Investigating the Visual-Motor Integration Skills of 60-72-Month-Old Children at High and Low Socio-Economic Status as Regard the Age Factor

Zülfiye Gül Ercan (Corresponding author)
Preschool Education Department, Education Faculty
University of Trakya, Turkey
T.Ü. Eğitim Fakültesi Okul Öncesi Öğretmenliği ABD
Ayşekadın Yerleşkesi, 22030, Edirne, Türkiye
Tel: 90-284-212-0808 E-mail: zgercan@yahoo.com

Emine Ahmetoğlu
Preschool Education Department, Education Faculty
University of Trakya, Turkey
T.Ü. Eğitim Fakültesi Okul Öncesi Öğretmenliği ABD
Ayşekadın Yerleşkesi, 22030, Edirne, Türkiye
Tel: 90-284-212-0808 E-mail: suat100@hotmail.com

Neriman Aral
Child Development Department, Health Sciences Faculty
University of Ankara, Turkey
Ankara Üniversitesi Sağlık Bilimleri Fakültesi, Çocuk Gelişimi Bölümü
Plevne cad. No:5 Aktaş Kavşağı, Cebeci, Ankara, Türkiye
Tel: 90-053-3338-8495 E-mail: aralneriman@gmail.com

Received: January 25, 2011 Accepted: February 14, 2011 doi:10.5539/ies.v4n3p100

Abstract

The aim of this study is to define whether there are any differences in the visual-motor integration skills of 60-72-month-old children at low and high socio-economic status as regard the age factor. The study was conducted on a total of 148 children consisting of 78 children representing low socio-economic status and 70 children representing high socio-economic status in the city center of Edirne. In the study, the Beery-Buktenica Developmental Test of Visual Motor Integration (VMI- 5th), which was developed by Beery-Buktenica (2004) and for which the studies of validity and reliability were made by Ercan and Aral (2011) after being translated into Turkish, was administered. It is reported that both the age and the status of being at low and high socio-economic status create a meaningful difference ($p<.05$) in the visual-motor integration, visual perception and motor integration of 60-72-month-old children at low and high socio-economic status and visual-motor integration mean score is higher for 66-72-month-old children and the children at high socio-economic status.

Keywords: Visual perception, Visual-motor integration, Preschool education, Socio-economic status, Age

1. Introduction

Visual-motor integration, which is the skill of coordinating motor skills and visual perception, covers basic skills related with life such as seeing and using objects, crawling, walking, running, avoiding dangers, eating; academic skills such as drawing, painting, reading and writing and more advanced intellectual skills such as using computer, constructing buildings, using tools, and discovering. Deficiencies or delays in visual perceptions or motor skills,

which improve rapidly in early childhood, arouse some problems in acquiring academic skills, participating in school activities, social relations and self- concept (Oliver, 1990, Akçin, 1993, Maneval, 1999, Marr, Windsor and Cemark, 2001, Case-Smith, 2002, Dankert, Davies and Gavin, 2003, Beery and Beery, 2004, Sanghavi and Kelkar, 2005, Brown and Gaboury, 2006, Ratzon, Efraim and Bart, 2007). Therefore, it is important to identify the problems in advance and to offer possible solutions. Early identification of environmental factors, which may have an impact on the improvement of visual motor integration skills, and the impacts of the age would create a convenient environment for the needs and interests of children and enable them to improve and to be developed in terms of their visual perception skills. The studies on this subject area reveal that supports offered to the children are effective in developing visual-motor integration (Aral and Erturan, 1999, Tuğrul, Aral, Erkan and Etikan, 2001, Ahmetoğlu, Aral and Bütün-Ayhan, 2008, Ercan, 2009).

In Turkey, there are quite limited studies in which visual-motor integration skills, playing an important role in the life of a child, are evaluated, supported and environmental factors are emphasized. Therefore, this study aims to identify visual-motor integration skills of 60-72-month-old children at low and high socio-economic status and to define whether high and low socio-economic status and age create any difference in visual motor integration.

2. Material and Method

2.1. Participants

The study has been conducted on 60-72-month-old children enrolled in preschools in the city center of Edirne. 148 children were selected with random sampling method from preschool educational institutions representing low and high socio-economic status in line with the recommendations of Provincial Directorate of National Education in Edirne by taking the educational level, occupation and income status of families (low SES: 78 children, high SES: 70 children) into consideration. In the study, the subjects were selected among volunteers.

In this study, it is reported that 53,8% of children at low socio-economic status are girls, 51,3% are 60-66 months old, 48,7% have no sibling, 83,3% come from immediate families, 30,8% of mothers and 29,5% of fathers are high school graduates, 74,4% of mothers are house wives and 46,2% of fathers are workers. Among the children at high socio-economic status, 54,3% are girls, 50% are 60-66 months old, 82,9% have no sibling, 91,4% come from immediate families, 84,3% of mothers and 91,4% of fathers are university graduates, 87,7% of mothers work as civil servants while all fathers work in academic and administrative areas.

2.2. Measures

In order to evaluate the visual-motor integration skills of children, the Beery-Buktenica Developmental Test of Visual Motor Integration (VMI- 5th), which was developed by Beery-Buktenica (2004) and for which the studies of validity and reliability were made by Ercan and Aral (2011) after being translated into Turkish, was administered.

2.2.1. The Beery-Buktenica Developmental Test of Visual Motor Integration (VMI-5th)

In this test, there are 24 geometric shapes, in a developmental order, arranged from the simplest to the most difficult shape in order to evaluate the visual-motor integrity, visual perception and motor coordination development by integrating visual and motor skills of children between the ages of two and eighteen. Beery VMI Test, which is based on copying the visual stimulus (geometrical shapes), consists of Visual perception test and Motor coordination test. **Visual perception test** covers visual perception skills such as visual discrimination, matching, classification, figure-ground differentiation, spatial relationship and visual memory while **motor coordination test** covers motor skills including hand-eye coordination which may be preparatory for writing. The child is asked to copy the shape on test booklet in the given order and the test is ended when the child fails to copy three shapes consecutively. Correct answers are scored as 1 while the incorrect answers are scored as 0. High scores in the test point that the attention, visual perception and motor coordination skills of the child are also high (Beery and Beery, 2004).

It is stated that KR-20 reliability coefficient of Beery-Buktenica Developmental Visual-Motor Integration Test which was translated into Turkish by Ercan and Aral (2011) and Visual Perception and Motor Coordination Tests vary between .67 - .69 while Pearson correlation coefficient vary between .73 - .78. In line with these results, it is reported that the test is valid and reliable for 60-72-month-old Turkish children.

2.3. Procedure

The test was administered individually at a bright, silent and independent place in the school environment different from game-playing rooms and distant from any stimulus. Administered approximately for fifteen minutes, the test was evaluated according to the evaluation orders in manual and for each child, visual-motor integration, visual perception and motor coordination test scores were acquired.

2.4. Analysis

Visual-motor integration skill scores of 60-72-month-old children at low and high socio-economic status were primarily evaluated in terms of assumption of normality. It is determined that the scores of visual-motor integration

test correspond to the assumption of normality according to the result of Kolmogorov-Smirnov (K-S) Test. Therefore, two-way ANOVA Test was applied for independent samples in the analysis of the data (Büyüköztürk, 2008).

3. Results

The aim of this study is to define whether there are any differences in the visual-motor integration skills of 60-72-month-old children at low and high socio-economic status as regard the age factor.

Table 1 shows that the score mean of 67-72-month-old children are higher than that of 60-66-month-old children and the score mean of children at high socio-economic status are higher than that of children at low socio-economic status in Beery VMI, VP and MC Tests. A significant difference has been noted in scores of Beery VMI and MC test based on socio-economic status (VMI $F_{(1, 144)}$=9.564; p<.01, MC $F_{(1, 144)}$= 4.572; p<.05) while no significant difference has been observed in scores of VP Test (VP $F_{(1, 144)}$=.000; p>.05) and moreover for the score means of all three tests, it is identified that there is a significant difference as regard the age (VMI $F_{(1, 144)}$ = 45.346; p<.001, VP $F_{(1, 144)}$ = 18.238; p<.001, MC $F_{(1, 144)}$= 21.739; p<.001). In terms of the common impact of socio-economic status and age factors, no significant difference has been identified statistically in all three tests (VMI $F_{(1, 144)}$=.348; p>.05, VP $F_{(1, 144)}$= .051; p>.05, MC $F_{(1, 144)}$= 1.313; p>.05).

4. Discussion

As a result of this study; it is found out that visual-motor integration, visual perception and motor coordination skills vary depending on socio- economic status and age. Previously conducted studies reveal that the skills of children on imitating what they see, copying shapes and lines improve correspondingly with their ages. Thus, Beery-Buktenica VMI is a test formulated with the consideration of developmental age and distinguishing developmental characteristics as a result of studies conducted for many years. During the process, it is possible for the child to become more successful in the test as she or he improves (Beery and Beery, 2004).

Josman, Abdallah and Engel-Yenger (2006) emphasized that visual motor integration skills of children enrolled in second grade are more advanced than children in kindergarten and first grade. In their study about visual-motor integration skills of children between the ages of 6 and 15 in both genders, Tekok-Kılıç, Elmastaş-Dikeç and Can (2010) addressed that age is an important factor in visual-motor integration skills of children and depending on the age these skills are observed to progress.

In the literature, it is emphasized that educational and cultural background of family and their contribution to the education of children are effective in the success of their learning and academic life. (Hoover-Dempsey, Bassler and Brissie, 1987, Lareau, 1987, Delgado-Gaitan, 1992, Ecless & Harold, 1993, Pena, 2000) In their research through which the relationship between the neuro-cognitive development of children enrolled in kindergarten and their socio-economic status are studied, Noble, Norman and Farah (2005) found out that socio-economic status and cognitive function have an impact on language, visual perception, visual spatial relations and memory. Ferguson, Jimerson and Dalton (2001) noted in their study that socio-economic status, education level of mother, educational values of family, social emotional functions in kindergarten and age are significant factors for children falling behind their peers and therefore these factors affects academic and behavioral skills. Martin, Sewel and Manni (1977) studied the effects of race and social class on development of visual motor integration in children enrolled in preschools and it is reported that children of white race and at high socio-economic status have more advanced visual motor development when compared to children of black race and at low socio-economic status.

According to these results, it can be inferred that visual perception skills of children enrolled in preschools and representing low socio-economic status need to be developed. In this context, the parents along with the school are attributed with great responsibilities. Therefore, to raise awareness of parents on the education of children, education programs for parents can be conducted.

References

Ahmetoğlu, E., Aral, N., & Bütün-Ayhan, A. (2008). A comparative study on visual perceptions of children with Attention Deficit Hyperactivity Disorders. *Journal of Applied Sciences,* 8(5); 830-835

Akçin, N. (1993). *Okuma becerisinin kazanılmasında görsel algısal gelişimin rolü.* Yayımlanmamış yüksek lisans tezi, Hacettepe Üniversitesi, Ankara.

Aral, N., & Erturan, N. (1999). Frostig Görsel Algılama Testi ve eğitim programına dayalı olarak dört-sekiz yaş arası serebral palsili çocuklarda görsel algılama davranışının incelenmesi. *Özel Eğitim Dergisi,* 2(3); 58-63

Beery, K.E., & Beery, N.A. (2004). *Beery VMI with suplemental developmental tests of visual perception and motor coordination administration, scoring and teaching manual* (5th Ed.). Minneapolis: NCS Pearson.

Brown, G.T., & Gaboury, I. (2006). The measurement properties and factor structure of the Test of Visual-Perceptual Skills-Revised: Implications for occupational therapy assessment and practise. *The American Journal of Occupational Therapy,* 60(2); 182-193

Büyüköztürk, Ş. (2008). *Sosyal bilimler için veri analizi el kitabı*. Ankara: Pegem Akademi.

Case-Smith, J. (2002). Effectiveness of school based occupationa theraphy intervention on handwriting. *The American Journal of Occupational Theraphy,* 56, 17-35

Dankert, H.L., Davies, P.L., & Gavin, W.J. (2003). Occupational therapy effects on visual-motor skills in preschool. *The American Journal of Occupational Therapy,* 57(5); 542-549

Delgado-Gaiton, C. (1992). School matters in the Mexican - American home: sociolizing children to education. *American Educational Recearch Journal,* 29(3); 459-513

Ecless, J.S., & Harold, R. D. (1993). Parent-school involvement during the early adolescent years. *Teachers College Record,* 94(3); 568-587

Ercan, Z.G. (2009). *Anasınıfına devam eden altı yaş çocuklarına verilen görsel algı eğitiminin görsel-motor koordinasyon gelişimine etkisinin incelenmesi.* Yayımlanmamış doktora tezi, Ankara Üniversitesi, Ankara.

Ercan, Z.G., & Aral, N. (2011). Anasınıfı çocuklarının görsel-motor koordinasyon gelişimine görsel algı eğitiminin etkisinin incelenmesi. *Türk Eğitim Bilimleri Dergisi, baskıda.*

Ferguson, P., Jimerson, S.R., & Dalton, M.J. (2001). Sorting out failures: exploratory analyses of factors associated with academic and behavioural outcomes of retained students. *Psychology in the Schools*, 38(4); 327-341

Hoover-Dempsey, K.V., Bassler, O.C., & Brissie, J.S. (1987). Parent involvement: contributions of teacher efficacy, school socioeconomic status, and other school characteristics. *American Educational Research Journal,* 24(3);417-435

Josman, N., Abdallah, T.M., & Engel-Yeger, B. (2006). A comparison of visual-perceptual and visual-motor skills between Paletisian and Israeli children. *The American Journal of Occupational Theraphy,* 60, 215-225

Lareau, A. (1987). Social class differences in family-school relationships: the importance of cultural capital. *Sociology of Education,* 60,73-85

Maneval, K.L. (1999). *Visual-motor integration training and its effects on self-help skills in preschool students with disabilities.* Master thesis, Rowan University. New Jersey. [Online] Available: http://ref.lib.rowan.edu/rowan_theses/RU1999/0211VISU.pdf(March, 13, 2009)

Marr, D. Windsor, M.M., & Cemark, S. (2001). Handwriting Readiness: Locatives and visuomotor skills in the kindergarten year. *Early Childhood Research and Practise* 3(1); 1-16

Martin, R., Sewell, T., & Manni, J. (1977). Effects of race and social class on preschool performance on the developmental test of visual-motor integration. *Psychology in the Schools*, 14(4); 466-470

Noble, K.G. Norman, M.K., & Farah, M.J. (2005). Neurocognitive correlates of socioeconomic status in kindergarten children. *Developmental Science,* 8(1); 74-87

Oliver, C.E. (1990). A Sensorimotor program for improving writting readiness skills in elementary-age children. *The American Journal of Occupational Theraphy,* 44, 111-116

Pena, D.C. (2000). Parent involvement: influencing factors and implications. *Journal of Educational Research,* 94(1); 42-54

Ratzon, N.Z., Efraim, D., & Bart, O. (2007). A short-term graphomotor program for improving writing readiness skills of first-grade students. *The American Journal of Occupational Theraphy*, 61, 399-405

Sanghavi, R., & Kelkar, R. (2005). Visual-motor integration and learning disabled children. *The Indian Journal of Occupational Therapy,* 37(2); 33-35

Tekok-Kılıç, A. Elmastaş-Dikeç, B., & Can, H. (2010). 6-15 Yaş arası çocuklarda görsel-motor birleştirme işlevlerinin değerlendirilmesi. *Türk Psikiyatri Dergisi*, 21(2); 97-104. [Online] Available: http://www.turkpsikiyatri.com/PDF/C21S2/097-104.pdf(October, 29, 2010)

Tuğrul, B., Aral, N., Erkan S., & Etikan, İ. (2001). Altı yaşındaki çocukların görsel algılama düzeylerine Frostig Görsel Algı Eğitim Programının etkisinin incelenmesi. *Journal of Qafqaz University,* 8, 67-84. [Online] Available: http://www.qafqaz.edu.az/journal/alt/arşiv/önceki neşrler/2001 (January, 26, 2008)

Table1. BEERY VMI, VP and MC test means, standard deviations and Anova results

	VMI			VP			MC		
Ages	Low (n=78) M ± SD	High (n=70) M ± SD		Low (n=78) M ± SD	High (n=70) M ± SD		Low (n=78) M ±SD	High (n=70) M ±SD	
60-66 months	14.95±2.06	16.45±2.01		19.92±2.32	20.02±2.77		15.72±2.86	17.08±1.85	
67-72 months	17.94±2.86	18.97±2.87		21.89±2.77	21.80±2.77		18.13±2.77	18.54±2.36	
Variance Analysis Results	Mean Square	F	p	Mean Square	F	p	Mean Square	F	p
SES (low/high)	59.073	9.564	.002*	0.01	.000	.992	28.95	4.572	.034*
Age (60-66/67-72)	280.091	45.346	.000**	129.04	18.238	.000**	137.64	21.739	.000**
SESxAge	2152	.348	.556	.363	.051	.821	8.31	1.313	.254

**p<.001, * p<. 05

ISSN 1913-9020 E-ISSN 1913-9039