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Relationship between the Self-efficacy and Imagery Ability with the Performance of Elite Women Table Tennis Players

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Abstract:

The aim of the present research is to examine the relationship between the self-efficacy and imagery ability with the performance of elite women table tennis players. The statistical population included 57 elite women table tennis players under the age of 21 years who managed to attend the national final tournament of single player to determine the rank of players from 1 to 32. Thirty two of these players were randomly selected through the accessible sampling method. The research was a descriptive-correlational method by which Bandura Personal Self-Efficacy (PSE) questionnaire was used as the tools for measuring data. Gold and Weisberg questionnaire was employed to measure internal-external mental imagery ability. Data analysis was performed by using SPSS: 18.0. Descriptive statistics as well as Spearman correlation coefficient was used (a=0.05) to test the association between the self-efficacy and internal-external mental imagery ability and performance. The result of analysis indicated that there was a significant association between the external mental-

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imagery ability and performance (P, 0<05), but no such relationship between the internal mental-imagery ability and performance (P, 0>05). It was concluded that self-efficacy is a good predictor of performance in competition.

Key words: Internal Mental Imagery, External Mental Imagery, Psychology, Performance, Self-efficacy

Psychology plays a significant role in sport. Despite the fact that this is a new area of interest, the subject is of interest to the researchers as well as practitioners in sport. Undoubtedly, without the knowledge and understanding of the psychological characteristics of the athletes, successful performance may not be achieved [1]. Psychological preparation not only enhances the likelihood of success of the athlete but it helps them to benefit from the mental ability to imagine the events and become more self-efficient [2].

In other words, high mental skill levels are one of the most important characteristics of the elite athletes that distinguish them from the ordinary athletes. Mental skills are the main components of high performance during the intense competitions [3]. Orlik and Partington (1988) demonstrated that the main factors that contribute to the success of elite athletes in the world scene are their commitment, quality of training, concentration and re-concentration ability prior to the competition. Two of the important mental skills are self-efficacy and the ability to use internal-external mental imagery [4]. Considering the body of knowledge regarding the importance of internal-external mental imagery in the literature and the difference in their application of these variables in different sport in addition to the usefulness of feeling of self-efficacy at various sport competitions, it may seem plausible to assume that internal-external mental imagery and self-efficacy are reliable predictors of motor skill performance for athletes. This research was designed to determine whether there was an

association between the internal-external mental imagery ability, self-confidence and successful performance of the elite athletes participating in table tennis national championship games for under 21 years old athletes.

Theoretical bases

Self-confidence

This concept is a general term used to describe the belief a person has about the self. Self-confidence in not about the nature of hope to success but rather it is an optimistic expectation for the task to fulfill and the judgment one has to achieve the task [5].

Self-confidence

This term describes the strength of confidence a person hold about a successful outcome or performance in regard to a specific task [6]. Self-confidence theory relies on the judgment of human regarding the self-capacity and ability in action. This judgment is the result of complicated processes experienced in personal beliefs and relies on different information from the past, beliefs, verbal persuasion and encouragement, psychological conditions and arousal [1, 2, 6].

Sport self-confidence

Sport self-confidence depends on three basic dimensions: skill, 2- environment, and individual [7]. Desirable sport self-confidence refers to the rate of personal belief in regard to the personal abilities in performance and achievement. This ability somehow depends on the feeling of skillfulness and personal self-confidence [8].

Mental imagery

Mental imagery is visualizing the successful performance of a motor skill execution or relaxing picture of executing a motor

skill in mind without any physical or external involvement [8]. For the experience of an unsuccessful performance of a motor skill, a person can try to perform the difficult and sometimes dangerous task through mental imagery pictures and relaxing experience to overcome the anxiety associated with a competition and learn to, concentrate on specific aspects of a task that are highly demanding [9, 10, 4]. Hall (2002) reported that mental imagery is a variable of inter individual differences [11].

Mental imagery can be employed inside or outside of the sport field or court. For instance, a tennis player may several times imagine for a few seconds the service that is aimed at landing in a particular location of the court before executing it in the court [9]. The question to be addressed is how the mental imagery leads to improvement in development of mental skills. Mental imagery helps the learner to develop the necessary mental instructions related to the actions and cause the nerve system to be subjected to stimulation similar to the experience of involvement in real physical practice. For this reason, Hall and Law (2009) assume that mental imagery is subject to the same rules and condition of learning [12]. In mental imager is constructed by practicing and using two types of pictures as follow:

Internal mental imagery

This type of imagery is an approximation of the real life condition. The person visualizes the execution or the scene of action without seeing oneself and experiences the real world conditions that are expected to occur in. The athletes frequently use this type of imagery for closed skills [13, 14].

External mental imagery

In this type of mental imagery, the person leaves the body and starts visualizing himself/herself performing a task as if he/she is watching a movie. For instance, a baseball thrower not only

sees his own throwing and catching actions of the other player from a watcher point of view, but also sees all the other players attending the field. Since in this type of imagery the person simply watches his actions, less emphasis is placed on kinetic sense. Most athletes often use this type of imagery for open skills [15, 16].

Comparing these two types of mental imageries, researchers have concluded that internal mental imagery is more efficient than the external mental imagery in most circumstances. Selection of one method over the other depends on sport type, athletes' character, and the goal of mental imagery [5, 17].

In general, it has been concluded that self-efficacy is one of the predictor of performance [18, 2, 1, 15, 19]. However, Woodman et al (2010) did not report any significant association between the self-efficacy and performance [20]. In addition, researchers claimed that internal mental imagery can be a good predictor of performance and learning [21, 4, 22, 23, 24].

Materials and Methods

The present study used a descriptive-associative field-based research. A questionnaire was employed to collect the data. The statistical population from which the subjects for the study were selected included 57 table tennis players under the age 21 year who had participated in youth notional championship competition in year 2012. A total of 32 players were selected as the accessible sample. Self-efficacy was assessed through Bandura physical self-efficacy (PSE) questionnaire. This instrument includes 10 basic techniques of table tennis game. Based on these scales the player score themselves from 1 to 10. Finally, the self-efficacy score is calculated by determining the ratio of total score for every technique divided to the number of techniques. The validity of this questionnaire has been established by previous work and its validity is 0.95. The

second questionnaire measured 24 internal mental activities. The subjects imagined themselves from within to perform the task and tried to experience the sensation and emotions resulting from the execution of the task. Another time, the subjects performed the same tasks but imagined themselves as if they watching themier own execution.

The self rating of the mental imagery was based on the clarity of the image they were able to see and ranked from 1 to 5. The validity and reliability of this questionnaire has also been established (r=0.82) by previous researchers (Hamayattalab, 20). The third questionnaire included 16 mental imagery pictures that the subjects used them as the eternal-imagery practice. The subjects once imagined the picture by closed eye and another time by open eye. For every practice, the performer scored the clarity of the image from 1 to 5.

Following the completion of the validating and reliability testing, ermission was obtained from the table tennis federation to reach the table tennis players to complete the questionnaire. Following the completion of data collections, statistical analysis was performed on data. The measures of central tendency as well as dispersions were calculated and reported. Spearman correlation coefficient was also used. The alpha level was set to 0.05 to test the hypothesis. All the procedure were performed by sing SPSS: pc 18.0.

Results

The first part of results included descriptive statistics presented in table 1.

Index	Mean	Sd
Self-efficacy	71.03	16.35
Internal mental imagery	45.87	18.13
External mental imagery	27.14	9.14
óóAge(year)	15.31	1.97
óSport background(year)	4.28	2.19

Table 1: descriptive statistics of self-efficacy, mental imagery, age and sport background

Table 1 shows that the mean of self –efficiency is 71.03, 45.87, for internal mental and external mental imagery 27.14, respectively. The mean of age and history of competition participation are approximately 15.31 and 4.28 years.

Test of hypothesis

1- Testing the association between the self-efficacy and performance

The result of analysis showed that there was a significant inverse association between the success of athletes in the competitions and self-efficacy scores.

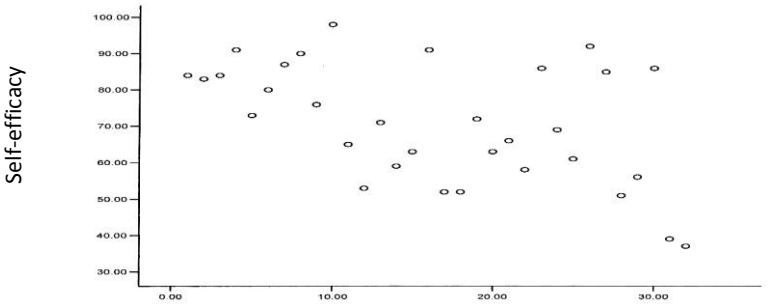

Figure 1: association between the self-efficacy and performance

N	r	P-value	decision
32	**-0.432**	**0.014**	**Significant**

Table 2: Spearman correlation coefficient between the self-efficacy and performance

Based on result presented in table 2, Spearman correlation coefficient is -0.432 (P=0.014). This association is statistically significant at alpha level set to 0.05.

2- Testing the association between the internal mental imagery and performance

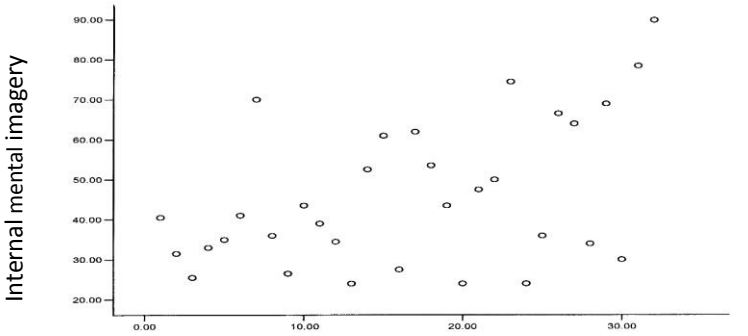

Figure 2: association between the internal mental imagery and performance

Based on the of result of analysis, it was found that a significant association between the internal–mental imagery and performance existed (r= 0.38, p=0.032). The result is shown in table 3. These results are also presented graphically in figure 2.

N	r	P-value	decision
32	**-0.38**	**0.038**	**Significant**

Table 3: Spearman correlation coefficient between the internal mental-imagery and performance

3- Testing the association between the external- mental imagery and performance

The result of analysis showed that a there was no significant association between the external–mental imagery and performance n (r= 0.25, p=0.15). The result is shown in table 4. These results are also presented graphically in figure 3**.**

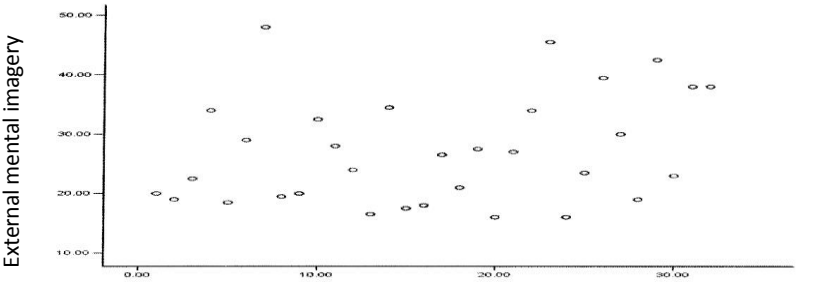

Figure 3: Association between the external mental imagery and performance

N	r	P-value	decision
32	-0.257	0.156	significant-not

Table 4: Spearman correlation coefficient between the external mental-imagery and performance

Discussion and conclusion

Hypothesis 1: association of self-efficacy and performance

The results of analysis of association of self-efficacy and performance indicated that there was significant association between these two variables. This result is in agreement with the result of other investigators who showed that there was such relationship between self-efficacy and performance [25, 26]. Balagour et al (2004) and Beaucamp et al (2003) concluded that self-efficacy is a reliable predictor of performance [19, 15]. It seems like the high ability athletes with experience and self-confidence score high in basic sport majors. Considering the low but the significant association between the self-efficiency and performance in this research, is seems plausible to conclude that with more experience, these athlete will also show higher association since more experience will lead to higher self-efficacy and performance score.

Hypothesis 2: association of internal mental imagery and performance

The result of this research in regard to the association of internal mental imagery and performance is in agreement with the results of some of the researches reported by Bertollo et al (2009), Ghezel souflu & Esfahani (2011) and Bar-Eli & Blumenstein (2004) [27, 28, 12]. The weak association of the present research between the two variables may be attributed to the age variation, nature of the task (open vs closed), different experience and imagery ability. However, the findings of the present research did not support the findings of J.Munroe

et al (2012), Orlick & Partington (1988) and Dulin et al (2008) [29, 4, 30] . These findings may be due to the low experience and age of the subjects.

Hypothesis 3: association of external mental imagery and performance

The findings of the present research are partly in agreement with the findings that were presented in regard to the association of internal mental imagery and performance Hemayattalab & Movahedi (2010) [31]. The authors concluded that internal imagery is preferred over the external imagery and results in more appropriate muscular involvement.

The general conclusion that can be drawn in regard to internal and external mental imagery is that athletes use the skill very often. Several researchers such as Thelwell & Maynard (2003), Wolframm & Micklewright (2011), Wei & Luo (2010), Guillot et al (2007) and Guillot et al (2012) examined the association between mental imagery and mental practice and concluded that mental imagery ability is an effective factor for learning, success in competition through mental imagery[32, 33, 9, 34, 22]. Their results indicated that individuals who have low level of ability to use mental imagery, mental practice has limited effect for them whereas those who have high level of mental imagery creation use the mental skill strategy for their training and mental preparation. In this research it was found that mental practice showed a significant effect on using mental training, thus, it seems necessary for the trainers or coaches to assess the mental ability of their learners or athletes and then present instruction appropriate for their athletes.

As it has been stated, the association between the self-efficacy and internal mental imagery with performance was significant but low and the lack of association between the external mental imagery and performance may be due to the poor experience and low age.

Orlick et al (1988) conducted a research to examine the effect of mental imagery on the performance of 7-10 years old table tennis players [4]. The result indicated that mental practice can be useful for children and it provides opportunity to have control over their performance.

Considering the result of the present research it is plausible to conclude that practice improves the mental imagery skills and enhances self-efficacy, thus this variables are useful for predicting the performance.

The effectiveness of mental imagery on performance is well established. In a research including high school and club rowers it was concluded that internal imageries were more effective than the external ones. The reason for the difference in the effectiveness of the two method may be attributed to the nature of the task, individual differences, personal experiences and the goals of mental imagery.

Thelwell & Greenless (2007) conducted a research to examine the effect of practicing some mental skills such as goal setting, relaxation, and mental imagery and concluded that practicing these skills considerably improves the performance [35]. The result of the present research showed that the difference in the effectiveness of the type of mental imagery is due to the personal experience, individual difference, the successful of failing experience of the individual to mention a few. Evans et al (2006) stated that there is a significant association between the mental imagery ability and performance of athletes; the elite athletes are superior in using their mental imagery compared to the ordinary athletes [36]. In addition, the more experienced athletes are more capable of using this ability compared to the less experienced athletes. Such findings may support the findings of the present research.

Frey (2003) showed that internal versus external mental imagery is more effective depends on the motor pattern of visual skills in tasks that emphasis timing and coordination, thus in table tennis that depends highly on timing and

coordination, internal mental imagery is more effective [23].

Considering the findings of the present research and others, mental skills and self-efficacy and internal-external mental imageries are significant predictors of athletes' performance.

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