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Investigation of Imagery Behaviours and Visualization of Athletes in Different Sports Branches

Suat AYBEK[1], Yakup YAZICI[2]

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[1]Gaziosmanpaşa University, Faculty of Sport Science, Tokat/Türkiye

[2]İstanbul Aydın University, Faculty of Sport Science, İstanbul/Türkiye

Abstract

This research aims Investigation of Imagery Behaviours and visualization of Athletes in Different Sports Branches. The "Imagination Imagery in Sports" scale was used. "T-Test and ANOVA" and "post hoc (Tukey)" tests were applied to find the difference between the groups regarding the sub-dimensions of our study. When examined according to gender and branch variables, it is seen that there is no statistically significant difference between the sub-dimensions ($p>0.05$). In contrast, a significant difference was found in the motivational general arousal sub-dimension ($p<0.05$). There is a statistically significant difference in cognitive imagery and general motivational arousal ($p=0.015$) sub-dimensions when examining sub-dimensions according to the sports age variable ($p<0.05$). It was determined that there was a statistically no significant difference between the branches according to the spatial visualization scores ($p>0.05$). Conclusion: In this study, while imagery levels were similar according to gender and branch variables, it was determined that they differed according to age and sports age variables. The values for spatial visualisation showed no significant difference between the studied sports. The significant difference as a function of age and sport indicates that more experienced athletes in their sports make better use of spatial visualisation skills and specialise in them over the years. It was found that with increasing athletic age, mental imagery scores increase and general motivational arousal scores decrease. Care should be taken to ensure that motivational general arousal levels do not decrease in athletes of advanced athletic age. This study should be conducted by expanding the scope with different sample groups.

Keywords: Athletics, Tennis, Archery, Wrestling, Swimming, Imagination.

Corresponding Author:
Suat AYBEK
suataybek@gmail.com

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Farklı Spor Branşlarındaki Sporcuların İmgeleme Davranışlarının Araştırılması

Öz

Bu araştırma, farklı spor branşlarındaki sporcuların imgeleme davranışlarının ve görselleştirmelerinin incelenmesini amaçlamaktadır. Çalışmada "Sporda Hayal Gücü İmgeleme" ölçeği kullanılmıştır. Çalışmamızın alt boyutlarına ilişkin gruplar arasındaki farkı bulmak için "T-Testi ve ANOVA" ve "post hoc (Tukey)" testleri uygulanmıştır. Cinsiyet ve branş değişkenlerine göre incelendiğinde alt boyutlar arasında istatistiksel olarak anlamlı bir fark olmadığı görülmektedir ($p>0,05$). Buna karşın motivasyonel genel uyarılmışlık alt boyutunda anlamlı bir fark bulunmuştur ($p<0,05$). Spor yaşı değişkenine göre alt boyutlar incelendiğinde bilişsel imgeleme ve genel motivasyonel uyarılma ($p=0,015$) alt boyutlarında istatistiksel olarak anlamlı bir farklılık vardır ($p<0,05$). Uzamsal görselleştirme puanlarına göre branşlar arasında istatistiksel olarak anlamlı bir fark olmadığı tespit edilmiştir ($p>0.05$). Sonuç: Bu çalışmada imgeleme düzeylerinin cinsiyet ve branş değişkenlerine göre benzerlik gösterirken, yaş ve spor yaşı değişkenlerine göre farklılık gösterdiği tespit edilmiştir. Mekânsal imgeleme puanları incelenen spor branşlarında anlamlı bir farklılık göstermemiştir. Yaş ve spor yaşına bağlı anlamlı farklılık, branşlarında daha deneyimli sporcuların imgeleme becerisini daha iyi kullandıklarını ve yıllar içinde bu konuda uzmanlaştıklarını ortaya koymaktadır. Spor yaşı arttıkça zihinsel imgeleme puanlarında artış, motivasyonel genel uyarılma puanlarında ise düşüş olduğu tespit edilmiştir. Spor yaşı yüksek olan sporcuların motivasyonel genel uyarılmışlık düzeylerinin düşmemesi için önlemler alınmalıdır. Bu çalışma farklı örneklem grupları ile kapsamı genişletilerek yürütülmelidir.

Anahtar kelimeler: Atletizm, Tenis, Okçuluk, Güreş, Yüzme, İmgeleme.

Introduction

Research on the concept of imagery and the results obtained from the research make essential contributions to the development of applied sports psychology. They are also effective at the performance level (Konter, 1999). Today, it is known that one of the issues that coaches and athletes focus on is physical and psychological studies to improve sportive performance. There are many skills available to improve physical and psychological performance. One is the skill of imagination (Kızıldağ and Tiryaki, 2012). While defining the concept of imagery, it is seen that similar expressions are used with the expression of mental training. These terms express symbolic concepts, mental, cognitive processes, visuomotor, ideomotor, and imaginative practices (Morgan, 1999).

Coaches and athletes use imagery to optimize performance. At the same time, they can use imagination and the strategy they will use against the opponent to determine the situation before the competition. It is necessary to reveal the performance to be applied during the competition, to have scenarios that can be experienced during the competition, and to reflect the athlete's performance on the field at the optimal level. For this reason, imagination helps in planning the technical and tactical skills that athletes will apply and in choosing the right decisions. It is possible to reduce the athlete's stress level using imagination. In a study conducted by Jones et al. in 2002, it was found that athletes who practiced imagining well significantly reduced their pre-game stress levels. It was concluded that the self-efficacy of athletes who imagine increases, which positively affects their performance in sports competitions (Uğur, 2016). Of course, imagery alone is not enough to increase physical skills. Athlete needs to train for their physical skills. However, it would not be wrong to say that they are supported by imagination. An advantage of imagination is that it can be used in every sport and every area of life to reinforce and strengthen one's self-belief. In addition, with imagery, the athlete can develop models for his own physical movements, which can significantly affect his performance. The athlete can motivate himself physically by imagining his past successful performances and can analyse which movements he did well, and which physical strategies made him successful while imagining these images. Numerous studies on imagery, a mental skill, are known to affect sports performance results specifically.

The main characteristics of the mental imagery subdimension are that it consists of cognitive features such as ideal application of ability, correction of errors, development of strategies, learning, and application of game planning. General mental imagery is imagery related to the strategies athletes use during competition. Special cognitive imagery is imagery related to skill development and production. Motivational General Arousal are images that relate to physical and emotional experiences and levels of arousal. By using this type of imagery, athletes find it easier to control their arousal levels. These mental skills are critical for coping with negative psychological variables.

Motivational General Mastery represents the ability and confidence to deal with challenging situations. The athletes who can use this subdimension more have mental strength and control, i.e., they are sovereign in this sense. This subdimension, which includes general mastery, provides mental competence in terms of motivation, and they are strong in coping with negative psychological variables. Motivational Special, that Imagination is a kind of imagination, stands for certain goals and goal-directed behaviours (Martin et al., 1999). In imagination, it is a mental process of being actively involved in an action and expending energy to experience an event while imagining it (Atasoy and Altun Ekiz, 2021).

Spatial reasoning is a set of cognitive skills, including the use of display and presentation tools and the process of comparing and understanding spatial concepts. Spatial visualization is the ability to visualize new situations in space by moving two-dimensional and three-dimensional objects consisting of one or more parts and their three-dimensional parts (Sarıkaya,2019; Sevimli, 2009).

What type of imagery athletes use and their ability to effectively measure their imagery skills. This is considered necessary both for the continued development of research on imagery in the field of sport psychology and for the development of imagery-focused interventions in applied sport psychology. This research aims to investigate imagery behaviour and visualisation of athletes in different sport domains.

Materials and Methods

Participants

The universe of the research consisted of licensed athletes working in the Aegean Region provincial sports directorates according to the selected branch, and the sample group consisted of 215 individuals from individual sports in Muğla, Aydın, İzmir and Denizli Provincial Directorates. Participants consisted of 103 women and 112 men. Participants consisted of Wrestling (n=48), Swimming (n=43), Tennis (n=45), Archery (n=39) and track and field (39) branches. A voluntary consent form was signed by the athletes participating in our research before filling out the questionnaire; They were asked to give complete and correct answers by giving information about the content and methodological model of the questionnaire. In the research, the "Imagination in Sports Inventory" scale, which was used in scientific studies in the literature and tested for validity and reliability (Kızıldağ and Tiryaki, 2012), was used.

Sports Imagery Inventory

Sports Imagery Inventory developed specifically for sports was developed by Hall et al. (1998). The inventory is a seven-point Likert-type measurement tool consisting of 30 items. Its

Turkish adaptation was made by Kızıldağ and Tiryaki (2012). The imagination inventory evaluated the expressions in seven steps and shaped them into 21 items. The sub-dimensions of the scale; "Cognitive Imagery" (1, 2, 4, 5, 7, 9, 13, 14, 15 questions), "Motivational Special Imagery" (3, 6, 8, 10, 20 questions), "Motivational General-Arousal" (11,12, 17, 19 questions) and "Motivational general- Mastery" (16, 18, 21 questions) (Kızıldağ and Tiryaki, 2012). The Cronbach alpha reliability coefficients calculated for the study were .82 for the "Cognitive Imagery" sub-dimension and .82 for the Motivational Special sub-dimension. 81, 72 for the "Motivational General Arousal" sub-dimension, and 60 for the Motivational General Mastery sub-dimension.

A Spatial Visualization Test

The billing form contains personal information consisting of questions such as gender, age, academic achievement grade, and industry. A spatial visualization test was adapted to Turkish by Dursun (2010). In this study, the reliability coefficient of the test was found to be 0.74. The spatial visualization test consists of 10 types and 32 questions. The lowest score that can be obtained with the test is zero, while the highest score is 32.

Statistical Analysis

SPSS 25.00 program was used in statistical analysis. The Shapiro-Wilk test was used to understand whether the data were normally distributed. It was determined that the data showed normal distribution. In the study, t-test for the difference between paired groups and one-way ANOVA test for multiple comparisons were applied. The Post-Hoc (Tukey) test was used to identify the group with a difference according to the ANOVA test results.

Ethical Report

This study was approved under the letter dated 27.11.2019 and numbered 923408882-050.04.04 of the Research Ethics Committee of the Non-Invasive Clinic of the Faculty of Health Sciences of Aydın Adnan Menderes University.

Findings

In Table 1, the gender, age, sports age and branch numbers and percentages of the athletes are given. Comparison of imagery dimensions according to gender variable in Table 2, comparison of imagery dimensions according to age variable of athletes in Table 3 are given. In Table 4, there is a comparison of the imagery dimensions of the athletes according to the branch variable, and in the table 5, the comparison of the imagery sizes according to the Sports age variable.

Table 1

Gender, Age, Sports Age and Branch Numbers and Percentages of the Athletes

Independent variables	Parameter	Number (n)	Percentage (%)
Sex	Female	103	47.91
	Male	112	52.49
Age (Year)	18-20	61	28.37
	21-24	99	46.05
	25 and above	55	25.58
Branch	Wrestling	48	22.35
	Track and field	40	18.60
	Archery	39	18.14
	Swimming	43	20.00
	Tennis	45	20.93
Sports Age (Year)	1-5	55	25.58
	6-11	108	50.23
	12 and above	52	24.19

Considering the gender distribution of the athletes participating in the research, 47.91% (103) are female athletes and 52.49% (112) are male athletes. According to age variables, there are 61 athletes between the ages of 18-20, 99 athletes between the ages of 21-24 and 55 athletes over the age of 25. 48 of the participants are wrestling, 40 are athletics, 39 are archery, 43 are swimming and 34 are tennis players. Sports ages of the athletes were 55 athletes between the ages of 1-5, 108 athletes between the ages of 6-11, and 52 athletes between the ages of 12 and above.

Table 2

Comparison of the Imagery Dimensions of the Athletes According to the Gender Variable

Variables	Sex	N	Mean	St. Deviation	t	p
Cognitive Imagery	Female	103	5.80	0.79	0.318	0.753
	Male	112	5.77	1.02		
Motivational Special Imagery	Female	103	5.52	1.03	0.098	0.920
	Male	112	5.50	1.23		
Motivational General Arousal	Female	103	3.28	0.85	1.398	0.168
	Male	112	3.12	0.70		
Motivational General Mastery	Female	103	5.88	0.96	-0.867	0.392
	Male	112	5.99	0.98		

When examined according to the gender variable, it is seen that there is no statistically significant difference between the sub-dimensions ($p>0.05$).

Table 3

Comparison of the Visualization Dimensions of the Athletes According to the Age Variable

Variables	Age	N	Mean	St. Deviation	F	p
Cognitive Imagery	18-20	61	5.75	0.91	2.03	0.138
	21-24	99	5.69	0.90		
	25 and above	55	6.04	0.95		
Motivational Special Imagery	18-20	61	5.56	1.20	0.278	0.759
	21-24	99	5.53	1.03		

	25 and above	55	5.39	1.30		
Motivational General Arousal	18-20	61	3.23	0.88	4.32	0.014*
	21-24	99	3.29	0.70		
	25 and above	55	2.88	0.72		
Motivational General Mastery	18-20	61	5.99	1.03	0.270	0.763
	21-24	99	5.88	0.97		
	25 and above	55	5.98	0.88		

$p<0.05$

No significant difference was found in mental imagery, motivational specific imagery and motivational general mastery sub-dimensions compared to the age variable ($p>0.05$). When compared according to the age variable, a significant difference was found in the motivational general arousal sub-dimension ($p<0.05$). The post hoc test was used to determine which group created the difference, and it was determined that the group that made the difference was 25 years old and over.

Table 4

Comparison of the Imagery Dimensions of the Athletes According to the Branch Variable

Variables	**Branches**	**N**	**Mean**	**St. Deviation**	**F**	**p**
Cognitive Imagery	Wrestling	48	5.75	1.04	0.409	0.802
	Track and field	40	5.73	0.977		
	Archery	39	5.95	0.858		
	Swimming	43	5.68	0.806		
	Tennis	45	5.81	0.899		
Motivational Special Imagery	Wrestling	48	5.49	1.04	0.176	0.950
	Track and field	40	5.45	1.07		
	Archery	39	5.47	1.27		
	Swimming	43	5.66	1.07		
	Tennis	45	5.47	1.28		
Motivational General Arousal	Wrestling	48	3.04	0.667	0.697	0.591
	Track and field	40	3.23	0.729		
	Archery	39	3.30	0.841		
	Swimming	43	3.17	0.809		
	Tennis	45	3.22	0.857		
Motivational General Mastery	Wrestling	48	5.89	1.02	0.235	0.913
	Track and field	40	5.89	1.01		
	Archery	39	6.07	0.928		
	Swimming	43	5.99	0.955		
	Tennis	45	5.89	0.949		

When examined according to the sport branch variable, no statistically significant difference was found in any sub-dimension ($p>0.05$).

Table 5

Comparison of Imagery Dimensions According to Sports Age Variable

Variables	**Sport Age**	**N**	**Mean**	**St. Deviation**	**F**	**p**
Cognitive Imagery	1-5	55	5.57	0.847	3.79	0.023*
	6-11	108	5.74	0.963		
	12 and above	52	6.09	0.851		
Motivational Special Imagery	1-5	55	5.33	1.15	1.58	0.212
	6-11	108	5.41	1.18		
	12 and above	52	5.72	0.998		

Motivational General Arousal	1-5	55	3.36	0.850	4.34	0.014*
	6-11	108	3.23	0.765		
	12 and above	52	2.90	0.630		
Motivational General Mastery	1-5	55	5.72	0.971	2.19	0.117
	6-11	108	5.97	0.998		
	12 and above	52	6.15	0.875		

p<0.05

There is a statistically significant difference in mental imagery (p=0.025) and general motivational arousal (p=.015) sub-dimensions when examining the sub-dimensions according to the sports age variable (p<0.05). To find out which group created the difference, the post-Hoc test was applied, and it was determined that there were athletes with a sports age of over 12 years. No statistically significant difference was found in other sub-dimensions.

Table 6

ANOVA Test Results in the Comparison of Spatial Visualization Scores of Data Obtained from Athletes According to Branches

Dimension	Branches	n	Mean	St. deviation	F	p
Spatial visualization	Wrestling	48	1.62	0.04	1.20	0.084
	Track and field	40	1.61	0.04		
	Archery	39	1.63	0.04		
	Swimming	43	1.59	0.05		
	Tennis	45	1.59	0.04		

It was determined that there was a statistically no significant difference between the branches according to the spatial visualization scores (p>0.05).

Discussion and Conclusion

This section is aimed to discuss the results related to the imagination levels of the athletes. Durmaz-Engeloğlu (2019) found significant differences in age, sports age and mental imagery scores according to gender. A study stated that there was no significant difference between the sub-dimensions of imagery in sports and the gender variable of 152 athletes (Kartal et al., 2017). In another study, Bayköse (2014) reported no statistically significant difference between the sub-dimensions of mental imagery, motivational-specific imagery, and general motivational mastery according to the gender variable. However, some studies do not show parallelism with our research. In the study conducted by Kızıldağ (2007), a significant difference was found between the mean scores of male and female athletes in mental imagery, motivational specific imagery and motivational general arousal sub-dimensions according to the gender variable. On the other hand, the average scores of the female athletes participating in the research from the sub-dimensions of imagery are statistically significantly higher than the male athletes. In another study, Yarayan and Ayan (2018) obtained results contrary to our research data. They stated that female athletes have higher imagery levels than male athletes, considering the average scores of the athletes participating in the research.

While Kan et al. (2023) found a significant difference in mastery when comparing the imagery scores of football players by gender, they did not find any difference in other subscales and total scale. In the study of Ağaoğlu et al. (2020), there was a significant difference in the "motivation-specific" dimension and the total score of image scores according to gender, while no significant difference was found in other sub-dimensions. According to the data obtained from our study, when the gender factor and imagery levels were examined, no statistically significant difference was found regarding the sub-dimensions of "Imagination in Sports" ($p>0.05$).

Bayrak and Nacar (2020) found a difference between the Sports Imagery Inventory subdimensions and the age variable in their study of female athletes. When the athletes who participated in the study conducted by Tekin (2018) were compared according to the age factor, a significant difference was found only in the Motivation-Specific Imagery subdimension of the Sports Imagery Evantary. However, it was found that the mean scores of the mental imagery, general motivational arousal, and general motivational mastery subdimensions did not differ significantly by age. When the two similar studies were examined according to the age variable, there was no statistically significant difference in all sub-dimensions (Vurgun, 2010; Parker and Lovell, 2012; Seleciler, 2019). According to the data of our study, when examining the age factor and imagination levels, statistically significant differences were found only in the subdimension of general motivational arousal related to the subdimensions 'Imagination in Sports Evanery' ($p < 0.05$). The group that makes the difference is the athletes aged 25 years and older.

In their study, Kolayiş et al. (2015) found that there was a statistically positive and significant relationship between the mental imagery and motivational general mastery sub-dimensions, which are the imagery sub-dimensions, and the age of sports, and that, in parallel with the increase in the sports age of the athletes, mental imagery and general motivational mastery sub-dimensions also increased—concluded that it increased. As a result of their study, Savaş and Yazıcı (2019) concluded that sportive imagery is higher in athletes with five years or more of sports compared to students who do sports between 1-4 years. Bayrak and Nacar (2020) did not find a semantic difference between the sub-dimensions of the inventory of imagery in sports and the variable of years of doing sports in their study on female athletes. Miçooğulları et al. (2009), in their study to determine the types of imagery and usage levels with 199 football players, compared to athletes with 6-10 years of sports experience, general cognitive imagery, cognitive specific imagery and motivational specific imagery compared to athletes with 1-5 years of sports history. They found that the mean size was statistically higher. Yamak (2019), in his study of female handball players, concluded that the exceptional motivational imagery sub-dimension scores of those who do sports between 3-7 years are lower than those who do sports for 12 years or more. In the study of Atasoy and Altun Ekiz (2021), a statistically significant

difference was found in favour of the participants in the 11-15 years range in the total imagination score, motivational specific imagery, general motivational arousal, and motivational general mastery sub-dimensions according to the variable of years of athletics. In the study of Yamak et al. (2018), in which they compared the visualization scores of female basketball players according to their sports age, it is seen that in the special motivational imagery sub-dimension, athletes 14 years and older and athletes with a sports age of 1-8 years have higher averages than athletes with a sports age of 9-13 years. In the same study, it was determined that in the general cognitive imagery, general motivational arousal and motivational general mastery sub-dimensions, athletes 14 years and older had a statistically higher mean than athletes 9-13 years of sports age. In another study, Gök et al. (2018), in their study to determine the level of imagination and perception of success of 321 track and field athletes aged between 13 and 15, revealed that the average of 13-year-old athletes was higher than 15-year-old athletes in all sub-dimensions of imagination levels. In this study, there was a statistically significant difference in mental imagery ($p=0.025$) and general motivational arousal ($p=0.015$) sub-dimensions when examining the sub-dimensions according to the sports age variable ($p<0.05$). It has been observed that the difference is created by athletes with a sports age of 12 years and above. It has been determined that there is an increase in mental imagery scores and a decrease in motivational general arousal scores as sports age increases. Precautions should be taken not to decrease the motivational general arousal levels of athletes with high sports age. Among these measures, sports training can be counted. In the studies of Imamoglu and Demirtaş (2017), it was found that sports education has positive reflections on body image. Yamaner et al. (2020) stated in their study that receiving sports training positively affects optimal performance mood. Again, in the study of Yamaner et al. (2018), it was suggested that receiving sports training increases athletes' maturity level. For these and similar reasons, efforts should be made to ensure that the athletes are educated, even sports trained.

The mental and physical performance of students is influenced by many factors. Sports have a positive effect on the physical and mental development of students. For example, it has been observed that students with high physical activity have higher attentional performance (İmamoğlu et al., 2018; Aslan et al., 2020; Uzun & İmamoğlu, 2020). Jansen and Lehmann (2013) found that gymnasts performed better in mental rotation tests than the sedentary group, with 120 participants consisting of gymnasts, football players and sedentary groups. In the same study, football players and gymnasts did not significantly differ in the tests. Yazıcı (2023) states in his study that there is a significant difference between children interested in individual sports and children interested in team sports in terms of spatial visualization scores ($p < 0.05$). The spatial visualization score of athletes interested in individual sports was higher than those interested in team sports.

In this study, although spatial imagination scores were similar by gender and industry variables, they were found to differ by age and sport age variables. Spatial visualisation scores did not show significant differences across the sports studied. The significant difference as a function of age and sport age indicates that more experienced athletes in their sports make better use of spatial visualisation skills and specialise in them over the years. It was found that as sport age increases, mental imagery scores increase and general motivational arousal scores decrease. Care should be taken to ensure that motivational general arousal levels do not decrease in athletes of advanced athletic age. This study should be conducted by expanding the scope with different sample groups.

Suggestions

Care should be taken to ensure that the general level of motivation of athletes with high sport age does not decrease. This study should be conducted by expanding the scope with different sample groups.

Ethics Committee Permission Information

Ethical review board: Aydın Adnan Menderes University, Non-Interventional Research Ethics Committee

Date of the ethical assessment document: 27.11.2019

Number of the ethical assessment document: 2019/063

Declaration of Contribution Rates of Researchers

Both authors contributed equally at all stages of the research.

Conflict Statement

The authors have no conflict declaration regarding the research.

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