

## **INVESTIGATION OF THE REALIZABILITY LEVELS OF MOVEMENTS REQUIRING DISPLACEMENT AND OBJECT CONTROL BY CHILDREN WITH LEARNING DISABILITY**

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### **Abstract**

*In this study, it was aimed to investigate the realizability levels of movements requiring displacement and object control by children with learning disability. 24 students with learning disability studying in special education subclasses in the schools of Ministry of National Education in Kars participated in the study. The required approval was received for the study and the permission letters for the study were collected from the children's families. "Basic Movements Check Lists" (BMCL), the reliability and validity studies of which were performed by (Gürsel and Yıldız 2008), was developed as a data collection tool. This form consists of 2 sections. The data were collected using Displacement Movements in Section I and the Movements Requiring Object Control in Section II. Data were summarized by giving the mean and standard deviation. T-test analysis was performed in the associations, and 0.05 significance level was taken into account in the interpretation of results. According to findings, when the experimental and control groups were compared before and after the application, it was concluded that the movements requiring displacement and object control could be realized by the children with learning disability in the experimental group, and this was significant at  $p < 0.01$  level.*

**Key words:** *learning disability, movement education, displacement, object control*

### **1. INTRODUCTION**

The most significant aim of education system is to help solving all children's potential problems during their development process and provide them with education in the fields they need. Special education under this system intends to create equal opportunities in terms of education for the individuals that aren't able to benefit from normal education processes for any reason. To achieve this, various studies are going on to define the individuals who need special education, establish and inspect special education institutions, prepare special education programs according to the development traits and personal competences of the individuals requiring special education and adapt the existing program accordingly (Demirci and Toptaşdemirci, 2014). The individuals that need special education must definitely be provided with education service which is their fundamental right at every age and gender no matter what incompetence, defect and disability they have. Countries are required to prepare education programs suitable for the individuals needing special education. While providing the convenient education under the basic education service, the following principles should be taken as basis: individuality, having education together with the same age group, early perception of disability, enabling these individuals to get such special service, continuity of education service, cooperation and centralized planning and execution of programs (Koparan, 2003).

A child is a being constantly moving and completely active. Especially after starting walking, a child is always in motion. A child needs moving to activate his/her organs, strengthen his/her skeletal structure, develop his/her lungs, activate his/her blood and strengthen neuro-motor links (Yarım kaya and Ulucan, 2015). The fact that a child tries movements in early period helps his/her self-perception which is based on one's skills and capabilities. Upon development of movements, a child starts knowing and managing his/her environment as well as gaining his/her independence (Yıldız and Gürsel, 2008). The skills acquired by children in the first two years of their lives constitute the foundation of the movements to be acquired in the following years (Sarı, 2005). After the age of two, the fundamental movements are roughly developed. These fundamental movements are the

movements requiring displacement such as running, jumping, stepping, hopping, side stepping and galloping as well as the movements requiring object control such as throwing, gripping, kicking and shooting a ball with an object in addition to the balancing movements such as straightening, stretching, twisting, bending, stopping, pushing and pulling. The fundamental skills may be affected by the presence of incapability. Connor-Kuntz and Dummer, (1996); Goodway and Rudisil, (1997); Hamilton et al. (1999) discovered in their studies that disadvantaged children show developmental retardation in terms of fundamental skills.

Another contribution of multi-dimensional movement education to children is no doubt about development of balance. Coordinated movement requires a certain balance system. Balance is briefly defined as the capability of moving body to provide the balance between the changing status and conditions (Taşkıran, 2003; Dündar, 1998). Balance capability is a considerably important factor in respect of acquisition of such skills as walking, running and jumping (Güven, 2006). Children needing special education aren't able to develop the knowledge, skills and attitudes required for an active and healthy life themselves. Such development is possible only within a learning process. Therefore, learning is required to start in childhood period and educators have the role to prepare the learning environment and enable disabled students to render daily physical activity a life-long habit and gain a healthy life style (Education, 2006). The fundamental movement skills including the movements requiring displacement such as walking, running, jumping and rolling as well as the balancing movements such as stooping, stretching, turning and weight-bearing in addition to the movements requiring object control such as throwing, gripping and dribbling should be rendered usable in a suitable form (suitable bio-mechanical form of movement) for students (Housner, 2009). Many studies (Connor-Kuntz and Dummer, 1996; Goodway and Branta 2003; Goodway et al. 2003; Valentini 1997; Zittel and Mc Cubin, 1996) discovered that disadvantaged children show developmental retardation in terms of fundamental movement skills. To prevent transformation of incapability into disability, the specialists in different disciplines should cooperate and work together to execute education process based on a common plan and program. A well-planned physical education and sports program can contribute positively to all development areas of children with mental disabilities (Winnick, 1990). This study intends to investigate the realizability levels of movements requiring displacement and object control by children with learning disability.

## **2. MATERIALS AND METHODS**

### **2.1. Participants**

12 students, as experimental group, and 12 students, as control group, participated in our study which was carried out in order to investigate the realizability levels of movements requiring displacement and object control by children with learning disability for 8 weeks. The students involved in the experimental group (n:12) were given multi-dimensional movement education for 8 weeks. A movement education program was applied for the experimental group for 8 weeks including one course hour for three days in a week. The control group (n:12) didn't attend any activity. "Fundamental Movements Checklists" were developed for both control and experimental groups before and after the movements requiring displacement and object control for 8 weeks. This form consists of two parts. The first part includes the data collected regarding the movements requiring displacement and the second one for the movements requiring object control (Gürsel and Yıldız 2008). The necessary approval was obtained for the study and the permission letters of the children's families were collected. Conducted in line with the relevant directive specified in Helsinki Declaration.

### **2.2. Data Collection Tool**

As data collection tool, "Fundamental Movements Checklists", whose reliability and validity tests were conducted by Gürsel and Yıldız 2008, were developed. This form consists of two parts. The first part includes the data collected regarding the movements requiring displacement and the second one for the movements requiring object control. While developing this observation form, "Test of Gross

Motor Development II” of Ulrich (7) and Fundamental Movement Pattern Assessment Instrument” of Gallahue and Ozmun (6) were inspired. According to Gallahue and Ozmun (6), a skill is performed at initial, elementary and mature levels. The skills were analysed according to mature levels of movements in this study. The observation items were created by three specialists in their fields taking into account the concepts of “movements requiring displacement” and “movements requiring object control”.

The observation items were created by three specialists in their fields taking into account the concepts of “movements requiring displacement” and “movements requiring object control”. While the Checklists were being prepared, it was paid attention to using a language easily comprehensible by physical education teachers, class teachers and primary education students. Therefore, a reviewer group consisting of a class teacher, a child development specialist and a Turkish Philology specialist was asked to assess the checklists in terms of suitability of the expressions and directions included in the checklists for the Turkish language. In line with the written and oral feedback, some items were amended in respect of language and clarity. Then, the final form of the checklist was created by a linguistic specialist and an assessment-evaluation specialist.

### **2.3. Collection of Data**

Before 8-week application, the displacement movements of children with learning disability including walking, running, stepping-hopping, vertical jumping, horizontal jumping, galloping and side stepping were videotaped in monitorable way. The checklists created by the specialists for the analysis of each movement were given to three specialists including a physical education teacher and two academic members. The specialists watched the video images and put a tick on the checklists based on whether the movement parts were realized or not and hence they performed the first assessment. The same images were watched again after 8 weeks and then the final test data were collected in the same way. This study was planned in order to investigate the realizability levels of movements requiring displacement and object control by children with learning disability in the schools under MEB (The Ministry of National Education) in the city of Kars for 8 weeks. 12 students, as experimental group, and 12 students, as control group, participated in this study. The study was executed for 8 weeks. In the study, a class teacher assisted the researcher during whole study. The study was conducted for one course hour on three days in a week. Each course lasted for 40 minutes including a) 5 minutes for introduction, b) 20 minutes for activities of movement education, c) 5 minutes for a game (e.g. running) regarding the “fundamental movement” of the related week and d) 5 minutes for cooling and finishing. After the movements were shown by the teachers, the children were asked to repeat them. Individual and corrective feedback was provided.

### **2.4. Statistical Analysis**

SPSS 22.0 statistics package program was used in this study to test the significance of the difference between preliminary and final test values of children’s movements requiring displacement and object control and to assess the data. The data were summarized by giving the average values and standard deviations. Whether the data have a normal distribution was tested via One-Sample Kolmogorov-Smirnov test and it was found out that the data had normal distribution. Since the data has normal distribution, Paired-Samples T was used to determine the difference between dependent variables while Independent-Samples T test was used for the difference between independent variables. The significance level was accepted as  $p < .05$

## **3. RESULTS**

According to the results of this study, the significance of the difference between preliminary test values of the movements requiring displacement and object control among the children with learning disability was tested. Based on these results, it was determined that there wasn’t a significant

difference at the level of  $p > 0,05$  between the preliminary test scores of control and experimental group of the 8-week program (Table 1).

**Table 1.** Comparison of preliminary test scores of movements requiring displacement and object control between the control and experimental group of children with learning disability

Groups	Variables	N	$\bar{x} \pm sd$	t value	P value
	<b>Movement requiring displacement</b>		<b>Preliminary test</b>		
Control	Walking	12	5,13 ± 0,27	1,397	0,156
Experimental			5,09 ± 0,20		
Control	Running	12	5,40 ± 0,52	,458	0,566
Experimental			5,25 ± 0,62		
Control	Vertical jumping	12	3,11 ± 1,05	,798	0,421
Experimental			3,19 ± 0,79		
Control	Horizontal jumping	12	3,55 ± 0,55	,382	0,695
Experimental			3,67 ± 0,61		
Control	Galloping	12	5,11 ± 1,21	1,403	0,169
Experimental			5,14 ± 0,23		
Control	Side stepping	12	3,09 ± 0,76	,384	0,710
Experimental			3,18 ± 0,83		
Control	Stepping-Hopping	12	3,13 ± 1,11	,392	0,721
Experimental			3,25 ± 0,90		
Control	Hopping	12	3,27 ± 1,14	,362	0,701
Experimental			3,33 ± 0,93		
Control	Striding	12	3,12 ± 1,05	,387	0,725
Experimental			3,28 ± 0,88		
<b>Groups</b>	<b>Movements requiring object control</b>				
Control	Underhead shooting	12	3,17 ± 1,10	,386	0,724
Experimental			3,22 ± 0,82		
Control	Overhead shooting	12	3,35 ± 0,65	,396	0,731
Experimental			3,62 ± 0,67		
Control	Underhead gripping	12	3,40 ± 0,66	,801	0,426
Experimental			3,71 ± 0,75		
Control	Overhead gripping	12	3,13 ± 0,78	,392	0,702
Experimental			3,21 ± 0,87		
Control	Kicking	12	3,10 ± 1,10	,389	0,705
Experimental			3,21 ± 0,88		
Control	Shooting ball with a mallet	12	3,31 ± 1,16	,376	0,712
Experimental			3,41 ± 0,98		
Control	Rolling	12	3,17 ± 1,12	,395	0,730
Experimental			3,36 ± 0,92		

**Table 2.** Comparison of final test scores of movements requiring displacement and object control between the control and experimental group of children with learning disability

Groups	Variables	N	x±sd	t value	P value
	<b>Movement requiring displacement</b>		<b>Final test</b>		
Control	Walking	12	5.33 ± 1.95	3,252	0,015*
Experimental			6.10 ± 1.20		
Control	Running	12	6.12 ± 1.25	2,445	0,040*
Experimental			6.78 ± 1.23		
Control	Vertical jumping	12	5.14 ± 1.23	2,725	0,012*
Experimental			6.16 ± 1.92		
Control	Horizontal jumping	12	5.89 ± 1.37	3,180	0,031*
Experimental			6.66 ± 1.50		
Control	Galloping	12	5.95 ± 1.20	3,275	0,025*
Experimental			6.65 ± 1.30		
Control	Side stepping	12	4.95 ± 2.08	2,380	0,043*
Experimental			5.55 ± 2.35		
Control	Stepping-Hopping	12	4.05 ± 1.15	3,860	0,015*
Experimental			5.17 ± 1.45		
Control	Hopping	12	6.85 ± 1.29	3,540	0,017*
Experimental			7.90 ± 1.75		
Control	Striding	12	5.05 ± 2.02	2,450	0,011*
Experimental			5.82 ± 2.65		
<b>Groups</b>	<b>Movements requiring object control</b>				
Control	Underhead shooting	12	4.22 ± 1.29	2,265	0,012*
Experimental			5.36 ± 1.15		
Control	Overhead shooting	12	5.75 ± 1.45	2,735	0,014*
Experimental			6.70 ± 1.32		
Control	Underhead gripping	12	5.36 ± 1.40	2,845	0,018*
Experimental			6.23 ± 1.63		
Control	Overhead gripping	12	4.85 ± 2.20	3,105	0,016*
Experimental			5.80 ± 2.32		
Control	Kicking	12	4.18 ± 1.21	3,530	0,015*
Experimental			5.10 ± 1.34		
Control	Shooting ball with a mallet	12	5.40 ± 2.27	2,430	0,012*
Experimental			6.60 ± 2.15		
Control	Rolling	12	3.75 ± 1.11	3,840	0,019*
Experimental			5.10 ± 1.25		

According to these results, there is a significant difference at the level of  $p < 0,01$  between the final test scores of eight-week program among the children with learning disability (Table 2). Based on these data, it can be stated that the eight-week program has led to a significant difference between the final test scores of the movements requiring displacement and object control in the experimental group compared to the control group.

#### **4. DISCUSSION AND CONCLUSION**

Totally 24 students including 12 students as experimental group and 12 as control group participated in this study in which the realizability levels of movements requiring displacement and object control by children with learning disability were investigated. Development of fundamental movement skills enables body to be used more efficiently in life. These movements constitute the movement background of more complex games and sports to be performed in the future by the students needing special education. Therefore, effective and safe use of movement skills is important for the development of children at the age of primary school education (Graham et al. 2010; Housner 2009). According to the results obtained, there is not a significant difference statistically between the preliminary tests (initial values) of the experimental and control group based on Table 1. It is seen that the development performances of the movements requiring displacement and object control are the same. Nonetheless, based on Table 2, there is a significant and positive difference statistically in favour of experimental group in terms of the final test scores of the control and experimental groups. This finding demonstrates that 8-week education program related to the movements requiring displacement and object control has a positive effect on the fundamental movement development of the children with learning disability. One of the studies conducted show that if children are encouraged to learn fundamental movement skills (motor development), their skills undergo a development stage faster than expected according to their age. Intervention in fundamental movement development doesn't only accelerate motor development but it also prevents possible delays and ensures suitable-value skill development (Ersöz, 2012). Karagöz (2009), following the program applied, obtained significant results in favour of the experimental group in the running, long jumping, hopping and gripping tests of the control and experimental groups. These findings show similarity with those of our study.

After the age of two, the fundamental movements are roughly developed. These fundamental movements are the movements requiring displacement such as running, jumping, stepping, hopping, side stepping and galloping as well as the movements requiring object control such as throwing, gripping, kicking and shooting a ball with an object in addition to the balancing movements such as straightening, stretching, twisting, bending, stopping, pushing and pulling. The fundamental skills may be affected by the presence of incapability. Connor-Kuntz and Dummer, (1996); Goodway and Rudisil, (1997); Hamilton et al. (1999) discovered in their studies that disadvantaged children show developmental retardation in terms of fundamental skills. After the age of two, particularly body coordination and balance movements of the children with learning disability show retardation compared to those of children with normal development (Dummer et al., 1996). In their study, Kayapınar and Pehlivan (2002) investigated the effect of movement education on double hand-eye coordination and reaction periods of children at the age of 6-7. 71 children including 35 children as experimental group and 36 as control group participated in that study and the education program was applied for three days in a week for totally 8 weeks and also preliminary and final tests were applied on both groups. As a consequence of that research, it was discovered that hand-eye coordination and reaction periods of the children who participated in the movement education had some improvements. Therefore, the fundamental movement skills including the movements requiring displacement such as walking, running, jumping and rolling as well as the balancing movements such as stooping, stretching, turning and weight-bearing in addition to the movements requiring object control such as throwing, gripping and dribbling should be rendered usable in a suitable form (suitable bio-mechanical form of movement) for the games and physical activities course of the children with learning disability.

## 5. CONCLUSIONS

The fundamental movement models requiring displacement and object control are seen by the children with learning disability as a part of their education and learning experience. In that period, the skills learnt will be life-long and constitute a foundation for new skills. Therefore, it has been concluded in this study that 8-week movement education requiring displacement and object control has a positive effect on the fundamental movement development of the children with learning disability. Nonetheless, failure to give children the opportunity to move and try or limiting them may affect children's motor skill performance adversely and cause them to be unwilling and shy against learning more complex skills.

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