

THE EFFECT OF THE TRAINING WITH RECESSIVE HAND ON THE HITTING PERCENTAGE OF SHOTS PERFORMED WITH THE DOMINANT HAND FOR TABLE TENNIS PLAYERS

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ABSTRACT

In this research, the transfer effect of the skill training with not-preferred hand for the table tennis players on the skills with the dominant hand was studied. The research was conducted on 20 table tennis players between the ages of 20-25, and the training program lasted for 6 weeks, 5 days a week for. In addition to every exercise, a 10- minute training with the recessive hand was carried out. The transferring condition was tested at two-week intervals, and the repeated measures variance analysis (repeated measures ANOVAs) was used in the analyses. It was seen that a significant change in the findings started as of the second week from the beginning ($p < .05$).

Consequently, it was observed that the training with recessive hand has a positive transfer effect on the dominant side.

Keywords : table tennis, recessive hand, dominant hand , bilateral transfer

MASA TENİŞÇİLERDE RESESİF ELLE YAPILAN ANTRENMANIN DOMİNANT ELLE YAPILAN VURULARDA SABİT YÜZDESİ ÜZERİNE ETKİSİ

Bu ara tırmada masa teniřçilerde tercih edilmeyen elle yapılan beceri alı malarının dominant el ile yapılan beceriler üzerindeki transfer etkisi ara tırılmı tır.

Ara tırma, 20–25 ya aralı ındaki 20 masa teniřçi üzerinde yürütüldü ve antrenman programı 6 hafta boyunca haftada 5 gün devam etti. Her antrenman birimine ilave olarak resesif el ile 10 dakika antrenman yaptırıldı.

Transfer durumu iki er hafta aralıklarla test edildi ve analizlerde tekrarlı ölçümler varyans analizi (repeated measures ANOVA) kullanıldı. Bulgularda anlamlı de imin 2. haftadan itibaren ba ladı ı görüldü ($p < .05$).

Sonuç olarak resesif elle antrenman yaptırıldı ında dominant tarafa olumlu bir transfer etkisi oldu u gözlemlendi.

Anahtar kelimler: Masa Tenisi ,resesif el, dominant el, bilateral transfer

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INTRODUCTION AND OBJECTIVE

In sport branches having “bilateral skills”, like ski, skate, football, and basketball in which both of the two extremities are preferred equally by the trainers, the bilateral transfer has gained great importance for trainers. It is clear that a teaching design that will not prevent the recessive side from symmetrical development; reducing the training duplication and accelerating the learning pace at the stages of developing both “concept” and “motor program” during the process of teaching these skills, would provide so much benefit (Smith 1986).

Bilateral transfer researches were seen most commonly between the years 1930 and 1950. It was reported that the interest had lasted until the mid-way through the 20th century. Cook, one of the first researchers in the field of bilateral transfer researches, contributed significant studies to the literature between 1933 and 1936. These were mostly about the reasons of the emergence of bilateral transfer, understanding what it means for learning and controlling the skills in terms of principle processes, and understanding the role of the left hemisphere on the skills controlled by hand (Smith, 1986; Razon, 1976).

Researches agreed that bilateral transfer is not symmetrical (Smith, 1986). Although there is an asymmetrical construction both at the nature and the functions of the human brain (left-hemisphere is more dominant at 95% of it) and although it was found that “the movements of an extremity cannot be imitated by the opposite extremity”, it was proved that there is a transfer between the extremities. It was shown that the transfers of the common components, “concept” and “motor controlling program”, between the hemispheres were done through the medium of corpus-callosum (Ya argil, 1990; Ulu, 1982).

Over-developments due to carrying out early and unilateral should be avoided (Erdil, 1987).

The coordination of multiple organs is required in moves that require talent, and it depends on the principle that most of the teaching process in class and the gym will be transferred. However, the effects of the abilities done with the hand which is not preferred in sportive skills; on the abilities that done with the dominant hand are not totally discovered yet, and the researches on this subject are still in progress.

In this research, the answer for the question, “Is there a difference between the four time-period in terms of the scores that the participants got using their right-left hands?” was sought.

The main aim of this research is to examine the level of using dominant and recessive skills and the bilateral transfer of the table tennis players.

For this purpose, the transfer effect of the skill trainings with the recessive hand on the skills done with the dominant hand was studied.

METHOD

In this research, in-group design consisting of repeated measures was used.

Participants:

20 male table tennis players (between the ages 20-25) whose right hands were dominant and who were studying at Istanbul Marmara University in the academic year of 2010-2011 participated voluntarily.

According to the personal statements of the table tennis players, they didn't have any kind of health problems and they were the athletes who were still playing table tennis actively. All of the participants were chosen among the ones using their right hands.

Data Collection

After giving information about the research to the athletes, each of the athletes played with the robot that was set beforehand to throw 60 balls in a minute at a constant speed. They tried to rack up by hitting the marks 1, 2, and 3 on the table with the ball coming from the robot. After one minute elapsed, robot was stopped by a siren sound and the scores they got were noted down.

The ball, robot, score counter, table, and paddles used during the research were chosen in accordance with the international standards.

The ball; 100 pcs. Circumference 40 mm. Weight 2.7 gr.

The paddles; personal ragged inward-oriented and basic rubber sided paddles were used.

The robot; Butterfly 2500 branded robot was used.

The score counter; an electronic counter recording the scores when balls hit circles with 1, 2 and 3 points.

The first test was practiced by the participants before they started to practice with their right hands. The second test was practiced 2 weeks later. Within this two-week time, the participants practiced with their recessive hands for 10 minutes in each period of training.

The third and the fourth tests were carried out at two-week intervals and the participants practiced with their recessive hands each time. The scores that the athletes got were noted down after each test.

The Training Program

The athletes practicing five days a week played using their recessive hands for 10 minutes within every training unit. This process lasted for 6 weeks.

The time period of one practice was 1.5 hours. At the last 10 minutes of the practice, the

participants played forehand with their recessive hands for 7 minutes, and backhand for 3 minutes.

The practice was carried out in the sports hall of BB Sports Club and in the sports hall of Marmara University for table tennis.

Data Analysis

Repeated measures ANOVA was used to evaluate the effect of the training program on the hitting scores of each test. Multiple comparisons of significant differences were performed by using bonferroni verification.

As for the descriptive statistics, standard deviation was used. Significance level was determined as $p < .05$ at first, and as for the statistical analyses, SPSS 14 package software was used.

FINDINGS

Table 1. Averages and the standard deviation of the hitting scores at each test of the group.

Beginning	2 nd week	4 th week	6 th week	F	sd
Average (Sd)	Average (Sd)	Average (Sd)	Average (Sd)		
13.05 (4.80)	14.00 (5.52)	15.20 (5.32)	17.80 _c (5.35)	11.390**	3

** $p < .01$

Table 1 shows the hitting scores of the athletes that they got in the beginning, at the end of the 2nd week, at the end of the 4th week and at the end of the 6th week. It is seen that hitting scores increase linearly.

As a result of the repeated measures ANOVA, it was seen that the main effect of the test was significant, $F(3) = 11.390$, $p = .000$.

This effect means that hitting scores change significantly throughout the time period.

The results of the multiple comparison depict that this difference is between the beginning of the practice and the 4th and the 6th weeks, also there is a significant difference between the average points of the 2nd and the 6th week ($p < .05$).

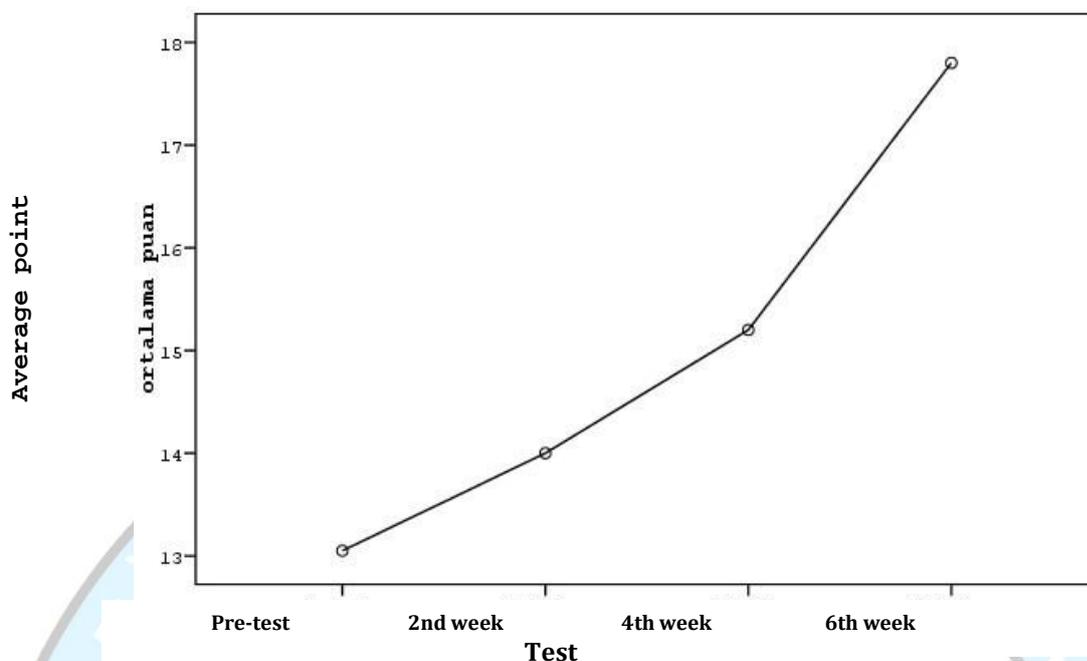


Figure 1. Hitting score changes of the athletes on each test

DISCUSSION

The findings of our research are supported with the literature of bilateral transfer. Generally, it shows parallelism with the researches arguing that starting the practice with the recessive side is useful.

After practicing with the recessive hand, the development on the dominant side became more obvious at the end of the each training. One of the significant findings in this research is that although it is performed only with right hand, it is important and meaningful for both the parallelism of the temporal bilateral transfer and having little difference of the recessive and dominant hands and getting so close scores.

After the practice sets, an increase in the transfer was recorded in all tests. This progress occurred in a similar way for all the participants. At the second test following the first, the dominant side showed an increase.

During the 6-week practice period, hitting scores of the athletes were seen to continue to increase linearly and this increase was found to be significant. Particularly, a significant change beginning from the 2nd week showed that the bilateral transfer started in a short span of time. And this associates with a change originating from neural system.

However, when we look at all the arithmetic averages, the highest score gained with dominant and recessive hands was achieved

just after the practice set and 4 weeks after the practice set.

In the researches, which were conducted to figure out whether or not the bilateral transfer really occurs, it was expected the organ (side) being researched to show the biggest profit or the development, but also that this significant change on the performance was performed by the organ, which was not used in practical terms. In that case, the obvious result is that the bilateral transfer occurred.

Bryant argues that it is uncertain whether the transfer is from the dominant hand to the other, or the vice versa. The theories about the transfer training between the different hands and feet have not been clarified enough by the current studies data. For instance, some people think that while the participant practices with one hand, little muscular changes recorded on the other hand cause the skill to develop for the second hand. The others suggest that some elements of intelligence and understanding provoke the transfer in one-handed tasks. In other words, thinking about the one-handed task causes a transfer through the mental connections formed between the tasks done with both hands.

Learning transfer deals with the knowledge, abilities, and skills acquired during the period of study and the aspects of the other characteristics implemented during the training process. The transfer could be positive,

negative or neutral. In order to be able to understand the effects of the transfer, an experimental group that learns the task and transfers it to a second task should be compared with a control group that merely implements the second task. If the experimental group performs better on the second task than the control group, a positive transfer occurs. It means that the first task being taught has been transferred and helped the second task to be carried out. If the experimental group performs worse on the second task than the control group, a negative transfer occurs. It means that the training over the first task has caused a weaker performance on the second task. Lastly, if there is no difference in terms of the performances of the control group and the experimental group; it means that a zero transfer has occurred (Gallahue, 1982). What is desired here is the transfer to be positive.

Learning transfer is a key concept for the students' learning. It is because many of the training programs requires what is learned to be transferred into the work. As it is used in this study, learning transfer means that the ones who learn at the work environment use the knowledge and skills newly acquired by attending a training program effectively and continuously at their own work. If the new acquirements make the learners work easier, the transfer is positive, and if they make it harder, the transfer is negative. If the new acquirements have no effect on the transfer process, it is thought that the transfer has not occurred (Broad & Newstrom, 1992; Demirel, 2007).

An interesting study supports the second theoretical assumption. A group of test participants carries out a one-handed task and then tries to do the same task with the other hand showing the expected positive transfer. A second group is allowed to observe how the task is done before they do this one-handed task with one of their hands. The success level of the second group is the same with the first group that has done the physical practice beforehand. This supports strongly that the transfer effects seen at both of the groups are related with the mental components of the task (Bryant, 1973).

From a theoretical perspective, knowing whether or not the bilateral transfer is symmetrical enables us to understand how the two hemispheres of the brain control the movement. If the transfer that is not

symmetrical is dominant in practice, the training with this organ should always be done before the training with the others. Contrary to this, if the symmetrical transfer is dominant, it makes no difference which organ is trained first. The commonly accepted argument about the direction of the transfer is that it is not symmetrical.

With a comprehensive research on bilateral transfer that was conducted before 1958, Ammons (1958) concluded that it could be expected that a perfect transfer was from the dominant organ to the recessive one.

According to Singer (1975; via Kasap, 1999) a skill gained through the practice of the muscular groups of an extremity also enables a learning for the extremity that is not practiced.

The transfer occurs when the change in a worker's personal performance depends on a learning situation, and this change is generalized to the area of work performance and after that, it becomes permanent for a long time (Demirel, 2007).

A recent study by Taylor and Heilman (1980) showed that the initial training with the recessive hand (the left hand for this study) for a complex finger-ordering task ended up with a better transfer towards the dominant hand than the opposite implementation and the transfer table did (Razon, 1976).

It is obviously seen that the direction of the bilateral transfer is not symmetrical. What is not clear is that more transfer occurs after the initial practice either from the dominant or the recessive organ.

RESULTS AND THE SUGGESTIONS

In many branches of sports, there is a great need for studies on the bilateral transfer. As a result of the current study, it was observed that there happened a development on the dominant side of the participants in a short span of time. The increase in the development of the participants' dominant sides can mean that they are more advantageous in terms of performance.

As a result, despite the findings that the organization of the brain is asymmetrical, and the right and the left hemispheres of it have different tasks to do than each other, and that the movements of an extremity cannot be imitated by the other one, a bilateral transfer thought to be formed in terms of concept and motor program occurs between hands.

Beginning the training with the recessive side reduces the learning differences between hands despite the motivational factors and the principles of from simple to complex and from the known to the unknown. Especially, it can be important for the branches of sports having bilateral skills. Bilateral transfer emerges in

different ways at different times during the learning and development processes. This should be taken into consideration at the design of training sets. Extremity changes that will be done with a good timing can be effective in learning, gaining time, and reinforcement.

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