

## **SURVEYING ON THE EFFECTS OF DUAL-TASK ON THE BASKETBALL DRIBBLING TRANSFER FROM THE NON-DOMINANT HAND TO DOMINANT HAND AND VICE VERSA**

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### **ABSTRACT**

The goal of this research was surveying on the effects of dual-tasks practice on the basketball dribbling transfer from non-dominant hand to top & vice versa. For doing this research selected 70 persons of non-athletic students from Islam Azad University Behbahan Branch, randomly & placed them in to the 7 groups each group included 10 persons. The groups included cognition of dual-practice non-dominant hand, motor dual-task -dribbling basketball of dominant hand & motor dual-task -dribbling basketball of non-dominant hand. Cognition of dual-practice non-dominant hand (groups 4, 5) more than dribbling practices & they beat to the Yoyo ball. Unit Task Groups just exercise dribbling (groups 2, 3) & first group was controlled group that they didn't participate none of the practices. The statistic method surveyed on the level of changes of skills of basketball dribbling after one course of exercise. Data analyzing showed that each motor dual-task causes to the meaningful changes in basketball dribbling. In other words, cognitive practice make more interference in basketball dribbling than motor practices in transfer step, also the level of transfer training on the effect of dual-task from non dominant hand to dominant hand was meaningful & vice versa. The findings showed that flexibility of attention capacity related to the needs of practice & can be said that the effect of appropriate dual-task can be effective based on decreasing the needs of practice or automation.

**Keywords:** *Attention, Dual-Task, Dribbling, Transfer*

### **INTRODUCTION**

One of the main goals of experts & researchers are surveying on the motor behavior, recognition the changes which have most effects on the training & motor skill transfer. This knowledge is so important in learning theories development & also the field usage is so important in training the motor skills. Surveying on the recognizing the effective variables on motor skills begins from second half of 20 century & also begins with the Adams & Smith's theories based on main & basic theoretical.

Smith's theory studied on the exercise samples & changes them & evaluated their effects as a dependent variable on acquisition, retention, transfer of training. Also this theory is emphasized on the effect of physical exercise conditions as on the most important skill training variables. Regarding to this theory, exercising in the appropriate conditions paid attention for optimum the acquisition, retention & transfer skills (Sayah & *et al.*, 2008).

Based on states the motor behavior study specially related to the motor skill, motor control & motor operation acquisition. Human is exploring the reasons of behavior from past centuries & tried to specify the mean of him/ her & others' self experiences. Sport psychology emerged as a bridge between science, physiology, neuroscience and biology is continuous with the advancement in the field, many of the findings and recommendations derived from these sciences. Attention is also one of the topics that are discussed in biological sciences, neuroscience &...this subject that many stimulus are faced to us & we cannot pay attention to them is obvious. Why it is happened? Why we cannot make contemporaneous answers? Why there are not various discussions? (Farsi & *et al.*, 2009).

Until now, there are different definitions about attention to function. About last 100 years James wrote that; all persons know what attention is, & he explained that attention is mind centralization a thing among other things, string of thoughts mass in clear and vivid form concentration, focalization &

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consciousness. This definition suggests that attention means the concentration of mental effort on sensory or mental events. Attention is our guided consciousness that continuously parallel of received by the senses (Martnz, 1987, translated by Hozhabr, 1993).

Attention included intellectual acquisition that along with person's readiness to sensory information & keep intellect. In other words, attention is a process that is guided our conscious to access the information to senses (Rahmani, 2003). Attention is process that person use senses for understanding the outside world by it. Concentration of attention means conscious from a case without paying attention to the other cases (Glin, 1940, translated by Seied & Masumeh, 2003).

James (1890) stated that attention is "mental selection to special stimulus among things or chain of stimulus & it is caused to for selecting better & effective stimulus, ignore some of stimulus." Regarding to the meaning of attention & obtained results of researches, the most important theories in about it includes two challenges; first explained the Bottleneck theory (filter), based on this theory the reason of difficulty of concurrent operation of several factors are the time limit of the human information processing system, so human is enable to concurrent operation of actions. It means processing system has bottleneck during the way, are not crossed the information that not selecting processing. Single-channel theory has more fans for long time till is specified not explained all of situations of operation. The most acceptable proposal is provided that the limitations resulting from limited access to the resources necessary to perform the function of information processing. While operate the dual-task don't need to the plenty of attention so it can be operated comfortably. This theory is provided more flexibility to provide multi-source theory. In this theory can consider processing resource (for example vision, space & hearing) if two practice don't need a same resource & can be operated comfortably. Most of researches were done in the dual task, secondary task & probe technique (Farsi & *et al.*, 2008).

So the role of attention is paid attention in retention of sport skills significantly in recent years by other researches & it concept is related by other concepts such as concentration, consciousness. The importance of attention must be said that most of the sport polices & strategies are based on the concept of attention. If a player can deflect key competitors' players to the fact false, deceptive movements, external events & the deception in un-correct way, cause to other players' attention deflects. So other surveyed dimension is athletes' attention during the sport activities that can be measured amount of players' readiness by this dimension recognition to participant in competitions & sport activities. This dimension recognition is vital for developing the athletes' mental skills, recognizing the mental strengths & weaknesses or persons' strengthen & readiness in sport field, implementation skills & specific performance (Rahmani, 2002). Regarding to the importance of attention, this research specified the role of attention in sport skills with doing cognitive & motor dual-task, also the authorities in about attention showed the importance of doing this research.

The question of this research; Can the dual-task be effective on the basketball dribbling transfer from the non-dominant hand to dominant hand and vice versa? How much it can be improved dribbling in basketball?

Farsi & *et al.*, (2008) studied on the effects of dual-task on the equilibrium & pattern of electrical activity of muscles on the 40 non-athletic students in Tehran University in 4 groups with 10 persons (without-practice group, equilibrium practice group, equilibrium-cognitive dual-task group & equilibrium-motor dual-task group) & resulted that equilibrium-cognitive dual-task & equilibrium-motor dual-task caused to meaningful changes on equilibrium. Equilibrium-motor dual-task method is the best ones. Also the level of interference of secondary task of continuum motor & secondary task of continuum cognitive on equilibrium & electrical activity of muscles specified that motor-task have more interference on equilibrium & also make electrical activity of muscles. So can be said that the effect of appropriate dual-task is effective with decreasing the task & automated requirements. In this research cognitive task, is the test of Stroop Test & motor-task tapping effects with Ping-Pong racket that data analyzing were done by analyzing tests such as; one-way variance, comminuted plots & dependent & correlation T.

Barznoni (2005), studied on the Comparison of the two-way transfer of learning to basketball dribbling in two different modes of the non-dominant hand among 30 girl students 20-24 years old (randomly). The

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results showed that two-way transfer of basket ball dribbling after practicing from dominant hand to non-dominant hand was done in the meaningful level. Also two-way learning dribbling basketball after one course exercise from dominant hand to the non-dominant hand was not done & it was done by active non-dominant hand significantly.

Ramezani (2004) studied on the effects of vision & motor sense feedback on skill retention of basketball dribbling among 32 boy students in the second years of experimental science 16-18 years old that they presented it voluntary. The findings of research showed the positive effect feedback in retention with emphasis on the role of vision feedback in retention skills of dribbling basketball.

Plotnik & *et al.*, (2009) studied on the bilateral coordination of gait in Parkinson's disease (PD) examined the effects of dual task. The analysis showed that the group of cognitive dual-task of gait had more weakness coordination than single task group. Also the data showed that cognitive resource can be effective in maintain the strength and frequency of the correct way of gait to the left and right of Parkinson's disease.

Hiscock & *et al.*, (2009) studied on “the coordination among counting & typing: dependence on the difference between the lateral interference in motor skills” the research findings supported on the effect of symmetry in the dual task interference pattern, apart from dominant of participants’ hand. The presence or absence of a basic asymmetry may be sufficient to determine whether the adverse dual task interference.

Silsupado & *et al.*, (2009) studied on the single task effects against the dual-task on equilibrium operations as three methods among older persons.

The results showed that dual-task affected on the walking speed dual-task conditions improvement in older participants with poor balance. Also dual-task may not most important & general in equilibrium control in about the important factor of speed of retention & learning.

Streng & *et al.*, (2008) studied on the indirect interference in using non-dominant hand in implementation contemporary play as a pin and groove boards and random assignments, & test the effect of interference among pin and groove boards play. The findings of research showed that the non-dominant hand is same in the processing resource in this play, but administrative aspects of random assignments are more sensitive to changes in the allocation of substantial resources.

### **MATERIALS AND METHODS**

Current research was semi-experimental & it was practical, too.

#### **Population**

The population of this research was all right-hand girl students in General Physical Education lesson in Islamic Azad University Behbahan Branch in 2009-10, & also they didn't participate in any sport competition in basketball (N=359)

#### **Static Sample**

Among above population selected randomly 70 persons. To ensure uniformity & homogeneity of groups, was done pre-test of basketball dribbling task from dominant & non-dominant hands & then caused to they were divided randomly, into the seven group.

#### **Measurement Tools**

- 1- Personal characteristics questionnaire such as age, height &...
- 2- Stopwatch for determining the controlled dribbling time record
- 3- Meter for measuring the specified dimensions in basketball court
- 4- Ball (Mikasa)
- 5- 6 barriers as corn
- 6- Test page that give one copy to students
- 7- Whistle

#### **Static Methods**

After obtaining the results of test, were used descriptive statics for determining the indexes such as; mean, standard deviation also table, chart for comparison. For testing the research hypotheses & data analysis

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were used dependent t-test & for determining the differences was used way ANOVA one, Bonferroni & LSD. SPSS22 software was used for data analysis.

**RESULTS AND DISCUSSION**

**Findings**

Table (1) showed that there was transfer from dominant hand to non-dominant hand in basketball dribbling in motor dual-task group, it means practice with dominant hand caused to time improvement in basketball dribbling with dominant hand ( $p=0.001$ ,  $t=13.679$ ). So (5) hypothesis was accepted ( $p\leq 0.001$ ) & can be resulted; motor dual-task basketball dribbling was effective on non-athletic girl students' dominant hands to non-dominant hands.

**Table 1: Dependent t-test for time means comparison of pre-test with transfer of motor dual-task basketball dribbling group's dominant hand**

	Mean	Standard deviation	t	Df	p-value
Transfer	14.700	2.268	13.679	9	0.001*
Pre-test	25.764	4.169			

Dual-motor task training - basketball dribble dribbling affected on the transfer of basketball dribbling transfer from non-athletic girl students' non-dominant hand to dominant hand.

Table (2) showed that there was transfer from non-dominant hand to dominant hand in motor-dual task basketball dribbling group. It means that practice with non-dominant hand caused to the to time improvement in basketball dribbling with dominant hand ( $p=0.001$ ,  $t=10.575$ ). so this hypothesis was accepted ( $p\leq 0.001$ ) & can be resulted; motor dual-task basketball dribbling was effective on non-athletic girl students' dominant hands to non-dominant hands.

**Table 2: Dependent t-test for time means comparison of pre-test with transfer of motor dual-task basketball dribbling non-dominant hand**

	Mean	Standard deviation	t	Df	p-value
Transfer	14.428	1.647	10.575	9	0.001*
Pre-test	25.515	3.724			

There was difference between task groups in transfer basketball dribbling step from non-dominant hand to dominant hand & vice versa among non-athletic girl students.

**Table 3: Variance analysis test for comparisons task groups in transfer step**

Static index	Total squares	Freedom rate	Mean squares	of f ratio	P-value
Changes resources					
Between group	163.359	5	32.672		
Internal group	723.094	54	13.391	2.440	0.046
total	886.453	59			

Table (10-4) showed that there was difference between task groups in difference among pre-test & transfer of practiced hand. So it can be resulted that there was different between non-athletic girl students' form non-dominant hand to dominant hand, among task groups in transfer basketball dribbling step.

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**Table 4: LSD tracking test for practiced hand for transfer**

Tas k grou ps	2 Mean differ ence	sig	3 Mean differ ence	sig	4 Mean differ ence	sig	5 Mean differ ence	sig	6 Mean differ ence	sig	7 Mean differ ence	sig
2			1.87	0.25	3.68	*0.028	6.68	0.67	0.13	0.93	0.15	0.92
3	1.87	0.25			5.56	*0.001	2.56	0.124	2.00	0.22	2.03	0.22
4	3.68	*0.028	-5.56	*0.001			3.003	0.072	3.55	*0.034	3.53	*0.035
5	6.68	0.67	-2.56	0.12	3.003	0.072			0.55	0.73	0.53	0.74
6	0.13	0.93	2.00	0.22	3.55	*0.034	0.55	0.73			0.02	0.98
7	0.15	0.92	2.03	0.22	3.53	*0.035	0.53	0.74	-0.02	0.98		

For comparison among the differences of pre-test & transfer test in different task groups was used one way ANOVA & for specifying the place of differences among 6 task groups was used LSD tracking test. Table (4) showed that there were difference between 4 task group with 2 task group (sig=0.028), 3 task group (sig=0.001), 6 task group (sig=0.034) & 7 task group (sig=0.035). it means that 4 task group is better than other groups & kind of their task had more transfer so can be resulted; cognitive task group than unit task had more effect on basketball dribbling transfer. Also motor dual-task had most affects on dribbling transfer than single task.

**Discussion**

The obtained findings showed that motor dual-task of basketball dribbling had positive effect on the transfer of basketball dribbling form dominant hand to non-dominant hand. It means that there was significant difference between pre-test record & transfer step on basketball dribbling & also can be said that subjects recorded better in transfer step than pre-test which it is determined the two-way transfer in training. The obtained results of is not same as Barznoni (2005) in this part that said transfer two-way training of basketball dribbling was not done after a practice course from non-dominant hand to dominant hand & two-way transfer was significant in dominant-hand to free non-dominant hand more than inactive non-dominant hand. This dissimilarity was because of kind of exercises & tasks & strategy of exercises that Barznoni was done in the 3 weeks.

The findings showed that in the transfer step, there was significant difference between single-task practice groups of dominant & non-dominant hands & cognitive dual-task group of dominant hand & motor-dual task groups of basketball dribbling of dominant hand to no n-dominant hand & cognitive dual-task of basketball dribbling of dominant hand. Maybe can be said that it is contextual interference that the Stroop effect is applied in tasks & caused to this interference be eliminated in time test which paid it more attention & subjects showed better operation. So can be said that contextual interference whether cognitive or motor has positive effect on the skill transfer between one member to other member & in the practice time involved the attention caused as cognitive (Stroop) or motor (hitting the yoyo ball) caused to better transfer of basketball dribbling from one part of body to the other than single task of non-dominant & dominant hand that need to the lower attention in time practice. So cognitive & motor dual-task method is appropriate method in transfer step of basketball dribbling & for making two-way transfer, first must train the organ & member of body then other members can be done it skillfully, this is a skill that can be improved with a dual task. Exercise can be an indication of the size of the improvement in other member, as a result of being a member failing to use its non-premium members that it is the best way to improve efficiency and increase the use of both hands simultaneously. The current results are same as results of

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some researchers; Ghaderi & *et al.*, (2005), Barznoni & *et al.*, (2005), Hiskok & *et al.*, (1997) & Jackvin & *et al.*, (2007).

### **Conclusion**

Regarding to the goal of this research that goal was surveying & comparison between dual-task on basketball dribbling from dominant hand to non-dominant hand & vice versa among non-athletic girl students. The results showed that in at all, there are two possible implementation task, some interferences are made by this implementation & may be caused to reduce the need for effective automated task or skills. Another issue is that the research deals with the issue of transfer are bidirectional which is integrated with the dual-task. According to previous research in this area, we find that the genetic superiority of one extremity of the superior limb leads one hemisphere of the brain & factors involved in the transfer of bilateral relations between the two hemispheres of the brain that calluses are mainly in the brain that cause the transfer of learning to the other hemisphere of the brain. Also according to the results of the acquisition, retention and transfer can be showed that especially the dual tasks of cognitive dual task can be a good way to two-way transmission because of the usefulness of bilateral, there are people on both sides of the body or limbs are more successful than others.

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