Available online at www.pelagiaresearchlibrary.com

Pelagia Research Library

European Journal of Experimental Biology, 2012, 2 (6):2303-2309

ISSN: 2248 –9215
CODEN (USA): EJEBAU

Effect of attentional focus of self-talk on anxiety and learning under pressure

Nastaran Parvizi[1], Afkham Daneshfar[2*], Masoumeh Shojaei[2]

[1]*Islamic Azad University, Science and Research Branch. Ashrafi Isfehani freeway, Simon Bolivar Blv., Tehran, Iran*
[2]*Alzahra University, Department of Physical Education and Sport Sciences, Vanak St., Tehran, Iran*

ABSTRACT

The purpose of present study was to investigate the effect of attentional focus treatment by self-talk on anxiety, before basketball free throw, and transfer of learning to pressure situation. Therefore, 33 novice female students (mean of the age=22±2.1 yr.) and intermediate trait anxiety were selected randomly. The participants were assigned to 3 matched groups according to pretest. The self-talk with internal and external focus groups repeated the words "wrist" and "center of ring", respectively, before each free throw during 6 sessions (2 blocks of 10 trials in each session). Control group performed the free throws without self-talk. Transfer test was performed 48 hours after the acquisition phase with spectators. Throw accuracy and state anxiety was measured by a 5-point scale and Illinois self-evaluation questionnaire (CASI-2), respectively. Results of repeated measures and mix 2-factor ANOVA did not indicate significant differences between acquisition, transfer, and state anxiety of groups in different phases ($p>.05$), but the within subjects effect of self-talk with external focus of attention on transfer to pressure situation was significant ($p<.05$). Therefore, it is not necessary to shift intentional focus by self-talk for anxiety decrement and accuracy of free throw improvement in relative novice basketball players.

Keywords: basketball free throw, focus of attention, self-statement, stress

---

INTRODUCTION

Successful free throw requires correct technique, calmness, concentration, and confidence. Compared to other throws, this one provides more opportunity to think and it can be resulted in physical and emotional tension especially during competition in presence of spectators due to extra efforts to perform optimally [1]. When the player performs under pressure, choking and yips will happen. For example, Baumeister in 1984, and 1985 and Lewise and Linder in 1997 consider choking as the result of the self-awareness and high anxiety of the individual regarding to perform the task. They consider the yips as the emotion and anxiety of the individual which are resulted from the stress during the matches and cause mistakes [2]. There are several theories and models regarding the relation between anxiety and performance such as Inverted U Hypothesis [3], Multidimensional Theory of Anxiety [4], the model of Zone of Optimal Functioning [5], and Catastrophe Theory [6]. On the basis of these theories and hypotheses, the relation between anxiety and performance is depended on the characteristics of task and individual differences [7, 8, 9].

Several strategies are being studied to reduce anxiety and improve performance. Self-talk is one of these strategies. Self-talk is the usage of verbal cues during performance by performers to focus of attention on the key aspects of the skill [10]. Self-talk has two main functions. Instructional self-talk improves the performance through focusing of attention on the movement, correct technique or performance of the proper strategy. Motivational self-talk improves

the performance by increasing the energy and effort and is used to control the arousal and anxiety [11]. Previous studies show the positive effect of instructional and motivational self-talk on performance of different skills such as centre of gravity displacement and hip joint kinematics during the vertical jump [12], skiing [13] basketball dribble and shoot [14], cross-country running [15], water polo shot accuracy [16], Tennis forehand [17,18], football pass, badminton serve, Sit-up, Knee extension [19], Chest pass and Layup in basketball [20]. Perkos, Theodorakis, and Chroni in 2002 found that the instructional self-talk has a more effect on performance of basketball pass and dribble skills compared to free throw [21]. Chroni et al in 2007 showed that the motivational self-talk has greater effect of shooting than the instructional self-talk; however there was no differences between the two types of self-talk in performance of pass and dribble [14]. Hatzigeorgiadis et al in 2004 compared the effects of instructional and motivational self-talk on accuracy of shot and throw from different distances in water polo. They found that both instructional and motivational self-talk improve the performance in tasks which require accuracy and strength; however, the effect of instructional self-talk was more on the tasks that require accuracy and the motivational self-talk had higher effect on strength tasks. As mentioned, despite the effect of the self-talk on performance of different skills, study of the effect of instructional self-talk on the accuracy of shoot shows different results [16]. In regard to the effect of instructional and motivational self-talk on anxiety, Hatzigeorgiadis et al have studied the arm and leg movements in butterfly stroke, tennis forehand and accuracy in water polo shot. They concluded that the effect of motivational self-talk on anxiety was more than instructional self-talk. Moreover, they found different results regarding the effect of instructional self-talk on reducing the anxiety within different skills [16, 17, 22].

Researchers believe that the self-talk will cause to focus the player's attention [11]. Attentional focus can be external (effects of movement on the environment) or internal (body movements and actions) [23, 24]. Many studies have been performed on attentional focus of instructions. To teach the sport skills, coaches often use the terms which change the focus of attention towards body and coordination between limbs [25, 26]. However, the studies showed that these instructions are not resulted to better performance and learning. According to the previous studies [27, 28] and on the basis of the Ideo motor theory [29], Common-coding theory [30], constrained-action hypothesis [31], action effect hypothesis [32, 33], and the nodal point [28], the external focus on the movement effect causes better performance and learning. Unlike the above mentioned theories, conscious processing hypothesis [34, 35], explicit monitoring hypothesis [36], Deautomatization of skills hypothesis [37], and the results of some studies such as Cottyn et al [38], Emanuel et al [39], Perkins-Ceccato et al [40], and Poolton et al [26] the internal focus of attention is an effective factor in representation of movement by novices and children and in some simple and complex tasks. The internal focus of attention will be resulted in conscious control of movements. There is converging evidence that pressure-induced anxiety causes shifts inattention that lead to decrements in performance and learning [7, 8]. With respect to perceptual-motor tasks, self-focus theories claim that with increased anxiety there are shifts in attention to internal matters. These shifts either lead to explicit attention to the sequential steps of how the skill should be executed (explicit monitoring hypothesis) [36] or perhaps even to conscious control of the sequential steps of how the skill should be executed (conscious processing hypothesis) [35, 41].

In most studies, instruction and feedback are used to focus attention under pressure situation or non-pressure situation. Despite the fact that self-talk researchers have suggested that the effects of self-talk may work through the focusing of individuals' attention [18], limited research attention has been paid to this proposal [11]. Therefore, the purpose of the present study is to investigate the effect of attentional focus change through providing the proper self-statements by coach on the anxiety before basketball free throw and transfer of learning to pressure situation. It is assumed that in this skill and level of skill, the self-talk with external focus of attention will prevent shifting the attention towards the internal factors in the pressure situation and will result in more accurate throw through preventing the disturbance in automatic processes of movement control.

MATERIALS AND METHODS

The participants were 38 healthy and right-handed young girls (mean of the age=22±2.1 yr.) and intermediate trait anxiety who were selected randomly among the students of Alzahra University who were passing basketball course. They were able to perform the one hand set shot with a correct technique and were not member of any basketball team (in clubs, university or national level). Written informed consent was received from all participants after verbal explanation of the experimental design. The participants were assigned to three matched groups according to their free throw accuracy points in the pretest (10 throws).

Task was basketball free throw by standard ball (No. 6). Accuracy of the free throws was scored within a range of 1-5 points; 5 points were awarded if the ball went through the hoop, 3 points for the ball touching the hoop, 2 points for the ball touching the board and the hoop, and 1 point for the ball touching the board. A missed shot was given a score of 0 [42].

The competitive trait anxiety was measured by Sports Competitive Anxiety Test (SCAT) [4]. The test consists of fifteen items which include 5 spurious items, 8 positive items and 2 negative items. The scores were ranked in three-point scales (from rarely= 1 to often= 3). The Competitive State Anxiety Inventory-2 (CSAI-2) was used to measure the competitive state anxiety [4]. The CSAI-2 self-evaluation scale is a multidimensional inventory which measures somatic state anxiety, cognitive state anxiety and state self-confidence. Each subscale contains nine items adding to a total of 27 items for the entire scale. Participants respond to items on a 4-point likert scale and indicate how they feel at the current moment using the following descriptors: 1 (Not at all), 2 (Somewhat), 3 (Moderately so) and 4 (Very Much So). With the exception of one reversed item in the somatic subscale, the score of each subscale is determined by the summation of each subscale response set. The CSAI-2 shows high internal consistency, with coefficients ranging from. 79-.90. Support for construct validity is available in a study conducted on collegiate intramural sport athletes who indicated that the CSAI-2 outcomes were related to Anxiety Rating Scale-2 scores [43].

The use of the self-talk in the experimental groups was evaluated at the last session of acquisition through a 10-point scale (1= Not at all, 10= fully). At the first session, the correct model of basketball free throw was shown and the instruction of correct performance of task was presented. The participants had a 5 minute warm up and then completed the CSAI-2 self-evaluation scale and had 10 free throws as the pretest. The participants then assigned into three matched groups (two experimental groups and a control group) based on their scores. During the acquisition phase, 6 sessions of free throw practice (two sessions per week and 2 blocks of 10 trials in each session) were performed. At the first session, some information about self-talk was provided for the experimental groups and the internal and external focus groups were asked to repeat the words “wrist” and “center of ring” respectively before each throw. No information and instruction about self-talk was provided for the control group and dimensions of the free throw lane were explained during the same period to control the Hawthorne and Avis effects. The participants had 5 minutes for warm up in each session and repeat the cue words before each throw. Interval between blocks was about two minutes. At the beginning of last session of acquisition phase, again CASI-2 was given to all groups and the experimental groups filled out the self-talk use questionnaire included seven10-point items. At the end of last session of acquisition phase, the control group was asked the following questions: “were you thinking about anything during the free throws? What was in your mind if the answer is yes?” [22]. Forty eight hours after the last session of acquisition phase, the CSAI-2 was presented and then the transfer test was performed including 10 free throws in presence of 10 spectators. After transfer test, self-talk was explained to the control group and the following questions were asked from all groups with a 10-point scale: “Have you used any type of self-talk? What did you tell yourself if the answer is yes? How many times did you repeat these words during throws?” [17].

The 3(group) * 3(test) ANOVA with repeated measures of the last factor was used to analyze the throw accuracy and the state anxiety, A 3(group) * 3(test) MANOVA with repeated measures of the last factor was used to compare the CSAI-2 subscales, the ANOVA with repeated measures was used for within group comparisons, and the independent t test and ANOVA were used to compare the self-talk frequency of groups. The significance level was determined $p<.05$.

RESULTS

Figure 1 shows the means of free throw accuracy of groups during three tests. The results of the 3(group) * 3(test) ANOVA with repeated measures of the last factor for accuracy of the free throw showed that the main effect of group and the interaction of session and group were not significant (respectively $F_{(2,30)}=.35$, $p=.707$; $F_{(4,60)}=.26$, $p=.902$); however the main effect of test was significant ($F_{(2,69)}=9.93$, $p<.001$). The pairwise comparisons indicated significant differences between the accuracy of free throw in pretest and transfer test ($p=.001$). The results of repeated measures ANOVA indicated no significant within group differences for the self-talk with internal focus group ($F_{(2,9)}=2.241$, $p=.162$) and the control group ($F_{(2,8)}=2.837$, $p=.117$); however the difference was significant for the self-talk with external group ($F_{(2,10)}=3.867$, $p=.057$). The pairwise comparisons indicated that the accuracy of throw in self-talk with external focus group during the transfer test ($M=2.59\pm.59$) was significantly higher than the pretest ($M=1.79\pm1.05$)($p=.043$).

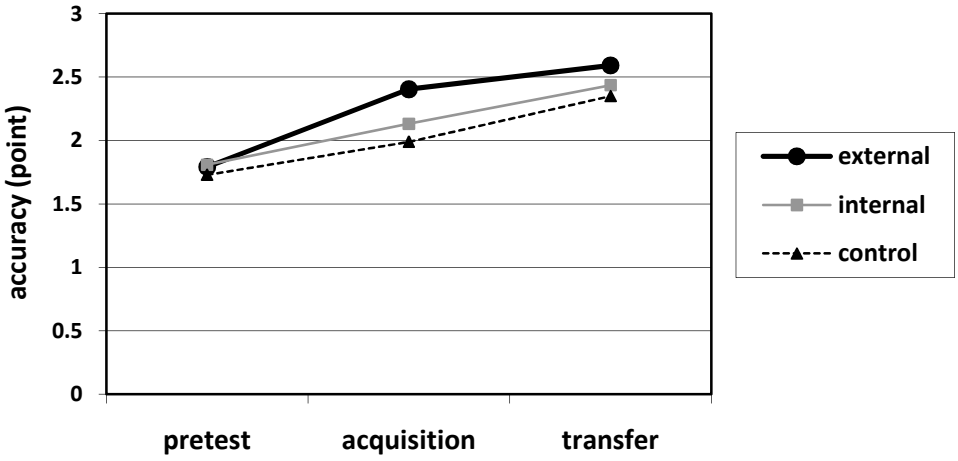

Figure 1. Free throw accuracy means of groups during different phases.

Figure 2 shows the means of the competitive state anxiety of groups during pretest, last session of acquisition and transfer test. The results of 3(group) * 3(test) ANOVA with repeated measures of last factor for competitive state anxiety indicated that the main effect of group and interaction of session and group were not significant(respectively $F_{(2,30)}$=.233, p=.793; $F_{(3.26,48.97)}$=.542, p=.671); however the main effect of test was significant ($F_{(1.63,48.97)}$=6.807, p=.004). The pairwise comparisons indicated significant difference between anxiety in pretest and transfer test (p=.006). The results of the repeated measures ANOVA indicated no significant within group differences for the self-talk with external focus group ($F_{(2,10)}$=2.157, p=.166), the self-talk with internal focus group ($F_{(2,9)}$=1.829, p=.215),and the control group ($F_{(2,8)}$=3.816, p=.069). The results of 3(group) * 3(test) MANOVA with repeated measure of last factor for state anxiety subscales indicated the significant effect of test ($F_{(6,25)}$=7.611, p<.001); however the main effect of group and the interaction of group and test were not significant(respectively $F_{(6,56)}$=.96, p=.461; $F_{(12.50)}$=1.124, p=0.363). The post hoc one-way ANOVA for the significant effect of test indicated the significant effect of test for three subscales of cognitive anxiety ($F_{(1.39,\ 41.83)}$=21.794, p<.001), physical anxiety ($F_{(2,60)}$=6.119, p=.004), and self-confidence ($F_{(1.471,\ 44.14)}$=3.687, p=.046). The pairwise comparisons indicated that physical anxiety during transfer test (M=11.66) was significantly lower than pretest (M=13.4, p=.005),cognitive anxiety during the transfer test (M=12.84) was significantly lower than pretest (M=15.96) and the last session of acquisition (p<.001, p=.001, respectively), and at the last session of the acquisition (M=13.98) was significantly lower than the pretest (p=.005). There was no significant difference between the self-confidence of different tests (p>.05).

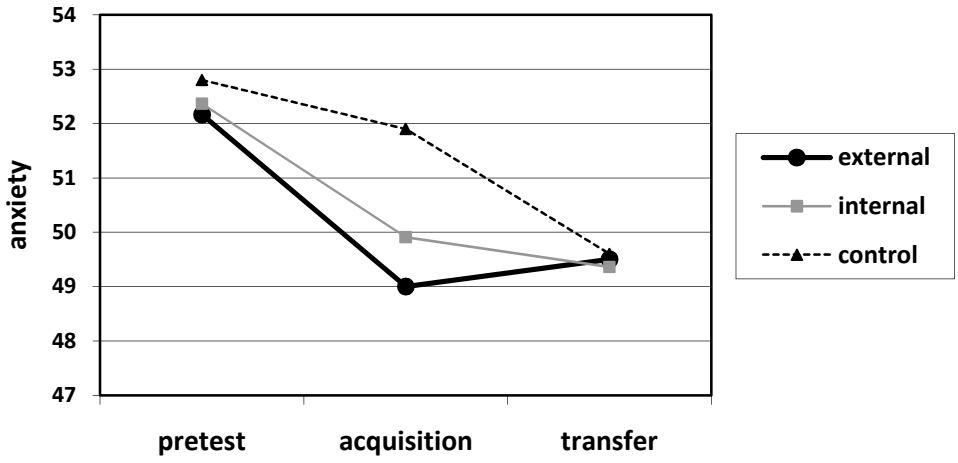

Figure 2. Competitive state anxiety means of groups during different phases.

The comparison between the self-talk frequency of experimental groups at the acquisition phase by independent t test indicated no significant difference between the self-talk with external focus group (M=7.67±2.77) and self-talk with internal focus group (M=7.36±1.9) ($t_{(21)}$=302, p=.765). Despite there was no self-talk instructions provided for the groups during the transfer test, 67% of the members of the self-talk with external focus group performed self-talk with external focus and none of them used self-talk with internal focus and 17% used Motivational self- talk;

however in the self-talk with internal focus group, the percentage of the members who used self-talk with internal and external focus was equal (36%) and none of them used motivational self-talk. Similarly, the percentage of the members who used self-talk with internal and external foci and motivational self-talk was equal in the control group (30%).

DISCUSSION AND CONCLUSION

The purpose of the present study was to investigate the effect of attentional focus treatment by self-talk on anxiety before basketball free throw and transfer of learning to pressure situation in novice young girls. The results of within group and between group comparisons did not indicate significant differences and solely the self-talk with external focus of attention was effective on the transfer to the pressure situation. The lack of between group differences and lack of significant effect of the instructional self-talk on acquisition and transfer can be attributed to the complexity of the task and low experience of the participants, as stated by Chroni et al [14]. It seems that the instructional self-talk has more effect on open skills, such as tennis volleying [18] and on simpler skills such as knee extension, sit-up [19], vertical jump [12], water polo throw accuracy [16], and basketball chest pass [20], than the closed and rather complex skills such as basketball free throw in this study.

Despite there was no significant between group differences in the present study, the self-talk with external focus group retained its advantage in acquisition and transfer and caused significant transfer to pressure situation. It is possible that more effects and significant differences are seen after more practices. Therefore, the within group results support the conscious processing hypothesis [34, 35] and the constrained action hypothesis [31]. According to the conscious processing hypothesis, internal focus instructions in the aiming tasks focuses the attention towards the important internal information in addition to the external information; therefore, internal focus instruction has a greater effect on the attention sources or the working memory which causes poorer performance [44, 45]. According to the constrained action hypothesis, the efforts for conscious control of the action in internal focus conditions limit the motor system and prevent automatic controlling processes [27].

The results of this study are inconsistent with the results of Gray in 2004 which was conducted in relation with the effect of skill level, focus of attention, and related and unrelated secondary task on performance of a stimulated baseball task. In the Gray study, the novices had less timing errors in performing the task with related secondary task (focus on throwing skill) than unrelated secondary task (regulating the throwing skill in accordance with the long and short sounds); however, the skilled individuals had weaker performance solely when the related secondary task was provided. If the participants of the present study have used self-talk at the time of performing, the self-talk has affected performance of the main task as a secondary task [46]. Considering the fact that the two types of self-talk in the present study were related to the skill, the self-talk with external focus may have caused fewer disturbances in execution due to higher relation with action effect. On the other hand, self-talk with internal focus may have caused overload in the attention capacity and caused focus on the target in aiming tasks due to the necessity of paying attention to the action. In the studies conducted by Passmore in 2003 [47] and Totska and Wulf in 2003 [48], superiority of external focus was seen in performance of a laboratory task; despite there was a mental overload. According to the action effect hypothesis [32, 33] attention to the effects of action causes more natural control of the different degrees of freedom in movement and leaves more capacity to focus on secondary task. Superiority of self-talk with external focus was witnessed in the present study too, although this superiority was not significant. According to the studies related to interaction of skill level and the focus of attention [49], it is possible that the positive effect of the internal focus in novices and the positive effect of the external focus in the skilled individuals has achieved the balance point in the middle of the skills continuum (not fully novices in the present study) and the difference between the types of focus of attention is disappeared.

Another possible reason for insignificant between group differences in the transfer test is the lack of control on self-talk. Despite the fact that more than a half of the members of self-talk group with external focus used this type of self-talk, the percentage of those members of two other groups who used self-talk with internal and external foci was equal. According to Mikes' point of view in 1987 and matching hypothesis of Hardy et al in 2009 another possibility is that the participants have not established a proper relation between self-talk and action [20, 21].

The results of the present study indicated that the state anxiety in the transfer test was significantly lower than pretest; however, there was no significant difference between various groups. It seems that one of the reasons for which the basketball free throw was better in the transfer test is lower physical and cognitive anxiety of the participants. According to the catastrophe theory [6] physical and cognitive anxiety is high in the pretest due to participants' lack of confidence for being able to fulfill the expectations of the researcher and therefore the performance was very bad; however, the physical and cognitive anxiety decreased in transfer test after a period of practice and performance improved. These results show that the researcher has been unsuccessful in providing the

pressure situation and it is required to focus on this issue in future studies. Considering that no significant difference was recognized between the anxiety of self-talk groups and control group in the present study shows that the witnessed decrease of anxiety during the experimental period shall not be considered as related to the self-talk and it shall be attributed to the practice. The results achieved in the majority of the researches are also indicate that the motivational self-talk has a greater influence on decreasing the anxiety compared to the instructional self-talk [17]. However, it is likely that insufficient practices and lack of control on self-talk in transfer test may conceal the effects of self-talk focus. In summary, in spite of the relation between performance and anxiety in the present study, instructional self-talk and the shift of the focus of attention through it had no effect on anxiety and free throw performance of the novice individuals. However, considering the fact that the participants were not fully novice and self-talk was not properly controlled, achieving a clear conclusion in this regard requires future studies through more practice and control of self-talk and consideration of type and level of skill.

REFERENCES

[1] Wissel H, *Basketball Steps to Success*, Human Kinetics, Champing, **2004**.
[2] Wulf G, *Attentinal and Motor Skill Learning*, Human Kinetics, Champaign, **2007**.
[3] Yerkes RM, Dodson JD, *J Comp Neurol Psychol*, **1908** ,18, 5, 459-482.
[4] Martens R, Vealey RS, Burton D, *Competitive Anxiety in Sport*, Human kinetics, Champing, **1990**.
[5] Straub WP, *Sport Psychology: An Analysis of Athletic Behavior*, Movement, Ithaca, **1980**, 236-249.
[6] Fazey J, Hardy L, British Association of Sport Sciences Monograph, 1, **1988**.
[7] Jalali A, MC thesis, Tehran University (Tehran, **2008**).
[8] Jarvis M, *Sport Psychology: A Student's Handbook*, Routledge, New York, **2006.**
[9] Roberts GC, Spink KS, Pemberton CL, *Learning Experiences in Sport Psychology*, Human Kinetics, Champaign, **1999.**
[10] Magill R, *Motor Learning & Control: Concepts and Applications*, Mc Graw- Hill, New York, **2010.**
[11] Hardy J, *J Sport Exercise Psy*, **2006**, 7, 81-97.
[12] Adwards C, Tod D, Macguigan M, *J sport Sci*, **2008**, 26, 13, 1459-1456.
[13] Rushall BS, Hall M, Roux L, Sasseville L, Rushall AS, *Sport Psychol*, **1988**, 2, 283–297.
[14] Chroni S, Perkos S, Theodorakis Y, *J Sport Psychol*, **2007**, 9, 1.
[15] Donohue B, Barnhart R, Cavassin T, Carpin K, Korb E, *J Sport Behav*, **2000**, 24, 2-12.
[16] Hatzigeorgiadis A, Theodorakis Y, Zourbanos N, *J appl Sport Psychol*, **2004**, 16, 138–150
[17] Hatzigeargiadis A, zourbanos N, Mpoumpaki S, Theodorakis Y, *J Psychol Sport Exercise*, **2008**, *10*, 186-192.
[18] Landin D, Hebert EP, *J appl Sport Psychol*, **1999**, 11, 263–282.
[19] Theodorakis Y, Weinberg R, Natsis P, Douma E, Kazakas P, *Sport Psychol*, **2000**,14, 253-272.
[20] Kolovelonis A, Goudas M, Dermitzaki I, *J Psychol Sport Exercise*, **2010**, 9,1-6.
[21] Perkos S, Theodorakis Y, Chroni S, *Sport Psychol*, **2002** ,16, 368–383.
[22] Hatzigeorgiadis A, *J Psychol*, **2006**, 3, 2, 164–175.
[23] Wulf G, Hob M, \Prinz W, *J Motor Behav*, **1998** ,30, 169-179.
[24] Wulf G, Lauterbach B, Toole T, *Res Q Exercise*, **1999**, 70, 120-126.
[25] Moghadam A, PhD thesis, Islamic Azad Sciences and Researches University (Tehran, **2007)**.
[26] Poolton JM, Maxwell JP, Masters RSW, Raab M, *J Sport Sci*, **2006** , 24, 1, 89-99.
[27] Wulf G, *E-Journal Bewegung und Training*, **2007** , 1, 1–11.
[28] Ehrlenspiel F, PhD thesis, Potsdam University (Berlin, German, **2006)**.
[29] James W, *The Principles of Psychology*, Holt, New York, **1890.**
[30] Neumann O, Prinz W, Relationships Between Perception and Action, Spring-Verlag, Berlin, **1990,** pp167-201.
[31] Wulf G, McNevin NH, Shea CH, *Q J Exl Psychol*, **2001**,54A, 1143–1154.
[32] Hommel B, Musseler J, Aschersleben G, Prinz W, *Behav Brain Sci*, **2001** , 24,5, 849.
[33] Prinz W, *Eur J Commun*, **1997**, 9, 129-154
[34] Hardy L, Mullen R, Jones G, *Brit J Psy*, **1996**, 87, 621-636.
[35] Masters RSW, *Brit J Psy*, **1992**, 83, 345-358.
[36] Beilock SL, Carr TH, *J Exp Psychol Gen*, **2001**,130, 701-725.
[37] Deikman AJ, *Psychiatry*, **1966**, *29*, 324-338.
[38] Cottyn J, Clercq D, Crombez G, Lenoir M, *J Sport Exercise Psy*, **2008,** 30, 159-170.
[39] Emanuel M, Jarus T, Bart O, *Phys Ther*, **2007**, 88, 251.
[40] Perkins- Ceccato N, Passmore SR, Lee TD, *J Sport Sci*, **2003**, 21, 187-202.
[41] Oudejans RD, Kuijper W, Kooijman CC, Bakker FC, *Anxiety Stress Copin***, 2010** , 24, 1, 59-73.
[42] Zachry T, Wulf G, Mercer J, Bezodis N, *Brain RES Bull*, **2005**, 67, 304-309.
[43] Cox RH, Russell WD, Robb M, *J Sport Behav*, **1998**, 21,30-*40*.
[44] Maxwell JP, Masters RSW, Evea FF, *Cosecuness & Cognition*, **2003** , 12, 376-402.
[45] Maxwell JP, Masters RSW, *Int J Appl Sport Sci*, **2002**, 14, 2, 70-88.

[46] Gray R, *J Exp Psychol-Appl*, **2004,** 10, 42-54.
[47] Passmore S, *J Sport Exercise Psy*. June, NASPSPA, Congress Abstract' s, **2003**, 107.
[48] Totska V, Wulf G, *Res Q Exercise Sport*, **2003** , 74, 220-225.
[49] Castaneda B, Gray R, *J Sport Exercise Psy*, **2007**, 29, 59-76.