

July 2022

Trait Anxiety in Mixed Martial Artists

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Recommended Citation

Pino, Julian; van Hauwermeiren, Olivier; Kwamanakweenda, Jordan; Peacock, Corey; and Tartar, Jaime (2022) "Trait Anxiety in Mixed Martial Artists," *NeuroSports*: Vol. 1: Iss. 2, Article 3.

Available at: <https://nsuworks.nova.edu/neurosports/vol1/iss2/3>

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Trait Anxiety in Mixed Martial Artists

Abstract

ABSTRACT

Mixed Martial Arts (MMA) is a hybrid combat sport incorporating techniques from boxing, wrestling, Judo, Jiu-Jitsu, Karate, Muay Thai (Thai boxing), and other disciplines. Having only been deemed a competitive sport in 1993 by the Ultimate Fighting Championship (UFC), not a lot of research has been done on these athletes. Research done so far on other areas of athletics has shown that personality traits can predict various cognitive, affective, and behavioral outcomes. Furthermore, elevated levels of Trait Anxiety have been shown to deteriorate non-MMA athletes' overall performance in high-pressure situations. The present study aimed to investigate the presence of Trait Anxiety in both professional fighters and Mixed Martial Artists, thenceforth comparing them to the control of non-Mixed Martial Artists. The hypothesis was that MMA and professional fighters would have significantly higher scores of trait anxiety on the State-Trait Personality Inventory (STPI) scale while scoring significantly lower on the secondary subscales of trait anger, trait depression, and trait curiosity. The independent samples T-test score for the subscale of trait curiosity on the STPI revealed a significantly greater trait curiosity score for fighters ($M = 6.25$, $SD = 1.89$) relative to the control group ($M = 5.20$, $SD = 2.29$), $t(63) = 2.01$, $p = .048$. According to Cohen's d , this effect is considered medium-to-large, $d = .502$. The independent samples T-test score for trait anxiety comparing the fighters ($M = 10.92$, $SD = 4.33$) to the control group ($M = 11.38$, $SD = 5.44$) was not significant, $t(63) = -.382$, $p = .704$. The T-test scores when measuring trait anger for the fighters ($M = 16.50$, $SD = 5.71$) and the control ($M = 16.51$, $SD = 7.12$) was not significant, $t(63) = -.010$, $p = .992$. Lastly, the T-test scores when measuring trait depression between the fighters ($M = 7.25$, $SD = 2.72$) and the control ($M = 6.89$, $SD = 3.22$) was also not significant, $t(63) = .480$, $p = .633$.

Key words: Trait Anxiety, Professional Fighters, STPI

Trait Anxiety in Mixed Martial Artists

Introduction

An estimated 2% of the U.S. population is afflicted by debilitating Performance Anxiety (PA) (Powell, 2004). PA can present in various forms. For instance, it can identify itself as stage fright, writer's block, clamping up, or choking up. PA can be so crippling that the individual (the athlete, musician, performer, or public speaker) cannot continue their activity, speech, or game. Professional athletes must perform at the ultimate competitive levels possible because, to win or succeed at their respective sport, they may have to compete against someone regarded as the best in the world at that sport. It is a common belief among psychologists in the field of Sports Psychology that the presence of a high level of Competitive Trait Anxiety would deteriorate an athlete's performance in sports (Weinberg & Gould, 2011; Ortiz, 2006). Mixed Martial Arts (MMA) has been on the rise since its inception in 1993. That year the first Ultimate Fighting Championship (UFC) bout took place in Denver, Colorado. Since then, the UFC has held bouts worldwide, becoming a multi-billion-dollar enterprise with exclusive television rights with ESPN. In a highly competitive sport where the slightest sign of weakness could mean defeat, it is vital for MMA athletes to be fully in-tune with their bodies and mental health.

Trait Anxiety refers to the stable tendency to attend to, experience, and report negative emotions such as fears, worries, and anxiety across many situations. This is part of the personality dimension of neuroticism versus emotional stability (Gidron, 2013). An example of this would be a soccer player experiencing elevated Competitive Trait Anxiety taking a penalty kick; he/she would likely be predisposed to view the situation as threatening. This predisposition would lead them to have negative thoughts, which could then lead to a greater somatic (bodily) response to the pressure of the situation. In the end, this would result in an impaired shot and a negative performance outcome (Weinberg & Gould, 2011).

Despite a multitude of published studies on anxiety relating to game performance in professional athletes, no current study has focused exclusively on Trait Anxiety with Mixed Martial Artists. Thus, the focal point of this study is to test for Trait Anxiety in professional Mixed Martial Artists and compare their scores to those of a control population of college-aged students. Previous studies have shown the skill level of an athlete seemed to have an impact on the level of anxiety the athlete experienced (Hembree, 1988; Jones, 1995). These studies however were done on Mixed Martial Artists at lower levels of competitiveness than that of the current study's test participants. The fighters used in the current study are at the top of the MMA profession, fighting for companies such as the UFC, ONE Championship and Bellator. Moreover, what was previously documented on non-Mixed Martial Arts athletes is that higher skilled athletes

reported lower levels of anxiety before and during competitions (Mahoney & Meyers, 1989; Cox et al., 1993).

Anxiety was defined by Freud as “something felt,” an emotional state which included feelings of apprehension, tension, nervousness, and worry accompanied by physiological arousal (Freud, 1905). Consistent with Darwin's evolutionary perspective, Freud observed that anxiety was adaptive in motivating behavior which helped individuals cope with threatening situations and that intense anxiety was prevalent in most psychiatric disorders. In measuring anxiety, Cattell (1966) emphasized the importance of distinguishing between anxiety as an emotional state and individual differences in anxiety as a Personality Trait. Specifically, to sports, one of the main factors that affect an athlete's performance is his/her/their ability to cope with anxiety. Symptoms can be physical, for instance, excessive sweating or muscle fatigue, or cognitive, such as worry or nervousness. Research in this area of PA has been completed to try to find methods of coping or reducing this anxiety in athletes.

One such study tried to utilize the coping strategy of Imagery and Visualization to lower anxiety levels (Parnabas, Mahamood, 2011). The authors of the study believed visualization and imagery would not only reduce anxiety but improve performance as well. The sample consisted of 844 athletes who were drawn from athletes who competed in the MASUM (Sports between Universities), MSSM (Sports between Schools) and the Sukan Olimpik Muda (Young Olympic Athletes Sports). The instrument used for the study was comprised of the Competitive State Anxiety Inventory-2 and the Cognitive Coping Anxiety Strategies. The results revealed that athletes who utilized the imagery techniques the most, highlighted by those who visualized green space the most, experienced the lowest level of anxiety. Those who used visualization and imagery the least exhibited the highest levels of anxiety. The researchers went on to state they believe all sports psychologists, sports counsellors and coaches should recommend their athletes use imagery as a coping strategy to reduce anxiety (Parnabas, Mahamood, 2011).

An additional study focused on the use of psychological skills in the professional athletic population and examined the psychological skills prevalent in collegiate Rodeo Athletes (Mahoney and Meyers, 1989). In the study, researchers administered the Psychological Skills Inventory for Sports (PSIS-R5; Mahoney, Gabriel, & Perkins, 1987) to 215 collegiate Rodeo Athletes from the National Intercollegiate Rodeo Association. The group consisted of 149 males and 66 females, with a mean age of 20.4. Psychological constructs identified by the researchers were: anxiety management, concentration, confidence, mental preparation, motivation, and team emphasis. The results showed no significant differences ($F = 1.20$; $P = 0.26$) in psychological skills across the events. Male athletes however, scored significantly higher in anxiety management,

concentration, and confidence compared to their female counterparts. Highly skilled competitors also scored significantly higher in anxiety management, concentration, confidence, and motivation than lower skilled athletes. These results indicate that, at the time in collegiate Rodeo Athletes, psychological skill patterns were evident even though they did not vary by event. However, these patterns were more inconsistent than patterns found in athletes in more traditional sports which were tested at that time. The researchers believed this was likely to be a function of specific cognitive skills required for human vs animal competition, which are unique to this sport. This study uniquely added to the literature that there were now perhaps differences with anxiety and coping skill by gender as well. It was then concluded that assessment of psychological skills may enhance predictions of athletic potential in this sport (Mahoney and Meyers, 1989).

Thus, the present study's purpose is to investigate the presence of Trait Anxiety in both professional fighters and Mixed Martial Artists and compared them to the control (non-Mixed Martial Artists). The hypothesis is that MMA and professional fighters would have significantly higher scores of trait anxiety on the State-Trait Personality Inventory (STPI) scale while scoring significantly lower on the secondary subscales of trait anger, trait depression, and trait curiosity. As previous research has shown, anxiety can be detrimental to professional athletes at various levels of competition, and little to no research has been done involving this specific group of athletes. The aim is to provide the first step and insight into this athletic arena so more research can be done to better help these unique group of athletes.

Methods

Procedures

The university's institutional review board approved all study procedures prior to collecting any data. When the participants agreed to participate in the survey, they were sent a link to access the online survey on the Qualtrics website. Researchers also asked friends and acquaintances if they would be interested in participating. Additionally, a comparison control group was recruited from college students taking psychology. Both groups of participants could to complete the electronic survey on their own time. Participants were recruited between January 2020 through April 2021. They were not given any financial compensation for completing the study. Participation in the study was voluntary.

Participants

The participant sample comprised of professional fighters who are currently active in their respective sport and compete in various disciplines (e.g., MMA=32, boxing=2, kickboxing=1, Judo=1). The sample consisted of professional fighters (N=36, M age = 30.03, and SD = 3.87). The professional fighters group consisted of a total of 36 male fighters with age ranging from 20 to

38 ($M = 30.03$, $SD = 3.873$) and 29 male college-aged non-fighters with age ranging from 19 to 34 ($M = 23.83$, $SD = 3.536$). Of the fighters, 17 identified as White or Caucasian (47.2%), seven as Black or African American (19.4%), four as Asian or Asian American (11.1%), and eight as other (22.2%); 5 fighters identified as Hispanic, Latino, or Spanish Origin (13.9%). A majority of the comparison group identified as White or Caucasian ($n = 18$, 62.1%); of the remaining participants, four identified as Black or African American (13.8%), 4 as Asian or Asian American (13.8%), and three as other (10.3%). Nine participants in the comparison group identified as Hispanic, Latino, or Spanish Origin (31%). Of the professional MMA fighters, 18 actively competed in one of the big three promotions (UFC $n = 10$, Bellator $n = 4$, ONE Championship $n = 4$), while 18 competed in smaller promotions (Titan FC, LFA, etc.). Females were also recruited, but females were ultimately excluded from the final analyses due to the low number of female fighters recruited. Additionally, two control group participants were excluded because they were older than college-aged.

Measures

Participants completed a battery of measures consisting of 125 total items. The four measures of the battery include the Difficulties in Emotional Regulation Scale (DERS-18) (Victor & Klonsky, 2016), the State-Trait Personality Inventory (STPI Form Y; Trait subscales only) (Spielberger, 1995), Sensation Seeking Scale Form V (Zuckerman, 1979), Dark Triad Personality (D3-Short) (Paulhus & Jones, 2011) test and a self-efficacy question. The 80-item State-Trait Personality Inventory (STPI, Form Y) comprises eight 10-item scales for measuring state and trait anxiety, anger, depression, and curiosity (Spielberger, Ritterband, Sydeman, Reheiser, & Unger, 1995). The 10-item STPI S-Anxiety and T-Anxiety scales comprise the items with the best psychometric properties that were selected from the 20-item STAI (Form Y). The 10-item STPI State and Trait Anger scales include the same items as the original STAXI S-Anger and T-Anger scales. For this study and battery given to the participants, the state portions of the STPI were removed, and only the trait anxiety questions were administered.

Participants in the study were asked to follow a hyperlink in the given email to complete the survey utilizing the online software provided by Qualtrics. Participants were recruited from various gyms and training facilities throughout the United States. The complete battery consisted of four questionnaires, as well as one self-efficacy question, which equaled 125 total items, excluding items from a demographic questionnaire. With the understanding that an athlete's time is limited and extremely valuable, the battery was kept at what was deemed a reasonable number of items.

Results

All data was analyzed using IBM SPSS Statistics, Version 27 for Mac. All p -values $< .05$ were considered statistically significant, and two-tailed p -values

were reported. Mean scale scores were calculated by taking the mean score of the items and reverse scoring when necessary. To test our hypothesis that the fighters would have a significantly higher trait anxiety score than the control but significantly lower trait depression, anger, and curiosity, we used an independent-samples t-test. Results of Levene's Test indicated the assumption of equal population variances was tenable, $F = .890$, $p = .349$. The independent samples T-test score for the subscale of trait curiosity on the STPI revealed a significantly greater trait curiosity score for fighters ($M = 6.25$, $SD = 1.89$) relative to the control group ($M = 5.20$, $SD = 2.29$), $t(63) = 2.01$, $p = .048$. According to Cohen's d , this effect is considered medium-to-large, $d = .502$.

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The statement "I feel interested" was one of the statements that showed a significant difference between the fighters and the control group. The fighters' average score on the t-test was $M = 3.24$ and $SD = .741$, $t(57) = 2.09$, $p = .041$. According to Cohen's d , this effect is considered medium-to-large, $d = .550$. It is possible that because this individual question (out of the set of trait curiosity questions on the STAI) is worded in a way that leaves it up to the reader to determine its meaning, each participant may have answered it according to an internal set of expectations. The other questions, such as "I feel like exploring my environment" and "I feel satisfied with myself," are more specific and easier to set in behavior terms.

Figure 1.

Spielberger Trait Anxiety	<u>Fighters</u>		<u>Students</u>		$t(59)$	p	Cohen's d
	M	SD	M	SD			
Trait Anxiety +	11.52	3.43	14.68	3.93	-3.321	.002	3.64

Trait Curiosity +	23.44	3.66	21.04	3.31	2.619	.011	3.52
Trait Anger +	17.72	4.13	21.08	5.22	-2.796	.002	4.61
Trait Depression +	7.77	2.09	9.00	2.67	-1.997	.050	2.35
Trait Anxiety -	6.02	2.07	6.84	1.67	-1.622	.110	1.92
Trait Curiosity-	6.66	1.12	6.04	0.97	2.259	.028	1.06
Trait Depression -	9.11	2.89	10.88	2.77	-2.387	.020	2.84

Figure 1. Significance for p value is set at < 0.05 .

Discussion

One of the possible explanations explored for the T-curiosity scores of professional fighters being statistically higher when compared to the control group could be that the martial arts are intertwined with religiosity and spirituality. Throughout the arts, especially in the martial arts founded in Asia, meditation is incorporated as part of the training using a mix of certain Buddhist, Taoist, and Confucian philosophies. The practice and use of meditation and mindfulness help fighters become more in-tune with their emotions and help them control and maintain their homeostasis. Aikido practitioners have a strong philosophical belief in the flow of energy and peace (Encyclopedia Britannica, 2020). In this Japanese style of martial arts, you can see these philosophies and teachings mentioned more clearly. These teachings were idealized by the art's founder Morihei Ueshiba. In Aikido, when practitioners are taught non-physical qualities of combat, certain concepts like "beginner's mind" are recurrent and taught to the fighters. These phrases, especially the "empty mind," could be seen and heard in mindfulness activities and scripts. Another such style of martial arts, Korea's Taekwondo, places an explicit emphasis on the development of the practitioner's spiritual and philosophical development (Encyclopedia Britannica, 2020). A common theme in this Korean martial art is the value of "inner peace" in its practitioner. This "inner peace" is stressed to be achievable only through individual meditation and training. However, when looking at the data collected, there was no significant difference between spirituality and religiosity between the fighters and nonfighting control groups.

The second aspect of martial arts sport is that these fighters need to be open to learning and trying foreign techniques to improve to be successful. Many

successful fighters have stated that their success was down to training every day, learning new techniques and styles to pin the opponent or cause them to “tap out,” which means they would win the fight in their sport. The spirituality/religiosity would only reinforce these behaviors in the fighters and could explain why they were significantly different compared to the control. Being curious and exploring the inner self and the world around you are facets of the martial arts and the sport. A similar approach to the study is represented by Kashdan (2002), who defines trait curiosity as a general tendency towards the recognition, pursuit, and integration of novel and challenging information and experiences. To illustrate the dispositional aspect of curiosity (trait curiosity), such notions as breadth and depth of curiosity are used (Litman & Spielberg, 2003; Silvia & Kashdan, 2009). Breadth is operationalized as the number of factors making the individual interested or curious, while depth refers to how this state is maintained and developed to appropriately integrate the new knowledge and experience. Thus, a person with a high curiosity would experience state curiosity in a wider range of various circumstances, more readily, more frequently, and over longer periods of time as compared to an individual with a low curiosity level. It should be noted that people usually rate their curiosity higher than that of their peers, which suggests that this property is rather desirable (Renner, 2006).

A well-known psychological construct similar to trait curiosity is openness to experience, included in the five-factor model of personality traits, or the Big Five, together with conscientiousness, agreeableness, extraversion, and neuroticism (McCrae & Costa, 1992). Openness to experience is defined as actively seeking new experiences accompanied by tolerance and readiness to explore the unknown. A person open to experience is curious, creative, original, imaginative, has a wide range of interests, and appreciates novelty, while a low level of this trait denotes conventionality, preference for the plain, earthbound, straightforward, and familiar a lack of artistic interests.

The study is one of the first in this field of literature to gather significant data on the high number of professional MMA fighters actively competing at the highest level of their field. It is vital for the long-term and continuous growth of this sport and for the athletes participating in it to be studied and tested. The following study also added to the literature in this area by analyzing personality characteristics, levels of aggression, and overall wellness of Mixed Martial Artists (Kerulis, 2011). This study was a useful model for the present study in that they used a similar MMA population; although they operationally defined an MMA fighter as someone who participates in courses or trains at a gym, we sampled professional MMA fighters who compete in professional bouts. In the Kerulis (2011) study, researchers wanted to create a profile that would provide counselors with a working model of general wellness that could be applied to the counseling population, which would be used to help the Mixed Martial Artists. The

participants were thirty-four adult male Martial Artists, of which 73.5% were men and 26.5% were female. The testing battery included personality measures (NEO-FFI) and sports-related aggression using the Bredemeier Athletic Aggression Inventory (BAAGI). The study results suggested that MMA athletes tend to have a normal personality profile with aggression levels that fall near the mode of the BAAGI scales. Additionally, they appeared to have high levels of wellness based on self-reports. The only significant gender difference was observed on the Neuroticism factor, for which women ($M = 53.4$, $SD 3.1$, $T = 2.2$, $p = .03$) scored higher than men ($M = 45.8$, $SD 8.7$), indicating women and men have different emotional fluctuations when reacting to various events and situations (Keruliss, 2011). Gaining a complete understanding of the sport and the artists who participate in it could help us explain and be more knowledgeable of the limits and abilities of the mind and body. As previous studies have shown, one of the most impactful factors on performance is indeed anxiety.

A similar study that measured anxiety in athletic performance analyzed “choking.” The study suggested an athlete’s tendency to choke versus the athlete performing better than usual (i.e., “clutch”) depends on his or her personality. Previous research has concluded that certain situational influences, such as pressure, can result in a reliance on explicit (versus implicit) knowledge even though athletes and performers would rather lean on the other. The study integrated these hypotheses and tested a structural equation model (SEM) to predict sports performance under pressure (Otten, 2009). Two hundred twenty-one participants were prompted to attempt two sets of 15 basketball free throws, during their second set of shots, they were videotaped as manipulation of pressure. The model suggests that “reinvesting” attention in the task leads to greater anxiety (cognitive and somatic), which then predicts a higher level of self-focus. Self-focus did not improve performance under pressure, whereas feelings of self-reported “perceived control” did help performance. Researchers believed these results could have huge implications in sports, specifically for athletes in high pressure situations or sports with a large following. Investigators concluded areas of future studies should be conducted on athletes’ personalities and interpersonal and intrapersonal relationships. They also concurred the health and positivity of these areas could be shown to correlate with performance in sports (Otten, 2009). This follows along the lines of our understanding of why the Mixed Martial Artists tested higher in trait curiosity.

Limitations and Future Directions

One future direction would be to measure PA levels during pre-fight camps at intervals such as one month out, two weeks out, and one week out. Another would be to measure at which point the athletes’ anxiety spikes so therapy and interventions could be implemented to help them get back to optimum levels. It would be interesting to test them post-fight, to see if the results

of the fight impact their anxiety levels as a whole. Certain promoters and promotions, one such being the UFC, fighters are signed on for a set number of fights. Depending on the results of the set number of fights, the UFC will determine how many more fights they will sign you up for with them or if you will even be with the UFC in the immediate future. If a fighter loses more than two fights in a five-fight span, they risk not being renewed, especially if the fighter is older. It is presumed that this pressure surely mounts on the fighters as soon as they lose that first fight, particularly with older fighters or fighters without a large fan following that can mask their losing streak with high pay-per-view buys.

A limitation of the study was that the fighters only had time to complete the STPI once due to the nature of their Mixed Martial Arts. This is due to the fighters being incredibly busy training and in varying stages of their fight camps. It took the fighters around 20 minutes on average to complete the battery in its entirety. This led us to another limitation in the study; the fighters were in different stages in the fight camp. As stated previously, a future direction would be to see if the fighter's anxiety levels peak or dip at certain times before a fight and post-fight. There is no data or literature in this area to date using this population, so it is unclear if the fighters being at different times in camp does indeed impact anxiety, so the data was not skewed. If it is shown to have a significant difference in the future, it has been noted, and the study will be run again with this new data. Another limitation that we were aware of early on during data collection was our relatively low sample size. While we can frame this as a pilot study, we had initially planned on recruiting upwards of 60 fighters. Along with that, we had hoped that we would have been able to recruit more female fighters to explore gender differences between female fighters and male fighters. However, with the difficulties of recruiting professional fighters for our study and a significantly fewer number of female fighters, it comes as no surprise that we struggled to recruit female fighters. We will likely benefit from extending our invitations to participate in future research to more training facilities and include gyms with a higher number of female fighters training. Future research will be beneficial to examine differences and identify between the male and female fighters to better develop emotion regulation interventions and better suit the respective fighters. Research comparing respective disciplines of fighting may also be of value.

A possible explanation for the similar scores between the fighters and the control group could be attributed to Covid-19, which co-occurred with study testing. Even though our participants completed our study via an online platform, it did not diminish the anxiety and natural fears that remained present during this period. Specifically, data from the fighters were almost exclusively collected during the lockdown period. This was also a factor that contributed to our small

sample size, with recruitment being slowed almost to a halt at the beginning of the pandemic. We recruited half of our college-aged control sample pre-pandemic and the other half once the summer semester restarted and every program transitioned to online courses. Being that some participants completed the questionnaire before the pandemic while others during it the midst of it, it is possible that the results and findings may have been impacted depending on the time that they had completed the measures. Future research on how COVID-19 has impacted the professional fighters and college students will likely be beneficial as we move forward.

Likewise, a limitation that we have considered is the average age of fighters in their respective promotions. Despite not finding any significant differences in emotional self-regulation after grouping fighters based on the age with groups of fighters aged 20-29 and 30-39, there was a significant difference in the mean age of fighters in the big three promotions ($M = 31.56$, $SD = 3.518$) and those in the other promotions ($M = 28.50$, $SD = 3.682$). As a result of the finding of fighters in the big three promotions having fewer difficulties accepting their emotions, results should be taken and interpreted with caution. Being that fighters in the big three promotions are significantly older, it is also assumed that they may have more experience in their sport. Age and experience may factor into their ability to better accept negative emotions they are experiencing rather than solely being based upon which promotion they compete in. Going forward, it may be beneficial to examine each promotion and determine their years of experience to see if there are any significant differences among the promotions. This study has no ethical concerns; the fighters' names remain anonymous.

The non-significant results for both trait anger and trait depression suggest that some of the previous stereotypes about the MMA fighters do not correspond to their internal psychological reality. According to the stereotype, these fighters alienate all others around them to the point that it is just them and the ring with no one else in their lives. In related work, Bernacka, Sawicki, Mazurek-Kusiak & Hawlena (2016) investigated whether the personality dimension of Conformism/nonconformist was a predictor of stress coping styles in athletes training in combat sports. The study used the scores of 346 males practicing combat sports such as kickboxing, MMA, Thai boxing, boxing, and wrestling. The participants in this study were, yet again, not at the same high level of performance as the population of the present study. The analysis showed statistically significant effect of the conforming/nonconforming personality variable related to task-oriented coping $F(5, 99) = 6.89$, $p = .000$ and emotion-oriented coping $F(5, 99) = 2.85$, $p = .019$.

Conclusion

Overall, the findings suggest that professional fighters are not statistically different from a control group of college students when it comes to trait anxiety.

Understanding that an individual's ability to self-regulate their emotions, specifically anxiety, is related to success is particularly relevant to athletes who rely on their talent to take them to the top of their sport. Whether that ability is tied in with the personality of the athlete or a learned behavior ultimately remains to be determined. Athletic careers can be quite short than most other professional careers, with an even smaller window for them to make money to sustain themselves and their family for the rest of their lives. Research should be continued to focus on how trait and even state anxiety differs between various fighters. By doing so, determine if there is a relationship between either trait and the performative success of these athletes. The results of our study display that fighters are no more prone to trait anger or trait depression than the rest of the population, further showing that these stereotypes are misleading and untrue.

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