goals (Cury et al., 2003; Morris & Kavussanu, 2009; Sideridis, 2008). In fact, mastery-avoidance goals were found to be the least adaptive orientation to adopt and can lead to negative behaviors such as self-handicapping; this finding

was also presented by Sideridis (2008) in an educational setting. These goals are detrimental to behavior because of the focus on worry and personal incompetence. If a person is concentrating on trying to avoid failing at a particular skill, it is likely that this individual may use maladaptive processing (Elliot & McGregor, 2001). Sideridis (2008) also suggests that implementing mastery-avoidance goals is linked with an inability to regulate emotions and can lead to the onset of anxiety if the student is not successful. Performance-approach goals were also found to be a negative goal orientation to adopt. These goals displayed a weak, negative relationship with perceived competence and a positive relationship with state anxiety. Performance-approach goals can be detrimental due to the focus on external criteria; Law, Elliot, and Murayama (2012) argued that performance-approach goals are susceptible to transition into performance-avoidance goals if the individual receives negative performance feedback.

Perceived competence was the strongest predictor of state anxiety in this study; the higher the perceived competence, the less anxious he or she was about performing the activity. Similarly, Endler (1997) suggested that experiencing anxiety is associated with a lack of confidence. This finding is also evident in relation to other self-belief constructs such as self-efficacy (Bandura, 1977) and the mastery hypothesis (Mellion, 1985) that have been used to explain the anxiolytic effects of physical activity. This provides support for the notion that AGT is a viable framework for describing how physical activity can decrease anxiety. In addition, there was a positive relationship between adopting mastery-approach goals and perceived competence, meaning the individuals who focused on self-improvement were more likely to rate their skill level as higher than any other goal orientation; this is in line with the tenets of AGT (Elliot, 1997; Elliot & McGregor, 2001). Because of this, it is important that practitioners promote adopting mastery-approach goals in order to decrease state anxiety and increase the

probability that the individuals will continue to participate in physical activity. Individuals with low levels of perceived competence are more likely to experience state anxiety. This is consistent with the negative consequences of lack of confidence about one's skill (Endler, 1997).

With regard to intention to participate in the activity, competence valuation was the most influential predictor of intention. This means that those who value doing well are more likely to participate in the activity again. No motivational climate or achievement goal orientation significantly predicted intentions, but both mastery-approach goals and climate were weakly related, at a significant level, to continuing the activity. Perceiving a mastery oriented climate was also associated with the highest level of intentions in a study by Wang, Morin, Liu, and Chian (2016). Similarly, adopting mastery-approach goals was related to higher intent to future participation; this finding was replicated by Standage, Duda, and Ntoumanis (2003). On the other hand, perceiving either performance oriented climate was negatively related, at a weak level, to intentions. Also, there was a small but significant relationship between state anxiety and intention; those who reported higher levels of anxiety in their activity class were less likely to continue participating in the activity. This is consistent with previous literature (Da Silva et al., 2012).

The findings from this study add to the existing AGT literature in the following ways: they posit that AGT is a suitable framework to explain the anxiolytic effects of physical activity and suggest that using a 2x2 framework to describe motivational climate can be beneficial compared to dichotomous framework. Consistent with previous literature, this study demonstrates the importance of promoting an environment that is focused on self-mastery for every student (e.g., mastery-approach climate) in order to eliminate state anxiety and increase the probability that the students continue the activity (Abrahamsen et al., 2008; Smith, Smoll, &

Cumming, 2007). It is also imperative that students are encouraged to adopt goals that are self-referenced and controllable for positive consequences (i.e., low state anxiety and high intention). However, there were some limitations to this study. First, there was a lack of variety in the perceived climates; since most of the participants perceived a mastery-approach climate, it is hard to conclude the effects of the other climates on state anxiety and intentions. Also, the sample was mostly female, but this may be an advantage to the study since females often report higher levels of anxiety. In addition, due to the large sample size, statistical significance was easier to achieve. Nevertheless, there is a need for other methodologies to explore these constructs to increase the understanding of how performance-framed and avoidance-framed climates affect state anxiety and intentions to continue the activity.

CHAPTER 3: USING CRITICAL INCIDENT TECHNIQUE TO INVESTIGATE ANXIETY IN PHYSICAL ACTIVITY SETTINGS AMONG COLLEGE STUDENTS

One of the leading health risks in the United States (US) is a lack of physical activity. According to the Centers for Disease Control and Prevention (CDC), less than 25% of adults in the US meet the recommended physical activity guidelines (CDC, 2017). There is clear evidence that being physically active is associated with many physical benefits including a reduced risk of cardiovascular disease, obesity, and certain types of cancers (CDC, 2017). In addition to the physical benefits, being physically active has also been associated with improved mental health. For example, there is robust evidence that participating in aerobic exercise reduces anxiety and can even protect an individual from developing a clinical anxiety disorder (Anderson & Shivakumar, 2013; Rebar et al., 2015; Wipfli, Rethorst, & Landers, 2008).

Anxiety is a normal human emotion characterized as an individual's reaction to a stressful situation. Everyone experiences anxiety from time to time, but about 20% of the US population experience anxiety so severe that it interferes with their daily functioning (Rebar et al., 2015). Although there is strong evidence demonstrating that physical activity can reduce anxiety, physical activity can, however, also be a source of anxiety for some people. Some individuals perceive that the physiological symptoms of physical activity (increased heart rate, sweating, etc.) are similar to those of a panic attack (Ströhle et al., 2009). Also, physical activity settings can be anxiety-provoking for some individuals (Lawton, Brymer, Clough, & Denovan, 2017). For example, having a negative experience with a teacher or coach who pressures them to be physically active in the form of punishment could discourage students from participating in physical activity in their leisure time. Additionally, most of the literature surrounding anxiety and physical activity focuses on the positive outcomes of physical activity participation on

anxiety. It is also important to investigate sources of anxiety that could prevent individuals who need it the most from taking part in physical activity. Furthermore, most of the research examining the relationship between physical activity and anxiety has been correlational in design, using self-report surveys. This previous work has established the anxiolytic effects of physical activity, but has not been informative with regard to providing an understanding of elements within physical activity settings that may produce anxiety and could potentially alienate individuals from participating in activities.

One way to gain a better understanding of anxiety-inducing events and their consequences in different physical activity settings is to use the critical incident technique (CIT). CIT is a qualitative method developed by Flanagan (1954) that can be used to reflect on positive or negative experiences that shape a person's future behavior. Flanagan (1954) defines an incident as "any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the persons performing the act" (p. 1). As suggested by Flanagan (1954), the principles of CIT are flexible and should be modified based on the specific situation that is being investigated. This technique, which was originally developed to be used with industrial and organizational psychology, is an effective investigative tool that focuses on a specific event including the circumstances surrounding the event, the response to the event, and how the event affected the outcome (Chell, 1998).

CIT has not often been used in the field of kinesiology. This technique can be beneficial to use to get descriptions of personal accounts of events that provoked anxiety and possibly prevented individuals from participating in the activity again. The results from CIT research provide the researcher with answers on how a particular practice can be improved; in this case, the results from this CIT approach can shed light on physical activity settings that are anxiety-

invoking and can guide implications for practitioners in the area to make physical activity settings so that they are less anxiety-provoking and ultimately promote activity for all. The purpose of this study is to investigate college students' experiences in various physical activity settings that incited anxiety and to examine the implications these negative experiences had on intentions to participate in the activity again.

Method

Participants

One hundred and twenty-two undergraduate students (23% male, 77% female, $M=21.23\pm1.77$ years) were recruited from upper level Kinesiology courses at a university in the Southeastern United States. When using CIT, Flanagan (1954) determined that the size of the sample should not be determined by the number of participants recorded but by the number of unique incidents (e.g. 100 critical incidents adds two or three behaviors). Students voluntarily participated in this study and were offered extra credit for their participation.

Instrumentation

An online survey consisting of demographic information, including age and gender, and CIT questions was developed by the researcher. The link to the survey was sent to the participants to complete during a regularly scheduled class.

CIT questions. The participants completed a set of questions pertaining to a specific event in a physical activity setting that was anxiety-provoking. These questions were developed by the researcher and reviewed by a panel of experts. In addition, these questions were piloted with a class of nine students, and the questions were deemed appropriate to elicit informative responses. The participants were given this prompt:

Anxiety is defined as a person's reaction to a stressful situation. It is usually an uncomfortable feeling characterized by tension and nervousness. People often avoid situations that make them feel anxious. I am interested in learning about what might make an individual feel anxiety in physical activity settings. Please take your time responding to these prompts and answer honestly. Do not put your name on the form- your responses are anonymous.

Then, the participants were prompted to think of a specific event when a physical activity setting, such as physical education, youth sport, visit to a workout facility, made them anxious and explain the event in as much detail as possible. In addition, the participants were asked how significant individuals (teachers, coaches, peers, etc.) contributed to their anxiety in the specific event. Finally, the participants detailed how this event affected their decision to participate in the activity again and what strategies could be used to decrease anxiety in the situation they described.

Procedures and Data Analysis

After IRB approval was granted, the online survey was distributed via a link to the students during a regularly scheduled class period. The researcher gave a brief overview of the study and encouraged the participants to be as honest as possible and to include very detailed answers. The participants provided informed consent before completing the online survey, and the data were collected anonymously.

Data were analyzed using the process outlined by Flanagan (1954). In his seminal article explaining CIT, Flanagan (1954) described the five main steps that studies using CIT should follow. The first step is to establish the general aims of the activity. In this case, the aim of the study was to understand how previous events in different physical activity settings that caused anxiety have an impact on a person's decision to participate in the activity again. The second step is to determine the plans and specifications for the data collection. This step includes

establishing the situation(s) that will be observed, the relevance to the general aim, and the persons to make the observations. For this study, the situations observed are the participants' negative experiences in a variety of physical activity settings; this is relevant to the general aim because the researcher gains an idea of what settings are anxiety-provoking and how significant other contribute to anxiety in these settings. Also, the researcher was the person who made the observations; I am knowledgeable in the content area and was not the instructor of record for the classes in which data were collected.

The third step in CIT according to Flanagan (1954) is collecting the data. Flanagan suggested that data collection includes having participants report about significant incidents from memory through a variety of means including interviews, group interviews, questionnaires, and record forms. For this study, the researcher used an open-ended response survey to investigate anxiety-provoking physical activity experiences. Next, the subsequent step is to analyze the data which includes the inductive development of categories (Flanagan, 1954). The initial step in the analysis was to read through the participants' responses gazing for codes. According to Saldaña (2015), coding is the process of assigning a word or phrase to portions of data that is indicative of an evocative element. The researcher read through the data a few times, coding and refining the codes throughout the process. The next step in data analysis is to categorize the data looking for commonalities among the codes (Saldaña, 2015). The researcher established the categories (i.e. settings that were anxiety-provoking and sources of anxiety) and they were reviewed by an expert in the field. Then, themes (i.e. specifics about the experiences in the settings that triggered anxiety) within each category were determined by the researcher. It is important to note that the participant responses were double coded. This means that if a response fit into more than one theme, it was coded for each. Last, the final step according to Flanagan (1954) is to interpret

and report the results. After the responses were coded by the researcher, 10% of the responses were sent to another knowledgeable individual in the field for a peer review to establish interrater reliability and help eliminate bias (Morse, 2015). There was a 90% agreement between the researcher and the other rater.

RESULTS AND DISCUSSION

The purpose of this study was to investigate anxiety-provoking events in physical activity settings and the consequences of these negative experiences using CIT. Every participant could think of a time when a physical activity setting triggered feelings of anxiety. Sport settings, school physical education or university physical activity classes in which participants earned course credit, and settings that promote volitional leisure-time activity such as workout facilities were all surroundings that invoked anxiety. Within these settings, there were commonalities among the sources of anxiety reported by the participants ranging from influence of significant individuals (teachers, coaches, etc.) and a lack of confidence in one's ability. A summary of the number of cases by gender and source of anxiety is presented in Table 3.1.

Settings and Sources of Anxiety

Sport Settings

The first physical activity setting that participants reported as anxiety-provoking was sport. Forty-two participants (34.4%) described an event in a sport setting that contributed to the individual's anxiety. The themes associated with sport-based anxiety were anxiety due to the competitive environment, often with an underlying fear of failure, and the coach's influence on anxiety. It is important to note that compared to the other settings, males reported a sport-based environment as anxiety-provoking; half of the male

participants described anxiety-inducing events in a sport setting compared to 28.6% and 21.4% for instructor-led and workout facility settings, respectively.

Table 3.1. Summary of responses.

Setting	Total number of cases	Number of males	Number of females	Source of anxiety	Number of cases
Sport	42	14	28	Competitive anxiety	28
				Fear of failure	21
				Coach	13
Credit-based	38	8	30	Social interaction	24
				Low perceived competence	19
				Teacher	7
Workout facility	42	6	36	Social interaction	31
				Unfamiliarity	12
				Lack of knowledge	9

Competitive anxiety and a fear of failure. Twenty-eight of the participants (23%) that reported experiencing anxiety in a sport setting due to competitive situations. Most of the responses categorized as competitive anxiety were also coded as a fear of failure. The participants who were only coded for competitive anxiety often reported somatic responses of anxiety that are normal before competition (Landers & Arent, 2005). For example, Samantha wrote, “Playing basketball and running track growing up I would get anxious and fidget with my clothes at the start of the event until I calmed

down.” Twenty-one of the 28 responses were double coded for competitive anxiety and fear of failure. For example, Ryan recounted his experience in youth baseball. He commented:

When facing one of the better pitchers I was up third to bat. The other two kids in front of me actually hit the ball well. I was excited but also anxious because I was afraid I could not match their production and continue to do well. I did not want to let my team down. I did not want to be judged by others, and was afraid I would look stupid even though I was actually pretty good.

Similarly, Clint discussed how the first beach volleyball tournament he participated in was anxiety-inducing due to the competitive environment and his lack of experience. He said, “It was my first tournament and I had not been playing beach [volleyball] for very long and was not sure if I was good enough to compete.” Shannon shared her experience about her fear of failure causing anxiety in a soccer game. She said:

What gave me anxiety was the thought of losing or failing at my job which occurred during a soccer game. I was a center fullback, so therefore any goal scored I felt was very much my fault. Specifically, during our last playoff game the game was tied and I could not handle my nerves as the game clock was running out thinking about what would happen if the other team scored by a girl getting past me. The thought of losing made me very anxious because I hate the thought of failure on a personal level and on a team level.

With regard to intentions to continue the activity, the competitive anxiety participants reported did not deter most of the participants from future participation. For example, Clint mentioned that he realized that playing in his first tournament was not a big deal and everyone was out there to have fun so he continued to sign up for more tournaments. The underlying sentiment was that even if participants experience anxiety in competitive situations, this anxiety does not prevent them from participation. According to Landers and Arent (2015), each individual has an optimal level of anxiety. It is possible that the

events the participants described were not at a level that was perceived as extreme to the point of deterring the individual from competing again. However, there were some examples of anxiety in competitive settings and a fear of failure that did deter individuals from participation. For instance, Leslie discussed her anxiety from playing softball. She said:

I was a pitcher and there was one weekend where I hit two batters in a game. Warming up and practicing I pitched fine but as soon as I faced a batter in a game, I felt as if I could not pitch anymore. Thinking about failing at pitching caused [me] to fail in the game.

Leslie's anxiety about pitching was so severe that she quit pitching and started playing a different position.

Coach influence. Thirteen of the participants recorded responses that indicated that their coaches were a source of anxiety. For example, Anna detailed:

I experienced anxiety during basketball practice at my middle school. I was put into the scrimmage game as the point guard and expected to run plays. I got incredibly nervous and ended up messing up a lot of the plays. My coach got angry and yelled at the whole team and I began crying and hyperventilating in response.

Cameron also wrote about an anxiety-producing situation caused by her basketball coach.

Cameron transcribed:

One practice after a bad loss, the coach said it would be a "gut check" conditioning practice. We were sure it would contain a lot of running. The coaches told us that we need a reality check and a tough practice because we need to learn. The thought of running, being tired, overheated, weak and miserable made me anxious.

Similarly, Leah shared her volleyball experience. She said:

When I was in high school, I played volleyball for the school on the junior varsity squad since I was only a freshman. During one of our home games, my coach told

me she needed me to go in and play the varsity game. This made me instantly nervous because I had never played varsity before and I was playing with a different group of girls than I was accustomed to. It was intimidating because it seemed like it was going to be so much harder. I was upset because my coach had not warned me about the possibility of me having to play in the game.

Regarding intention, most of the individuals who experienced coach-influenced anxiety reported that he or she continued despite the negative event. The reasoning behind not quitting was often related to not wanting to let their teammates down. Also, some participants stated that they felt as if they no choice in the matter due to scholarship reasons. In addition, others stated that the event led them to seek out less demanding roles. For instance, Anna mentioned that the pressure from her coach led her to a more sedentary role on the team. She mentioned, “I no longer wanted to participate but I also didn’t want to quit. As a result, I just wanted to stay on the bench during games and avoid any pressure.”

Credit-Based Classes

Thirty-eight participants (31.1%) reported that they experienced anxiety in some form of credit-based physical activity. The credit-based anxiety-provoking events included experiences in physical education (PE), college physical activity classes, and labs for college courses. The sources of anxiety in credit-based physical activity settings included teacher influence, low perceptions of their ability often accompanied with pressure from external sources such as peers.

Teacher influence. There were seven instances of teachers invoking anxiety in credit-based physical activity settings. Some of the responses shared a common theme of a teacher creating a hostile environment. Rob described the harsh environment created by the teachers in his high school PE class. He wrote:

During PE class in high school, I'd always be anxious about getting in my uniform because I was really insecure about my body and felt people were making fun of me because I was smaller and weaker than other boys, so I'd go out of my way to skip PE. The coaches would tell me to not be a sissy and to get in my uniform then would proceed to make fun of me because I did not perform as well [as the other students].

In addition, ineffective teachers led to anxiety in credit-based settings for some participants. Linda, for example, wrote about her experience in her college jogging course. She noted:

I have never been a runner and I was hoping this class would teach me. In class, I realized that the woman teaching knew nothing about running, she just knew she could run. I learned nothing and became more and more anxious when my knees began to hurt and I did not know how to stop it. When I asked her [the teacher] questions she just said I needed to stretch more before my run. This stressed me out because I know that it was not a stretching problem.

These experiences intensified by teachers led to negative consequences such as being apprehensive about taking part in events similar to the anxiety-provoking events the participants described. This is consistent with characteristics and consequences of a performance climate (Ames, 1992a). Linda continued:

[Because of this experience] I will probably never run again. I have not had to lately and I do not plan on doing it ever again. This is sad because I used to run every night, but since I was forced into completely blind, I will never go back [to running].

Low perceived competence and social interaction. There were 19 examples of a concern about a lack of ability, or low perceived competence, and 24 instances of social interaction, including peers, producing anxiety in credit-based physical activity settings. These sources of anxiety often coincided with one another. In these evaluative settings, if an individual was not confident in his or her ability, then social interaction often amplified anxiety. Most of the participants who indicated social interaction as a source of

anxiety articulated that their peers, mostly due to social comparison, heightened their anxiety. For example, Carole noted:

In high school PE I would get nervous when we would have to do fitness assessments like the PACER test, pull ups, 60-yard dash, etc. I would always try to go last and I would not perform at my best because I was afraid people were looking at me or laughing at me doing the assessments. Also, if I did badly my scores would make me feel worse and more embarrassed. My peers would laugh and joke about the scores other students made and that would make me nervous when it was my time to perform because I did not want them to laugh at my results.

This is analogous with the outcome of adopting performance-avoidance goals. Elliot (1997; 1999) suggested that implementing the goal of avoiding normative incompetence is associated with lowered self-esteem and higher levels of anxiety. Audrey shared a similar experience from her college lab class. She detailed:

In this specific class, we had to participate in the PACER test to measure aerobic capacity. We had to get up in front of the rest of the class and run as many laps as possible. I am a very shy person and do not like getting up in front of people, much less running in front of people. I am very out of shape and was the first one to stop during this measurement. This also made me feel very uncomfortable because I was embarrassed. Being physically active in front of people and basically thinking of them judging every aspect of what I did made me feel anxious.

Public evaluation is one principle of a performance climate which is consistently related to anxiety (Harwood et al., 2015). Based on the TARGET framework (Epstein, 1989; Ames, 1992b) describing the ways to create motivational climates, evaluations in a mastery climate should be given in private and should be based on the individual (Ames, 1992b).

In addition, Frank shared how social comparison caused him anxiety in his college weightlifting class. He discussed:

For someone who does not lift weights, being grouped with other males who had clear advantages in weightlifting in terms of experience was hard on my insecurity. Self-comparison was an issue. The fear of being judged for my lack of strength was the worst part. I feel as though men draw comparisons and measure other men by their physical strength, muscle tone, muscle mass, etc. Being in this setting increased negative thought of self. Made me feel like my strength or body was inadequate or deficient.

The fear of being judged by their peers sometimes led to self-handicapping their performance; this is consistent with previous literature (Su, McBride, & Xiang, 2015).

For example, Carole said that she would not try very hard in her PE assessments and would act as if she did not care about her performance so that the other students would not make fun of her, especially the male students. With regard to intentions to continue the activity, this fear of judgement and lack of perceived competence prevents participants, such as Frank, from exercising in public. After his weightlifting course he noted, “Since taking this course, I purchased my own set of weights that I work out with at home. I do not want to work out at [in public] for fear that those anxieties will return.” Also, some of the participants felt as if they had no choice in future participation due to the fact that they needed the credit received as a result of their participation.

Workout Facility

The last setting that participants described as being anxiety-inducing was being physically active at a workout facility such as a gym. Forty-two of the participants (34.4%) reported experiencing anxiety in this setting; the participants’ anxiety stemmed from social influences and an unfamiliarity with the setting or a lack of knowledge about participating in physical activity. More females reported feeling anxious in a workout facility than males; 36 females described a negative experience in a workout facility compared to only 6 males.

Social interaction. Thirty-one of the participants' experiences were anxiety-provoking because of social interactions such as a fear of being judged or being intimidated. For instance, David mentioned his experience when he was initially going to the gym. He said:

When I first began working out at the gym, I would run on the treadmill. When I was running, I felt really nervous. I was feeling like I never ran or even knew how to run. As I continued I just felt like everyone was staring or laughing at me so I stopped running.

David's negative experience led him to stop going to the gym altogether.

Again, it is noteworthy that female participants were more likely than males to report this type of event; some female participants noted that an abundance of men present while they were being active was a source of anxiety. For example, Amy mentioned:

I always feel anxious when there are men in the weight room at the gym I belong to. I find myself sticking to machines instead of free weights. Sometimes I will even skip resistance training if there are too many men in the weight room. My anxiety probably comes from fear of embarrassing myself or fear of being judged. I am a small girl, so I don't lift very heavy weights, and being around a bunch of men that can lift hundreds of pounds is intimidating.

This is consistent with research from Pridgeon and Grogan (2012); these researchers discovered that females who viewed the exercise facility as being a "masculine culture" stopped going to the facility altogether. Another female participant, Michele, discussed an experience she had with the males at a workout facility:

Of course there are plenty of people [at the gym], so there are always new faces. New people usually don't bother me, but there are some times when guys would follow me to watch me workout. It does not happen very often, but when it does I usually end up going somewhere private or leaving the gym completely. There was one guy that almost followed me into the bathroom before he realized where he was going. It was really awkward and made me feel uncomfortable. I told the

staff about it and they said they would look into it, so it put my mind at ease. Now, whenever I go back to the gym by myself I tend to get very nervous thinking that an incident like that might happen again.

Also, Mary reported feeling uncomfortable when going to the gym where there are “regulars” who exercise at the same time. She recounted a specific event:

I was using a piece of equipment someone was clearly waiting for me to hurry up and finish so that they could use it. The individual was almost laughing at my attempt to complete my set on a low level. When I finished, he jumped on and bumped up the machine to the maximum [level] and made sure I saw him doing the “correct” workout for that machine.

This experience made Mary wary about going to the gym and she changed how and when she exercised because of this event. She said, “I have just been sticking to running and not resistance training. I avoid using the gym during peak hours when most ‘regulars’ want to use popular equipment.

There were also examples of same-gender perceived judgments that incited anxiety. For example, Margaret detailed a time when she was self-conscious when exercising in a gym next another female. She said:

When I get on the stair climber next to a girl on the treadmill, sometimes I feel like she is thinking bad thoughts about me because my workout is a different intensity than hers. I often feel intimidated by people who are more advanced in fitness than I am. Sometimes I will cut my workout short if I feel as if I am not as skilled in a certain task than the people around me.

This is consistent with research by Coen, Rosenberg, & Davidson (2018). These researchers determined that females often “police” the activities that other females participate in based on traditional gender roles. Regarding future intentions, Margaret’s negative experiences have led her to find the quietest place in the gym to exercise.

Unfamiliarity of facility and lack of knowledge. Another source of anxiety in exercise in workout facilities was not being familiar with the location/logistics of the workout center or having a lack of knowledge. These are both common cited barriers to physical activity (Allender, Cowburn, & Foster, 2006; Joseph, Ainsworth, Keller, & Dodgson, 2015; King, Vidourek, English, & Merianos, 2014). There were 12 responses recorded by the participants that indicated being unfamiliar with the facility resulted in anxiety and nine responses indicating a lack of knowledge. With regard to not being familiar with the workout facility, Megan described her experiences:

I think just going to any gym that I have not been to before causes me anxiety, especially if I am not sure where the machines are located. Just not knowing what kind of situation I am walking into causes me a lot of anxiety. Also, when I use a machine, I wonder if I am taking too long, and I do not want people to think I am hogging the machine.

Additionally, Blair specified that going to a new workout class gives her anxiety. She explained, “I sometimes get the cold sweats and my stomach starts to hurt before entering the new class or workout environment. My face turns red and my mouth becomes dry because I am anxious and nervous.” Annie reported a similar situation:

My mom and I attended a Zumba class for the first time. I had danced before but I had never danced in a Zumba style. I was scared that I looked different from everyone and did not know how to dance like everyone else. I was terrified that the entire time everyone was going to look stupid and judge me for not knowing the routines.

With regard to a lack of knowledge causing anxiety, Elizabeth described:

I often feel uncomfortable in a physical activity setting when I begin a workout and there are a lot of people around. The more people around made me feel pressured to perform better and when learning new machines, it made me feel pressured to do it right on the first try as to not embarrass myself in front of others.

Rebecca encountered a similar experience and shared:

One time I went with a friend to a workout facility to lift weights. While there, it made me have anxiety because there was so much equipment that I did not know how to work and so many people watching. The fact that I did not know how the weight machines worked or which machines to use made me anxious.

Fragile Self-Beliefs and the Threat of Negative Social Evaluation

Based on the participants' responses across settings, core themes of fragile self-beliefs and threat of negative social interactions that confounded a lack of confidence emerged as underlying sources of anxiety. This is consistent with the literature; for instance, Endler (1997) surmised that feelings of anxiety emerge when an individual is not confident in his or her ability (i.e. demonstrates low perceived competence). Based on the common lack of belief in one's ability reported as a source of anxiety, Achievement Goal Theory (AGT) provides a suitable framework for describing the cultivation of anxiety in these settings and can also guide efforts to decrease anxiety. AGT is a dominant social-cognitive theory that describes the goals that direct an individual's behavior in an evaluative setting. Nicholls (1984) originally posited that people enter achievement situations with the goal of demonstrating their competence; Elliot (1997, 1999) later argued that it is possible for individuals to adopt goals framed with a negative valence of avoiding incompetence. In his seminal work on AGT, Nicholls (1984) suggested that two goal orientations exist: task goals that define success as personal mastery and ego goals that are normatively motivated in the form of outperforming others.

Based on earlier motivational work such as McClelland (1951), Elliot (1997; 1999) included avoidance-framed goals and expanded the framework. Elliot discussed four possible goals: mastery-approach (personal mastery), mastery-avoidance (striving not to lose one's skill), performance-approach (outperforming others), and performance-avoiding (avoiding normative incompetence). Individuals who enter achievement settings with the goal of self-improvement

(i.e. adopt mastery-approach goals) will typically see increases in their perceived competence because of the amount of control they have in achieving their goal (Roberts, Treasure, & Conroy, 2007). On the other hand, individuals who are unsure about their skills may adopt avoidance-framed goals to avoid demonstration of incompetence and anxiety may undermine their level of perceived competence. The presence of worry and anxiety can possibly lead to an individual withdrawing from the activity (Elliot & Dweck, 2005).

From a situational perspective, tenets of AGT, more specifically motivational climate, can help describe anxiety present in these settings. Motivational climate (Ames, 1992a) refers to the environment created by significant individuals such as a teacher or coach. Ames (1992a) proposed that significant influencers can create one of two climates: mastery climate with a focus on improvement for all students/athletes and performance climate that is associated with norm-reference comparisons. Mastery climates are linked with positive constructs such as enhanced self-esteem, feelings of autonomy and positive affect (Harwood, Keegan, Smith, & Raine, 2015). On the other hand, performance climates focus on normative comparison and foster competitiveness are often related to undesirable consequences such as negative affect, worry, and anxiety (Harwood et al., 2015).

Perceived competence also plays a critical role in AGT. Perceived competence is an innate psychological need that refers to a person's judgment of his or her skills and is essential in understanding motivation (Elliot & Dweck, 2005). In the dichotomous framework, Nicholls (1989) proposed that perceived competence is an outcome based on the goals individuals adopt. However, Elliot (2005) asserted that perceived competence is actually an antecedent of a person's behavior; meaning that the goals individuals embrace are mediated by their perceptions of ability. Because of this, adopting avoidance-framed goals coupled with low perceived

competence are established as sources of anxiety and could keep individuals from participating in physical activity (Roberts et al., 2007).

This is similar to what the participants described in this study. For example, Katie was enrolled in a physical activity course at her university and stated this about her experience:

This class was solely aerobic exercise, which was something I was not comfortable with doing. We then had to do some warm up exercises and even these exercises had me feeling like everyone was watching how bad I was or how “in-physically” fit I was... It gave me really bad anxiety in that current situation and had me thinking about future situations where I would have to do physical activity in this class three times a week. It all became too much for me and I dropped the class after the first meeting.

Similarly, Mark stated that lifting weights in his college physical activity course led to anxiety due to his perception of his ability. He said, “I felt that others around me were watching me unsuccessfully complete some exercises. I was also anxious about how little I was lifting compared to the others around me.” This underlying fear of failure affected his decision about what exercises he would participate in. Mark continued, “After feeling anxious in class, I began to only participate in weight training exercises I know I can complete successfully and have not tried any new exercises.”

Strategies to enhance one’s perceived competence based on the tenets of AGT include focusing on controllable, internally-referenced abilities (i.e. adopt mastery-approach goals). These goals are associated with the most adaptive motivational profile including increased effort (Roberts et al., 2007). Some participants even noted the importance of self-referencing in their responses. For example, Carole said, “[to decrease my anxiety I can] do my best and look for ways to improve. Try not to worry about what other think and just focus on myself.” David shared a similar strategy to improve his

confidence in his running ability. He mentioned, “I can practice running alone until I become more confident running in public.” Likewise, Mark mentioned to trying new skills at a low weight in order to master the movements of different resistance exercises is a strategy to increase his confidence in his abilities.

Significant others also contributed to the participants’ fragile self-beliefs; teachers, coaches, and peers were common sources of anxiety for the participants. For example, Tara experienced a performance climate in her college jogging course which incited anxiety. She commented:

My teacher significantly contributed to my anxiety as he was the one that set the guideline that we were not allow to walk at all throughout training. This led to anxiety because if we were caught walking three times we were told we would fail the class. Because I am not necessarily a skilled runner, I had anxiety about not being able to exercise at a comfortable pace.

Tara’s negative experience had repercussions on her future physical activity as well; it led to hesitancy and worry about participation in similar courses. Suzanne described a similar situation in her college activity course. She remarked:

I sometimes feel anxious when I’m off balance so doing things like lunges really stresses me out and my anxiety causes me to do worse. I feel anxious being surrounded by people who know what they are doing because I’m unconfident and I feel like they’re judging me. Knowing that everyone else around me could do them correctly and I couldn’t make me feel like everyone was looking at me and thinking I looked funny.

One framework that has been established to help social influencers create supportive environments (i.e. mastery climates) is the TARGET framework (Epstein, 1989; Ames, 1992b). This framework describes how evaluative settings should be shaped in order to enhance positive emotions and decrease anxiety. Tara’s experience is in conflict with the TARGET strategy related to time, or structuring the instructional setting

to allow individuals to workout at their own pace. Her anxiety would have been reduced with more flexibility in the class standards. Frank mentioned an important aspect of a mastery climate in his strategy to reduce anxiety. He stated that working with a positive and understanding instructor could help make him feel more comfortable participating in his weight training class. Other participants mentioned the need for social support to help alleviate anxiety. For example, Margaret noted that bringing a friend to go to the gym with her would help to reduce the intimidation she experienced. Similarly, Megan stated that being active with people she knows would make her feel more confident and less anxious.

Conclusion

It is well-established that physical activity participation is commonly associated with reductions in anxiety, therefore it is important that adults meet the recommended guidelines for physical activity to help alleviate symptoms of anxiety (Rebar et al., 2015; Wipfli et al., 2008). Based on the results from this study, everyone felt anxiety in a physical activity setting at one time or another; the settings that were anxiety provoking for the participants were sport, credit-based settings, and workout facilities. Within these settings, common sources of anxiety included a lack of confidence in one's abilities, social influences including teachers, coaches, and peers, and a lack of knowledge or an unfamiliarity with the workout facility. There is evidence in the responses that anxiety in class settings and workout facilities can deter physical activity engagement in the future. At the core of the sources of anxiety is fragile self-beliefs.

Principles from AGT can help guide efforts to improve physical activity settings to make them inclusive for all and to promote physical activity (Ames, 1992; Elliot, 1997, 1999). For example, it is crucial for teachers and coaches to promote a mastery climate and mastery-approach goals for physical activity adherence (Wang, Morin, Liu, & Chian, 2016). Focusing on personal improvement (i.e. adopting mastery-approach goals) is associated with long-term physical activity (Wang et al., 2016). It is also important that females feel comfortable and not threatened in what sometimes may seem to be a “masculine” environment (Pridgeon & Grogan, 2012). This is paramount because females are typically more susceptible to anxiety and also tend to be less active than males (Altemus, Sarvaiaya, & Epperson, 2014; King et al., 2014).

One limitation of this study was the underrepresentation of males; however, due to the fact that females are generally more anxious and less active, this may actually be a strength of the study. Another limitation was the fact that anxiety was not empirically measured. Qualitative approaches have not been used to explore sources of anxiety in physical activity settings. This study demonstrates that CIT was an effective methodology to explore underlying sources of anxiety and shows promise. In the future, studies examining anxiety and physical activity should employ other qualitative designs, such as interviews and case studies, to fully understand what prevents individuals with anxiety from being physically active despite the known benefits. Also, interventions should be designed to examine the efficacy of theory-based physical activity programs targeting participation for anxious individuals.

CHAPTER 4: GENERAL DISCUSSION

In the US, less than 25% of adults meet the weekly recommended levels of physical activity despite the known physical, social, and psychological benefits (CDC, 2017). Another disturbing health concern is the prevalence of anxiety. Anxiety is a normal human emotion that is described as an individual's perception of a stressful situation. It is estimated that one in every five adults suffers from anxiety so severe that it disrupts normal functioning (Kessler et al., 2005). Physical activity has been found to be an effective means to reduce anxiety at clinical and sub-clinical levels in adults and children (Biddle & Asare, 2011; Conn, 2010; Petruzzello et al., 1991; Rebar et al., 2015; Wipfli et al., 2008). However, there is little agreement regarding the mechanism explaining the anxiolytic effects of physical activity, and it is suggested that the mechanism is most likely a combination of psychological and biological processes. Most of the psychological explanations are related to self-belief constructs. In achievement settings, AGT may provide a framework to explain how physical activity can alleviate anxiety. The primary purpose of this dissertation was to investigate relationships among anxiety, physical activity, achievement goals, and motivational climate, and how the interaction among these constructs impacts an individual's intent to continue being active. This was accomplished in two ways. First, through a correlational design, these constructs were explored to examine anxiety in an achievement setting with relation to AGT and how they relate to intentions to be active. Second, CIT was used to characterize events in physical activity settings that were anxiety-inducing and explore the effects these negative experiences had on future participation.

There is plentiful research examining AGT and physical activity, but there is far less literature examining how these constructs relate to anxiety. The major purpose of the first study

was to examine the interrelationships among anxiety, physical activity, tenets of AGT, and intentions to be active. Based on the results from the first study, AGT was found to be a suitable framework to explain the anxiolytic effects of physical activity in achievement settings. AGT examines the goals that individuals adopt in an achievement setting that direct behavior (Ames, 1992a; Elliot, 1999; Nicholls, 1987). Consistent with previous research, adopting mastery-approach goals and perceiving a mastery-approach climate were associated with positive consequences including low levels of anxiety and stronger intentions to be active (Boyce et al., 2009; Harwood et al., 2015). Also, the avoidance-framed goals were more strongly related to anxiety than the approach-framed, as expected (Cury et al., 2003; Morris & Kavussanu, 2009; Sideridis, 2008). In addition, adopting mastery-approach goals was associated with the highest anxiety levels; this finding has only been replicated by Sideridis (2008) in an educational setting. Results from this study indicated that a mastery climate was associated with lower levels of anxiety in achievement settings, but it was not as influential as achievement goals with regard to intentions to be active. It is also important to note that this study was the first to incorporate the 2x2 framework in the examination of anxiety.

The second study examined characteristics of anxiety-inducing physical activity settings through a rarely used qualitative method, CIT. The purpose was to examine what physical activity settings are anxiety-invoking, the sources of anxiety in these settings, and how negative experience affected decisions to be active. Based on the responses from the participants, three distinct physical activity settings were identified as environments that triggered anxiety: sport, activity classes in school or university settings, and workout facilities. Within these settings, there were three common sources of anxiety, two of which AGT can help to explain. First, having a lack of confidence in one's skill was linked with anxiety, especially for those who

reported anxiety in achievement settings. Consistent with AGT; individuals who adopt avoidance-referenced goals that are associated with an underlying fear of failure are more susceptible to anxiety (Cury et al., 2003; Morris & Kavussanu, 2009). Next, important others (e.g. teachers, coaches, peers) in the physical activity settings influenced anxiety. In achievement settings, teachers and coaches who were critical of an individual's skills or put too much pressure on the individual were influential in creating anxiety. These leaders often created norm-referenced environments inherent in performance climates, which are linked with negative consequences such as high levels of anxiety and worry (Ames, 1992a; Harwood et al., 2015). Peers often invoked anxiety in physical activity settings because the participants felt as if they were being judged based on their performance. Consistent with previous research, females in these settings often felt as if the exercise facility was "a masculine culture" that translated to negative implications for exercise adherence (Pridgeon & Grogan, 2012). Finally, individuals who had a lack of knowledge about being physically active or were unfamiliar with the workout facility reported anxiety for these reasons. This is commonly cited as a barrier to physical activity (Allender et al., 2006; Joseph et al.; 2015).

Taken together, the results from this dissertation emphasize the importance of self-referenced goals and a mastery climate. They provide a blueprint for teachers and coaches to reduce anxiety in achievement settings. One established approach to creating a mastery-oriented climate is the TARGET framework created by Epstein (1989) and adapted to physical activity by Ames (1992b). This framework has been used to assist teachers, coaches, and even parents establish internally-referenced climates. The TARGET framework describes how tasks should be designed, how to provide opportunities for students to be involved in the decision making process, how recognition should be given, how groups should be formed, how evaluations should

be made, and the appropriate amount of time that should be allocated for learning (Ames, 1992b; Epstein, 1989). In addition, teachers and coaches need to foster perceptions of competence and provide each individual the opportunity to be successful. Since a lack of confidence is consistently related to higher levels of state anxiety, it is essential that teachers and coaches provide appropriately challenging tasks on an individual basis. Following this advice will ensure that an individual's competence is not threatened, and this person will be less likely to experience anxiety and more likely to continue the activity. Also, since workout facilities were a setting in which participants reported as being anxiety-invoking, it is important that health care professionals create environments in which everyone, especially females, feels comfortable participating in physical activity. For example, having female-only areas or classes could be an advantageous strategy for reducing anxiety. Providing instructional assistance to clientele as they begin their workout programs and appropriate supervision and instruction throughout the workout facility is also important.

In the future, there is a need to examine the interrelationships of these constructs using different methodologies to gain an even better understanding of anxiety and physical activity. It is firmly established that physical activity can help alleviate symptoms of anxiety, but what is not understood is how to get individuals who view physical activity as anxiety-invoking to start being active. Also, the participants in the first study viewed their environments as primarily mastery-approach, there is a need to investigate anxiety and intentions to be active in other climates. Finally, intervention studies need to be conducted to test the efficacies of different climates and their consequences on anxiety and intentions.

In conclusion, this dissertation provided evidence that AGT can serve as a mechanism to explore anxiety in physical activity settings. The findings highlight the importance of internally-

referenced achievement goals and motivational climates for fostering competence, reducing anxiety, and promoting long-term physical activity. It is crucial that teachers, coaches, and health care professionals are sensitive to a person's needs and ensure that he or she feels comfortable being active in his or her environment in order to reduce anxiety.

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APPENDIX A: EXTENDED REVIEW OF LITERATURE

Examining Anxiety and Achievement Goal Theory in Physical Activity Settings

One of the most alarming health concerns in the United States is the lack of physical activity. It is well documented that regular, and even intermittent, bouts of physical activity are associated with prevention of chronic ailments such as cardiovascular disease, diabetes, and certain types of cancers (Warburton, Nicol, & Bredin, 2006). In addition, participating in physical activity is associated with enhanced physical appearance, improved psychological health, and provides opportunities to develop social relationships (Lox, Martin Ginis, & Petruzzello, 2014). The Centers for Disease Control and Prevention (CDC) recommends that adults aggregate a total of 150 minutes of moderate-intensity aerobic activity every week; however, only about 20% of American adults meet this criterion (CDC, 2016). Similarly, for adolescents the CDC recommends 60 minutes of daily physical activity, and only 30% of this population is active enough to meet this recommendation.

Being physically inactive may also contribute to the development of mental health problems including anxiety (Strölhe, 2009). Anxiety is an undesirable psychological construct that has been defined as an individual's reaction to a stressful situation (Spielberger, 1966). When an individual perceives the stressful situation negatively, symptoms of anxiety surface. Some common symptoms of anxiety include unpleasant feelings such as feeling overwhelmed or uncertain what to do, changes in cognitions and behavior changes (e. g., avoiding certain situations) (Lox et al., 2014). Most individuals can overcome these stressful situations that may arise, but when the anxiety starts to affect an individual's daily behavior, clinical anxiety may be diagnosed. In the United States, about 20% of the population suffer from anxiety at clinical

levels, and of these individuals with clinical anxiety, less than 20% of them seek treatment (Kessler, Chiu, Demler, & Walters, 2005).

The purpose of this review is two-fold: 1) to explore AGT as a theoretical framework to understand the mechanism of the effects of exercise on anxiety and 2) guide efforts to create a motivational climate that will reduce anxiety and increase physical activity. This review begins by presenting a multi-dimensional view of anxiety and evidence for using exercise as a treatment for alleviating symptoms of anxiety. Potential mechanisms explaining how exercise can lessen anxiety are then discussed. Next, Achievement Goal Theory (AGT) and the evolution of this theory is presented. Using this framework, motivational climate is considered as a construct that can influence individual anxiety. Then research evidence examining the relationships among achievement goals, motivational climate and anxiety are discussed. I conclude with a summary of findings, practical implications, and directions for future research.

Anxiety

Multidimensional View of Anxiety

Due to the often ambiguous conceptualization of anxiety, Spielberger (1966) delineated anxiety into state and trait components. In addition, Endler (1997) asserted that state and trait anxiety are multidimensional as well. Trait anxiety refers to an individual's predisposition to being anxious and is thought of as a personality characteristic. This component of anxiety is hypothesized to be composed of at least four facets including social evaluation, ambiguous situations, daily routines, and physical danger (Endler, 1997). On the other hand, state anxiety refers to situational, temporary reactions to worrisome stimuli (Spielberger, 1966). Once the stressful stimuli (e.g. test taking, sport performance) is no longer present, the individual's state

anxiety will vanish (Craft, Magyar, Becker, & Feltz, 2003). Individuals that are predisposed to having high levels of trait anxiety often perceive more situations as threatening, and therefore often have more intense levels of state anxiety as well (Martens, Vealey, & Burton, 1990)

State anxiety is further delineated into cognitive and somatic aspects. Cognitive anxiety, as defined by Morris and colleagues (1981), is the “conscious awareness of unpleasant feelings about oneself or external stimuli” (p. 547). Cognitive anxiety is caused by negative expectations about performance, external reference to others, and disrupted attention (Kais & Raudsepp, 2005). This component of state anxiety has been shown to have an inverse relationship with performance; that is, the more cognitive anxiety before an assessment or performance, the worse the subsequent performance will be (Craft et al., 2003). Somatic anxiety refers to the “affective and physiological elements of the anxiety experience that develop directly from autonomic arousal” (Martens et al., 1990, p.6). Symptoms of somatic anxiety include unpleasant feelings such as nervousness in the stomach, muscle tension, and clammy hands (Kais & Raudsepp, 2005). Somatic anxiety’s relationship with performance is curvilinear; too high or too low somatic anxiety is detrimental to performance. That is, there is an optimal level of arousal reflected by somatic anxiety that facilitates performance. When compared with cognitive anxiety, somatic anxiety has less of an influence on performance (Martens et al., 1990). In addition, once the actual performance begins, an individual’s somatic anxiety dissipates. Although cognitive and somatic anxiety are categorized as separate components of state anxiety, these aspects often covary together in stressful environments (Morris, Davis, & Hutchings, 1981).

Delineating state anxiety into cognitive and somatic components only accounts for the “intensity” of the perceived anxiety. Mahoney and Avenier (1977) suggest that the “direction” of

anxiety should also be examined. The direction of anxiety refers to how individuals view the perceived anxiety. Ekkekakis et al. (1999) claim that a person's evaluation of the situation is the most essential element when presented with an anxiety-inducing environment. For example, if a person does not perceive the environment as threatening, no state anxiety response will be provoked (Ekkekakis, Hall, & Petruzzello, 1999). In their study of elite gymnasts, Mahoney and Avenier (1977) concluded that the most successful gymnasts perceived anxiety as an energizing force to better performance, while those that were not as successful viewed anxiety as feelings of self-doubt, leading to worsened performance. It is also important to note that levels of preferred anxiety differ at the individual level. Two individuals who report similar levels of anxiety may differ in their interpretation of the direction of the anxiety (Jones, Swain, & Hardy, 1993). Jones and colleagues (1993) also reported that individuals who are highly skilled are more likely to view the anxiety as facilitating to performance.

Measurement of Anxiety

Anxiety is usually assessed by self-report questionnaires. Two of the most frequently used questionnaires to assess anxiety are the Competitive State Anxiety Inventory-2 (CSAI-2) and the State-Trait Anxiety Inventory (STAI). The CSAI-2 is a 27 question instrument assessing three dimensions of state anxiety: cognitive anxiety, somatic anxiety, and self-confidence (Martens et al., 1990). Self-confidence emerged as a dimension of this assessment of state anxiety through factor analysis. This questionnaire is a valid and reliable instrument assessing state anxiety most often used in athletic settings. It is recommended that this instrument should be completed no less than 15 minutes before competition, and that the participant answer each prompt with how they feel "right now" (Martens et al., 1990).

The STAI is a two-part questionnaire assessing both trait and state anxiety; Spielberger (1983) developed this questionnaire based on his delineation of anxiety into state and trait components. This instrument is comprised of two 20-item scales, one for state anxiety and one for trait anxiety. The STAI state scale assesses the intensity of the anxiety individuals feel “at this moment,” while the trait scale assess how individuals feel “generally” (Spielberger, 1983). This inventory has been shown to have appropriate levels of validity and reliability and is a very popular psychological measure assessing both state and trait anxiety (Spielberger & Reheiser, 2009). The STAI has been used as a measure in over 14,000 peer-reviewed studies and translated into over 60 different languages.

Anxiolytic Effects of Exercise

Exercise has been examined as a possible treatment for reducing the symptoms of trait, state, and even clinical levels of anxiety. There have been several meta-analyses, reviews of reviews, and even a meta-meta-analysis compiling evidence for the anxiolytic effects of exercise in both children and adults. According to these reviews, there is robust, concrete, comprehensive evidence that physical activity can have a reductive effect on anxiety and anxiety symptoms in non-clinical as well as clinical populations (Biddle & Asare, 2011; Conn, 2010, Petruzzello, Landers, Hatfield, Kubitz, & Salazar, 1991; Rebar et al., 2015; Wipfli, Rethorst, & Landers, 2008). Main findings from these various publications, including a summary of the population of interest in the studies and the number of studies included in their investigation, effect sizes reported in studies, main findings from the reviews/meta-analyses, and important comments based on the findings are reported in Table A.1.

Table A.1. Evidence of Anxiolytic Effects of Exercise

Review	Studies Included	Main findings	Effect size	Comments
Biddle & Asare, 2001	4 reviews of 32 studies targeting children and adolescents	Exercise interventions have a small, beneficial effect on anxiety	.47; small to moderate effect	Some reviews included studies that had methodological weaknesses
Conn, 2010	19 studies; 3289 adult subjects	Larger effect size for studies with random assignment	.22; small effect	Better improvements in anxiety when focus is only on physical activity behavior
Petruzzello et al., 1991	207 studies with focus on state anxiety; 62 studies with focus on trait anxiety	Largest reductions in anxiety (both state and trait) for exercise lasting 21 to 30 minutes	.24; small effect for state anxiety; .34; small effect for trait anxiety	Exercise is just as effective as other treatments (e.g. relaxation, meditation)
Rebar et al., 2015	306 studies from 4 reviews; 10,755 adult participants	Small, significant reduction of anxiety	.38; small effect	Comprehensive evidence that exercise reduces anxiety
Wipfli et al., 2008	49 studies	Level 1, Grade A evidence that exercise can help reduce anxiety	.48; small to moderate effect	Exercise just as effective as other forms of treatment

At a clinical level, exercise has been shown to improve negative symptoms of anxiety as much or even more than more traditional forms of treatment such as prescription drugs or

cognitive behavioral therapy (Wipfli et al., 2008). For clinical populations, it is suggested that 30-60 minutes of aerobic exercise twice weekly for an extended period of time (i.e. at least six weeks) helps to alleviate symptoms of clinical anxiety (Wipfli et al., 2008). With regard to state anxiety, Petruzzello and colleagues (1991) determined that acute bouts of continuous, aerobic exercise for 21-30 minutes leads to the largest reductions in anxious symptoms. In addition, these post-exercise reductions in state anxiety have been shown to last at least two to four hours.

For trait anxiety, Petruzzello et al. (1991) individuals who adhered to an aerobic exercise program (21-30 minutes in each session) for at least 10 weeks reported the largest reductions in anxious symptoms. Conn (2010) added that interventions with supervised exercise delivered directly to the participants are more effective at reducing anxiety (of any kind) than unsupervised exercise programs. Also, the most successful interventions focus only on targeting physical activity behavior and not a variety of healthy behaviors (Conn, 2010). It is worthy to note that even participating in smaller quantities of exercise than the recommended dose response can provide mental health benefits. Increasing the amount of exercise in a non-clinical population can not only reduce the symptoms of anxiety, but this additional exercise can also help protect against clinical levels of anxiety (Rebar et al., 2015).

Potential Mechanisms

The mechanism explaining the anxiolytic effects of exercise is not fully understood. Rebar and colleagues (2015) argue that there may not be one single mechanism that explains how exercise reduces anxiety; it is more likely a combination of psychological and neurobiological influences working together. For example, one proposed mechanism, the thermogenic hypothesis, purports that a rise in body temperature from exercise can result in a

reduction in anxiety; however, there is a lack of evidence that this hypothesis is directly responsible for the reduction, implying that it may possibly include a psychological component (Petrusello, Landers, & Salazar, 1993). Another potential explanation for the anxiolytic effects of exercise is the reduction in sympathetic nervous system activity and hypothalamic-pituitary-adrenal (HPA) axis, which plays a critical role in adapting to stressors, reactivity (Anderson & Shivakumar, 2013). Exercising can help modify any dysregulation in HPA axis, which, in turn, will reduce anxiety (Anderson & Shivakumar, 2013). Although there is evidence for the neurobiological mechanisms, examining them in detail is beyond the scope of this review. The focus here is on how psychological constructs may explain the relationship between physical activity and decreases in anxiety.

Though there is some evidence for potential mechanisms explaining the anxiolytic effects of exercise, Rebar et al. (2015) assert that additional research is needed to more fully understand the psychological mechanisms underlying the mental health benefits of exercise. Similarly, Gurlan and contemporaries (2016) called for more research to help establish a theory-based approach for individuals with non-clinical anxiety symptoms. A theory-based perspective may help recognize the aspects of behavior that can be manipulated; adding theoretical components to interventions may help determine what components of specific theories help to drive behavior change (Gurlan et al., 2016). Understanding the psychological mechanisms through which physical activity decreases anxiety is an important step in this process. Potential mechanisms seem to be related to self-beliefs, diversion of attention, or social interactions.

Self-Belief Constructs

Experiencing anxiety is often associated with a lack of confidence (Endler, 1997). In achievement settings, this lack of confidence can be attributed to feelings of incompetence and concerns about one's ability. Several self-belief constructs have been proposed to explain the anxiolytic effects of physical activity including self-efficacy, the mastery hypothesis, and perceived competence. These constructs are parallel to one another with subtle differences. For example, self-efficacy is more specific to situations and based on personal beliefs, while perceived competence is a more general sense of one's capabilities (Rodgers, Markland, Selzer, Murray, Wilson, 2014). Regardless of the specific framework invoked, it is clear that self-doubt is associated with higher levels of anxiety.

Self-efficacy. According to Bandura (1977), self-efficacy refers to the strength of belief that an individual can successfully master a task or execute a behavior in a specific situation. An individual's perceptions of his or her capabilities to be successful has an important relationship to anxiety. If an individual has a sense of control over the task, he or she will not be overwhelmed with thoughts of worry and therefore should experience lower levels of anxiety (Anderson & Shivakumar, 2013). Since self-efficacy can be derived from physiological and affective states, measuring self-efficacy through levels of fitness or fatigue could be advantageous. For example, as an individual becomes more physically fit, he or she will have reduced feelings of fatigue and, as a result, increased self-efficacy (Petruzzello et al., 1991). This outcome of increased self-efficacy would also be linked with a reduction in anxiety. Bodin and Martinsen (2004) found evidence for this mechanism. They reported increases in self-efficacy and decreases in state anxiety associated with participation in martial arts. Similarly, Katula and colleagues (1999) found decreases in state anxiety accompanied with increases in self-efficacy in

individuals participating in moderately-intense exercise. This hypothesis may be particularly useful for sedentary individuals since self-efficacy is especially effective with new or challenging tasks (Bandura, 1977).

Mastery hypothesis. The mastery hypothesis states that successfully completing an exercise routine should lead to a sense of accomplishment that is associated with decreased anxiety. As an individual gains mastery of physical skills, he or she will have a feeling of control over his or her life (Mellion, 1985). An increase in mastery from exercising can counteract any worrisome or catastrophic thinking and lead to a further increase in an individual's sense of mastery. Also, individuals that have positive assessments of their performance will have the largest reductions in anxiety (Bartholomew & Miller, 2002).

Based on the constructs of this proposed mechanism, Achievement Goal Theory (AGT) could be a promising theoretical framework to explain the anxiolytic effects of exercise. Similar to the mastery hypothesis, task-involved goal orientations define success as mastering a skill and are associated with adaptive behaviors. In a review of the benefits of exercise on mood and affective states Tuson and Sinyor (1993) point out that both motivational and cognitive appraisals are important to understanding this relationship but are often left unstudied. In addition, the authors stated that investigating mastery-oriented goals and the individual's appraisal of whether or not the goals were met is a direction for future research. Taking this approach would consider the psychological variables that are often omitted (Tuson & Sinyor, 1993).

Perceived competence. Perceived competence may also help to explain why exercise can reduce anxiety. Perceived competence refers to an individual's opinion of their ability to

successfully perform a task. Competence is an innate psychological need that serves as the basis of achievement behavior; in addition, competence is at the core of most motivational theories (Elliot & Dweck, 2005). Also, Elliot and Dweck (2005) mention that the need for demonstrating competence is evident in everyday life and throughout the lifespan. An individual's level of perceived competence increases as one is successful in completing a task (Harackiewicz, Manderlink, & Sansone, 1992). Anxiety may affect an individual's level of perceived competence, especially in an evaluative setting. In most cases, anxiety in evaluative settings leads to a decrease in perceived competence because of the presence of worry and distraction of cognitive interference (Elliot & Dweck, 2005). For tasks that require a high level of attention, anxiety can be especially detrimental to an individual's perceived level of his or her competence. In these situations, individuals who are unsure about their ability will have an increase in anxiety leading to a decrease in performance (Craft et al., 2003). Also, competence valuation may have an impact on this relationship. Competence valuation refers to the degree of importance that an individual places on performing well (Harackiewicz & Manderlink, 1984). The level of value an individual applies to competence can be increased with the external contingencies such as rewards or competition.

Other Psychosocial Mechanisms

Distraction hypothesis. Bahrke and Morgan's (1978) distraction or "time out" hypothesis suggests that taking time out of a person's day can alleviate symptoms of anxiety. Based on this hypothesis, taking time out of an individual's day to exercise will distract the individual from his or her stressors and reduce anxiety. Specifically, Bahrke and Morgan (1978) established that acute vigorous exercise led to reductions in state anxiety. However, these reductions in anxiety were the same as individuals who meditated or took quiet rest periods.

Although similar reductions were found for multiple techniques, exercise reduces anxiety symptoms for longer periods of time (Raglin & Morgan, 1985). In addition, exercise produces longer lasting reductions on anxiety than cognitive therapies. For trait anxiety, the distraction hypothesis has been found to be superior in reducing anxiety symptoms when compared to cognitive techniques such as meditation or relaxation (Raglin & Morgan, 1985). There is, however, also some criticism associated with this hypothesis. A review by Yeung (1996) suggests that this hypothesis alone may not explain the anxiolytic effects of exercise. Also, Arent and colleagues (2005) noted that there is a lack of empirical findings in support of the distraction hypothesis.

Social interaction hypothesis. The social interaction hypothesis states that having social support during exercise can help reduce anxiety symptoms. In addition, having mutual support to exercise can have positive effects on overall mental health (Paluska & Schwenk, 2000). However, there has been little evidential support for this mechanism. Even studies that have supported this contention concluded that this hypothesis cannot be used on its own to explain the anxiolytic effects of exercise but can be used in conjunction with other mechanisms (Paluska & Schwenk, 2000). Also, the studies that have supported this mechanism mention that social interaction may be important for initiating exercise but the effects do not last over time (Paluska & Schwenk, 2000).

Achievement Goal Theory

Being physically active is associated with better mental health as well as lower levels of anxiety (Ströhle, 2009). Relatedly, there is sufficient evidence that physical activity is an effective alternative treatment for individuals with clinical anxiety (Rebar et al., 2015; Wipfli et

al., 2008) and can reduce symptoms of state and trait anxiety in both children and adults (Biddle & Asare, 2011; Conn, 2010; Petruzzello et al., 1991). Although the mechanism through which physical activity decreases anxiety remains unclear, based on this well-documented evidence, the question now becomes how can practitioners create an environment that promotes engagement and decreases anxiety? AGT provides a theoretical framework to guide these efforts.

AGT has been a dominant social-cognitive motivational theory used to guide research efforts to understand individual motivation (Roberts, Treasure, & Conroy, 2007). Motivation has been defined as a psychological construct that energizes, directs, and regulates achievement behavior (Roberts et al., 2007). AGT identifies the purposes of goals that help to direct achievement behavior and assumes that every individual enters an achievement setting with the goal of demonstrating competence (Nicholls, 1989). An individual is predisposed to adopt a combination of the two achievement goal orientations: task or ego orientation (Nicholls, 1989). Individuals with task oriented goals define success as personal mastery, while ego oriented individuals define success as outperforming others.

These orientations are not to be viewed as personality traits, although they are considered to be dispositional. These goal dimensions are dynamic and can change based on information received (Roberts et al., 2007). Also these orientations are orthogonal; it is possible to be high or low in both task and ego orientations and any combination of those dimensions. Individuals high in task orientation regardless of the level of ego orientation have the most adaptive motivational profiles (Roberts, Treasure, & Kavussanu, 1996). On the other hand, individuals low in task orientation and high in ego orientation have the most maladaptive motivational profile that is associated with attrition and burnout. Similarly, individuals low in both task and ego orientation are the least motivated (Roberts et al., 1996). Due to the orthogonality of goal orientations, it

may be more important to examine the combination of ego and task orientations instead of each orientation individually (Roberts et al., 2007).

At the situational level, state of involvement represents a combination of an individual's personal dispositional goals and environmental factors. Similar to the goal orientations, two states of involvement exist: task and ego involvement (Nicholls, 1984). An individual with task-involved goals defines success as demonstrating mastery in a specific task (Nicholls, 1984). The main goal of task involved individuals is improvement, and a task involved individual believes he or she can improve through exerting effort. Effort is seen as leading to mastering a task and higher levels of ability (Nicholls, 1984). Task involvement is also associated with learning and a self-referenced criterion for success. Individuals who are task involved are more likely to exhibit adaptive behaviors including choosing challenging tasks, persisting in the face of difficulty, and attributing success to exerting effort (Nicholls, 1984). From a task involved perspective, a sense of achievement is always a realistic possibility due to the internally referenced criteria for success.

On the other hand, ego involvement is externally-referenced and success is defined as outperforming others (Nicholls, 1984). A person who is ego involved could exert effort, but if this person does not perform better than others, the ego involved individual will not feel successful. If an ego involved person does not believe he or she has the ability to outperform others, he or she has little (or no) reason to exert effort (Nicholls, 1984). Also, ego-involved individuals are at a higher risk to display maladaptive behaviors including avoiding challenge and attributing success to ability (Nicholls, 1984). Since success is based on social comparison, improving upon skill is not adequate to generate feelings of competence. However, ego involvement may be advantageous for individuals with high levels of perceived ability. These

two involvements are mutually exclusive but are dynamic and can change based on information that is received (Roberts et al., 2007).

Expansion of AGT

McClelland (1951) hypothesized that there are two distinct types of achievement behavior: focusing on demonstrating competence (approach) and concentrating on avoiding failure (avoidance). Based on this work, Elliot (1997) bifurcated ego (also known as performance) goals into approach and avoidance parts, creating three separate goal orientations: performance-approach goals, performance-avoidance goals and mastery (also known as task) goals. In this trichotomous framework, performance-approach goals define success as outperforming others, while performance-avoidance goals focus on avoiding normative incompetence (Elliot, 1997). Performance-avoidance goals are interpreted as an avoidance orientation because they involve attempting to avoid a negative outcome; the valence of avoidance goals are negative when compared with the positive valence of approach goals. Finally, in the trichotomous framework, mastery goals define success as improvements in skill or mastering a task (Elliot, 1997).

Later, mastery goals were also delineated into avoidance and approach measures to account for negatively valenced, internally-referenced goals, creating a 2x2 framework. This fourth dimension, mastery-avoidance goals, was added to goal theory to incorporate both definitions of success and valences to each goal dimension (this is exhibited in Table 2) (Elliot & McGregor, 2001). Mastery-avoidance goals define success as avoiding doing worse than previously or not losing one's skill (i.e. striving not to lose physical capabilities or doing anything incorrectly). On the other hand, mastery-approach goals define success as besting

previous performance or mastering a task (equivalent to mastery or task goals in the dichotomous model). These goals are accepted to be the optimal orientation because they combine the more desirable definition (personal mastery) and valence (positive) (Elliot & McGregor, 2001).

Table A.2. Definition of Success and Valence of the 2x2 Framework Goal Orientations

		Definition of success	
		Internally-referenced	Normative comparison
Valence	Positive (approaching success)	Mastery-approach goals	Performance-approach goals
	Negative (avoiding failure)	Mastery-avoidance goals	Performance-avoidance goals

In this expanded 2x2 model, Elliot (1999) asserts that each of the four dimensions can be salient at varying degrees depending on the antecedent of the goal. Each of the four goal dimensions functions as the direction of behavior and the antecedent describes the reason why an individual pursues a dimension. Examples of antecedents include fear of rejection, need for approval, need for achievement, and self-esteem (Elliot, 1999). The antecedents can have an impact on achievement-relevant outcomes. For example, an individual with a performance-approach goal undermined with an antecedent of fearing of failure may be resilient and succeed in the short term, but will likely experience anxiety and low self-determination when compared to an individual with a performance-approach goal with an antecedent of wanting to demonstrate competence (Elliot, 1999). Antecedents and consequences of all four goal orientations are listed

in Table 3. Also, in this expanded model, the differing goal orientations are not considered to be orthogonal, but individuals can pursue different orientations simultaneously.

Table A.3. Antecedents and Consequences of the 2x2 AGT Framework

Goal Dimension	Antecedents	Consequences
Mastery-approach	Positive perceptions of ability, perceived situational importance	Optimal set of consequences; enhanced information processing; high levels of control and enjoyment
Mastery-avoidance	Negative perceptions of self and others, reduced self-determination, perceived situational importance	Generally undesirable set of achievement process (anxiety, disorganization)
Performance-approach	Appetitive and aversive motivational dispositions and competence perceptions	Can have positive effect on achievement-related outcomes (strive to do best, require sustained attention, etc.) and negative effect (distract from focusing on own performance)
Performance-avoidance	Avoidance motivational dispositions, reduced competence expectations	Increased distraction and worry leading to self-doubt or can facilitate performance by making an individual work harder or smarter

Note. Adapted from “Understanding the Dynamics of Motivation in Sport and Physical Activity. An Achievement Goal Interpretation,” by G. C. Roberts, D. C. Treasure, and D. E. Conroy, 2007, in G. Tenenbaum and R. C. Eklund (Eds.), *Handbook of Sport Psychology*, p. 14-15. Copyright 2007 by John Wiley & Sons, Inc.

While the 2x2 framework of AGT has shown promise for enhancing the understanding of achievement motivation, there have also been criticisms. First, there has been an argument that the hierarchical model of goal orientations does not capture the dynamic qualities of the goals; most of the work done using the expanded model has been dispositional (Roberts et al., 2007). One way to combat this would be to vary the time when achievement goals are assessed. By doing this, researchers can capture the dynamic link between goals and their consequences (Roberts et al., 2007).

Measurement of AGT. Like anxiety, achievement goals are measured with self-report questionnaires. Two of the most frequently used questionnaires measuring personal achievement goals include the Perception of Success Questionnaire (POSQ) and the Task and Ego Orientation in Sport Questionnaire (TEOSQ). The POSQ is a 12-item questionnaire consisting of six items measuring task goals and six items measuring ego goals. The respondent is asked to answer based off the prompt, “I feel most successful when:.” This instrument has acceptable reliability and construct validity (Roberts & Balague, 1989). The TEOSQ was created to assess task and ego involvement in sport contexts. This questionnaire has the subjects reflect on a time when he or she felt successful and then answer 13 questions representing task and ego orientation. This scale also has demonstrated appropriate validity and reliability (Duda & Whitehead, 1998).

For the expanded model of AGT, the Achievement Goal Questionnaire for Sport (AGQ-S) is often used. This questionnaire was taken from the realm of education and applied to sport (Conroy, Elliot, & Hofer, 2003). The AGQ-S consists of 12 questions describing ways that individuals strive for competence or avoid incompetence. Before completing the questionnaire, participants are asked to think about the way they feel about the present activity they are about to

complete. This instrument is a valid and reliable way to measure approach-avoidance achievement goals (Conroy et al., 2003).

Motivational Climate

Situational factors also play a role in the individual differences in achievement behavior; the structure of the environment can influence an individual to become either more or less task or ego involved. Based on AGT, the motivational climate refers to the environment created by significant individuals, (i.e. teachers, coaches, etc.) in a learning environment (Ames, 1992a). Ames (1992b) postulated that there are two different motivational climates: mastery (or task-involving) climate and performance (or ego-involving) climate. A mastery climate is an environment in which the leader promotes competence in the form of self-improvement and mastering skills. Evaluations in a mastery climate are self-referenced (Ames, 1992b). Also, mastery climates are associated with a variety of positive constructs including high self-esteem, feelings of autonomy and relatedness, and positive affect (Harwood, Keegan, Smith & Raine, 2015). On the other hand, a performance climate is an environment focused on norm-referenced comparisons and outperforming others (Ames, 1992b). In this climate, demonstrating normative ability is valued. Performance climates are linked with undesirable constructs including negative affect, negative worry, and antisocial moral functioning (Harwood et al., 2015). However, some individuals may perform well in this climate; individuals who have higher levels of perceived competence and want to display their superiority may prefer a performance climate (Roberts et al., 2007).

Since AGT has expanded into a two-by-two model, a dichotomous framework describing motivational climate may not be sufficient. Because of this, Guan (2015) proposed four different

motivational climates. The first climate, mastery-approach, is a created climate in which teacher emphasizes learning and understanding and encourages each individual to perform to the best of his or her ability. Next, a mastery-avoidance climate is described as a promoted climate in which the significant leader encourages not performing worse than before or not losing ability (Guan, 2015). Then, a performance-approach climate is an environment in which the teacher emphasizes competition and praises only those who are the most successful. Finally, a performance-avoidance climate is associated with avoiding incompetence or doing worse than others in the class (Guan, 2015).

In addition, the individual's perceptions of the climate are critical in predicting future behavior patterns (Ames, 1992b). Perceptions may be especially important in predicting behavior because each individual has unique prior experiences and can interpret environments differently. An individual's perception of the motivational climate can be influenced by his or her relationship with the significant individual who created the climate (Smith, Balaguer, & Duda, 2006). Individuals perceiving a mastery climate explore for opportunities to improve skill development and feel a sense of control over the task, while perceiving an ego climate is associated with more maladaptive behavior patterns including low levels of sportspersonship (Boyce, Gano-Overway, & Campbell, 2009). Additionally, individuals are more likely to be aware of a performance climate. A possible explanation for this occurrence is that individuals are more aware of negative than positive evaluations (Smith et al., 2016).

Characteristics of each climate are assumed to affect how an individual interprets the criteria of success and guides subsequent achievement behavior. In a mastery climate, individuals are assumed to adopt more adaptive strategies such as seeking out difficult tasks and persisting when faced with challenges (Ames, 1992b). Individuals perceiving a performance

climate, especially with low levels of perceived competence, are likely to adopt maladaptive behavior patterns including reducing effort or giving up completely. As mentioned previously, some individuals may thrive in a perceived performance climate. As long as the individual perceives their ability as high, he or she will continue to seek more difficult challenges to exhibit his or her ability (Ames, 1992b). If the individual's level of perceived competence is threatened, however, he or she is at risk to adopt maladaptive behaviors. Ames (1992b) adapted Epstein's (1989) TARGET framework as a way to describing structures of the different motivational climates. This framework depicts designs of tasks, authority of decision making process, recognition of rewards, grouping of individuals, evaluations of performance, and time dedicated to learning for each climate. Descriptions of each structure can be found in Table 4.

Table A.4. TARGET framework

	Mastery Climate	Performance Climate
Tasks	Challenging and diverse tasks	Absence of variety and challenge
Authority	Choices and leadership roles offered to students	Students not included in decision-making process
Recognition	Private and based on individual progress	Public and based on social comparison
Grouping	Mixed-ability groups	Groups formed based on ability (best to worst)
Evaluation	Based on mastery of tasks and individual improvement	Based on winning and outperforming others
Time	Time allowed adjusted to personal capabilities	Uniform time allocated for all students

Note. Adapted from "Achievement Goals and Classroom Motivational Climate," by C. Ames, 1992, in G. Roberts (Ed.), *Motivation in Sport and Exercise*, p. 263-268. Copyright 1992 by Human Kinetics.

Measuring motivational climate. Perceived motivational climate can be evaluated through a variety of questionnaires. Two of the most frequently used instruments to assess the dichotomous view of motivational climate are the Learning and Performance Orientations in Physical Education Classes Questionnaire (LAPOPECQ) (Papaioannou, 1994) and the Perceived Motivational Climate in Sport Questionnaire (PMCSQ) (Walling, Duda, & Chi, 1993). The LAPOPECQ is a 27-item questionnaire measuring perceptions of mastery and ego created climates in physical education contexts. This survey consists of five factors, two assessing mastery-oriented factors and three assessing performance-oriented factors. This instrument has demonstrated appropriate levels of reliability and validity (Papaioannou, 1994). The PMCSQ examines athletes' perceptions of a coach created motivational climate. This questionnaire is comprised of two dimensions: mastery and performance climate. For this instrument, individuals are asked to respond to 12 items assessing performance climate and nine items assessing mastery climate. Each scale has appropriate levels of validity and reliability (Walling et al., 1993).

To measure the two-by-two interpretation of motivational climate, Guan (2015) created the perceived motivational climate questionnaire in physical activity settings (PMCQPAS). This instrument is comprised of 20 questions with five questions assessing each of the four possible motivational climates. For each question, the individual is asked to respond based on the prompt, "In this class, my instructor...". This questionnaire has exhibited appropriate levels of reliability and validity in physical activity settings (Guan, 2015).

Interaction of Goal Orientations and Motivational Climate

Both situational and dispositional variables play an important role in producing behavior; because of this, an interactionalist approach may help provide a more complete understanding of

the motivation process (Roberts, 2012). An individual's predisposition to adopting a certain goal orientation may be modulated by situational factors, such as perceptions of the motivational climate. When the motivational climate created is not influential, an individual will follow his or her goal orientation (Roberts, Treasure, & Kavussanu, 1997). On the other hand, when the created climate is prominent, the climate will override the individual's dispositional goal orientation. In addition, children and young adolescents may be more susceptible to situational cues than adults and older adolescents (Roberts et al., 1997). While examining the interaction between individual and situational factors may help to paint a more complete picture of motivation; there is limited research in this area.

A parallel can be drawn between the constructs of anxiety and AGT. Nicholls (1984) asserts that individuals have dispositions toward task and ego involvement, somewhat analogous to trait anxiety. Ames (1992a, 1992b) applies AGT using a situational approach focused on perceptions of a mastery or performance climate, parallel to state anxiety. While both approaches acknowledge that individuals have predispositions toward these constructs, the argument has been supported that situational factors can function to enhance or constrain dispositional factors in a specific situation.

Perceived Competence and AGT

Within AGT, individuals with ego-oriented goals and high levels of competence valuation who are outperformed in an evaluative setting are most likely to experience negative affect (Cury, Elliot, Sarrazin, Da Fonseca, & Rufo, 2002). In addition, individuals with performance-avoidance goals are expected to have reductions in their competence valuation (Cury et al., 2002). Competence valuation represents an individual's self-investment in pursuit of

competence; anxiety can impact competence valuation due to the distraction the worrisome thoughts about performance (Cury, Da Fonseca, Rufo, Peres, & Sarrazin, 2003). As previously mentioned, individuals with performance-avoidance goals usually show decreases in competence valuation possible reason for this reduction in valuation could be due to high levels of anxiety (Cury et al., 2003).

The environment an individual is in may also impact perceived competence. A mastery climate fosters perceptions of a person's competence; individuals that perceive a mastery climate are more likely to have higher levels of perceived competence than those in a performance climate because of the focus on self-improvement (Standage, Duda, & Ntoumanis, 2003). In a performance climate, perceived competence may be lower, especially for those who are not confident in their ability (Roberts et al., 2007). In addition, individuals who are unsure about their ability to be successful may have higher levels of state anxiety (Craft et al., 2003).

Research Evidence

Anxiety and Achievement Goals

There has been limited research conducted examining the relationship between anxiety and achievement goals, and much of the work has been cross-sectional in nature. Because of the lack of evidence, few conclusions have been drawn. Also, different conceptualizations of anxiety have been used in different studies. Regardless of the conception of anxiety used, however, there is consistent evidence linking these concepts (Stenling, Hassmen, & Holmstrom, 2014). Roberts (1986) was one of the first researchers to consider the relationship between anxiety and achievement goals. He argues that adopting different orientations can make an individual either more or less likely to experience anxiety. A person adopting an ego orientation is more likely to

experience anxiety in an achievement setting because of the emphasis on externally-referenced success (Ntoumanis & Biddle, 1998). This finding is robust and females are especially vulnerable to heightened anxiety with the adoption of ego oriented goals, based on cross-sectional data of youth sport athletes (Grossbard, Cumming, Standage, Smith, & Smoll, 2007). In these achievement settings, success is based on winning, which includes the performance of oneself and others, and victory is uncertain which can lead to heightened levels of anxiety (Eisenbarth & Petlichkoff, 2012).

On the other hand, individuals who adopt task-oriented goals are not as susceptible to anxiety because of their internally-referenced definition of success (Ntoumanis & Biddle, 1998). Also, the outcome of task oriented goals is more controllable than the focus of ego oriented goals. Eisenbarth and Petlichkoff (2012) determined in their sample of college sport participants that task-oriented athletes are not as susceptible to anxiety because of their internal referencing of success. Based on the research findings, task orientation is unlikely to be related to anxiety (Li & Chi, 2007).

The relationship between anxiety and achievement goals, however, is likely not that simple; perceived competence may play a role in the interaction of these constructs. For example, in their study of university team sport athletes, Ntoumanis and Biddle (1998) determined that before knock-out matches, individuals with a low perception of their competency and ego oriented goals were highly susceptible to anxiety because the outcome was very unstable and uncontrollable. An individual who has ego oriented goals and high levels of perceived competence is not as vulnerable to anxiety as long as he or she is successful (Ommundsen & Pedersen, 1999). In their sample of youth sport athletes, Ommundsen and Pedersen (1999) reported that individuals with task oriented goals and high levels of perceived

competence had the lowest levels of anxiety. Similarly, Abrahamsen and colleagues (2008) reported that perceived competence modulated the relationship between achievement goals and anxiety in their sample of elite athletes. They concluded that as long as an individual's perception of competence remains high, individuals are less likely to experience anxiety with ego oriented goals (Abrahamsen, Roberts, & Pensgaard, 2008). In addition, Ntoumanis and Biddle (1998) found that even if the athletes with high levels of perceived competence felt symptoms of anxiety before the knockout matches, this anxiety was thought to be facilitative to performance.

Furthermore, using a trichotomous or 2x2 framework of achievement goals may be a more advantageous model to explain this relationship. These expanded frameworks are more consistently associated with anxiety because of the inclusion of avoidance goals. Since avoidance goals are more negative in valence and often elicit worries or concerns about performance, they are important to consider in this relationship (Morris & Kavussanu, 2009). In these frameworks, both mastery-avoidance and performance-avoidance goals are associated with higher levels of anxiety than the approach-framed goals (Cury et al., 2003; Morris & Kavussanu, 2009; Sarrazin, 2003; Sideridis, 2008). This robust relationship has been displayed in a variety of settings and populations including sport and physical education and adolescents and young adults. Stenling and colleagues (2014) reported that female adult team sport athletes are more likely to adopt mastery-avoidance goals than other goal orientations, and as a result, have high levels of anxiety. Individuals with mastery-avoidance goals will often have high levels of arousal and "self-handicap" their performance to avoid showing his or her lack of competence (Sideridis, 2008). Because of this and the negative implications and consequences of adopting mastery-avoidance goals, this orientation may have the largest emotional cost on individuals.

Similarly, performance-avoidance goals have been shown to be consistently related to high levels of anxiety (Cury et al., 2003; Goetz, Sticca, Pekrun, Murayama, & Elliot, 2016; Morris & Kavussanu, 2009). In a sample of high school physical education students learning to dribble a basketball, performance-avoidance goals were correlated with the highest levels of anxiety; also, these individuals with performance-avoidance goals took the least amount of time to prepare for the activity (Cury et al., 2003). Based on this finding, performance-avoidance goals diminish the chance of success which can interfere with proper preparation and ultimately can lead to diminished interest in the activity (Cury et al., 2003). Morris and Kavussanu (2009) also reported that youth sport athletes who adopt performance-avoidance goals are more likely to experience symptoms of anxiety before competition. It is also important to note that performance-approach goals can become performance-avoidance goals with negative feedback of performance (Law, Elliot, & Murayama, 2012). A person with low, or even moderate levels of, perceived competence and performance-approach goals who does not outperform others will likely adopt performance-avoidance goals and, as a result, will have increased anxiety as demonstrated by Law et al. (2012). These individuals who do not have high perceived competence are not as confident in their ability and will likely focus on the possibility of failure and commit their attention to avoid doing so.

Anxiety and Motivational Climate

The climate created by significant leaders may also impact an individual's level of anxiety in achievement settings; in fact, Abrahamsen and colleagues (2008) reported that the motivational climate may actually be more influential on anxiety than goal orientations. However, an influential mastery climate can potentially neutralize anxiety symptoms by encouraging the individuals to focus on what he or she can control; this may be especially

important for children since they are particularly susceptible to the influence of the climate (Smith, Smoll, & Cumming, 2007). In one of the only intervention studies examining these variables, Yoo (2003) found that as performance (in this case, tennis skill) increases over time in a mastery climate, anxiety decreases. Individuals in the mastery climate condition were not threatened by social comparison and found the task challenging in self-referent terms and thus were less likely to report high levels of anxiety. Again, perceived competence may play an important role in this relationship. In this study, individuals with low perceptions of competence showed increases in their levels of anxiety and, as a result, decreased performance (Yoo, 2003). In the performance climate condition, anxiety increased which led to impaired performance for individuals with low perceived competence. Individuals in the performance climate condition with high perceived competence showed stable levels of anxiety and performance throughout the intervention (Yoo, 2003). In addition, Abrahamsen et al. (2008) reported that female elite athletes in a performance climate report higher levels of anxiety than males and higher levels of anxiety than athletes in a mastery climate.

There are, however, studies that have not yielded finds that are consistent with the theoretical prediction that a performance climate as opposed to a mastery climate is strongly associated with anxiety. Barkoukis, Koidou, and Tsorbatzoudis (2010) surprisingly reported that individuals in high school physical education placed in either a mastery or performance climate decreased their levels of anxiety and performed the skills at a similar level in either climate. The authors attributed this finding to the fact that the individuals did not perceive the situation (learning triple jump) as threatening as they became more familiar with the task (Barkoukis, Koidou, & Tsorbatzoudis, 2010). This surprising finding was qualified by the authors who suggested that the intervention applied in this study may not have been long enough in duration

and the skills chosen were too simple (Barkoukis et al., 2010). Another finding inconsistent with theory is reported by Cecchini et al. (2001). In their study of elementary physical education students, they reported that individuals assigned to a mastery climate actually had higher levels of somatic anxiety before a sport competition than children in the performance climate (Cecchini et al., 2001). The authors surmised that the students in the performance climate were constantly placed in a pressure-filled environment in which they were expected to perform better than others and, because of the created climate, were better suited to dealing with stressors, in this case, sport competition (Cecchini et al., 2001). An alternative explanation is found when considering the type of anxiety reported. As established in the examination of dimensions of anxiety earlier in this review, somatic anxiety may not be detrimental, but in fact may facilitate performance, so the increase in somatic anxiety might not have had a negative effect. Additionally, these studies that did not report a relationship between a performance climate and anxiety did not use a 2 X 2 framework that encompasses the avoidance valence.

Summary and Conclusions

Anxiety is a mental health problem that affects many individuals; people who are inactive are at a higher risk of developing anxiety (Ströhle, 2009). It is well-documented that exercise can be used as an alternative method for alleviating symptoms of anxiety. Exercise has been shown to be just as effective in reducing clinical anxiety as more traditional treatments such as cognitive behavioral therapy and pharmaceutical drugs (Wipfli et al., 2008). In addition, when individuals who suffer from high levels of anxiety, they may view physical activity settings as anxiety-provoking, and this could prevent them from participating in exercise. Because of this, it is important for practitioners to create environments in which all individuals can feel competent, experience mastery, and hopefully continue to be physically active. Although there is significant

evidence for the anxiolytic effects of exercise, the mechanism explaining how exercise can reduce symptoms of anxiety is still debated. Based on the previously explored mechanisms, AGT may be a useful theoretical framework to help explain the relationship between anxiety and exercise.

With regard to AGT, previous research examining the relationship between anxiety and achievement goals has determined that adopting task oriented goals is effective for most individuals in helping to reduce anxiety because of the control and focus on internal referencing (Eisenbarth & Petlichkoff, 2012; Li & Chi, 2007; Ntoumanis & Biddle, 1998). Though ego oriented goals are usually associated with high levels of anxiety, adopting ego oriented goals may not increase anxiety as long as the person has high perceived competence and he or she is successful in outperforming others (Abrahamsen et al., 2008). Furthermore, using expanded models of AGT such as the trichotomous or the 2x2 framework is perhaps a better approach to use to explain this relationship. In these models, the avoidance-framed goals are associated with high levels of anxiety (Cury et al., 2003).

The motivational climate instilled by significant others may also play a role in this relationship. Promoting a mastery climate is associated with lower levels of anxiety, and promoting a performance climate is usually related to higher levels of anxiety (Abrahamsen et al., 2008). However, there is not as much consistent evidence linking motivational climates and anxiety. Some studies have reported no differences in anxiety levels in contrasting climates and even higher levels of anxiety in a mastery climate (Barkoukis et al., 2010; Cecchini et al., 2001). Since there are some inconsistencies in the current literature, it is important for more research to be conducted to gain a clearer understanding of the relationship among these constructs.

The most evident implication is to create an environment in which every individual has the opportunity to succeed. To do this, and to keep anxiety levels low, coaches and teachers should promote a mastery climate. Since this climate is associated with adaptive behaviors, including reduced anxiety, instructors should focus on helping their students to improve their own performance rather than focusing on the performance of others. In addition, coaches and teachers should try to encourage their students to adopt task or mastery-approach goals. By adopting these goal orientations, the student is focusing on an outcome that he or she can control. The negative valence of avoidance goals is associated with negative affect and anxiety, so it is also important to focus on approach goals directed toward achieving success rather than avoiding failure. Also, practitioners creating climates need to be sensitive to physical activity settings; these settings can be intimidating, especially if one is not familiar with the environment. For example, an individual going to an exercise facility for the first time that has no experience using equipment could find this environment anxiety-inducing. It is important for the individuals working at that facility to create a welcoming environment and to help new individuals in a nonthreatening way. By doing this, the new exerciser will feel welcomed and will be more likely to come back and exercise in the future. If an appropriate motivational climate can be structured to decrease state anxiety in physical activity settings, this could lead to increased engagement in physical activity that could lead to decreases in trait or generalized anxiety.

Directions for Future Research

It is important to understand how one's interpretation of anxiety interacts with his or her goal orientations, perceived motivational climate, and perceived competence and how these interactions can affect future physical activity participation. There are two broad avenues for future investigations of the relationships among anxiety, physical activity, and motivational

climate that could yield valuable insight for researchers and practitioners. First, it is central to this line of research to gain a better understanding of the mechanisms through which physical activity decreases anxiety and benefits mental health. Several theoretical perspectives were presented as possible explanations in this review, but the antecedents and consequences inherent in the complex network of relationships related to physical activity and anxiety have not been established. Correlational designs that encompass constructs embedded in these theoretical perspectives have the potential to explain variables that moderate or mediate the relationship between physical activity and decreased anxiety, and intentions to continue to be physically active. I have tried to make the case in this review that considering achievement goal theory constructs and a focus on self-beliefs in theoretical models to test the relationships among these variables is a viable approach that can make a contribution to the literature.

The second avenue of research that has rich potential to inform researchers and practitioners as they strive to design physical activity interventions to decrease anxiety and promote mental health is to more closely examine the effect of motivational climates. Theoretical predictions are that a mastery, approach-focused climate should decrease anxiety, but the research findings are not robust. Much of that literature is rooted in sport contexts and it is questionable how well that will translate to more generalized physical activity or exercise contexts. Additionally, some work that has been done in class settings has not supported theoretical assertions. There is a need for research designs that test the efficacy of climates structured to promote mastery approach goals and that document the effects of performance avoidance constructs. It is important to examine how structured climates affect an individual's level of state anxiety and intentions to continue that activity. In conclusion, physical activity is beneficial for reducing anxiety and improving one's overall mental health, therefore it is important

to create environments in which individuals do not view as threatening and feel comfortable being active so they will continue being physically active.

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APPENDIX B: STUDY ONE INFORMED CONSENT

Consent Form

1. Study Title: Exploring the Relationships Among Achievement Goal Theory, State Anxiety, and Intentions to Be Physically Active
2. Performance Site: Louisiana State University and Agricultural and Mechanical College
3. Investigators: The following investigator is available for questions about this study:
M-F, 8:00 a.m. - 4:30p.m., Timothy Dasinger: 601-942-9087; Dr. Melinda Solmon 225-578-2913
4. Purpose of the Study: To examine relationships among tenets of Achievement Goal Theory, anxiety, and intentions to be physically active.
5. Subject Inclusion: Students enrolled in Kinesiology activity classes
6. Study Procedures: Researchers will administer questionnaire to all consenting students during regularly scheduled class time.
7. Benefits: Information from this study will be used to better understand the relationship among these constructs.
8. Risks: The risks of participating in this study are similar to those experienced in ordinary life. All information will be stored in secure cabinets, and the investigators will be the only people with access to the data.
9. Right to Refuse: You may choose not to participate or to withdraw at any time without penalty or loss of any benefit.
10. Privacy: Results of the study may be published, but no names or identifying information will be included in the publication. Your identity will remain confidential unless disclosure is required by law.
11. Signatures:
The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dennis Landin, Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb. I agree to have my child participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

Subject Signature: _____ Date: _____

Subject Name: (printed) _____

Institutional Review Board
Dr. Dennis Landin, Chair
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Exempted by Dr. Landin

APPENDIX C: STUDY ONE INSTRUMENTATION

PMCQPAS In this class, my instructor:	Not at all true	Somewhat untrue	A little untrue	Indifferent	A little true	Somewhat true	Very true
Is happy when we are improving after showing some effort	1	2	3	4	5	6	7
Gives special treatment to those students who do best	1	2	3	4	5	6	7
Tells us that it is important that we don't look worse than others	1	2	3	4	5	6	7
Points out that it is important for us not to perform worse than before	1	2	3	4	5	6	7
Really wants us to enjoy learning new things	1	2	3	4	5	6	7
Makes it obvious when certain students are not doing well on their skill performance	1	2	3	4	5	6	7
Often tells us that it is important to avoid failing	1	2	3	4	5	6	7
Says that showing others that we are not	1	2	3	4	5	6	7

doing poorly in the activity is important							
Is happy when we show improvement in our learning	1	2	3	4	5	6	7
Usually lets us know which student performs best	1	2	3	4	5	6	7
Tells us that is important to avoid doing anything wrong in our learning	1	2	3	4	5	6	7
Tells us it's important to join in activities so we don't look unskilled	1	2	3	4	5	6	7

Thill and Cury's State Anxiety

Please respond to each question with how you feel before participating in this class.	Don't agree at all	Somewhat disagree	Indifferent	Somewhat agree	Agree completely
When I think about participating in this class, I am apprehensive about making mistakes.	1	2	3	4	5
I experience unpleasant feelings before this class.	1	2	3	4	5
I feel very little anxiety before participating in this class	1	2	3	4	5
I am relaxed before this class.	1	2	3	4	5

Competence Valuation

1. How important to you is your performance on this activity?

1	2	3	4	5	6	7
Not at all important	Somewhat unimportant	A little unimportant	Neutral	A little important	Somewhat important	Very important

2. I care very much about how I do on this activity.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

Intention

After this semester, I intend to do this activity again.	1 Very unlikely	2 Unlikely	3 Somewhat unlikely	4 Indifferent	5 Somewhat likely	6 Likely	7 Very likely
I plan to participate in this activity again in the future.	1 Very unlikely	2 Unlikely	3 Somewhat unlikely	4 Indifferent	5 Somewhat likely	6 Likely	7 Very likely
I am determined to do this activity again.	1 Very unlikely	2 Unlikely	3 Somewhat unlikely	4 Indifferent	5 Somewhat likely	6 Likely	7 Very likely

Perceived Competence

I think I am pretty good at this activity	1 Strongly Agree	2 Agree	3 Somewhat Agree	4 Indifferent	5 Somewhat Disagree	6 Disagree	7 Strongly Disagree
I am satisfied with my performance in this activity	1 Strongly Agree	2 Agree	3 Somewhat Agree	4 Indifferent	5 Somewhat Disagree	6 Disagree	7 Strongly Disagree
After participating in this activity, I feel pretty competent	1 Strongly Agree	2 Agree	3 Somewhat Agree	4 Indifferent	5 Somewhat Disagree	6 Disagree	7 Strongly Disagree
I am pretty skilled at this activity	1 Strongly Agree	2 Agree	3 Somewhat Agree	4 Indifferent	5 Somewhat Disagree	6 Disagree	7 Strongly Disagree
I couldn't do this activity well	1 Strongly Agree	2 Agree	3 Somewhat Agree	4 Indifferent	5 Somewhat Disagree	6 Disagree	7 Strongly Disagree

Achievement Goal Question in Sport

Please respond to each item based on your thoughts and feelings about this activity.

	Completely like me		50% like me		Completely unlike me		
1. It is important to me to perform as I possibly can.	1	2	3	4	5	6	7
2. My goal is to avoid performing worse than everyone else	1	2	3	4	5	6	7
3. It is important for me to master all aspects of my performance	1	2	3	4	5	6	7
4. I worry that I may not perform as I possibly can.	1	2	3	4	5	6	7
5. Sometimes I'm afraid that I may not perform as well as I'd like.	1	2	3	4	5	6	7
6. It is important to me to do well compared to others.	1	2	3	4	5	6	7
7. I'm often concerned that I may not perform as well as I can perform	1	2	3	4	5	6	7
8. It is important for me to perform better than others.	1	2	3	4	5	6	7
9. My goal is to do better than most other performers.	1	2	3	4	5	6	7
10. I just want to avoid performing worse than others.	1	2	3	4	5	6	7
11. I want to perform as well it is possible for me to perform.	1	2	3	4	5	6	7
12. It is important for me to avoid being one of the worst performers in the group.	1	2	3	4	5	6	7

APPENDIX D: STUDY TWO INFORMED CONSENT

Consent Form

1. Study Title: Using Critical Incident Technique to Explore Anxiety in Physical Activity Settings
2. Performance Site: Louisiana State University and Agricultural and Mechanical College
3. Investigators: The following investigator is available for questions about this study:
M-F, 8:00 a.m. - 4:30p.m., Timothy Dasinger: 601-942-9087; Dr. Melinda Solmon 225-578-2913
4. Purpose of the Study: To investigate anxiety-producing events that may prevent individuals from participating in physical activity.
5. Subject Inclusion: Students enrolled in Kinesiology classes
6. Study Procedures: Students will be recruited from junior and senior level courses. Professors may provide extra credit for participation. Participants will denote their physical activity level then complete the critical incident survey.
7. Benefits: Information from this study will be used to better understand the relationship among these constructs.
8. Risks: The risks of participating in this study are similar to those experienced in ordinary life. All information will be stored in secure cabinets, and the investigators will be the only people with access to the data.
9. Right to Refuse: You may choose not to participate or to withdraw at any time without penalty or loss of any benefit.
10. Privacy: Results of the study may be published, but no names or identifying information will be included in the publication. Your identity will remain confidential unless disclosure is required by law.
11. Signatures:
The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Dennis Landin, Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb. I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

By answering the questions and completing the survey online, I agree to participate and give consent to use my answers in the study described above.

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Exempted by Dr. Landin

APPENDIX E: STUDY TWO INSTRUMENTATION

CIT prompt

Anxiety is defined as a person's reaction to a stressful situation. It is usually an uncomfortable feeling characterized by tension and nervousness. People often avoid situations that make them feel anxious. I am interested in learning about what might make an individual feel anxiety in physical activity settings. Please take your time responding to these prompts and answer honestly. Don't put your name on the form- your responses are anonymous.

Think of a specific event when a physical activity setting (physical education, activity class, youth sport, visit to a workout facility, etc.) made you feel anxious (nervous or uncomfortable) and explain it in detail.

When did this event take place?

What about this event specifically made you anxious?

Thinking about this event, describe how significant individuals (teachers, coaches, peers, etc.) contributed to your anxiety.

Describe, in detail, how this event affected your decision to participate in the activity again.

What strategies could be used to decrease anxiety in the situation you described?

VITA

Timothy Michael Dasinger was born in St. Louis, Missouri and raised in Madison, Mississippi. He is the youngest of four high-achieving siblings and the son of exemplary parents. He grew up around the pool and quickly found his love of swimming. From getting a scholarship to an SEC school to achieving his lifelong dream of qualifying for Olympic Trials, swimming has always been a constant in his life and many of his memories are from his time in the water. His interest in sport and exercise psychology also grew from his swimming experiences, and he hopes to continue researching topics surrounding anxiety and physical activity. Upon completion of his degree, he will begin work as an Assistant Professor at University of Tennessee-Martin.