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## A LONGITUDINAL RESEARCH ON CHILDREN WITH DIFFERENT PRIMARY SCHOOL ENTRANCE AGE

(Research article)

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### Abstract

This study was designed and conducted as the second step of a longitudinal research planned to be carried out in four steps. The aim of the study was to observe and compare the academic achievements in formal education period and the status in the transition to the labor market of the children enrolled in primary school at the age of five or six in 2012-2013 academic year. This longitudinal study, which started in the 2013-2014 academic year when the students in the study group were in the second grade of primary school, will end in 2028, when the students will theoretically graduate from a four-year undergraduate program. The first step of the longitudinal study was conducted when the students in the study group were in the second grade of primary school and was published in 2016. The purpose of the second step of the study was to compare the academic achievements of the participants in the fourth grade of primary school, secondary school and in the transition to high school education. Correlational survey model was used in conducting the second step of the study. The number of participants in the study sample was 60. The number of participants in the study group of the second step changed due to loss of participants. Data was collected using the document review technique. Descriptive and relational statistical techniques were used to analyze the data. As a result of the study, it was determined that the end-of-year grade point averages and High School Entrance Exam scores of the participants who started primary school at the age of five were lower than those who started at the age of six. The difference between the scores of the two groups was statistically significant. Based on the findings of the study, it is recommended to end the practice of starting primary school at the age of five and to take measures for students who started school early and are still studying in pre-university classes.

**Keywords:** School age, academic achievement, transition in school education, primary education

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## 1. Introduction

### 1.1. Introduction to the problem

In 2012, in Turkey, it was made way for children to enroll primary school at the age of five (Law on Amendments and Additions on Primary Education and Training, 11.04.2012). This practice was “partially” abolished with a law amendment made in 2019 (Law on Amendments to Certain Laws and Decree Laws, 05.07.2019). With the amendment, the compulsory primary education age was defined as the 6-14 age range; it was envisaged that “children who have completed 72 months of age on December 31 of that year” would be enrolled in the first grade of primary school. However, an exception was made stating that “the issues related to the child's early start to school or postponement of enrollment depending on the child's developmental status” would be regulated by a regulation. Article 11 of the Regulation on the subject states that “Children who complete 69 months at the end of September of the enrollment year are registered for the first grade of primary schools. In addition, it is stated that “children aged 66, 67 and 68 months, who have a written request from their parents, will be enrolled in the first grade of primary school” (Ministry of National Education Preschool Education and Primary Education Institutions Regulation, 10.07.2019). Accordingly, it is possible for children aged 66 months, that is, it would be possible for 5.5 years old children to enroll in primary school with the “written request of their parents”. This situation shows that the problem of “early start” in primary school continues. The problem of starting primary school early means children with insufficient readiness levels, regardless of age, start primary school; it also involves young children being educated in the same classroom with older children. Especially in Turkey, where central exams are the determining factor in the transition between grades, the education of children at different developmental levels in the same classroom may lead to irreparable problems for children who start school early.

### 1.2. Review of Related Literature

Warnings stating that starting primary school before the age of six would have negative academic, psychological, physical, etc. effects on the child, and those negative effects might continue throughout the child's entire educational life were made before the implementation started, (Ankara University, 2012; Mother Child Education Foundation [ACEV] 2012; Bogazici University, 2012; Cukurova University, 2012; Educational Reform Initiative, 2012; Hacettepe University, 2012; Koc University, 2012; Mersin University, 2012; Middle East Technical University [METU] 2012; Turkish Medical Association, 2012). Research conducted after the early school enrollment practice also yielded results regarding the disadvantages of starting primary school before the age of six. Duran (2013), who followed 56 students who started primary school at the age of 60 months for 16 weeks in the first year of the early school enrollment practice, reported that the “deficiencies in regular line drawing, hand, arm, muscle and eye coordination, notebook use and pencil holding skills” observed at the beginning of the study were still present in a significant number of students at the end of the sixteen-week education. Başar (2013) concluded that students between 60-66 months “are insufficient in their self-care skills [...] they have problems in their skills of holding a pencil, writing in line

spacing, writing sounds correctly according to the writing direction, and using the board." Gündüz and Çalışkan (2013) stated that 60-72 months old children were behind those of 72-84 months old children in terms of school maturity levels and literacy skill; Tatal and Oral (2015) found that the first literacy success of children aged 60-66 months was lower than of the children aged 67 months and over. In a study conducted on 637 students attending the first grades of primary school (Kapçı, Artar, Avşar, Daşcı, & Çelik, 2013), it was observed that children who started primary school at a younger age had "more problems regarding academic self-esteem and social behaviors both at the beginning of the academic year and at the end of the academic year" than those who started primary school at 70 months and later. One of the most striking results found by the research was that "studying in separate classes of students in five and six age groups does not lead to a difference in the problems experienced by the five-year-old children" (Kapçı, Artar, Avşar, Daşcı, & Çelik, 2013). In another study with a large sample, it was observed that children who started primary school between the ages of 60 and 71 months had more difficulty in activities that required the use of small muscles, and learned reading and writing later, and accordingly fell behind in other lessons, compared to children aged 72 months and above (Ünver, Diyarbakır and Yurdakul, 2015). In a study on the Relative Age Effect on a Turkish sample (Ünal, 2019), the 2015 TIMSS Mathematics scores of fourth and eighth grade students who started school in the same year and were born in different months of the same year were compared; it was found that there was a decrease in the average scores with the decrease in student age. In addition to these studies, lowering the school starting age has been reported as one of the main "problems" in studies on the 4+4+4 education system (Bahtiyar Karadeniz, 2012; Boz and Yıldırım, 2014; Cerit, Akgün, Yıldız and Soysal, 2014; Durmuşçelebi and Bilgili, 2014; Epçaçan, 2014; Işıkoğlu Erdoğan and Şimşek, 2014; Külekçi, 2013; Memişoğlu and İsmetoğlu, 2013; Meral Kandemir, Şara, Akay and Zemin, 2013; Örs, Erdoğan and Kipici, 2013; Özden, Kılıç and Aksu, 2014; Öztürk and Uysal, 2013; Yılmaz, Taşçı, Fidan and Nurlu, 2014).

In the literature outside Turkey, there are longitudinal studies on the effects of school starting age on individuals' academic success and social adaptation at various educational levels. In these studies, the effects of school starting age were examined multidimensionally and in depth, including the individual's lifelong educational attainment, language and mathematics skills in adulthood, work and income, and the academic success of siblings (Fredriksson and Öckert, 2013; Görlitz, Penny and Tamm, 2022; Landersø, Nielsen and Simonsen, 2017). Ponzio and Scoppa (2014) state that students who start school at an earlier age show "significantly" lower school success in the fourth, eighth and tenth grades than the students who start school later. The advantage enjoyed by students who start school later does not disappear as the years' progress. Compared to students who start school earlier, these students are enrolled in academic high schools at a higher rate, while they are placed in vocational high schools at a lower rate (Ponzio and Scoppa, 2014). School starting age has effects on the child's mental and spiritual development as well as her/his academic success. Starting school later increases the child's self-awareness and significantly reduces attention deficiency and hyperactivity (Dee and Sievertsen, 2018; Elder and Lubotsky, 2009). A study

covering OECD countries (Korea and Turkey were excluded due to practice differences) found that school starting age has long-term effects on student achievement. In that study, the group score of the youngest participants in the sample was lower than the oldest participants by 4% to 12% in the fourth grade (depending on the country), and by 2% to 9% in the eighth grade. In the USA and Canada samples of the study, it was observed that the youngest participants were less likely to enter academic faculties/departments of the universities than the older participants (Bedard and Dhuey, 2006). In their study on the school performance of Hungarian students in fourth and eighth grades, Altwicker-Hámori and Köllö (2012) found that the amount of performance increase of students from low socio-economic level families when they started school one year later was higher than that of students with higher socio-economic levels. These studies show that the school starting age also affects individuals in advanced education levels and affects their placement in higher education institutions that differ in terms of quality and structure.

In the foreign literature, the ages referred to as "children starting school early" are different from those in Turkey. In Turkey, this expression is used for children aged 60-69 months who started primary school with the change in the law in 2012, and comparisons are made with children aged 72 months and above (Boz and Yıldırım, 2014; Kartal, 2013; Özden, Kılıç and Aksu, 2014; Tatal and Oral, 2015). In the foreign literature, young children who were born in the last months of the year and who are months away from other children in the year they start school are defined as "early school starters" (Bedard and Dhuey, 2006; Dhuey, Figlio, Karbownik, Roth and 2019; Elder and Lubotsky, 2009; Görlitz, Penny and Tamm, 2022; Ponzio and Scoppa, 2014). While the age difference between students who started school in the same year in the USA and EU countries is 11 months at most, it can be up to 23 months in Turkey (considering those who started school in 2012). This means that the achievement differences observed in the foreign literature and Ünal's (2019) study between students who were born in different months of the same year and started school in the same year may increase exponentially for students who had year difference.

### *1.3. Statement of the Problem*

The most important point of the criticism made during the period when the practice of starting primary school at the age of five was implemented in Turkey was that children who started school at the age of five would remain behind their classmates who started school at the age of six throughout their entire education life (Güven, 2012). In order to test this criticism, the academic achievements of students who started primary school at the age of five and six in the 2012-2013 academic year were measured in the 2013-2014 academic year and the results were published in 2016 (Küçükler, 2016). The students participating in the research were randomly selected from a primary school in the central district of Tokat province. The academic achievements of the students were measured using the Turkish, Mathematics and Life Science tests administered by the researcher and the report card grades the students

received from these courses in the first semester of the 2013-2014 academic year. Correlation and independent groups t-test were applied in the analysis. According to the findings of this research, which is the first step of the follow-up study, it was determined that the academic achievements of students who started primary school at the age of five were significantly lower than those of students who started primary school at the age of six. This finding is discussed based on the assumption that students attending the same school and in the same classes have similar socio-economic conditions.

Students who participated in the research, the data of which was collected in the 2013-2014 academic year, and was published in 2016 (Küçüker, 2016), studied in ninth grade in the 2020-2021 academic year. The transition to ninth grade is an important turning point in measuring students' academic achievements. That is because these students take the High School Entrance Examination (LGS) administered at the national level. If the criticisms made during the period when the five-year-old practice started are correct, it should be expected that the academic achievement differences of students who started school at different ages, detected in the second grade of primary school, will continue in the following years (4th-8th grades) and during the transition to high school. In this context, the problem of this research, which is the second step of the longitudinal study, is to examine whether the academic achievement differences observed in the second grade of 60 students who were five or six years old when they started primary school in the 2012-2013 academic year, continue in the 4th-8th grades of primary school and LGS.

#### *1.4. Purpose of the Research*

This study is the second step of a four-step follow-up study examining the relationship between primary school starting age and academic achievement. In this step, the aim of the research is to monitor and compare the academic achievements of 30 students, each of whom started primary school at the age of five (60-66 months) and at the age of six (73-84 months) in the 2012-2013 academic year, in the 4th-8th grades of primary school and in the LGS. For this purpose, answers to the following questions will be sought:

Participants who started primary school at the age of five or six in the 2012-2013 academic year;

1. What is the type of secondary school (public/private; public/imam-hatip) and the city they graduated from in the 2019-2020 academic year?
2. What is the change in end-of-year grade point averages of primary school fourth, secondary school fifth, sixth, seventh and eighth grade year? Is there a significant difference between grade point averages?
3. Is there a significant difference between LGS scores? What are the percentiles they are in based on their LGS scores? What are the types of placement in high school? What are the types of high schools they were enrolled in?

### *1.5. Importance of the Problem*

The school starting age has been lowered twice in the history of Turkish education. The first implementation was made in the 1983-1984 academic year and it was observed that five years of age was too early to start primary school (Gürkan, 1987). The second implementation was made in the 2012-2013 academic year. Research on the subject and reports of the Faculties of Education revealed that this practice also has/will have negative consequences. Likewise, the Ministry of National Education (MEB) increased the school starting age to six years with the regulations it made in the following years. However, in the 2012-2013 academic year, 416,191 children started primary school at the age of five (MEB, 2013, p. 104). These children were still at the ninth-grade level in the 2020-2021 school year. The fact that the academic achievement of children who started primary school at the age of five was lower than their classmates who started at the age of six is important as it reveals that additional measures should be taken for these children and that such decisions should not be taken without consulting educational sciences.

### *1.6. Assumptions*

In the study, the assumptions were made that the end-of-year grade point averages and LGS scores used to compare the academic achievements of the participants were formed under objective conditions. It was assumed that the effects of differences in the quality of education received by the participants studying in different secondary schools on academic achievement differences could be ignored.

## **2. Method**

### *2.1. Research model*

This research was designed with a longitudinal study approach from temporal scanning models. In this approach, "the variable whose temporal development or change is desired to be determined is taken from a certain starting point on the same elements or units and observed continuously or at certain intervals" (Karasar, 2017, p. 112). The dependent variable whose change over time is examined in the current study is the academic achievement levels of students who started primary school at different ages. Observations to reveal academic achievement levels are made intermittently. These intervals, as the steps of the longitudinal research are as follows:

First Step: Observations regarding the first step were made in the second semester of the 2013-2014 academic year, while the students were attending the second grade of primary school, and were published in 2016 (Küçüker, 2016).

Second Step: The observations in this step were made between April and June in the second semester of the 2020-2021 academic year, when the students were in the ninth grade. The current study is the report of observations regarding the second step.

Third Step: Observations regarding the third step will be made in the second semester of the 2024-2025 academic year, when students are theoretically in their first year at university.

Fourth Step: Observations regarding the final step will be made in the last six months of 2028, when students theoretically graduate from a four-year undergraduate program.

The method of the current research is the relational screening model. The relational screening model is a research model that aims to determine the existence and/or degree of change between two or more variables (Karasar, 2017). In this context, the academic achievements of the participants in primary education classes (4th-8th grades) and LGS were compared according to their school starting age.

## 2.2. Participants

The longitudinal study was started with 60 students enrolled in primary school in the 2012-2013 academic year. Criterion, proportional and random sampling methods were used together to determine the study group. In the criterion sampling process, it was aimed to represent the participants' gender and school starting age in equal numbers in the study group. In this context, it was planned that the study group would consist of 30 female and 30 male students, 15 students from each gender whose school starting age was 5 or 6, for a total of 60 participants (Table 1). Each participant in the study group was determined first by proportional and then by random sampling method. For this purpose, the primary school with the highest number of students in the Central district of Tokat province was determined, the student lists of the second grade of this school were obtained, the ages and genders of the students were examined, and the number of participants that could be recruited from each class was calculated with a proportional sampling approach. Then, starting from the beginning of the class lists, male and female students who started school at the age of five and six who met the criteria were randomly selected. The selection process continued until each class reached its quota and 60 participants in total.

Table 1. Distribution of Participants by Primary School Starting Age and Gender

Number of Participants	Female	Male
Who Started Primary School at the Age of Five	15	15
Who Started Primary School at the Age of Six	15	15
Total	30	30

The “theoretical” study group of the current research consists of 60 students who participated in the research in the first step of the longitudinal research. However, the number of participants decreased due to the loss of subjects in the seven years between the 2013-2014 academic year, when the first step was carried out, and the 2020-2021 academic year, when

the second step was carried out. The number of participants depending on the data collected in the study is given in Table 2. Accordingly, although the primary school 4th-8th grade point averages of all 60 participants were obtained, the LGS scores of only 54 participants could be obtained.

Table 2. Number of Participants Depending on the Type of Data Collected in the Research

Data Type	5 Old	6 Old	Total
Graduated Secondary School	29	28	57
4th – 8th Grade Point Average	30	30	60
LGS Score	26	28	54

### 2.3. Collecting and Analyzing Data

The research data were obtained from the grade record books of the primary school from which the participants graduated and from the LGS result announcement system. These data were analyzed within the framework of the second and third sub-objectives of the study. The differences between the end-of-year grade point averages of the 4th and 8th grades of the participants who started primary school at the age of five or six, and their changes over the years are shown in tables and graphs. An independent groups t-test was conducted to determine the significance of the difference between the end-of-year grade point averages and LGS scores of the two groups. In the analysis, end-of-year grade point averages were converted into standard T scores; LGS scores were used verbatim.

### 2.4. Definitions

Participants in the five-year age group: Participants who were between 60-66 months of age when enrolled in primary school were defined as the five-year age group.

Participants in the six-year age group: Participants who were between 73-84 months of age when enrolled in primary school were defined as the six-year age group.

## 3. Results

### 3.1. Findings Regarding the First Sub-Purpose: Type and Location of the Secondary School the Participants Graduated from

In accordance with the first sub-objective of the study, the type of secondary school the participants graduated from (public/private, public/imam-hatip) and the city they were located in were examined. This review has two purposes. First purpose is to create a record of tracking participants' educational experiences from the moment they enroll in primary school until they graduate from higher education, and the second purpose is to create a general view on the school variable as it is one of the factors affecting the academic success of the two groups of



students whose academic achievements are compared. Information about the secondary school graduated from by 57 of the 60 students who participated in the first phase of the longitudinal research was obtained. The information of the three participants could not be accessed because it was hidden by the Ministry of National Education. Of the 57 participants whose information was obtained, 50 attended public secondary schools and 7 attended private secondary schools. Of the 50 students attending public secondary school, 38 graduated from general secondary school and 12 from imam-hatip secondary school (Table 3).

Table 3. Findings Regarding the Secondary School the Participants Graduated from

School Type and City Where the School is Located	5 Old	6 Old	Total
Official Secondary School	26	24	50
General Secondary School	19	19	38
Imam-Hatip Secondary School	7	5	12
Private Secondary School	3	4	7
In the same city as the primary school (Tokat)	25	26	51
In a different city than primary school	4	2	6
Total	29	28	57

The primary and secondary school that majority of the participants (51 students) graduated from are in the same city, that is, Tokat (Table 3). The secondary school that six participants graduated from is in a different city. It is seen that the distribution of the participants who started primary school at the age of five or six in public/private, public/imam hatip and same city/different city distinctions is equal or close to each other. For example, the number of five-year-old participants attending public schools is 26, and the number of six-year-old participants is 24. The numbers of participants attending private schools are three and four, respectively. It could be said that the closeness of these numbers strengthens the assumption that the participants studied under similar conditions and reflects a distribution suitable for comparing their academic achievements.

### 3.2. Findings Regarding the Second Sub-Purpose

The second sub-objective of the study includes the change and comparison of the participants' end-of-year grade point averages in 4<sup>th</sup>-8<sup>th</sup> grades of the primary education.

#### 3.2.1. Findings Regarding the Change in Participants' End of Year Grade Point Averages in Grades 4-8

Within the context of the second sub-objective of the study, the end-of-year grade point averages of the participants who started primary school at the ages of five and six were examined for the fourth, fifth, sixth, seventh and eighth grades (Table 4, Figure 1). As could be seen in Table 4, the end-of-year grade point averages in all grades of the participants who started primary school at the age of five are lower than the participants who started primary

school at the age of six. The difference between the end-of-year grade point averages (raw scores) of the two groups varies between six and ten. The grade with the highest difference is the sixth grade, and the grade with the lowest is the eighth grade.

Table 4. Participants' Fourth, Fifth, Sixth, Seventh and Eighth Grade Year-End Grade Point Averages (Raw Scores)

Grades	5 Old	6 Old	Difference
Four	80,1755	89,8056	-9,6301
Five	79,1226	88,9889	-9,8663
Six	77,2241	87,3094	-10,0854
Seven	77,6193	85,0591	-7,4398
Eight	79,2277	85,2916	-6,0639

The end-of-year grade point averages of both groups started to decrease starting from the fifth grade, and increased in the seventh grade in the five-year-old group and in the eighth grade in the six-year-old group (Table 4). This change could be observed clearly in Figure 1. According to the Figure 1, the end-of-year grade point averages of students who started primary school at the age of five and six decrease almost parallel in the fifth and sixth grades. While this decline continues in the seventh grade for students who started primary school at the age of six, students who started primary school at the age of five increase their end-of-year grade point averages in the seventh and eighth grades. The end-of-year grade point averages of students who started primary school at the age of six increased in the eighth grade.

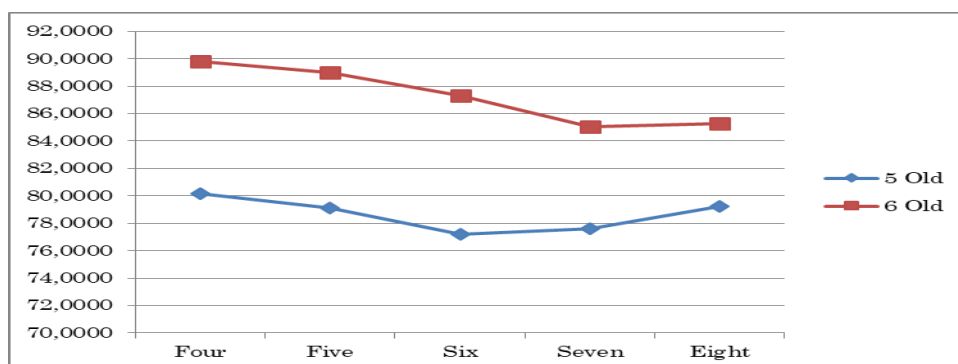


Figure 1. Change in End-of-Year (Raw) Grade Point Averages of Students Who Started Primary School at the Age of Five and Six

### 3.2.2. Findings Regarding the Differences Between the Participants' 4th-8th Grade End-of-Year Grade Point Average

The t-test results of the standardized end-of-year grade point averages (T scores) of the students in the study group for the fourth, fifth, sixth, seventh and eighth grades according to the age of starting primary school are given in Table 5.

Table 5. T test results of the participants' primary school 4th-8th grade standardized end-of-year grade point averages (T scores) according to the age of starting primary school

Grade	School Starting Age	N	X	S	sd	t	p
Four	5	30	46,2967	10,58791	58	3,066	,003*
	6	30	53,7033	7,93536			
Five	5	30	46,0505	10,46501	58	3,307	,002*
	6	30	53,9495	7,85232			
Six	5	30	46,6867	9,93589	58	2,700	,009*
	6	30	53,3133	9,05611			
Seven	5	30	47,4056	9,96247	58	2,064	,043**
	6	30	52,5944	9,50114			
Eight	5	30	47,9562	10,33705	58	1,604	,114
	6	30	52,0438	9,37826			

\*p<.01 \*\*p<.05

According to the analysis results, the end-of-year grade point averages in all classes of students who started primary school at the age of five were lower than the averages of students who started at the age of six. The grades where the difference between the end-of-year grade point averages of the two groups was significant were the fourth ( $t(58)=3.066$ ,  $p<.01$ ), fifth ( $t(58)=3.307$ ,  $p<.01$ ), sixth ( $t(58)=2.700$ ,  $p<.01$ ) and seventh ( $t(58)=2.064$ ,  $p<.05$ ) grades. Although there is a difference between the eighth grade end-of-year grade point averages against students who started primary school at the age of five, this difference is not statistically significant.

### 3.3. Findings Regarding the Third Sub-Purpose

Within the framework of the third sub-objective of the research, the LGS scores and high school placement status of the students in the study group were examined.

#### 3.3.1. Findings Regarding the Differences between Participants' LGS Scores

The t-test results of the LGS scores of the students in the study group according to their school starting age are given in Table 6.

Table 6. T-test results of participants' LGS scores according to school starting age

	School Starting Age	N	X	S	sd	t	p
LGS	5	26	295,7973	62,98533	52	2,269	,027**
	6	28	333,6758	59,67872			

\*\*p<.05

The number of students included in the analysis is 54. Six of the 60 students in the study group do not have an LGS score because they did not take the exam or access to information about them was prevented. Of the 54 participants included in the analysis, 26 started primary school at the age of five and 28 at the age of six. It could be seen in the result of the analysis that the LGS scores of the students who started primary school at the age of five are lower

than the students who started at the age of six, and the difference between the mean scores of the two groups is significant ( $t(52)=2.269, p<.05$ ).

### 3.3.2. Findings Regarding the Percentile of Participants' LGS Scores

The percentiles of the exam scores of the 54 participants whose LGS scores could be obtained are given in Table 7. 37.0% of fifty-four participants are in the top 20 percent. While this rate decreases to 26.9% for the participants who started primary school at the age of five, it increases to 46.4% for the participants who started primary school at the age of six. The rate of participants in the second 20 percent reflects a similar situation. While 15.4% of the participants who started primary school at the age of five are in this, the rate of participants who started primary school at the age of six is 32.1%. The distribution reverses in the third, fourth and fifth percentiles, where there are candidates with lower LGS scores. The rate of participants in the five-year-old group in the third 20 percent is 23.1%, the six-year-old group is 10.7%; in the fourth percentile, 26.9%, 3.6%, respectively; in the fifth percentile, it is 7.7% and 7.1% (Table 7).

Table 7. Findings Regarding Percentiles of Participants' LGS Exam Scores

Percentage Range	5 Old	%	6 Old	%	Total	%
% 00 – 20	7	26,9	13	46,4	20	37,0
% 20 – 40	4	15,4	9	32,1	13	24,1
% 40 – 60	6	23,1	3	10,7	9	16,7
% 60 – 80	7	26,9	1	3,6	8	14,8
% 80 – 100	2	7,7	2	7,1	4	7,4
Total	26	100,0	28	100,0	54	100,0

### 3.3.3. Findings Regarding the High School Placement Type of Participants

The distribution of participants who started primary school at the age of five or six according to their high school placement type is given in Table 8. According to this, 21 out of 60 participants (35.0%) transferred to high school through central placement and 29 (48.3%) through local placement. There is no information regarding the settlement type of ten (16.7%) participants. While only 20.0% of the 30 participants who started primary school at the age of five transferred to high school through central placement, this rate increases to 50.0% for those who started primary school at the age of six. In local placement, the opposite is true. 60.0% of the participants who started primary school at the age of five, and only 36.7% of those who started at the age of six, transferred to high school through local placement.

Table 8. Distribution of participants according to high school placement type

Enrollment Type	5 Old	%	6 Old	%	Total	%
Central Placement	6	20,0	15	50,0	21	35,0
Local Placement	18	60,0	11	36,7	29	48,3
No information	6	20,0	4	13,3	10	16,7
Total	30	100,0	30	100,0	60	100,0

### 3.3.4. Findings Regarding the Type of High School the Participants Went to

The distribution of the participants according to the type of high school they were placed in is given in Table 9, distinguishing between central and local placement. Of the participants who were placed in a high school through central placement, one was enrolled in an Anatolian High School, five were enrolled in a science high school, eight were enrolled in imam-hatip high school, three were enrolled in an Anatolian technical high school, and four were enrolled in social sciences high school. None of the 24 participants who started primary school at the age of five were able to enroll in Anatolian high school. One of these participants was enrolled in a science high school, two were enrolled in imam-hatip high school, one was enrolled in Anatolian technical high school, and two were enrolled in social sciences high school. Among the participants enrolled in Anatolian high school, science high school, imam-hatip high school and Anatolian technical high school, the number of those who started primary school at the age of six is higher. Same number of participants from both groups was enrolled in the social sciences high school (Table 9).

Table 9. Distribution of participants according to the type of high school they were enrolled in

Enrollment Type	School Type	5 Old	%	6 Old	%	Total	%
Central Placement	Anatolian	0	0,0	1	3,8	1	2,0
	Science	1	4,2	4	15,4	5	10,0
	İmam-Hatip	2	8,3	6	23,1	8	16,0
	Anatolian technical	1	4,2	2	7,7	3	6,0
	Social Sciences	2	8,3	2	7,7	4	8,0
Local Placement	Anatolian	7	29,2	5	19,2	12	24,0
	İmam-Hatip	3	12,5	2	7,7	5	10,0
	Vocational	8	33,3	4	15,4	12	24,0
Total		24	100,0	26	100,0	50	100,0
No information		6		4		10	

The results of the distribution of participants enrolled in a high school through local placement according to school starting age in the distribution of high school types point to the opposite of the central placement results. According to this, the majority of the 29 participants (18 participants) who were enrolled in high school through local placement started primary school at the age of five. Seven of these participants were enrolled in Anatolian high school,

three were enrolled in imam-hatip high school, and eight were enrolled in vocational high school. It is seen that these numbers are lower in participants who started primary school at the age of six (Anatolian high school: 5, imam-hatip high school: 2, vocational high school: 4, respectively) (Table 9).

#### 4. Discussion

Data were available on which secondary school 57 of the 60 students in the study group of the longitudinal research graduated from. According to this, 50 of the 57 students are the graduates of public secondary school, and seven are private secondary school graduates. The number of participants in the five-year-old group who graduated from public secondary school is 26, and the number of participants in the six-year-old group is 24. The number of public general secondary school graduates was the same in both groups (19 participants). The number of students graduating from public imam-hatip secondary schools is seven in the five-year-old group and five in the six-year-old group. All seven students who attended private secondary school are general secondary school graduates. The city where the secondary school they graduated from is the same as the primary school they graduated from, that is, the number of participants who completed primary and secondary school in Tokat is 51, and the number of participants who completed them in a different province is six. Various studies (Aslan, 2017; Ünal, Özsoy, Yıldız, Güngör, Aylar and Çankaya, 2010) have shown that the socio-economic characteristics of schools and students have an impact on academic achievement. In this context, when the secondary schools they graduated from, the type of these schools (public/private, public/imam-hatip), and the cities they are located in are examined, it is seen that the majority of the participants who started primary school at the age of five or six studied in similar schools, therefore the effect of school and the socio-economic characteristics on academic achievement differences could be taken as marginal.

The end-of-year grade point averages of the participants who started primary school at the age of five in the 4<sup>th</sup>-8<sup>th</sup> grades of primary school are lower than the participants who started at the age of six. When the end-of-year grade point averages from the fourth to the eighth grades are examined, it is seen that the averages of both groups begin to decrease from the fifth grade onwards. It was determined that it started to increase in the seventh grade in the five-year-old group and in the eighth grade in the six-year-old group. The difference between the grade point averages, which was 9.6301 in the fourth grade, reached its highest point (10.0854) in the sixth grade, and then began to diminish in the seventh and eighth grades and decreased to 6.0639. The differences between the end-of-year grade point averages of the 4<sup>th</sup>-8<sup>th</sup> grades of the participants who started primary school at the age of five or six are statistically significant at the level of .01 in the fourth, fifth and sixth grades and at the level of .05 in the seventh grade. These findings show that the academic achievement differences observed in the second grade of students who started primary school at the age of five or six (Küçükler, 2016) continue in the 4<sup>th</sup>-8<sup>th</sup> grades. There are other studies showing that the problems faced by students who

start school early in their primary school years continue in middle school and high school years (Aslan and Çelik, 2022; Şahin, Kardaş İşler and Zoraloğlu, 2022; Şahin, Zoraloğlu and Kardaş İşler, 2023).

The difference between the participants' academic achievement scores begins to decrease starting from the seventh grade, leading to the expectation that the LGS scores of both groups will be close to each other. However, the analysis results show that the difference between LGS scores is significant at the .05 level in favor of participants who started primary school at the age of six. In a study conducted with a larger sample, it was concluded that the LGS scores of students who started primary school at the age of five were lower than those of students who started at the age of six (Şahin, Kardaş İşler, & Zoraloğlu, 2022). These results suggest that the increase in end-of-year grade point average observed in the seventh and eighth grades in the five-year-old group may be due to subjective reasons arising from the teachers who give grades. Likewise, the closeness that occurs between students and teachers until the eighth grade may cause teachers to give higher marks. On the other hand, teachers may be more liberal in grading eighth grade students because of its impact on LGS scores. In a study on the measurement-evaluation practices of secondary school mathematics teachers, it was concluded that teachers used subjective methods such as class participation and impression of the student in addition to objective tools such as written and oral examinations, project, etc.; and they felt under pressure to give high grades (Önel, Dalkılıç, Özel, Deniz, Balkaya and Kurt Birel, 2020). According to this finding, it could be said that the increase observed in the participants' end-of-year grade point averages in the seventh and/or eighth grades could not be attributed to a real progress in their academic success.

Participants' LGS scores and, their high school placement types according to those scores could be considered as variables that show their academic success and progress in the formal education system. The scores of each student taking the LGS examination are in five groups, from the highest 20% to the lowest 20%. The rate of LGS scores being in the top 20% is 26.9% in the five-year-old group and 46.4% in the six-year-old group. While the LGS score of approximately four out of five participants (78.5%) in the six-year-old group is in the top 40%, only two out of five (42.3%) in the five-year-old group are in this percentile range. Students' placement types in high school are directly determined by the scores they receive from LGS. Accordingly, students with high scores are enrolled in high school through central placement, and students with low scores are enrolled in high school through local placement. Transfer of a participant to high school with the central placement type means his/her academic achievement is higher than a participant who transfers with the local placement type. High school placement type of 50 participants in the study group could be determined. Of these participants, 24 were in the five and 26 in the six age group. The number of participants enrolled in high school with the central placement score was six in the five-year-old group, and 15 in the six-year-old group. On the other hand, the number of participants enrolled with the local placement was 18 in the five-year-old group, and 11 in the six-year-old group. Those findings show that one out of every four participants in the five-year-old group and two in the

six-year-old group was enrolled in a relatively "qualified" high school based on the central placement score.

Among the participants who enrolled in high school with the central placement score, the rate of placement in Anatolian high school, science high school, imam-hatip high school, and Anatolian technical high school was higher in the six-year-old group, whereas the placement rate for social sciences high schools was higher in the five-year-old group. On the other hand, those in the five-year-old group were enrolled in all types of high schools through local placement at a higher rate than the six-year-old group. When the comparative findings regarding the participants' transition to high school (LGS score, percentile, placement type and high school enrolled) were evaluated together, it was seen that the participants who started primary school at the age of five were behind the participants in the six-year-old group in all comparisons.

The results of the current study show that the academic achievement differences of participants who started primary school at different ages, measured in the second grade of primary school (Küçüker, 2016), continue in the 4<sup>th</sup>-8<sup>th</sup> grades of primary school and the transition to high school. This result shows that the five-year-old primary school enrollment regulation, which was implemented in the 2012-2013 academic year, had a negative effect on children who started school at the age of five, and that this effect continued during the transition to high school.

The followings are the recommendations developed based on the results of the current study, which revealed that the academic achievements of the participants who started primary school at the age of five were lower than the academic achievements of the participants who started primary school at the age of six during the transition to primary school, secondary school, and high school:

- Measures should be taken to increase the academic achievement levels of the five-year-old participants in the study group of the research before their transition to university.
- Children between the ages of 66-68 months who are currently given the right to enroll in primary school should be encouraged to continue preschool education.
- Comprehensive changes in the education system should be made based on data and research, and cooperation opportunities should be developed between the Ministry of National Education and educational scientists.

## **5. Conclusions**

It could be concluded from the study that:

- Majority of the participants in the longitudinal study completed primary and secondary school, often in the same schools and/or schools in the same city. This shows that the participants mostly have similar socio-economic conditions.



- The end-of-year grade point averages of the 4<sup>th</sup>-8<sup>th</sup> grades of the participants who enrolled in primary school at the age of five are lower than the participants who enrolled at the age of six. The difference between the end-of-year grade point averages of the two groups is statistically significant.
- The average LGS scores of the participants who started primary school at the age of five is statistically significantly lower than the participants who started primary school at the age of six.
- While five-year-old group participants mostly transferred to Anatolian vocational high school through local placement, six-year-old group participants transferred to Anatolian high school through central placement.

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