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The Relationship of Use of Imagery in Sports with Athletic Mental Energy

Esin KAPLAN[1], Berkan BOZDAĞ[2]

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ORIJINAL ARTICLE

[1]Mehmet Akif Ersoy Üniversitesi,
Spor Bilimleri Fakültesi,
Burdur/Türkiye

[2]Yozgat Bozok Üniversitesi,
Spor Bilimleri Fakültesi,
Yozgat/Türkiye

Sorumlu Yazar: Esin KAPLAN
esinkaplan2@gmail.com

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Abstract

Mental energy is key for athletes, as sports performance depends on specific psychological characteristics. The fact that imagery is a mental method used to increase sportive performance reveals the necessity of handling it together with mental energy. The study, it was aimed to determine the effect of the mental athletic energy levels perceived by the athletes on their use of imagery and also to determine whether there is a significant difference between the demographic characteristics of the athletes. The study group of the research consists of a total of 303 athletes. As a data collection tool in the study, the "Personal Information Form" created by the researchers, the "Sports Imagery Questionnaire (SIQ)", and the "Athletic Mental Energy Scale (AMES)" were used. As a result, when the values of the use of imagery in sports were examined, a statistically significant difference was observed in favor of athletes in the cognitive imagery sub-dimension. A statistically significant difference was observed in favor of team sport in the Athletic Mental Energy Scale subdimension of composed. Also, it is seen that there are generally positive and moderately significant relationships in the relationship of the scales. In conclusion, male athletes' mental imagery levels were higher than female athletes. It is seen that the composition levels of the athletes who are interested in team sports are higher than the athletes who do individual sports. In addition, the changes in the mental athletic energy level perceived by the athletes affect the level of the athlete's use of imagery.

Keywords: Athletic Mental Energy, Imagery Use, Sports

Sporda İmgeleme Kullanımının Atletik Zihinsel Enerji İle İlişkisi

Öz

Sportif performans belirli psikolojik özelliklere bağlı olduğundan, zihinsel enerji sporcular için anahtar niteliğindedir. İmgelemenin sportif performansı artırmak için kullanılan zihinsel bir yöntem olması, onu zihinsel enerji ile birlikte ele almanın gerekliliğini ortaya koymaktadır. Mevcut çalışmada, sporcuların algıladıkları zihinsel atletik enerji düzeylerinin imgeleme kullanımlarına etkisinin belirlenmesi ve sporcuların demografik özelliklerinde anlamlı bir farklılık olup olmadığının belirlenmesi amaçlanmıştır. Araştırmanın çalışma grubunu toplam 303 sporcu oluşturmaktadır. Araştırmada veri toplama aracı olarak; araştırmacılar tarafından oluşturulan "Kişisel Bilgi Formu", "Sporda İmgeleri Envanteri (SİE)" ve "Atletik Zihinsel Enerji Ölçeği (AZEÖ)" kullanılmıştır. Bulgulara göre, imgelemenin sporda kullanım değerleri incelendiğinde, bilişsel imgeleme alt boyutunda erkek sporcular lehine istatistiksel olarak anlamlı bir farklılık gözlenmiştir. Atletik Zihinsel Enerji Ölçeği sakinlik alt boyutunda takım sporcular lehine istatistiksel olarak anlamlı bir farklılık gözlenmiştir. Ayrıca ölçeklerin ilişkisinde genel olarak olumlu ve orta düzeyde anlamlı ilişkilerin olduğu görülmektedir. Sonuç olarak, erkek sporcuların bilişsel imgeleme düzeylerinin kadın sporculara göre daha yüksek olduğu, takım sporlarıyla ilgilenen sporcuların sakinlik düzeylerinin bireysel spor yapan sporculara göre daha yüksek olduğu görülmüştür. Ek olarak, sporcuların algıladıkları zihinsel atletik enerji düzeyindeki değişimler sporcuların imgeleme kullanım düzeyini etkiler.

Anahtar kelimeler: Atletik Zihinsel Enerji, İmgeleme Kullanımı, Spor

Introduction

Energy enables us to meet our needs; in this respect, it is essential for human life. Energy exists in various forms and comes from different sources, such as kinetic, chemical, solar, nuclear, and mental (Lu et al., 2018).

Although mental energy may not seem well defined, it is an important concept. The physical energy required to complete a task can be determined objectively, but the concept of mental energy is relatively new. Mental energy is a state of mind, but it can also be defined as the ability or willingness to engage in cognitive work (Lieberman, 2007). In a special issue on Intelligence, Lykken (2005) defined mental energy as "an individual's ability to keep thinking for long hours, concentrate attention and block out distractions to accomplish a certain task" (Lu et al., 2018).

Researchers have studied mental energy in various fields in the literature. They were interested in investigating which type of supplement increases human mental energy, particularly in nutrition (Lu et al. 2018). Studies on factors affecting mental energy, such as drugs, food, insomnia and disease states, are frequently encountered (Lieberman, 2007). Research shows that nutrition plays an important role in optimal mental energy or mental performance (Prats Lara, 2020). On the other hand, sports psychology researchers touched on mental energy and examined the relationship between mental energy and sports (Nideffer, 1985; Suinn, 1986; Loehr, 2005).

Athletic mental energy is the concept created by Lu et al. (2018) by expanding O'Connor's (2006) 's mental energy conceptualization. At the same time, they express athletic mental energy as a multidimensional construct related to sports experiences. Lu et al. (2018) defined athletic mental energy as an "athlete's perceived current energy state characterized by its intensity in motivation, confidence, concentration, and mood". Mental energy is key for athletes, as sports performance depends on psychological characteristics such as cognition (learning and memory, attention and focus, creativity and intelligence, etc.), mood and motivation (Prats Lara, 2020).

Today, many strategies, such as imagery, self-talk, and goal setting, are used to bring sportive performance to the optimal level (Hasker, 2010). Imagination is expressed by various names such as mental practice, condition technical skills, and visualization by some coaches and sports psychologists. Imagery is the method of using all the senses to create or recreate an experience in mind. For most people, it represents an event or task forming pictures in their minds (Hale & Crisfield, 2005).

Many athletes sometimes use their imaginations before, during or after competitions. Some dream of success, scoring the winning goal, reaching the best, and winning the big race, while others dream of failure, missing the critical shot. Your mind is constantly creating visual pictures,

experimenting with emotional events and activating bodily sports experiences or movements, whether you are fully awake or in a deep sleep. Unfortunately, few coaches and players have learned how to maximize the use of daily imagery techniques to improve performance (Hale and Crisfield, 2005).

Two skills regularly studied in the context of imagery are the ability to imagine and use imagery. Sports psychology has frequently studied both concepts (Morris et al. 2005). Hall, Mack, Paivio, and Hausenblas (1998) developed the Sports Imagery Questionnaire (SIQ) based on Paivio's (1985) theory to evaluate how often athletes use imagery functions (Kızıldağ & Tiryaki, 2012). According to the inventory, Cognitive custom imagery is associated with learning and developing physical skills, in which athletes make mental adjustments to physical skills by imagining their skills. Cognitive general imagery is the imagery of the strategic task of competition. Motivational private imagery refers to goal-oriented imagery, such as imagining that a person has won a competition. Motivational general arousal focuses on somatic and emotional experiences associated with stress, anxiety, and arousal. Motivational general mastery is the imagery of focusing and staying safe in challenging situations (Pakulanon, 2016).

Although the contribution of imagery to sportive performance is well known, studies on athletic mental energy and the use of imagery by athletes, which are prominent as a new concept in the literature, are quite limited. Recent studies show that the concept of athletic mental energy in the determination of mental processes and difficulties is an important concept for both sporting performance and success (Yıldız et al., 2020a; Yıldız et al., 2020b; Yıldız, 2021; Lu et al., 2018; Tatlısu, et al., 2022; Cook and Davis, 2006). In light of this information, measuring and reporting the mental energy of the athletes and the use of imagery by the athletes is an important step in increasing success. In this context, it is thought that this research, conducted to determine the relationship between the use of imagery in sports and athletic mental energy, will contribute to the relevant literature and the trainers and athletes. In addition, the study is based on the assumption that the athletes' athletic mental energy level will affect the athlete's use of imagery.

Material and Methods

The study, it was aimed to determine the effect of the mental athletic energy levels perceived by the athletes on their use of imagery and also to determine whether there is a significant difference between the demographic characteristics of the athletes.

Model of the Research

The model of this research is a relational survey model. "This approach is based on researching and describing a past or present situation as it is. The event, phenomenon or situation that is the subject of the research is tried to be explained as it is" (Karasar, 2015).

Study Group

The study group consists of 303 participants, 132 women (21.15 ± 4.09) and 171 men (21.25 ± 3.89), who were determined by the easily accessible sampling method among the athletes. The mean age of the participants was determined as 21.19 ± 4.00.

Table 1

Frequency and Percentage Distributions of Athletes' Demographic Characteristics

	Groups	**f**	**%**
Gender	Female	132	43,6
	Male	171	56,4
Sports Branch	Individual	114	37,6
	Team	189	62,4
	Total	303	100

Data Collection Tools

As a data collection tool in the research, the "Personal Information Form" created by the researchers, the "Sports Imagery Questionnaire (SIQ)", and the "Athletic Mental Energy Scale (AMES)" were used.

Personal Information Form

The researchers created it to determine the gender, age and sport types of the athletes who voluntarily participated in the research.

Sports Imagery Questionnaire (SIQ)

To determine the imagery levels of the athletes, the "Sports Imagery Questionnaire (SIQ)" developed by Hall et al. (1998) was used in the study. The adaptation of the inventory into the Turkish version was conducted by Kızıldağ and Tiryaki (2012). The inventory was designed to assess athletes' cognitive and motivational function uses of imagery. The inventory consists of 4 sub-dimensions, "Cognitive Imagery", "Motivational Specific Imagery", "Motivational General-Arousal", and "Motivational General-Mastery", and a total of 21 items. Cronbach α coefficient sub-

scales and total were calculated as total .86, cognitive imagery .81, motivational specific imagery .80, motivational general-arousal .71 and motivational general-mastery .59 in the adaptation study of the inventory to Turkish. In the present study, Cronbach's α coefficient was a total of .93, cognitive imagery .86, motivational specific imagery .89, motivational general-arousal .81 and motivational general-mastery .83.

Athletic Mental Energy Scale (AMES)

To evaluate the current energy status perceived by the athletes, the "Athletic Mental Energy Scale (AMES)" developed by Lu et al. (2018) was used in the study. The adaptation of the inventory into the Turkish version was conducted by Yıldız et al. (2020a). AMES is designed to assess the current energy state perceived by athletes. The scale consists of 18 items and 6 sub-dimensions, 6-point Likert type. Cronbach α coefficient sub-scales and total were calculated as: total .91, vigor .78, confidence .79, motivation .79, tireless .83, concentration .78, composed .80 in the adaptation study of the inventory to Turkish. In the present study, the Cronbach's α coefficient was total .91, vigor .80, confidence .77, motivation .75, tireless .84, concentration .66, composed .77.

Data Analysis

SPSS 22 statistics program was used in the analysis of the data. As a statistical method in data analysis, frequency, arithmetic mean, standard deviation, t-test, and Pearson Correlation test was used. The normality test was performed using skewness and kurtosis analysis. Cohen d analysis was performed to determine the effect size. SS l = √ SB2 A + SS2 B / 2 (Kılıç, 2014).

Table 2

Score Distribution of Measurement Tools

	Item	N	$\bar{x}$	ss	Skewness	Kurtosis	Min.	Max.
Vigor	3	303	4.89	1.02	-1.392	1.348	1.00	6.00
Confidence	3	303	4.55	1.00	-.778	.544	1.00	6.00
Motivation	3	303	5.10	0.95	-1.739	1.855	1.00	6.00
Tireless	3	303	3.92	1.28	-.310	-.583	1.00	6.00
Concentration	3	303	3.81	1.12	-.115	-.300	1.00	6.00
Composed	3	303	4.12	1.14	-.389	-.265	1.00	6.00
AMES	18	303	4,40	0.85	-.701	1.34	1.00	6.00
Cognitive Imagery	9	303	5.60	1.01	-.612	.291	1.11	7.00
Motivational Specific Imagery	5	303	5.69	1.26	-.928	.431	1.00	7.00
Motivational General-Arousal	4	303	4.95	1.37	-.411	-.385	1.00	7.00
Motivational General-Mastery	3	303	5.85	1.10	-.900	.272	1.67	7.00
SIQ	21	303	5,52	0.97	-.593	.087	1.81	7.00

*AMES Athletic Mental Energy Scale *SIQ Sports Imagery Questionnaire

In Table 2. The mean scores obtained from the Sports Imagery Questionnaire and Athletic Mental Energy Scale total and sub-dimensions do not deviate from the normal distribution. According to George and Mallery (2010), skewness and kurtosis values between -2.00 and +2.00 are normal distributions. In this case, parametric tests were preferred in the current study.

Ethics of Research

The ethics committee approval of the study was obtained from the Ethics Committee of Yozgat Bozok University (Decision No: 2022/34-42).

Results

Table 3

Athletic Mental Energy and Sports Imagery T-test and Cohen's d Results by Gender Variable

	Gender	N	x̄	Ss.	Sd	t	p	d
Vigor	M	171	4,871	1,081	301	-0,530	0,293	.06
	F	132	4,934	0,946				
Confidence	M	171	4,569	1,022	301	0,291	0,962	.03
	F	132	4,535	0,982				
Motivation	M	171	5,087	1,064	301	-0,324	0,650	.03
	F	132	5,123	0,804				
Tireless	M	171	3,933	1,285	301	0,131	0,966	.01
	F	132	3,914	1,298				
Concentration	M	171	3,918	1,156	301	1,753	0,467	.20
	F	132	3,689	1,085				
Composed	M	171	4,278	1,150	301	0,995	0,995	.29
	F	132	3,934	1,118				
AMES	M	171	4,443	0,879	301	0,888	0,995	.08
	F	132	4,355	0,822				
Cognitive Imagery	M	171	5,677	0,932	301	1,447	0,016*	.16
	F	132	5,504	1,108				
Motivational Specific Imagery	M	171	5,637	1,263	301	-0,874	0,501	.10
	F	132	5,765	1,260				
Motivational General-Arousal	M	171	4,951	1,387	301	-0,113	0,884	.01
	F	132	4,969	1,359				
Motivational General-Mastery	M	171	5,879	1,082	301	0,378	0,815	.04
	F	132	5,830	1,132				
SIQ	M	171	5,536	0,935	301	0,169	0,520	.01
	F	132	5,517	1,019				

*AMES Athletic Mental Energy Scale *SIQ Sports Imagery Questionnaire *M Male *F Female

In Table 3, no significant difference was observed between men and women in the athletic mental energy scale point according to gender variable ($p > 0.05$). Cohen's d values were found as .06, .03, .03, .01, .20, .29, .08 for the athletic mental energy scale sub-dimensions and total, respectively . A statistically significant difference was observed in favor of men in the subdimension of "Cognitive Imagery" ($p<0.016$). Cohen's d values were found as .16, .10, .01, and .04 for the sports imagery questionnaire sub-dimensions and total, respectively.

Table 4

Athletic Mental Energy and Sports Imagery T-test and Cohen's d Results by Sport Branch Variable

	Sports Branch	N	x̄	Ss.	Sd	t	p	d
Vigor	I	114	4,962	0,884	301	0,834	0,57	.10
	T	189	4,860	1,100				
Confidence	I	114	4,502	0,981	301	-0,694	0,753	.08
	T	189	4,585	1,017				
Motivation	I	114	5,090	1,000	301	-0,180	0,858	.02
	T	189	5,111	0,933				
Tireless	I	114	3,886	1,230	301	-0,411	0,559	.04
	T	189	3,948	1,326				
Concentration	I	114	3,757	1,064	301	-0,731	0,408	.08
	T	189	3,855	1,168				
Composed	I	114	3,991	1,023	301	-1,693	0,031*	.19
	T	189	4,211	1,211				
AMES	I	114	4,365	0,805	301	-0,629	0,199	-.06
	T	189	4,428	0,884				
Cognitive Imagery	I	114	5,540	1,009	301	-0,828	0,807	.09
	T	189	5,639	1,018				
Motivational Specific Imagery	I	114	5,638	1,306	301	-0,583	0,347	.06
	T	189	5,725	1,235				
Motivational General-Arousal	I	114	5,103	1,354	301	1,415	0,819	.16
	T	189	4,873	1,380				
Motivational General-Mastery	I	114	5,880	1,147	301	0,270	0,421	.03
	T	189	5,844	1,078				
SIQ	I	114	5,540	1,044	301	0,170	0,172	.01
	T	189	5,520	0,926				

*AMES Athletic Mental Energy Scale *SIQ Sports Imagery Questionnaire *I Individual *T Team

In table 4, a statistically significant difference was observed in favor of team sport in the subdimension of "Composed" ($p<0.031$). Cohen's d values were found as .10, .08, .02, .04, .08, .19 for the mental athletic energy scale sub-dimensions and total, respectively. no significant difference was observed in the athletic mental energy scale point according to the sports branch variable ($p> 0.05$). Cohen's d values were found as .09, .06, .16, and .03 for the sports imagery questionnaire sub-dimensions and total, respectively.

Table 5

Sports Imagery Questionnaire and Athletic Mental Energy Scale Pearson Correlation by Age Variable

Age	V	C1	M	T	C2	C3	AMES	CI	MSI	M G-A	M G-M	SIQ
Pearson	-0,105	-0,086	-0,065	-0,027	0,057	-0,004	-0,45	0,004	-0,005	0,002	-0,072	-0,20
p	0,068	0,137	0,261	0,646	0,320	0,942	0,437	0,950	0,931	0,972	0,212	0,724
n	303	303	303	303	303	303	303	303	303	303	303	303

*V Vigor *C1 Confidence *M Motivation *T Tireless *C2 Concentration *C3 Composed *CI Cognitive Imagery *MSI Motivational Specific Imagery

*M G-A Motivational General-Arousal *M G-M Motivational General-Mastery *AMES Athletic Mental Energy Scale *SIQ Sports Imagery Questionnaire

In Table 5, no significant relationship between the age of the athletes and the mean scores of the Sports Imagery Questionnaire and Athletic Mental Energy Scale.

Table 6

Sports Imagery Questionnaire and Athletic Mental Energy Scale Correlation Test Results

	CI	**MSI**	**M G-A**	**M G-M**	**SIQ**
V	,385**	,313**	0,002	,376**	,344**
C1	,494**	,374**	,080	,424**	,399**
M	,425**	,328**	,179**	,432**	,404**
T	,379**	,269**	,067	,231**	,275**
C2	,242**	,118*	-,075	,183**	,127*
C3	,213**	-,007	-,300**	,145*	-0,12
AMES	,449**	,289**	,002	,370**	,317**

*V_{Vigor} *$C1_{Confidence}$ *$M_{Motivation}$ *$T_{Tireless}$ *$C2_{Concentration}$ *$C3_{Composed}$ *$CI_{Cognitive\ Imagery}$ *$MSI_{Motivational\ Specific\ Imagery}$

*M G-$A_{Motivational\ General\text{-}Arousal}$ *M G-$M_{Motivational\ General\text{-}Mastery}$ *$AMES_{\ Athletic\ Mental\ Energy\ Scale}$ *$SIQ_{\ Sports\ Imagery\ Questionnaire}$

In Table 6, there is a relationship between the Composed Sub-Dimension and Motivational Specific Imagery subdimension (-0.007 low in the negative direction) and between the Motivational General-Arousal and the Concentration Sub-dimensions (-,075 low level in the negative order). On the other hand, there is a moderate negative correlation of -.300 between the Composed Sub-Dimension and the Motivational General-Arousal sub-dimension. It is observed that there are generally positive, moderately significant relationships in other sub-dimensions.

Discussion and Conclusions

The study aimed to determine the relationship between athletes' Use of Imagery in Sports and Athletic Mental Energy. According to the findings, the imagery use levels of the athletes change only in the "Cognitive Imagery" sub-dimension according to the gender variable. It is seen that the mean scores of male athletes in the cognitive imagery sub-dimension are significantly higher than female athletes (see Table 3).

There are studies in the literature that support this finding. The study by Çelik and Güngör (2020) on the students of the faculty of sports sciences determined that the mean scores of male students in the Mental Performance Skills sub-dimension were significantly higher than that of female students. On the other hand, in the study of Kızıldağ (2007), a significant difference was found in favor of female athletes between the average scores of the athletes in the sub-dimensions of Cognitive Imagery, Motivational Specific Imagery and Motivational General-Arousal. Kumartaşli et al. (2021), in their study examining the imagery styles of athletes in different branches, concluded that men's Cognitive Imagery, Motivational General-Arousal and Total imagery scores were higher than females. Bozdağ and Ergin (2021) concluded that there was no significant difference between the participants regarding the imagery levels of the athletes according to the gender variable. The results of Doğan's (2019) study comparing the imagery styles of male and female athletes show no significant difference between the genders. According to the

results of the study of Ulucan and Bölükbaşı (2020), in which they evaluated the imagery levels of athletes dealing with different branches, the use of imagery does not differ according to gender and sports branch. The results of Şahinler's (2021) study examining the imagery levels of the athletes, no significant difference was found in the total and sub-dimensions of imagery according to the gender variable.

The current study determined that there was no significant difference according to gender in the athletic mental energy scale sub-dimensions of the athletes. (see Table 3). According to the branch of the athletes, A statistically significant difference was found in the sub-dimension "Composed", which is the sub-dimension of athletic mental energy. It is seen that the mean scores of the team athletes in the "composed" sub-dimension are significantly higher than the individual athletes (see Table 4). Due to the necessity of teamwork in team sports compared to individual sports, sharing the responsibility among the athletes in the whole team may have caused a difference in the average of composed. As it is known, in addition to the development of physiological characteristics, psychological studies are of great importance in the determination of mental processes (Bozdag, 2020). In the literature, it is seen that athletic mental energy is a new concept in sports research. İlhan (2020) examined the relationship between athletic mental energy and eating behaviours of tennis athletes and concluded that the confidence and calmness sub-dimensions of the athletic mental energy scale were higher in male tennis athletes than female athletes. Yıldız et al. (2020a) stated that eating behaviour is a predictor of cognitive energy as a result of their studies. Chiou et al. (2020) study results in which athletes investigated the effect of athletic mental energy on the relationship between life stress and burnout show that athletic mental energy directs the life stress-burnout relationship of athletes. Gülşen et al. (2021) stated that actuating thinking is a predictor of athletic mental energy. Yıldız (2021) examied the Mediating Role of Coach – Athlete Relationship in the Effect of Emotional Intelligence of Football Players on Athletic Mental Energy and found that emotional intelligence affects athletic mental energy and the coach-athlete relationship. Yıldız (2021) also stated that the relationship between the coach and the athlete affects athletic mental energy. Islam (2022) stated that athletic mental energy affects sports courage and attitudes toward wrestling. Tatlısu et al. (2022) studied athletic mental energy and found that gender and educational variables do not affect the athletic mental energy of boxers. However, it has been revealed that nationality, sports age, and mental preparation before the competition positively affect the athletic mental energy levels of boxers.

It was observed that there was no significant relationship between the age of the athletes and the mean scores of the Sports Imagination Inventory and Athletic Mental Energy scale (see Table 5).

However, a low negative correlation was observed between the sub-dimensions of the sports imagery questionnaire and the sub-dimensions of the athletic mental energy scale (between the "Calmness" Sub-Dimension and the "Motivational Special Imagery" and between the "Motivational General Arousal" and "Concentration" Sub-Dimension). It is observed that there are generally positive and moderately significant relationships in other sub-dimensions (see Table 6).

In this context, we can say that the changes in the mental athletic energy level affect the level of imagination the athlete uses. In addition, the effect size was also used to interpret the analysis results. In the current study, when the athletic mental energy scale is examined, it is seen that the effect size is approximately medium in the sub-dimensions of "concentration" (.20) and "composed" (.29) according to the gender variable (see Table 3). Kilic (2014) states that Cohen's effect size (d) value can be defined as weak if it is less than 0.2, medium if it is 0.5, and strong if it is more significant than 0.8.

In conclusion, male athletes' cognitive imagery levels were significantly higher than female athletes. According to the sports branch variable, it is seen that the composed levels of the athletes who are interested in team sports are higher than the athletes who do individual sports. In addition, it has been observed that the mental athletic energy level perceived by the athletes affects the level of the athlete's use of imagery. In addition, the sportive performance effect of imagery in sports is known in the literature, but; Studies on the concept of athletic mental energy, which stands out as a new concept in the literature, are quite limited. In this context, the present study was only designed with a quantitative research approach. In another study, the direction of the relationship between mental energy and imagery in sports can be evaluated by constructing mixed research in which a qualitative approach supports quantitative findings.

Ethics Committee Permission Information

Ethics review board: Yozgat Bozok University Ethics Committee
Date of ethics assessment document: 2022
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Statement of Researchers' Contribution Rates

Both authors contributed equally at all stages of the research.

Conflicts of interest

The authors declare no conflicts of interest.

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