

The Effect of Athletic Mental Energy on Sports Mental Training and Sports Courage in Rugby Players

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Abstract

This study aimed to determine whether athletic mental energy played a mediating role between sports mental training and sports courage in rugby players. The study developed an original theoretical model, which was tested using the Sobel test. The sample consisted of 309 rugby players in the 15 men's, 7's women-men, U18 7's men's-women's rugby leagues of the 2021-2022 Turkish Rugby Federation. The sample consisted of rugby players aged 18 to 35 years of age. Data were collected using a sociodemographic characteristics questionnaire, the Sports Mental Training Questionnaire (SMTQ), the Sports Courage Scale-31 (SCS-31), and the Athletic Mental Energy Scale (AMES). There was a positive correlation between mental training and athletic mental energy. There was a positive correlation between athletic mental energy and sports courage. There was a positive correlation between mental training and sports courage. Moreover, athletic mental energy played a fully mediating role between sports courage and mental training. The results confirmed the theoretical model. These results will pave the way for further research and contribute to the literature as they are a reflection of the cycle in the model. Authorities should inform rugby players about the relationship between athletic mental energy, mental training, and sports courage.

Keywords: Sports courage, Mental training, Athletic mental energy, Rugby

1. Introduction

Rugby has been played in many European countries since 1823. It is also popular in Australia and Africa. Rugby is said to have originated in England when a soccer player picked up a ball and ran with it to the goal during a game of soccer (Dunning, 2013). World Rugby is the highest-level management unit of rugby in the world (World Rugby, 2021; cited in Göral, 2021: 6). There is also a Turkish Rugby Federation, which completed the World Rugby membership criteria and became an official member in 2020. Two disciplines of rugby are

practiced in Turkey; rugby 7s and rugby 15s. Rugby 7s men's league consists of 12 teams. Rugby 15s men's league consists of eight teams. Rugby 7s women's league consists of eight teams. U-18 men's league consists of ten teams. U-18 women's league consists of four teams (TRF, 2022). In traditional 15s rugby, teams consist of 15 players. There are two 40-minute halves and a 10-minute break in between the halves. The goal in a rugby game is to advance the ball past the opponents' side of the field and touch it to the ground. Players may only pass the ball backward or sideways (Worldrugby.org, 2021). Rugby is a rough sport involving motor skills, such as speed, agility, balance, and endurance. Sportsmanship and socialization are always crucial in rugby (Donnelly & Young, 1985).

While researchers focus on physical skills in sports, they ignore the factors that affect performance. Sports psychology is a promising and exciting field. There is a growing body of research on exercise and sports psychology (Weinberg & Gould, 2015). Coaches and managers have begun to recognize that performance does not only consist of technical, tactical, and physical elements. Research shows that physical, technical, and tactical elements are critical from a psychological point of view. According to Konter (1998), high performance requires physical-physiological and psychological (emotional and mental) strength. Mental training helps athletes improve their performance (Altıntaş & Akalan, 2008). Mental training is divided into two main parts: cognitive and somatic. Cognitive methods include mental imagery and visualization, mental rehearsal, cognitive behavior, therapies, and visual-motor behaviors. Somatic methods include biofeedback, relaxation training and meditation, and advanced deepening elements (Behncke, 2004). According to Stuart (2009), mental training motivates athletes and helps them focus, set goals, and develop self-confidence and effective thinking skills.

Mental energy is an important determinant of high performance and success. Lykken (2005) associates mental energy with reflecting on problems, concentrating on different factors, and insisting on finding solutions without being distracted. Many scientists and mathematical geniuses such as Archimedes, Galileo, Socrates, Einstein, and Newton are successful not only because they are smart but also because they are constantly immersed in a problem or a subject (Lykken, 2005). There is little research on mental energy (Cook & Davis, 2006). Researchers consider factors such as fatigue and alertness while studying mental energy (Lieberman, 2007). Lykken (2005) argues that mental energy is an important predictor of success. Athletes should have high mental energy levels because sporting events require extraordinary concentration. Famous golfer Tiger Woods manages to hit hard even though millions of people watch him because he has a high level of mental energy that allows him to stay away from distractions (Lykken, 2005). Events, psychological state, and personal, social, and environmental elements play a decisive role in athletic mental energy. Athletic mental energy may fluctuate momentarily (Yıldız, 2021). The International Life Sciences Institute (ILSI) defines mental energy as “the ability to perform mental tasks, the intensity of feelings about energy/fatigue, and the motivation to accomplish mental and physical tasks” (Lu et al., 2018; Yıldız, 2021).

Although courage is seen as a valuable concept by all cultures (Dahlsgaard et al., 2005), it has not been on the agenda of scientific psychology for a long time. With the development of positive psychology, there has been an increasing interest in the concept of courage in recent

years (Pury & Lopez, 2009). Sports courage is an important virtue (Konter & Toros, 2012) that has received little scientific attention from sports psychology researchers (Corlett, 2002; Konter et al., 2013). Although researchers concentrate on concepts and measures of courage in different fields, there is little research on sports courage (Konter & Ng, 2012: 165). Sports courage is affected by many factors (fear, danger, risk, etc.). It is a dynamic process related to position, experience, and personality traits (Pury & Kowaski, 2007). Sports psychology focuses on different psychological variables that maximize performance (Castro-Sanchez et al., 2018). However, sports courage is more complicated than what the dictionary says it means. Depending on socio-psychological factors, sports courage plays a vital role in performance (Corlett, 1996). Konter (2013) defines sports courage as a “natural and developed, interactional and perceptual concept between person and situation, and the task at hand that enables a person to move in competence, mastery, determination, assertiveness, venturesome and sacrificial (altruistic) behavior on a voluntary basis and in danger(ous) circumstances.” According to Konter (2013), sports courage is based on interactions between situational factors (risks, dangers, and fear), personal dispositions (personality traits, experience, and knowledge), sports-related factors (individual and team sports, contact and non-contact sports), and risky situations (a critical penalty). In his model, sports courage is a dynamic and transformational process determined by the interactions of those factors (Konter & Beckmann, 2019). Very few studies focus on sports courage models to help us understand the level of courage and performance characteristics of athletes. Therefore, if we want to understand the impact of rugby players’ sports courage on their performance, it is appropriate to investigate the concept of sports courage in rugby.

There is a small body of research on athletic mental energy (Islam, 2022; Yıldız, 2021; Chiou et al., 2020; Yıldız et al., 2020; Lu et al., 2018). There is limited research on sports courage in different sports branches (soccer, wrestling, American football, skiing, students, etc.) (Islam, 2022; Konter et al., 2022; Islam et al., 2021; Islam, 2021; Güvendi et al., 2020; Konter & Beckmann, 2019; Güvendi et al., 2018; Cigrovski et al., 2018; Avşar et al., 2016). Research on mental training is limited to technical skills, competitive anxiety, golf, darts, the process of learning skills, and applying programs in soccer and handball (Aktop, 2008; Kulak, 2011; Yazıcılar Özçelik, 2012; Aslan, 2015; Tuna, 2018; Aktepe, 2006; Islam et al., 2021). There is no research addressing these components in rugby. Based on all the information above, the concepts of mental training, athletic mental energy, and sports courage are important for both rugby teams and players because they are expected to exhibit top-level performance. These structures are of key importance for optimal performance. We searched international and national databases using the keywords “sports courage,” “mental training,” and “athletic mental energy.” The search yielded only a handful of studies. Therefore, we can state that this study will contribute to the literature. In short, this study was based on three premises: (1) there is little research on rugby players’ sports courage; (2) We do not have a very good understanding of the relationship between courage and athletic mentality in rugby players; (3) We should propose sports courage as a desirable psychological trait. Based on these premises, this is the first study to investigate whether athletic mental energy plays a mediating role between sports mental training and sports courage in rugby players. Within the framework of this objective, we will be able to elicit new information to make theoretical and practical

suggestions about sports courage and make sure that rugby players are more represented in psychology studies. In parallel with this idea, we think that the evaluation of athletic mental energy in the relationship between sports courage and mental training in rugby players will contribute to the field and help us recognize the concept of sports courage and understand its development processes. In this context, this study will pave the way for further research and contribute to the literature.

2. Method

2.1 Research Model and Type

This study adopted a qualitative, correlational survey method to develop an original theoretical model to determine the direct and indirect effects of sports courage on athletic mental energy and mental training and the mediating role of athletic mental energy between sports courage and mental training (Karasar, 2005). In the model, sports courage (SCS-31) was the dependent variable, Sports Mental Training (SMTQ) was the independent variable, and athletic mental energy (AMES) was the mediating variable. Mediation analyses that add new information to the literature are theoretical studies. The survey method aims to describe a situation as it is or as it was in the past (Karasar, 2005, 2008). The model was assessed using the Sobel test (Sobel, 1982). Based on the work of Michael Sobel from Columbia University in New York, the Sobel test is used to test the significance of a mediating effect (Sobel, 1982, 1986). The mediation model determines the mediating role of a third variable in the relationship between an independent variable and a dependent variable. Researchers turn this indirect effect into hypotheses and interpret them. The model tests whether the decrease in the independent variable is significant after the mediator variable is added (Sobel, 1982, 1986; MacKinnon et al., 2002). For this purpose, we used three simple linear regression models to test the hypotheses. The models and hypotheses generated within the scope of this study are given below:

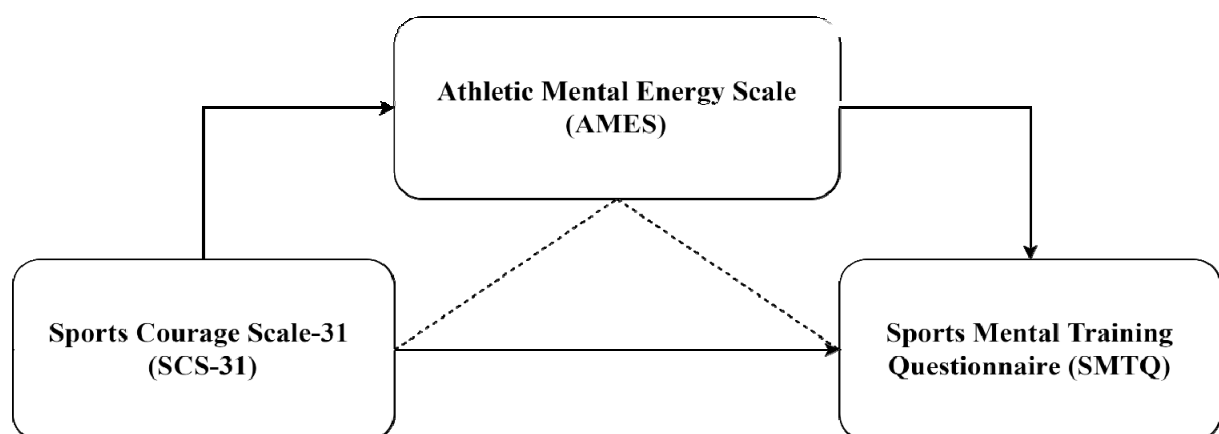


Figure 1. Sobel test model

H₁: Mental training positively affects rugby players' athletic mental energy.

H₂: Athletic mental energy positively affects rugby players' sports courage.

H₃: Mental training positively affects rugby players' sports courage.

H₄: Athletic mental energy plays a mediating role between sports courage and mental training in rugby players.

2.2 Research Purpose

This study aimed to determine whether athletic mental energy played a mediating role between sports mental training and sports courage in rugby players in the 2021-2022 rugby leagues of the Turkish Rugby Federation.

2.3 Population and Sample

The study population consisted of male and female rugby players from the 15s men, 7s women-men, and U18 7s men-women leagues determined by the 2021-2022 the Turkish Rugby Federation. Participants were recruited from ARSKD, ASPGSKD, HÜGSKD, SKSKD, GSKD, OASKD, FSKD, KGSKD, KÜSKD, TESKD, CASKD, ASKD, EGSKD and *Ragbi A Milli Erkek* teams. A common rule of thumb for scale studies is to have a sample size five times the number of items in the scale (Tavşancıl, 2014). Therefore, the sample consisted of 309 rugby players.

2.4 Data Collection Tools

Data were collected using a survey method. The researchers visited rugby clubs and administered the questionnaires face-to-face. Participants were briefed about the research purpose and procedure. They were also informed that this was a scientific study in which they were expected to answer the questions accurately and that they could withdraw from the study at any point. The researchers answered the participants' questions as they filled out the data collection forms. The data were collected using a sociodemographic characteristics questionnaire, the Athletic Mental Energy Scale (AMES), the Sports Courage Scale-31 (SCS-31), and the Sports Mental Training Questionnaire (SMTQ).

2.4.1 Sociodemographic Characteristics Questionnaire

The sociodemographic characteristics questionnaire was based on a literature review conducted by the researcher. The questionnaire consisted of five items on age, professional experience, position, category, and the status of being a national athlete.

2.4.2 Athletic Mental Energy Scale (AMES)

The Athletic Mental Energy Scale (AMES) was developed by Lu et al. (2018) and adapted to Turkish by Yıldız et al. (2020). The instrument consists of 18 items rated on a six-point Likert-type scale. The instrument consists of six subscales: vigor (Items 1, 12, and 15), confidence (Items 3, 9, and 13), motivation (Items 4, 8, and 16), tireless (Items 7, 11, and 12), concentration (Items 2, 5, and 10), and composed (Items 14, 17, and 19). The subscales of the original scale "vigor," "confidence," "motivation," "tireless," "concentration," and

“composed” have a Cronbach’s alpha (α) of 0.75, 0.82, 0.86, 0.89, 0.87, and 0.90, respectively (Lu et al., 2018). The subscales of the Turkish version of the scale have a Cronbach’s alpha of 0.78 to 0.91 (Yıldız et al., 2020).

2.4.3 Sports Courage Scale-31 (SCS-31)

The Sports Courage Scale-31 (SCS-31) was developed by Konter and Ng (2012). The instrument consists of 31 items rated on a five-point Likert-type scale (“1 = Strongly Agree” to “5 = Strongly Disagree”). The instrument has five subscales: mastery ($\alpha = .82$; Items 1, 6, 11, 16, 21, 24, and 27), determination ($\alpha = .82$; Items 2, 7, 12, 17, 20, 22, 25, 28, and 30), venturesome ($\alpha = 0.72$; Items 3, 8, 13, 18, 23, 26, and 29), assertiveness ($\alpha = 0.72$; Items 4, 9, 14, and 19), and self-sacrifice behavior ($\alpha = 0.61$; Items 5, 10, 15, and 31) (Konter & Ng, 2012).

2.4.4 Sports Mental Training Questionnaire (SMTQ)

The Sports Mental Training Questionnaire (SMTQ) was developed by Behnke et al. (2017) and adapted to Turkish by Yarayan and İlhan (2018). The questionnaire consisted of 20 items and five subscales: foundations skills ($\alpha = 0.60$), performance skills ($\alpha = 0.78$), interpersonal skills ($\alpha = 0.72$), self-talk ($\alpha = 0.85$), and mental imagery ($\alpha = 0.70$) (Yarayan & İlhan, 2018). In the present study, the SMTQ had a Cronbach’s alpha of 0.94, while the “foundations skills,” “performance skills,” “interpersonal skills,” “self-talk,” and “mental imagery” subscales had a Cronbach’s alpha of 0.78, 0.77, 0.85, 0.84, and 0.79, respectively.

2.5 Data Analysis

This study aimed to determine whether athletic mental energy (AMES) played a mediating role between sports mental training (SMTQ) and sports courage (SCS-31) in rugby players. Participants’ sociodemographic characteristics were presented using frequency (n) and percent (%). The reliability of the SCS-31, SMTQ, and AMES was analyzed. The relationship between scale scores was analyzed using correlation tests. Normality was tested using the Shapiro-Wilk test. The results showed that the data were normally distributed ($p > 0.05$). Pearson’s correlation test was used to determine the relationship between the variables. Mean (\bar{X}) and standard deviation (SD) values were used for descriptive statistics. Analysis was performed to determine whether athletic mental energy (AMES) played a mediating role between sports courage (SCS-31) and sports mental training (SMTQ). Three simple linear regression models were developed to test the assumptions. In the first model, athletic mental energy (AMES) was the dependent variable, while sports mental training (SMTQ) was the independent variable. In the second model, sports courage (SCS-31) was the dependent variable, while athletic mental energy (AMES) was the independent variable. In the third model, sports courage (SCS-31) was the dependent variable, while sports mental training (SMTQ) was the independent variable. The results of the models showed that the conditions for investigating the mediating effect of psychological skills were met. In line with this, a fourth model was developed. The results of the fourth model showed that athletic mental energy (AMES) played a fully mediating role between sports mental training (SMTQ) and sports courage (SCS-31). The significance of the change in Beta values was tested to

determine the validity of the full mediation effect of psychological skills (Hayes, 2013). Sobel, Aroian, and Goodman's test statistics evaluated the significance of the change in beta values. In Monte Carlo simulations, the Sobel and Aroian tests yield the best results for samples larger than 49 (MacKinnon et al., 1995). The margin of error in the statistical analyses was 5%. All analyses were carried out using the R-Project program (R Core Team, 2020) and the bda (Wang, 2015) package.

3. Results

Table 1. Sociodemographic characteristics

Variable	n	%
<i>Age (year)</i>		
≤ 18	186	60.2
19-24	88	28.5
25-29	27	8.7
30-35	7	2.3
≥ 35	1	0.3
<i>Gender</i>		
Man	243	78.6
Woman	66	21.4
<i>Professional experience (year)</i>		
0-2	200	64.7
3-5	80	25.9
6-8	17	5.5
9-11	6	1.9
≥ 11	6	1,9
<i>Team category</i>		
U18 women	131	42.4
7s men	28	9.1
7s women	86	27.8
15s men	64	20.7
<i>Being a national athlete</i>		
Yes	86	27.8
No	223	72.2

Table 1 shows the participants' sociodemographic characteristics. More than half the participants were younger than 18 (60.2%). More than a quarter of the participants were 19 to 24 years of age (28.5%). Most participants were men (78.6%). More than half the participants had a professional experience of 0 to 2 years (64.7%). A quarter of the participants had a professional experience of 3 to 5 years (25.9%). Participants played in the U18 women (42.4%), 7s men (9.1%), 7s women (27.8%), or 15s men (20.7%). The majority of the participants were not national athletes (72.2%).

Table 2. Reliability test results

Scales	Item No	Cronbach's Alpha
SCS-31	31	0.928
SMTQ	20	0.933
AMES	18	0.913

Note. SCS-31: Sports Courage Scale-31; SMTQ: Sports Mental Training Questionnaire; AMES: Athletic Mental Energy Scale.

Table 2 shows the SCS-31, SMTQ, and AMES had a Cronbach's alpha of 0.928, 0.933, and 0.913, respectively, indicating that the data were highly reliable.

Table 3. Pearson correlation test results

Variable	X	SD	1	2	3
1. SCS-31	69.916	20.387	1	-0.142*	-0.148*
2. SMTQ	75.566	17.401		1	0.465*
3. AMES	81.981	15.878			1

Note. X: Mean; SD: Standard deviation; * $p < 0.05$; SCS-31: Sports Courage Scale-31; SMTQ: Sports Mental Training Questionnaire; AMES: Athletic Mental Energy Scale.

Table 3 shows participants had a mean SCS-31, SMTQ, and AMES score of 69.916, 75.566, and 81.981, respectively. The SCS-31 score was negatively correlated with the SMTQ ($r = -0.142$, $p < 0.05$) and AMES scores ($r = -0.148$, $p < 0.05$). On the other hand, there was a positive correlation between the SMTQ and AMES scores ($r = 0.465$, $p < 0.05$).

Table 4. Simple linear regression analysis (Model 1)

Variable	Beta	Std. Error	t	p
Constant	49.913	3.575	13.963	< 0.001
SMTQ	0.424	0.046	9.205	< 0.001
R	0.465			
R ²	0.216			

Note. Beta: Coefficient; Std. Error: Standard Error; SMTQ: Sports Mental Training Questionnaire.

Table 4 shows the simple linear regression analysis where athletic mental energy (AMES) was the dependent variable, while Sports Mental Training (SMTQ) was the independent variable. The results showed that Sports Mental Training significantly affected athletic mental energy ($p < 0.05$).

Table 5. Simple linear regression analysis (Model 2)

Variable	Beta	Std. Error	t	p
Constant	85.451	6.052	14.120	< 0.001
AMES	-0.189	0.072	-2.615	0.009
R	0.148			
R ²	0.022			

Note. Beta: Coefficient, Std. Error: Standard Error, AMES: Athletic Mental Energy Scale

Table 5 shows the simple linear regression analysis where sports courage (SCS-31) was the dependent variable, while athletic mental energy (AMES) was the independent variable. The results showed that athletic mental energy significantly affected sports courage ($p < 0.05$).

Table 6. Simple linear regression analysis (Model 3)

Variable	Beta	Std. Error	t	p
Constant	83.928	5.592	15.010	< 0.001
SMTQ	-0.175	0.072	-2.446	0.015
R	0.142			
R ²	0.020			

Note. Beta: Coefficient; Std. Error: Standard Error; SMTQ: Sports Mental Training Questionnaire.

Table 6 shows the simple linear regression analysis where sports courage (SCS-31) was the dependent variable, while Sports Mental Training (SMTQ) was the independent variable. The results showed that Sports Mental Training significantly affected sports courage ($p < 0.05$).

Table 7. Multiple linear regression analysis (Model 4)

Variable	Beta	Std. Error	t	p
Constant	84.755	6.567	12.907	< 0.001
SMTQ	0.021	0.075	0.275	0.783
AMES	-0.200	0.082	-2.439	0.015
R	0.148			
R ²	0.022			

Note. Beta: Coefficient; Std. Error: Standard Error; AMES: Athletic Mental Energy Scale; SMTQ: Sports Mental Training Questionnaire (SMTQ).

Table 7 shows the multiple linear regression analysis where athletic mental energy (AMES) was added to Model 3 as an independent variable. The regression coefficient in Model 4 was statistically insignificant ($p > 0.05$). On the other hand, the coefficient of AMES total scores was statistically significant ($p < 0.05$). These results showed that athletic mental energy played a fully mediating role between sports courage and sports mental training. However, the significance of the change in beta values is taken into account to determine whether the effect of the mediating role of athletic mental energy is significant (Hayes, 2013).

Table 8. Sobel test values

Test type	Test Stat.	p
Sobel	-2.358	0.018
Aroian	-2.345	0.019
Goodman	-2.371	0.018

Table 8 the results showed that the Sobel, Aroian, and Goodman test values were statistically significant ($p < 0.05$), indicating that athletic mental energy played a fully mediating role between sports courage and Sports Mental Training.

Table 9. Results according to hypotheses

Hypotheses	Result
H ₁ : Mental training positively affects rugby players' athletic mental energy.	Confirmed
H ₂ : Athletic mental energy positively affects rugby players' sports courage.	Confirmed
H ₃ : Mental training positively affects rugby players' sports courage.	Confirmed
H ₄ : Athletic mental energy plays a mediating role between sports courage and mental training in rugby players.	Confirmed

Table 9 shows the hypotheses and their results.

4. Discussion

After presenting the results, you are in a position to evaluate and interpret their implications. In recent years, there has been a growing body of research on psychological structures in soccer. However, there is limited research on athletic mental energy, mental training, and sports courage. This is the first study to address those three components. Therefore, the results were discussed within the scope of the hypotheses.

The first result (Table 3) showed that the SCS-31 total score was negatively correlated with the SMTQ ($r = -0.142$, $p < 0.05$) and AMES total scores ($r = -0.148$, $p < 0.05$), indicating that mental training did not predict athletic energy. Our result is consistent with the literature (Konter, 2021b, 2021c; Islam, 2021; Güvendi et al., 2020; Islam, 2022). Some studies have reported similar results, while others have not. The discrepancy in the results may be due to the fact that researchers have used different protocols and recruited different samples. On the other hand, there was a positive correlation between the SMTQ and AMES total scores ($r = 0.465$, $p < 0.05$), suggesting that the higher the mental training, the higher the mental energy. Therefore, we can state that rugby players with self-confidence, motivation, and concentration are more likely to have foundation skills, mental performance, and self-talk,

positively affecting their mental imagery and courage. Our result is consistent with the literature (Konter et al., 2022; Konter, 2021a, 2021d; Geneşke, 2020). However, Islam (2022) detected a negative correlation in wrestling athletes.

The second result (Table 4) showed that Sports Mental Training significantly affected athletic mental energy ($p < 0.05$), suggesting that the higher the mental training, the higher the athletic mental energy. Rugby competitions have high-intensity efforts and collision percentages. During competitions, rugby players should prepare themselves mentally and keep their confidence and motivation at the maximum level against sudden fluctuations. Therefore, mental skills and performance help them control their mood (motivation and concentration) and show high performance. This is consistent with the ILSI's definition of mental energy. Our results confirmed Hypothesis I. Islam (2022) found that wrestling athletes' attitudes toward wrestling affected their athletic mental energy levels. Our results are also consistent with the literature (Islam et al., 2021; Cebeci et al., 2019; Kara & Ustaoglu Hoşver, 2019; Yıldız, 2021; Islam, 2022). Mesagno et al. (2021) found that nervous athletes with psychological fear underperformed, which is inconsistent with our result. The small number of these studies creates a positive impression about the validity of our results. Based on this information, we can state that rugby players' mental training levels positively affect their athletic mental energy levels, which in turn leads them to exhibit high performance.

The third result table 5 showed that athletic mental energy significantly affected sports courage ($p < 0.05$), suggesting that the higher the athletic mental energy the rugby players have, the more courageous they are. Motivation makes rugby players more courageous, resulting in them performing better. Confident and concentrated rugby players are determined and assertive risk-takers who take bold actions despite risks. This positively affects teammates, turning them into players who can take risks bravely. Our result confirmed Hypothesis II. According to Konter (2015b), courage is required to maintain or increase performance under adverse conditions and cope with challenges. A brave leader is needed on the field to prevent the team from disintegrating and to turn the game in their favor (Beckmann & Nash, 2018). Islam (2022) reported that wrestlers' athletic mental energy affected their courage. Our result is consistent with the literature (Yıldız, 2021; Islam, 2022). Konter et al. (2022) found that female soccer players became less courageous as they moved from amateur to professional. This result is not in parallel with our study. Since there are few studies on this topic, it was difficult to compare our results, but we tried to evaluate our results based on studies focusing on similar concepts and characteristics.

The fourth result table 6 showed that sports mental training significantly affected sports courage ($p < 0.05$). Rugby players with mental training are likely to be more courageous. Rugby players who mentally talk to themselves and can visualize and communicate mentally are assertive, self-sacrificing, and determined risk-takers with high courage. High courage brings team success. This is consistent with Konter's model of sports courage. Our result confirmed Hypothesis III. Islam (2022) found that wrestlers' attitudes toward wrestling positively affected their courage. According to Konter and Toros (2013), brave players get injured more often because they take more risks. Karaca and Gündüz (2021); Islam (2022) reported a positive relationship between performance and mental training, which is consistent

with our result. On the other hand, Islam et al. (2021) could not detect a significant difference in the mental training status of soccer players, which is inconsistent with our result. Konter et al. (2022) reported no significant difference in the national team levels of female soccer players, which is inconsistent with our result. Since there are few studies on this topic, it was difficult to compare our results, but we tried to evaluate our results based on studies focusing on similar concepts and characteristics.

The fifth result table 8 showed that athletic mental energy played a fully mediating role between sports courage and sports mental training. For maximum performance, rugby players need athletic mental energy, sports courage, and mental training. Athletic mental energy transforms them into more determined athletes during their competitions because they have high confidence, motivation, and concentration in the face of anxiety and stress. Rugby players who support mental imagery, self-awareness, and mentally basic and performance skills by talking to themselves have better mental performance. Our result confirmed Hypothesis IV. Based on this information, psychological factors in sports performance influence the emotional state of athletes in relation to qualities related to courage. From this point of view, we can talk about the possible effect of athletic mental energy on sports courage and mental training. Therefore, our results support this. Islam (2022) observed that wrestlers' athletic mental energy fully mediated between their attitudes toward wrestling and sports courage. Brave soccer players cope better with stress and have higher confidence and motivation. The higher the courage, the higher the perception of success (Hidrus et al., 2017; Konter, 2015a). Öner and Cankurtaran (2020) and Erdoğan and Gülşen (2020) found significant differences in the mental training of athletes depending on their professional experience. Our result is consistent with the literature (Yıldız, 2021; Islam, 2022).

5. Conclusion and Recommendation

Our results indicate that sports courage, mental training, and athletic mental energy play an important role in maximum performance in rugby. Athletic mental energy plays a fully mediating role between sports courage and mental training. In conclusion, the theoretical model was evaluated using three models based on the data and confirmed by the hypotheses. Therefore, our results show the effects of courage and mental training on athletic mental energy in rugby players. Our results are a reflection of the cycle in the model. Therefore, this study provides a rational argument for the discourses. The direction and effect level of the mediating role will shed light on future studies.

Authorities should inform rugby players about athletic mental energy, sports courage, and mental training and provide them with appropriate settings where they can develop these components. Coaches should encourage rugby players to take bold action. Rugby players should perform practices related to changes in their mood during competitions. Coaches should also raise their awareness of courage because rugby players have to develop a collective form of those psychological factors to achieve maximum performance during competitions. Authorities should raise rugby players' awareness of athletic mental energy, mental training, and courage. We think that this study contributes to the literature. Researchers should recruit different sample groups to better understand the relationship

between athletic mental energy, mental training, and sports courage. Researchers who address the concepts that interact with sports courage and athletic mental energy will contribute to the literature with different applications and designs. Further studies should address the limitations of our model. Researchers should reconstruct our results with other applications and designs.

The original theoretical model brings a new breath to the literature because there are very few studies on mediating variables in sports sciences. Researchers should recruit different samples to investigate the mediating role of athletic mental energy between mental training and sports courage. However, we could not analyze these psychological variables qualitatively for three reasons. First, such research would take too much time. Second, it would be difficult to get permission from rugby clubs due to the COVID-19 pandemic. Third, rugby players would be unwilling to participate due to the pandemic. However, researchers can replicate this study with rugby clubs in different countries.

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Ethical Considerations

The study was approved by the Social and Human Sciences Research Ethics Committee of Ordu University Rectorate (Date: 11.11.2021 & No: 2021/197).

References

- Aktepe, K. (2006). *The importance of mental training in sports, and determination of mental training knowledge and application levels of individual national athletes* (Unpublished Master's Thesis, Niğde University, Institute of Social Sciences, Niğde).
- Aktop, A. (2008). *Investigation of the effect of biofeedback and mental training on dart performance* (Unpublished Master's Thesis, Akdeniz University, Institute of Health Sciences, Antalya).
- Altıntaş, A., & Akalan, C. (2008). Mental training and high performance. *Journal of Spormetre Physical Education and Sports Sciences*, 6(1), 39-43.
- Aslan, Ö. (2015). *The effect of mental training practices on the process of learning overplay skills in golf beginners (13-15 years old)* (Unpublished Master's Thesis, Marmara University, Institute of Health Sciences, İstanbul).
- Avşar, Y., Balcı, A. T., Kocabaş, A., & Konter, E. (2016). *Prospective Teachers' Critical Thinking Dispositions According to Their Courage Levels*. 15th International Symposium on Classroom Education, Muğla Sıtkı Koçman University, Muğla.
- Beckmann, J., & Nash, C. (2018). *Sports coaching for lifelong development: A sustainable ambition?* Technical University of Munich, Germany.

- Behncke, L. (2004). Mental skills training for sports: A brief review. *Online Journal Sport Psychol*, 6(1).
- Behnke, M., Tomczak, M., Kaczmarek, L. D., Komar, M., & Gracz, J. (2017). The sport mental training questionnaire: Development and validation. *Current Psychology*, 38(2), 504-516. <https://doi.org/10.1007/s12144-017-9629-1>
- Castro-Sánchez, M., Zurita-Ortega, F., Chacón-Cuberos, R., López-Gutiérrez, C. J., & Zafra-Santos, E. (2018). Emotional Intelligence, Motivational Climate and Levels of Anxiety in Athletes from Different Categories of Sports: Analysis through Structural Equations. *International Journal of Environmental Research and Public Health*, 15(5), 894. <https://doi.org/10.3390/ijerph15050894>
- Cebeci, C., Doğu Algün, G., & Yılmaz, B. (2019). *Investigation of Mental Training Levels of Badminton Athletes*. 2nd International Congress on Sports and Wellness for All, Antalya.
- Chiou, S. S., Hsu, Y., Chiu, Y. H., Chou, C. C., Gill, D. L., & Lu, F. J. (2020). Seeking positive strengths in buffering athletes' life stress-burnout relationship: the moderating roles of athletic mental energy. *Frontiers in Psychology*, 10, 3007. <https://doi.org/10.3389/fpsyg.2019.03007>
- Cigrovski, V., Radman, I., Konter, E., Ocic, M., & Ružic, L. (2018). Sport Courage, Worry and Fear in Relation to Success of Alpine Ski Learning. *Sports*, 6(3), 96. <https://doi.org/10.3390/sports6030096>
- Cook, D. B., & Davis, J. M. (2006). Mental energy: defining the science. *Nutrition Reviews*, 64(7), 1. <https://doi.org/10.1111/j.1753-4887.2006.tb00251.x>
- Corlett, J. (1996). Virtue lost: Courage in sport. *Journal of the Philosophy of Sport*, 23(1), 45-57. <https://doi.org/10.1080/00948705.1996.9714530>
- Corlett, J. (2002). Virtue lost: Courage in sport. In A. Hollowchak (Ed.), *Philosophy in sport* (pp. 454-465). Upper Saddle River, NJ: Prentice Hall.
- Dahlsgaard, K., Peterson, C., & Seligman, M. E. P. (2005). Shared virtue: The convergence of valued human strengths across culture and history. *Review of General Psychology*, 9(3), 203-213. <https://doi.org/10.1037/1089-2680.9.3.203>
- Donnelly, P., & Young, K. M. (1985). Reproduction and Transformation of Cultural Forms in Sport A Contextual Analysis of Rugby. *International Review for the Sociology of Sport*, 20(1-2), 23. <https://doi.org/10.1177/101269028502000103>
- Dunning, E. (2013). Sport Matters Sociological Studies of Sport. *Violence and Civilisation*. Taylor and Francis. <https://doi.org/10.4324/9780203025291>
- Erdoğan, B. S., & Gülşen, D. B. A. (2020) Determination of Mental Training' Levels of Athletes Studying at the Faculty of Sport Sciences. *Mediterranean Journal of Sport Sciences*, 3(1), 218-228.
- Geneşke, E. K. (2020). *Investigation of the Relationship between Psychological Skills and Personality Traits of Türkiye Olympic Preparation Center (TOPC) Athletes-Ankara*

(Unpublished Master's Thesis, Atatürk University, Institute of Winter Sports and Sports Sciences, Department of Physical Education and Sports Teaching, Erzurum). <https://doi.org/10.21276/ambi.2020.07.sp1.oa33>

Göral, E. (2021). *The Effect of 8-Week Core Training on Some Performance Parameters in Elite Rugby Players* (Unpublished Master's Thesis, Ondokuz Mayıs University Institute of Postgraduate Education, Samsun).

Güvendi, B., Güçlü, M., & Türksoy Işım, A. (2020). Investigation of sports courage levels and mental toughness of American soccer players. *Journal of Sport and Performance Research*, 11(2), 132-140.

Güvendi, B., Türksoy, A., Güçlü, M., & Konter E. (2018). Investigation of courage levels and mental toughness of professional wrestlers. *International Journal of Sports Exercise & Training Sciences*, 4(2), 70-78. <https://doi.org/10.18826/useeabd.424017>

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York: The Guilford Press.

Hidrus, A. B., Kuan, G., Konter, E., & Kueh, Y. C. (2017). *Relationship between courage and coping among football players in Kelantan*. 14th ISSP World Congress of Sport Psychology, 10-14 June, Seville, Spain.

Islam, A. (2021). *Professional Soccer Players' Courage According to Their Psychological Skills and Mental Resilience* (Unpublished Ph.D. Thesis, Ondokuz Mayıs University, Institute of Postgraduate Education, Samsun).

Islam, A. (2022). The effect of athletic mental energy on wrestlers' sports courage and attitudes toward wrestling. *Physical Education of Students*, 26(5), 247-255. <https://doi.org/10.15561/20755279.2022.0504>

Islam, A., Konter, E., & İmamoğlu, O. (2021). Soccer Players' Courage Levels According to Mental Training (Chapter 23). In Y. Doğan & M. H. Selçuk (Ed.), *Research and Evaluations in Sports Sciences* (1st ed., Vol. 2, pp. 179-206). Ankara: Night Bookshelf.

Kara, Ö., & Ustaoglu Hoşver, P. (2019). Investigation of mental training levels of female volleyball players in play-off competitions in terms of various variables. *International Sport Science Student Studies*, 1(1), 35-42.

Karaca, R., & Gündüz, N. (2021). Investigation of Mental Training and Performance Relationship in Orienteering Athletes. *The Journal of Spormetre Physical Education and Sport Sciences*, 19(1), 99-115.

Karasar, N. (2005). *Scientific Research Method* (pp. 151-152). Ankara: Nobel Publication Distribution.

Karasar, N. (2008). *Scientific Research Method*. Ankara: Nobel Publication Distribution.

Konter E. (1998). *Theory and Practice of Preparation in Sport* (Vol. 16, pp. 41-60). Ankara: Bağırhan Publishing House.

- Konter, E. (2013). Towards multidimensional-interactional model of sport courage. *Energy Education Science and Technology Part B: Social and Educational Studies*, 5(2), 957-968.
- Konter, E. (2015a). *Courage of association football players: Decision-making at risk*. 14th European Congress of Sport Psychology, 14-19 July, Bern, Switzerland.
- Konter, E. (2015b). *Courage profile of professional footballers in relation to selected individual, social and performance variables*. National Sport Medicine Congress, 20-22 November, Swiss Otel, Ankara, Turkey.
- Konter, E. (2021a). *Sport courage in relation to depression-anxiety-stress, self-confidence, self-control and self-management, psychological vulnerability, and sport performance*. 15th World Congress of the International Society of Sports Psychology (ISSP), September 30-October 4, Taipei, Taiwan.
- Konter, E. (2021b). *Sport courage and performance: Proactive personality, persistence, achievement Orientation, game preferences, and sport participation*. 15th World Congress of the International Society of Sports Psychology (ISSP), September 30-October 4, Taipei, Taiwan.
- Konter, E. (2021c). *Leadership power perceptions of soccer coaches in relation to grit, coach-athlete relationship, vengeance, individual and performance variables*. 15th World Congress of the International Society of Sports Psychology (ISSP), September 30-October 4, Taipei, Taiwan.
- Konter, E. (2021d). *Children sport courage in relation to anger and selected individual, sport, health, and success variables*. 15th World Congress of the International Society of Sports Psychology (ISSP), September 30-October 4, Taipei, Taiwan.
- Konter, E., & Beckmann, J. (2019). Courage in football (Part III). In E. Konter, J. Beckmann, and Loughhead (Eds.), *Football psychology: From theory to practice* (1st ed., pp. 38-49). London, England: Routledge. <https://doi.org/10.4324/9781315268248-4>
- Konter, E., & Ng, J. (2012). Development of sport courage scale. *Journal of Human Kinetics*, 33, 163-172. <https://doi.org/10.2478/v10078-012-0055-z>
- Konter, E., & Toros, T. (2012). Courage of football players and their playing positions. *Energy Education Science and Technology Part B: Social and Educational Studies*, 4(4), 1997-2006.
- Konter, E., & Toros, T. (2013). Courage and performance in football. *International Journal of Academic Research*, 5(4), 276-282. <https://doi.org/10.7813/2075-4124.2013/5-4/B.42>
- Konter, E., Gledhill, A., Kueh, Y. C., & Kuan, G. (2022). Understanding the Relationship between Sport Courage and Female Soccer Performance Variables. *Int. J. Environ. Res. Public Health*, 19(8), 4654. <https://doi.org/10.3390/ijerph19084654>
- Konter, E., Ng, J., & Bayansalduz, M. (2013). Revised version of sport courage scale for children. *Energy Education Science and Technology Part B: Social and Educational Studies*, 1, 331-340.

- Kulak, A. (2011). *Investigation of the effect of mental training method on technical skill performance in 10-12 years old soccer players* (Unpublished Master's Thesis, Harran University, Institute of Health Sciences, Sanliurfa).
- Lieberman, H. R. (2007). Cognitive methods for assessing mental energy. *Nutritional Neuroscience, 10*(5-6), 229-242. <https://doi.org/10.1080/10284150701722273>
- Lu, F. J., Gill, D. L., Yang, C., Lee, P. F., Chiu, Y. H., Hsu, Y. W., & Kuan, G. (2018). Measuring Athletic Mental Energy (AME): Instrument Development and Validation. *Frontiers in Psychology, 9*, 2363. <https://doi.org/10.3389/fpsyg.2018.02363>
- Lykken, D. T. (2005). Mental energy. *Intelligence, 33*(4), S331-335. <https://doi.org/10.1016/j.intell.2005.03.005>
- MacKinnon, D. P., Lockwood, C. M., Lockwood, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychol Methods, 7*(1), 83-104. <https://doi.org/10.1037/1082-989x.7.1.83>
- MacKinnon, D. P., Warsi, G., & Dwyer, J. H. (1995). A simulation study of mediated effect measures. *Multivariate Behavioral Research, 30*, 41-62. https://doi.org/10.1207/s15327906mbr3001_3
- Mesagno, C., Harvey, J.T. & Janelle, C.M. (2012). Choking under pressure: The role of fear of negative evaluation. *Psychology of Sport and Exercise, 13*, 60-68. <https://doi.org/10.1016/j.psychsport.2011.07.007>
- Öner, Ç., & Cankurtaran, Z. (2020). The Role of Mental Skills and Techniques of Elite Archers in Determining Their Shooting Performance. *International Journal of Exercise Psychology, 2*(1), 01-9.
- Pury, C. L. S., & Kowaski, R. M. (2007). Human strengths, courageous actions, and general and personal courage. *J. Posit. Psychol., 2*, 120-128. <https://doi.org/10.1080/17439760701228813>
- Pury, C. L. S., & Lopez, S. J. (2009). Courage. In S. J. Lopez & C. R. Snyder (Eds.), *Oxford handbook of positive psychology* (2nd ed., pp. 375-382). New York, NY: Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780195187243.013.0035>
- R Core Team. (2020). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria. Retrieved from <https://www.R-project.org>
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290-312). Washington, DC: American Sociological Association. <https://doi.org/10.2307/270723>
- Sobel, M. E. (1986). Some new results on indirect effects and their standard errors in covariance structure. *Sociological Methodology, 16*, 159-186. <https://doi.org/10.2307/270922>
- Stuart, M. E. (2009). *Mental skills training for sport*. Cognella Academic Publishing, United States of America.

Tavşancıl, E. (2014). *Measurement of Attitudes and Data Analysis with SPSS* (5th ed.). Ankara: Nobel Publishing.

Tuna, N. (2018). *The effect of mental training program with biological feedback on athletes' performance* (Unpublished Master's Thesis, Hacettepe University Institute of Health Sciences, Ankara).

Turkish Rugby Federation. (2022). *Turkish Rugby Leagues (2021)*. Retrieved January 27, 2022, from <https://ragbi.gov.tr/2021-ragbi-ligleri>

Wang, B. (2015). *bda: Density Estimation for Grouped Data* (R Package Version 5.1.6). Comprehensive R Archive Network. Retrieved from <https://CRAN.R-project.org/package=bda>

Weinberg, R. S., & Gould, D. (2015). *Foundations of Sport and Exercise Psychology*. Illinois: Human Kinetics.

World Rugby-Olympic Sport. (2021). *International Olympic Committee*. Retrieved from <https://olympics.com/ioc/world-rugby>

Worldrugby.org. (2021). *Laws of the Game: World Rugby Laws*. Retrieved from <https://www.world.rugby/the-game/laws/law/3>

Yarayan, Y., & İlhan, E. (2018). The adaptation of the sport mental training questionnaire (SMTQ). *Gazi Journal of Physical Education and Sport Sciences*, 23(4), 205-218.

Yazıcılar Özçelik, İ. (2012). *The effect of mental training on competition anxiety and match performance in elite female handball players* (Unpublished Master's Thesis, Ondokuz Mayıs University, Institute of Health Sciences, Samsun).

Yıldız, A. B. (2021). *The Mediating Role of Coach-Athlete Relationship in the Effect of Emotional Intelligence on Athletic Mental Energy in Soccer Players* (Unpublished Ph.D. Thesis, Ankara Yıldırım Beyazıt University, Institute of Health Sciences, Sports Sciences Program, Ankara).

Yıldız, A. B., Yarayan, Y. E., Yılmaz, B., & Kuan, G. (2020). Adaptation of the Athletic Mental Energy Scale (AMES) into Turkish and Investigation of Its Psychometric Properties. *Spormetre-The Journal of Physical Education and Sport Sciences*, 18(3), 108-119. <https://doi.org/10.33689/spormetre.684587>

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