

## **MENTAL IMAGERY TRAINING PROGRAM IMPLEMENTATION AND MEASUREMENT FOR ELITE ATHLETES**

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### **ABSTRACT**

The field of sports and exercise psychology mainly examines the effect of emotional and psychological factors on sportive performance. The condition that the athlete is in from psychological and emotional perspective affects the physical performance of the athlete directly. Envisioning exercise is one of the types of exercises that form the basis of mental training. It is used in various fields from assisting performance increase to physical rehabilitation following injury. It makes significant contributions to physical performance increase when it is implemented with annual physical training period systematically.

The subject of this research was to measure the envisioning skills of professional athletes. This measurement study was implemented among 120 licensed athletes, who had never done mental imagery exercise previously and who were between the ages of 18 and 30. Envisioning skills of these athletes were measured from the perspective of various psychological dimensions without doing any mental imagery exercise. Mental imagery exercise training program was added to the annual physical training periods of the athletes following implementation of a pre-test. Final test was made following such implementation, and a comparison was made between the imagery skills of athletes prior to doing any imagery exercises and after doing imagery exercises systematically, and an interpretation was made.

According to the results of the research, it was found in the pre-test results that most of the athletes had low mental imagery skills from the perspective of various psychological dimensions. As a result of the mental imagery exercises that were done systematically, a significant improvement was observed in the mental imagery skills of the athletes statistically. This case proves that mental imagery exercises that are done systematically cause a significant improvement in the skills of mental imagery skills.

**Key Words:** Sports and Exercise Psychology, Measurement of Envisioning, Imagination in Sports, Envisioning Exercise

## 1. INTRODUCTION AND OBJECTIVE

One of the most significant characteristics of the human brain is that it cannot tell dreams from reality (Martens 1987, Cox 2007). This case provides an advantage in terms of mental imagery exercises. Imagining sports events that are not realized yet, but desired, cause the brain to give electrical reactions as if such events took place (Murru and Kathleen 2010, Williams, Cumming and Balanos 2010, David, Hardy and Oliver 2011). These reactions are transmitted to our muscles, and our muscles become ready for the imagined sports events when they become real (Acevedo and Ekkekakis 2006). Muscles being ready for the imagined sports events make positive contribution to the performance of the athlete (Orlick 2008, Wilson, Vine and Wood 2009).

Envisioning refers to imagining all types of events that we experienced in reality as if we are performing them for real, provided that necessary pre-conditions come into existence. It is the case of forming or re-creating our experiences in our brains by using all of our senses. Envisioning is similar to our sensory experiences that we sense by using all of our senses; however, it generally sources from absence of an external stimulus. These experiences are the products of our brains, and they may be remembered as required afterwards. They may be controlled and new experiences may be built on former external cases and experiences.

Main objective of mental imagery exercises are to ensure that there is an increase in physical performance, to remove the negative issues that may occur during competition and to shorten the recovery period in case of any possible injury (Weinberg and Gould 2003, Roberts, Callow, Hardy, Markland and Bringer 2008). Mental imagery exercises ensure that various psychological states that have negative impacts on athletes are minimized, such as stress, anxiety, concern, motivation disorders, depression etc. (Williams 2006, Bartholomew, Ntoumanis, Ryan and Thogersen-Ntoumani 2011). It also ensures that issues that play an important in performance increase improve in positive direction, such as attention, concentration, goal setting, stress management, stimulus control, self-confidence, motivation and communication skills etc. (Biçer 1998, Mouratidis, Vansteenkiste, Lens and Sideridis 2008, Sarah and Cumming 2011, Smith, Ntoumanis, Duda and Vansteenkiste 2011). In case the athlete does envisioning exercises in his/her brain during recovery and return period following injury, it accelerates the healing process in the positive direction as it supports the administered treatment (Biçer 1999, Gardner and Moore 2006). It is revealed by scientific researches that envisioning exercises make positive contributions to performance increase (Cumming, Olphin and Law 2007, Pesce, Cereatti, Casella, Baldari and Capranica 2007, Burton and Raedeke 2008).

Envisioning requires experiencing the imagined situation with all of our sense organs. Events that are envisioned clear enough in the mind form stimuli in our brains that are very close to reality (Williams 2006). Therefore, athletes may benefit from envisioning exercises in order to strengthen, detail, intensify, remember new or former sports skills, and for purposes, such as strategies, sports tactics and techniques, sports rehabilitation etc. (Cox 2007). The main contribution that envisioning exercises make in athletes is that it ensures that athletes increase their skill to control their behaviours during training or competition. Thus, the athlete either manages to convert emotional and physical negative effects that are formed on him to positive or manages to remove the same.

Most frequently used envisioning methods in sports literature are as follows; Visual-Motor-Behaviour Rehearsal, Clarity and Controlling Exercise, Emotional Control and Consciousness Exercise (Konter 1999). In this study, Visual-Motor-Behaviour Rehearsal exercise program developed by Richard Suinn shall be provided to the athletes.

Main objectives of the Visual-Motor-Behaviour Rehearsal that shall be implemented by the athletes are as follows; to support technical developments in the field of sports, to analyse and correct the mistakes that are made in technical and tactical terms, to prepare the athlete to actual competition conditions, and to

provide assistance in removing possible problems that may be faced during training and competition by imaging. This training program is used in various sports branches in order to improve imagery skills (Suinn 1972, Feltz and Landers 1983, Suinn 1986, Van, Wenger and Gaul 1990, Shambrook and Bull 1996 Hale and Whitehouse 1998).

Visual-Motor-Behaviour Rehearsal is used in various sports branches for technical improvement, to analyse and correct mistakes. This training program is effective in increasing physical performances of athletes, preparing athletes to the matches, environmental conditions, opponents and particular cases that may possibly occur during competition (Suinn 1972, Feltz and Landers 1983, Suinn 1986, Hale and Whitehouse 1998). Another aim of the Visual-Motor-Behaviour Rehearsal is to structure and improve self-confidence in athletes. Athletes implemented the Visual-Motor-Behaviour Rehearsal, as explained above, half an-hour for 3 days in a week. Envisioning exercise programs of the athletes shall continue to be implemented simultaneously with their physical training programs. Athletes implemented the three sections available in the training program for three days a week according to the aforementioned order. Initial test was performed 30 days after commencement of implementation, and final test measurement was made in the end of implementation.

The contribution of this study to sports sciences literature: Envisioning exercises that are done together with physical training support sportive performance increase significantly (Cumming, Olphin and Law 2007, Pesce, Cereatti, Casella, Baldari and Capranica 2007, Burton and Raedeke 2008). Sportive performance of athletes increases, as their envisioning skills increase at a significant level (Acevedo and Ekkekakis 2006, Mouratidis, Vansteenkiste, Lens and Sideridis 2008, Orlick 2008, Wilson, Vine and Wood 2009). It is considered that this study which aims to measure how the mental imagery exercise is implemented by the athletes, as well as how much the quality of mental imagery skills increase shall form a basis for the athletes on how to perform and measure mental imagery exercises. It is envisaged that the performances of athletes shall increase, as their imaging skills increase.

## **2. MATERIAL AND METHOD**

In this chapter of the research, the objective of the researcher is to provide data on the objective, population and sampling, limitations, hypotheses of the research, programs and procedures, data collection tool used in the research, method of the research and analysis of research data.

### **2.1 Objective of the Research**

In our country, psychological training is not considered as important as physical training within the framework of training concept. The effects of psychological training on physical performance in sports are proved with the studies made in the field of study. These studies are comprised of data that are in the direction of institutionalization and implementation in order to maximize the performances of athletes during training and competition periods.

The information on how the envisioning exercises affect physical and psychological sportive performance is explained in the theoretical development of the research. This research is performed in order to measure how much the envisioning skills of professional athletes improve following implementation of envisioning exercises. As a result of this measurement, it is suggested that envisioning exercise that is done systematically causes envisioning skills that effect physical performance directly to increase.

## 2.2 Population and Sampling of the Research

The population of the research was comprised of athletes in Turkey, who were engaged in the branches of football, basketball, volleyball, handball, judo, skin diving, weight lifting, fencing, skiing, tennis, swimming and body building. In this context, sampling group of the research was comprised of male licensed athletes between the ages of 18-25, who were selected from any of the branches of sports via random sampling method and who currently deal with sports actively, and who had never done envisioning exercise and who did not participate in any envisioning measurement research previously. This research is in the form of field research.

## 2.3 Limitations of the Research

This research is limited to 120 licensed athletes between the ages of 18-25, who were engaged in the branches of football, basketball, volleyball, handball, judo, skin diving, weight lifting, fencing, skiing, tennis, swimming and body building and who were selected from any of the branches of sports via random sampling method. 10 athletes were selected from each branch of sports according to the aforementioned criteria by using this method. Findings obtained in the research were limited with the time frame when the tests were implemented. Data were obtained by using only the envisioning skill survey. Mental statuses of the athletes included to the research were limited with the answers given to the survey questions. This research was interpreted according to the answers given to the test that measured envisioning skills of the athletes. Judgements, ideas and personal opinions of the athletes were not considered during the measurement.

## 2.4 Research Hypotheses

Research hypotheses are as follows:

H<sub>1</sub> : There is a significant relationship between the increase in physical performances of athletes and envisioning skills of the same.

H<sub>2</sub>: Visual-Motor-Behaviour Rehearsal causes certain characteristics of athletes to improve in the direction of envisioning.

H<sub>3</sub>: Lowness of the skill levels of athletes, who had never done envisioning exercise previously, shall be revealed as a result of the measurement of the envisioning skills of the same.

H<sub>4</sub>: Envisioning exercise that is done systematically makes a positive impact on envisioning skills.

## 2.5 Programs and Procedures Used in the Research

Envisioning exercise program that was implemented in this research was implemented by 10 professional licensed athletes, who were each engaged in any of the branches of football, basketball, volleyball, handball, judo, free diving, weight lifting, fencing, skiing, tennis, swimming and body building and who were selected from any of the branches of sports via non-random sampling method, in 90 days for 3 days in a week and for a period of 30 minutes per day. The program was implemented on total of 120 athletes by the researcher.

Main objectives of the Visual-Motor-Behaviour Rehearsal implemented by the athletes were as follows; to support technical developments in the field of sports, to analyse and correct the mistakes that were made in technical and tactical terms, to prepare the athlete to actual competition conditions, and to provide assistance in removing possible problems that may be faced during training and competition by envisioning.

This training program was used in various sports branches in order to improve envisioning skills (Feltz, Landers 1983, Hale and Whitehouse 1998, Suinn 1986, Suinn 1972, Van, Wenger and Gaul 1990, Shambrook and Bull 1996). Visual-Motor-Behaviour Rehearsal may be divided into two parts as relaxation training and imagery training. Athletes shall envision for half an hour, 3 days per week the physical training, competitions and particular cases that are within the scope of sports training as if they are actually performing the same.

## 2.6 Data Collection Tool

Sport Imagery Questionnaire (SIQ) measurement test developed by Hall, Mack, Paivio and Hausenblas in 1998 in order to measure envisioning skill shall be used as the data collection tool in the research (Hall, Mack, Paivio and Hausenblas 1998). Subscales of the test are as follows;

**Cognitive Specific:** Refers to the part of envisioning which is related with skills development and formation.

**Cognitive General:** Refers to the part of envisioning which is related with competition strategies.

**Motivational Specific:** Refers to the part of envisioning which is related with setting specific goals and being target oriented.

**Motivational General-Arousal:** Refers to the part of envisioning which is related with stimulation, relaxation and competition anxiety etc.

**Motivational General-Mastery:** Refers to the fact that envisioning provides assistance in formation of self-confidence and effective coping techniques against complications that may occur.

Validity and reliability study of the questionnaire were made by the scientists, who developed the test in 1998. Reliability values of each subscale of the test were as follows; cognitive specific  $r = .83$ , cognitive general  $r = .81$ , motivational specific  $r = .90$ , motivational general-arousal  $r = .81$ , motivational general-mastery  $r = .85$ . General reliability value of the test was  $r = .70$ , and internal consistency value of the same was  $.68 - .87$  (Hall, Stevens and Paivio 2005, Morris et. al. 2005).

This test was used by several scientists in order to measure the envisioning skills of athletes from various branches of sports (Martin, Mortiz and Hall 1999, Sordoni Hall and Forwell 2000, Callow, Hardy and Hall 2001, Beauchamp, Bray and Albinson 2002, Cumming and Hall 2002, Cumming, Hall and Gammage 2002, Hardy, Hall and Carron 2003, Gregg, Hall and Nederhorf 2005). Studies with regards to adaptation of the questionnaire to Turkish, and validity and reliability studies were made by Vurgun in 2010. Cranchbach Alpha coefficient of the Turkish translation of SIQ was  $.70$ .

## 2.7 Data Collection Method

In the data collection section of the research, data were collected by the researcher personally. Envisioning exercise program implemented by the athletes, autogenic trainings implemented prior to the program, measurement study made before and after the program were managed by the researcher. It was explained to the athletes in written and orally that the research was in the nature of a scientific study, that they must be objective while giving answers, and that it was very important for them to provide accurate information.

## 2.8 Analysis of Research Data

In this section, a comparison was made between the results of the pre-test that was made on the athletes at the start of the research and results of the final test that was made on the same following implementation of envisioning exercise for ninety days. Points received by each athlete from Cognitive General, Motivational Specific, Motivational General-Arousal and Motivational General-Mastery imageries were revealed prior to the comparison procedure. General means of each of the imageries were calculated after pre-test and final test. Thus, pre and post envisioning exercise skill points were obtained with regards to each of the imageries. This procedure was implemented on each branch of sports that is within the scope of research. Then, means of pre-tests and final tests that were obtained in relation with each of the imageries were paired, and sampling was analysed and assessed statistically by using t test method. SPSS 20.0 statistical program was used in order to analyse data. As a result of the data analysis, obtained mean skill values were interpreted.

## 3. FINDINGS

Following values were presented in this section; general means of the pre-test and final test results of the athletes engaged in 12 branches of sports that were included within the scope of the research, and t test values that were obtained as a result of comparison of the values.

### 3.1 Overall Averages

#### 3.1.1 Pre-Test Overall Averages

Table 1 – Pretest Results Overall Averages.

|                              | Soccer | Basketball | Volleyball | Handball | Judo | Skin Diving | Weight Lifting | Fencing | Skiing | Tennis | Swimming | Body Building | Overall Averages |
|------------------------------|--------|------------|------------|----------|------|-------------|----------------|---------|--------|--------|----------|---------------|------------------|
| Cognitive Specific           | 1.9    | 1.98       | 2.26       | 2.24     | 2.79 | 4.49        | 3.5            | 2.41    | 4.42   | 3.95   | 4.23     | 4.65          | 3.23             |
| Cognitive General            | 1.85   | 1.96       | 2.21       | 2.15     | 2.78 | 4.34        | 3.6            | 2.44    | 4.13   | 3.77   | 3.94     | 4.32          | 3.12             |
| Motivational Specific        | 2.02   | 2.02       | 2.13       | 2.34     | 2.84 | 4.84        | 3.6            | 2.56    | 4.56   | 3.68   | 4.18     | 4.21          | 3.24             |
| Motivational General-Arousal | 1.72   | 1.82       | 2.33       | 2.39     | 3.23 | 4.59        | 3.49           | 2.51    | 4.59   | 3.71   | 4.09     | 4.68          | 3.26             |
| Motivational General-Mastery | 2.08   | 2.063      | 2.29       | 2.19     | 3.43 | 4.79        | 3.41           | 2.19    | 4.26   | 3.58   | 4.24     | 4.64          | 3.26             |

### 3.1.2 Final Test Overall Averages

Table 2 – Final Test Results Overall Averages.

|                              | Soccer | Basketball | Volleyball | Handball | Judo | Skin Diving | Weight Lifting | Fencing | Skiing | Tennis | Swimming | Body Building | Overall Averages |
|------------------------------|--------|------------|------------|----------|------|-------------|----------------|---------|--------|--------|----------|---------------|------------------|
| Cognitive Specific           | 5.2    | 5.87       | 6.11       | 5.71     | 6.11 | 6.14        | 5.48           | 5.62    | 6.38   | 6.04   | 6.08     | 6.48          | 5.93             |
| Cognitive General            | 4.9    | 5.8        | 6.21       | 5.91     | 6.18 | 6.1         | 5.76           | 5.56    | 6.16   | 5.96   | 5.91     | 6.11          | 5.88             |
| Motivational Specific        | 5.18   | 5.7        | 6.14       | 5.66     | 6.12 | 5.98        | 5.64           | 5.68    | 6.6    | 5.84   | 6.26     | 5.86          | 5.88             |
| Motivational General-Arousal | 5.28   | 5.68       | 6.1        | 5.66     | 6.16 | 6.08        | 5.45           | 5.65    | 6.51   | 6.01   | 6.01     | 6.3           | 5.90             |
| Motivational General-Mastery | 5.36   | 5.71       | 5.96       | 5.56     | 6    | 6.25        | 5.3            | 5.51    | 6      | 5.9    | 5.95     | 6.26          | 5.81             |

### 3.1.3 T Test Results

|               |   | Mean   | N  | Std. Deviation | Std. Error Mean |
|---------------|---|--------|----|----------------|-----------------|
| <b>Pair 1</b> | Cognitive Specific Pretest              | 3.2350 | 12 | 1.07574        | .31054          |
|               | Cognitive Specific Final Test           | 5.9350 | 12 | .37316         | .10772          |
| <b>Pair 2</b> | Cognitive General Pretest               | 3.1242 | 12 | .98068         | .28310          |
|               | Cognitive General Final Test            | 5.8800 | 12 | .36561         | .10554          |
| <b>Pair 3</b> | Motivational Specific Pretest           | 3.2483 | 12 | 1.04840        | .30265          |
|               | Motivational Specific Final Test        | 5.8883 | 12 | .36526         | .10544          |
| <b>Pair 4</b> | Motivational General-Arousal Pretest    | 3.2625 | 12 | 1.09249        | .31537          |
|               | Motivational General-Arousal Final Test | 5.9075 | 12 | .36320         | .10485          |
| <b>Pair 5</b> | Motivational General-Mastery Pretest    | 3.2633 | 12 | 1.06269        | .30677          |
|               | Motivational General-Mastery Final Test | 5.8133 | 12 | .32242         | .09307          |

Table – 3 Paired Sample Statistics

Paired samples test was used in relation with the statistical analysis presented in the research. This test is particularly used in trial model researches for comparison of pre- and post-test values.

General mean, standard deviation and standard error values of the pre-test and final test results with regards to all of the imageries may be observed together in Table 3.

Mean values that are determined for each of the imageries are the mean values of the 12 branches of sports indicated as the N value within the scope of research. As it may be seen in the table, an increase was observed in the mean values of each of the imageries following implementation of envisioning exercise program on the athletes.

|               |   | <b>N</b> | <b>Correlation</b> | <b>Sig.</b> |
|---------------|---|----------|--------------------|-------------|
| <b>Pair 1</b> | Motivational Specific Pretest<br>Cognitive Specific Final Test                        | 12       | .669               | .017        |
| <b>Pair 2</b> | Cognitive General Pretest<br>Cognitive General Final Test                             | 12       | .499               | .098        |
| <b>Pair 3</b> | Motivational Specific Pretest<br>Motivational Specific Final Test                     | 12       | .562               | .057        |
| <b>Pair 4</b> | Motivational General-Arousal<br>Pretest<br>Motivational General-Arousal<br>Final Test | 12       | .717               | .009        |
| <b>Pair 5</b> | Motivational General-Mastery<br>Pretest<br>Motivational General-Mastery<br>Final Test | 12       | .716               | .009        |

Table – 4 aird Samples Correlations

Correlation and significance values of each of the imageries obtained from the measurement results of pre-tests and final tests may be observed in Table 4.

Table – 5 Paired Samples Test Result

|        |   | Paired Differences |                |                 |   | t        | df      | Sig. (2-tailed) |       |
|--------|---|--------------------|----------------|-----------------|---|----------|---------|-----------------|-------|
|        |   | Mean               | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference |          |         |                 |       |
|        |   |                    |                |                 | Lower                                     |          |         |                 | Upper |
| Pair 1 | Motivational Specific Pretest<br>Cognitive Specific Final Test                  | -2.70000           | .87157         | .25160          | -3.25377                                  | -2.14623 | -10.731 | 11              | .000  |
| Pair 2 | Cognitive General Pretest<br>Cognitive General Final Test                       | -2.75583           | .85864         | .24787          | -3.30139                                  | -2.21028 | -11.118 | 11              | .000  |
| Pair 3 | Motivational Specific Pretest<br>Motivational Specific Final Test               | -2.64000           | .89572         | .25857          | -3.20911                                  | -2.07089 | -10.210 | 11              | .000  |
| Pair 4 | Motivational General-Arousal Pretest<br>Motivational General-Arousal Final Test | -2.64500           | .86970         | .25106          | -3.19758                                  | -2.09242 | -10.535 | 11              | .000  |
| Pair 5 | Motivational General-Mastery Pretest<br>Motivational General-Mastery Final Test | -2.55000           | .86162         | .24873          | -3.09744                                  | -2.00256 | -10.252 | 11              | .000  |

In Table 5, it may be observed that the values in “Significance” column are 0.00. Since the subject matter value is smaller than 0.05, we may indicate that the difference between the results of pre-tests and final tests made on each of the 5 imageries is significant statistically at the level of  $p < 0.05$ .

## DISCUSSION AND RESULT

In this section of the research, we shall assess the data obtained within the scope of research and a comparison shall be made with the sports psychology literature.

Mental imagery exercises are the exercises that are generally done to improve the skills of motivation, attention – concentration, goal setting, emotional control, stimulus control, stress management, as well as to prevent injuries and to shorten the recovery period of an already occurred injury. Positive improvements observed in these skills make an impact on physical performance directly. The most significant component that makes imagery exercises important for athletes is that, imagery exercise that is done regularly after meeting the pre-conditions allows us to pre-form the situation that we require to turn into reality. Electrical signals that are transmitted from our brains to our muscles ensure that our muscles are prepared for the skill, situation or sports technique we wish to demonstrate. In this context, we must regularly measure the quality and accuracy levels of the imagery skills we demonstrate.

The main subject of this research is the effects of mental imagery exercise on athletes and what type of procedures they must implement in order to perform imagery exercises with better quality, and measurement of such procedures. As a result of the experimental studies made within the scope of sports psychology literature, it is proved that imagery exercise makes positive contributions to physical and mental sportive performance. It has become evident that it is necessary particularly for the competitive athletes to include envisioning exercise within their annual physical training schedules. Therefore, psychological exercises of athletes are schedules as in the case of their physical trainings and they are varied according to the competition calendar of the athlete. In this context, benefits of imagery exercises are as follows;

- 1- It Ensures that Emotions are Controlled
- 2- It Improves and Structures Concentration
- 3- It Supports Strategy Formation
- 4- It Supports Development of Self-Confidence
- 5- It Supports Healing Period of Injuries
- 6- It Ensures Development of Technical Skills
- 7- It Corrects Mistakes that are Made
- 8- It Supports Learning and Development of Sports Skills

As it may be understood from the research made, athletes must do envisioning exercises within the framework of a systematic plan that is included to the annual training schedule of the athletes so that the aforementioned benefits may emerge. Mental imagery exercises may be done during, before and after a physical training, and before and after a competition.

As we make an assessment according to the research hypotheses, following results are obtained in consideration of the scientific data that emerged;

Hypothesis 1: Regarding the hypothesis where it is indicated that there is a significant relationship between the increase in the physical performance of athletes and their imagery skills, according to the research results, there is a significant relationship at the level of  $p < .005$ .

Hypothesis 2: Regarding the hypothesis where it is indicated that Visual-Motor-Behaviour Rehearsal

causes certain characteristics about mental imagery of the athletes to improve, it is accepted since there is a significant difference between the pre-test and final test results at the level of  $p < .005$ .

Hypothesis 3: Regarding the hypothesis where it is indicated that a low skill level shall be obtained as a result of making measurements on the envisioning skills of athletes, who had never done any envisioning exercise previously, it is significant statistically according to the pre-test results that emerged at the significance level of  $p < .005$ .

Hypothesis 5: Regarding the hypothesis where it is indicated that envisioning exercises that are made systematically affects envisioning skills positively, it is accepted according to the statistical analysis result that is obtained as a result of the comparison made between final test results and pre-test results which emerged at the significance level of  $p < .005$ .

As we consider the development of the envisioning skills of the athletes engaged in the branches of sports that are included to the research, in the sports that are within the scope of the research, it is observed that there is no equality in the measurements made in the sub dimensions of the scale. For example, according to the pre-test general mean results, likert values that were obtained in the football and basketball branches were lower than the likert values obtained in branches, such as skiing, body building and free diving etc. This situation also occurred in the final test results. Difference between the development of mental imagery skills and effect of this development on the physical performances of the athletes according to branches of sports is another academic issue that must be examined in the field of sports and exercise psychology.

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