

A STUDY ON THE COGNITIVE INDEX IN CHILDREN AGED 6 TO 8

6-8 YAŞ GRUBU ÇOCUKLARIN BİLİŞSEL GELİŞİMLERİNİN DEĞERLENDİRİLMESİ

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ÖZET: Bu araştırma farklı sosyo-ekonomik düzeydeki 6-8 yaş çocuklarının bilişsel gelişimlerini değerlendirmek amacıyla yapılmıştır. Araştırmanın örneklem grubunu 51'i 6 yaş, 43'ü 7 yaş, 49'u 8 yaş olmak üzere toplam 143 çocuk oluşturmaktadır. Çocukların bilişsel gelişimleri Mc. Carthy Scales of Children Abilities kullanılarak değerlendirilmiştir. Araştırma sonunda elde edilen verilerin istatistiksel analizi sonucunda sosyo-ekonomik düzey ile çocukların bilişsel gelişim puanları arasındaki fark anlamlı bulunmuştur. Cinsiyetler arasındaki farka baktığımızda ise 6 yaş grubu çocuklarının bilişsel gelişim puanları ile cinsiyet arasındaki fark önemli bulunurken, 7 ve 8 yaş grubu çocuklarda fark önemsiz bulunmuştur.

ANAHTAR SÖZCÜKLER: *Bilişsel gelişim, okulöncesi çocuklar, ilkokul çocukları*

ABSTRACT: This study aims at the evaluation of cognitive development for 6-8 years old children from different socio-economic status. The sample space of the study consists 51 children in the age group 6, 43 children in the age group 7 and the 49 children in the age group 8 (a total of 143 children)

In this study, the cognitive development of children was evaluated with the Mc Carthy Scales of Children Abilities. According to the findings obtained from this research, it turned out that significant differences were found between socio-economic status and cognitive development. We also observed that significant differences were found between sexes and cognitive development at 6 years age group but on the other hand no significant differences were found at 7 and 8 years age group.

KEY WORDS: *Cognitive development, preschool children, primary school children.*

INTRODUCTION

In this study, the cognitive index of children was evaluated according to the McCarthy Scales of Children Abilities (1).

McCarthy is the most popular and most diverse scale used in the evaluation of children's

cognitive index. Studies conducted revealed that the subtests of the scale evaluated the cognitive index of children in a broader and more diverse fashion than the Stanford-Binet Intelligence Test, the Weschler Preschool and Primary Scale of Intelligence, or the British Ability Scale and Griffiths Mental Development Scale. Therefore, McCarthy is widely used in developed countries for clinical, educational and research purposes. (2,3,4,5).

The battery consists of 18 subtests which are grouped into five primary scales, verbal, perceptual performance, quantitative, memory, and motor.

The general cognitive index of the child is determined through calculating the total of the first three subtests which is very similar to the IQ test. The reliability of the McCarthy scale has been proven with numerous factor analysis performed (6).

Truman & Branthwaite (7), have found the general cognitive index (GCI) of the McCarthy scale to be very satisfactory and have emphasized its value because factor analysis were made numerous times.

McCarthy's profile method of analysis proposed by Kaufman & Kaufman (2), which consist of the detection of strong and weak points in the performance of the different scales, is often used for analysis. It is assumed that each subtest evaluate diverse abilities, some of which are shared by various subtests, other being specific.

The explanation of the successes or failures

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of a subtest in terms of shared or specific abilities demands in addition to the clinical demonstration that the subtests pertain to a concrete factor in which the subtests influence the factor and the total scale (8).

The McCarthy GCI (General Cognitive Index) is however not interchangeable with the IQ for special groups. The McCarthy Scales does differ significantly from both Stanford-Binet and Weschler Intelligence Scale for Children Revised IQ's in the learning disabled population (9,10).

Therefore, in this research, the difference in the socio-economic levels and sexes in the cognitive index (GCI) of children between the ages six and eight were determined through the McCarthy Scales of Children Abilities.

METHOD

In this study, the cognitive index of children was evaluated with the McCarthy Scales of Children Abilities.

In this study, 51 children in the age group six, (of which 26 were girls and 25 were boys), 43 children in the age group seven (of which 21 were girls and 22 were boys), and 49 children in the age group eight (of which 20 were girls and 29 were boys) for a total of 143 children were examined.

Of the children in the sample groups, 20 were at the low, 15 were at the medium and 16 were at the high, 15 were at the medium and 16 were at the upper socioeconomic levels in the age group six, and 14 low, 16 medium and 13 upper level in the age group seven; 16 low, 16 medium and 17 at the upper socio-economic level in the age group eight and all the subtests of the scale were applied.

McCarthy Scales of Children Abilities

The McCarthy Scales are appropriate for children from 2.1/2 through 8.1/2 years of age. The content of the tasks are designed to be suitable for both sexes as well as for children various ethnic, regional, and socio-economic groups. The materials and questions are gamelike and nonthreatening.

The battery consists of 18 subtests which grouped into five primary scales; verbal, perceptual-performance, quantitative, memory and motor. The sixth scale, general cognitive is omnibus dimension that accounts for variance in 15 of the 18 Subtests. The General Cognitive Scale originates from three primary scales whose item content is independence of one another (verbal, perceptual-performance, quantitative). The memory and motor scales are highly redundant with the three other scales and as such do not directly contribute to the General Cognitive Scale (1).

GENERAL COGNITIVE ABILITY LEVELS

GENERAL COGNITIVE INDEX	DESCRIPTIVE CLASSIFICATION
130 AND Above	Very Superior
120-129	Superior
110-119	Bright Normal
90-109	Average
80-89	Dull Normal
70-79	Borderline
69 AND Belows	Mentally Retarded

The test to determine the importance in the difference between the two averages to determine if there is a difference between the sexes in the statistical analysis of the data, unilateral variance analysis was used to determine if there was a difference between the socio-economic levels, and statistical analysis (LSD) was used to determine which group caused the difference, and the smallest important difference methods were used.

FINDINGS and DISCUSSION

Table. 1 Variance Analysis of Six Years Old Children's General Cognitive Index Scales According to Socio-Economic Levels

Socio-economic Status	Df	Mean Square	F	P
Between groups	2	1129.815	3.466	.039
Within groups	48	325.945		
Total	50			

Table 2. Comparison of the General Cognitive Index Scores of Six Years Old Children of Different Socio-Economic Levels

SES	Mean Difference		Standart Error (S.E)		P	
	Low	Middle	Low	Middle	Low	Middle
Low	-12.400*	-14.575	6.167	6.055	.050*	.020*
Middle	12.400*	-2.1750	6.167	6.489	.050*	.739
High	14.575*	2.1750	6.055	6.489	.020*	.739

*The mean difference is significant at the .05

Table 3. Variance Analysis of Seven Years Old Children's General Cognitive Index Scales According to Socio-Economic Levels

Socio-economic Status	Df	Mean Square	F	P
Between groups	2	3131.404	8.559	.001
Within groups	40	365.872		
Total	42			

Table 4. Comparison of the General Cognitive Index Scores of Six Years Old Children of Different Socio-Economic Levels

SES	Mean Difference		Standart Error (S.E)		P	
	Low	Middle	Low	Middle	Low	Middle
Low	-16.116*	-30.428	7.000	7.367	.027*	.000*
Middle	16.116*	-14.312	7.000	7.142	.027	.052
High	30.428*	14.312	7.367	7.142	.000*	.052

*The mean difference is significant at the .05

Table 5. Variance Analysis of Seven Years Old Children's General Cognitive Index Scales According to Socio-Economic Levels

Socio-economic Status	Df	Mean Square	F	P
BetweenGroups	2	1956.777	5.667	.006
Within groups	46	345.270		
Total	48			

Table 6. Comparison of the General Cognitive Index Scores of Six Years Old Children of Different Socio-Economic Levels

SES	Mean Difference		Standart Error (S.E)		P	
	Low	Middle	Low	Middle	Low	Middle
Low	-17.500*	-20.231*	6.570	6.472	.011*	.003*
Middle	17.500*	-2.716	6.570	6.472	.011	.675
High	20.231*	2.7316	6.472	6.472	.003*	.675

*The mean difference is significant at the .05

As can be seen from Tables 1-6 an important difference was found in the groups as a result of the variance analysis according to the socio-economic levels in the GCI scores of children in

the age groups six, seven and eight ($p < 0.05$). Statistical analysis (LSD) was conducted to evaluate the difference between the groups and the difference in the low-medium, low-upper socio-economic levels of the children in all the three age groups was found to be important.

In looking at the average General Cognitive Index scores of the children in the age group six, GCI was observed to be 102.8 at low, 112.2 at medium and 117.3 at upper socio-economic levels. When these results were evaluated according to the McCarthy Abilities Test: General Cognitive Ability levels, they were found to be "average" for low, and "bright normal" for medium and upper socio-economic levels. The children of the low socio-economic level taken as samples in the age group six, attended public kindergartens. It is an undeniable fact that public kindergartens were more like child care centres rather than educational centres.

From the results obtained from the Metropolitan Readiness Test applied in 1999 by the Üstün, Akman and Uyanık (11), to children in the age group of six, of different socio-economic levels, in order to determine their level of readiness for primary school, it was observed that the difference between the socio-economic levels and the readiness for primary school was important.

In looking at the average General Cognitive Index (GCI) was found to be 97.5 at low socio-economic levels, 113.6 at medium and 128.0 at upper socio-economic levels. In evaluating these results according to the McCarthy Abilities Test General Cognitive Ability Levels, the average score of low socio-economic levels was evaluated as "average", scores of medium levels as "bright normal" and upper socio-economic levels as "superior".

As for the average General Cognitive Index (GCI in children in the age group eight, the GCI score averages were evaluated as 92.0 for low, 109.5 for medium and 112.2 for upper socio-

economic levels. In evaluating these results according to the McCarthy Abilities Test: General Cognitive Ability Levels, the average scores for low and medium socio-economic were determined as “average” and “bright normal” for upper socio-economic levels.

Considering the fact that the children from families with low socio-economy attend public schools and that many of the children from families with medium and upper socio-economy attend private schools, it can be said that the results obtained are not surprising at all.

Although both the public and private schools follow the curriculum set by the Ministry of Education, it can be said that the standards of the schools, pupils and teachers are quite different.

The McCarthy Abilities Test applied in this research is used in numerous developed countries on children between the ages of 2.5 through 8.5 either to determine their academic abilities, and it was found that it had excellent cognitive test features from the results obtained.

In the studies conducted by Thomas, P. Reilly et. al (12), similarities were found between WISC-R, IQ and MSCA General Cognitive Index and WJ (Woodcoach-Johnson Test of Cognitive Ability (13) and that it could be used in determining and estimating the abilities of children in cognitive index.

Similarly, Neil Massoth (10), in his comprehensive studies, applied the McCarthy Scales Abilities Test on 24 preschool children and applied the Comprehensive Testing Program to the same children in grades I and VI later.

The results revealed a meaningful relation between the scores obtained in the McCarthy Abilities Test and in the Comprehensive Testing Program.

It is also possible to administer tests such as the McCarthy Abilities Test in our schools by student advisors or related experts to evaluate in detail the cognitive index of the pupils and assist

them in determining their future targets according to their academic abilities and to act as a guide to parents in this regard. Perhaps, this may, to an extent, assist in closing the gap in the education between public and private schools.

Table 7. The distribution, according to sexes, of general cognitive index scores of six years old children

GCI Sex	X	sd	n	t	P
Girls	118.462	13.4171	26	3.075	P<0.05 significant
Boys	103.280	20.8836	25		

In looking at the distribution, according to sexes, of cognitive index scores in children in the age group six, in Table 7, there are significant differences in cognitive index scores between the sexes ($p<0.05$)

Table 8. The distribution, according to sexes, of general cognitive index scores of seven years old children

GCI Sex	X	sd	n	t	P
Girls	114.286	29.2765	21	0.425	P<0.05 significant
Boys	111.318	13.2031	22		

Table 9. The distribution, according to sexes, of general cognitive index scores of eight years old children

GCI Sex	X	sd	n	t	P
Girls	103.200	26.4448	20	0.412	P<0.05 significant
Boys	105.897	15.1454	29		

The distribution, according to sexes, of cognitive index scores in age groups of seven and eight was examined in Table 8 and 9, and the difference between the groups was insignificant ($p>0.05$).

People grow and develop very rapidly during the first six years of their lives, and the number of studies conducted in this regard show that girls are more successful in their academic abilities during this period. However, growth and development slow down during primary

school age as compared to pre-school age and number of studies conducted in this regard support this result. The average GCI scores and the difference in the sexes in children in age groups of seven and eight were found to be insignificant ($p > 0,05$).

Broman, Nichols and Kennedy (14) state that girls have a higher IQ than boys in their infancy. It was also determined that the academic abilities of girls of primary school age reached the level of the boys.

Stein and Bailey (15), stated that the mathematical skills of girls and boys equalled each other during the primary school age.

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