Impacts of the School Starting Age on Academic Achievement

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Abstract
The present research attempted to investigate the impacts of gender and age on the freshly-graduatedeighth graders' percentiles in the central high school entrance exam (LGS) in 2020. The sample of this causal-comparative study comprised 6,039 students selected from secondary schools in Isparta who took the LGS in 2020. The data were obtained from the Isparta Directorate of National Education on a chart demonstrating the participants' demographic characteristics and the percentiles of their exam scores. The findings revealed significant differences between the students starting school at 60-65, 66-68, and 69-71 months and those with a school starting age of 72 months and older by exam achievement. In this sense, the students starting school at an early age (60-71 months) had poorer achievement in the LGS than their counterparts starting school at an older age (72 months and above). Moreover, the students' achievement on the said exam significantly differed by gender. Accordingly, the female students demonstrated greater achievement in the LGS when compared to the male students. Considering the findings, it may confidently be asserted that it would be appropriate to amend the provision of the relevant regulation as the minimum age for starting school to be 72 months as of the fall semester.
Keywords: Primary School, Age, LGS

Introduction

Today's world has witnessed substantial transformations in almost all domains thanks to rapidly developing technology. Not surprisingly, such unstoppable developments deeply affect education. Despite innovative and transformative steps in education in Türkiye, the decision dated 2012 that now mandates children older than five years to start school led to a new debate in education. This decision still remains a hot agenda of education around advocating and critical views.The link between school starting age and academic achievement becomes another aspect of the said debate. School-based or nationwide examinationsdrive scholars to scrutinize this link more. Inequalities arising from the uneven distribution of resources and opportunities in the Turkish education system make examinations a target rather than a part of the education itself.

Children are welcomed to the world with some hereditary characteristics that are thought to be powered by environmental impacts. In this sense, development is of great importance for mastering primary school skills; thus, the opportunities and initial experiences in the family and social environment occupy an important place in ensuring children acquire academic skills (Erkan, 2011). It is well-known that socioeconomic status highly differs among people by industrial and geographical conditions. These differences generate substantial gaps in educational opportunities to be offered to children and even in their readiness, which shifts the interest to school starting age. Each preschool experience tends to return as affective and cognitive acquisitions, playing a major role in overcoming adaptation problems early.

When it is time to start school, the child's abilities to adapt to school, develop positive attitudes toward school, be interested in lessons, make friends, and fully fulfill their duties and responsibilities are all related to their active participation in the learning environment and academic achievement (Ladd, 1996).Although hereditary, environmental, and socioeconomic factors highly affect children's readiness, a certain standard for school starting age seems mandatory in public education. Since most student-related problems are attributed to the above-mentioned differences between children, school starting age has been debated worldwide for many years. Here, the key idea is that every student is not born to and does not live by the same standards.

While children start school at the age of 5 in some countries (e.g., Australia, Lebanon, Uruguay, and England), some others set school starting age as 6 (e.g., the United States, Portugal, Norway, the Netherlands, and Switzerland) or 7 (e.g., Sweden and Denmark) (Akyol, 2006; Güneş, 2000). As a result of a decade of debates on school starting age in Türkiye, compulsory basic education now covers children aged 6-13 years with the relevant regulation introduced by Law No. 6287. In addition, school starting age begins at the end of September of the year when the child turns five years (ResmîGazete, 2012). While some children starting school at the age of 5 may not experience problems thanks to a sufficient level of readiness, most of these children may have to undertake heavy academic and social burdens not compatible with their readiness level. Therefore, they may experience different issues arising both in the school and the social environment due to insufficient physical, mental, and social maturity.

As time passes, children grow to move away from temporal emotional changes. The preschool period (i.e., pre-operational stage) and primary school period include entirely different aspects of education and intellectual transformations. The initial years of basic education are those when children develop concrete thinking, while they acquire abstract thinking toward the end of primary school. In the final years, children begin to make sense of abstract concepts such as numerical figures, phrases, social rules, and logical reasoning. For example, at the age of seven, children begin to settle their problems by resorting to various cognitive methods that they could not use at earlier ages. It is thought that it is not a coincidence that children can assess their experiences from different perspectives and come to solve challenging meaning components when participating in the school environment (Yavuzer, 2000). Children's achievement in school highly relies on their preschool experiences. Children with substantial experiences, mental maturity, and adaptation to the environment and social life can overcome many problems in the first year of school. However, those who have not reached sufficient maturity and cannot adapt to the social environment are likely to confront adaptation problems in this period. Such an undesirable start to school always leaves something missing in the following years.

For children, starting school may refer to a challenging process requiring physical, social, cognitive, and emotional adjustment. In other words, it may be the most radical event that can happen in childhood, which is critical for their achievement and failure in their remaining life. Children's social and behavioral issues in the early years of school may also bring along some other problems to persist throughout their school life (Ladd & Price, 1987).

From the past to the present, famous theorists, such as Dewey, Gessell, and Piaget, have put forward different views about starting school. While Dewey considered six years appropriate for starting school, Gessell adopted a different perspective and emphasized the importance of maturity. His thoughts introduced the concept of "readiness." On the other hand, Piaget mentioned the significance of the transition from the pre-operational stage to the concrete operational stage. Regardless of what has been uttered about it so far, the school starting age is constantly debated in the education community. It should be noted that neither is every child born with the same body and mind nor do they feel the same emotions; therefore, one should acknowledge individual differences and the effects of the school starting age and school readiness on children (Akay & Ceylan, 2019). What should be minded here is the adverse consequences of starting school early. The term "early" refers to a period when children still cannot reach the cognitive, affective, and

psycho-motor competence to be able to acquire primary school skills. It is then inevitable that children starting school early experience problems with school adaptation as well as academic and social failures.

Cognitive development refers to the whole of the mental processes that ensure communication with the external environment from the moment of birth and acquiring, using, interpreting, recompiling, and evaluating the necessary knowledge to perceive the world. Therefore, the relationship between knowledge acquisition and mental processes seems critical. As developing cognitively, children can understand the plots of events and similarities and differences between objects and produce logical responses with reasoning (MEB, 2007). The accumulation of knowledge is a process where information is constantly constructed; however, it should be noted that the cognitive base needs to be braced to be able to build a robust knowledge scaffold. In this case, the timely acquisition of knowledge becomes prominent. For example, knowledge or behavior that one is not ready to learn will likely not remain permanent; thus, learning toilet using or walking is strictly bound to critical developmental periods. When such periods are missed, one may encounter psychological and emotional problems in the future.

In Türkiye, the government substantially amended national education with a new system, publicly known as "4+4+4," and increased compulsory education to 12 years in 2012, and, thus, divided schools into three levels: primary school, secondary school, and high school. Moreover, the amendment to the Regulation on Basic Education Institutions reduced the school starting age from 72 months to 60 months. Now, children aged 66 months and older are compulsorily admitted to school, but it is left to parents' discretion to send their children aged 60-66 months to school. Yet, children starting school at 60 months seem to have academic and social difficulties later on since they are assumed at the pre-operational stage when starting school, according to cognitive development theory (Başar, 2013). Besides, it seems as if the classroom hosted two groups: those aged 72 months and older and those aged 60-66 months, which invokes the perception of an unfair setting due to differences between the students. It is also the case that younger students who cannot reach the required level of achievement are bullied by their older classmates and that their parents put too much burden on them to eliminate their developmental gaps. However, it is not surprising that these students are worn out under pressure and stress and develop adverse attitudes toward school (Doğan et al., 2014). Due to such adverse situations, the Ministry of National Education (MoNE) took a step back in the 2019-2020 academic year and amended the said regulation again. Accordingly, children aged 69,70, and 71 months are compulsorily admitted to school, but their parents may request a one-year postponement. Moreover, children aged 66, 67, and 68 months are admitted to school with a written request from their parents (ResmîGazete, 10/7/2019-30827). However, the amendment to the regulation seems insufficient to overcome possible difficulties that children would experience since the discretion of the school admission of a 66-month-old child remains on their parents, who may not have a pedagogical background.

A plethora of studies investigating age and school achievement revealed that students starting school younger become disadvantaged (Verachtert et al., 2010). Baer (1958) examined the link between the school success of students in the 3rd, 6th, and 8t grades and their school starting age and concluded that those starting school at an older age showed greater achievement in math and reading. Similarly, Bell and Daniels (1990) reported that the academic performance of students is related to their age and that students starting school at an older age are more advantageous. Younger students without a sufficient level of maturity are likely to have difficulty focusing and learning and can also acquire less knowledge and skills. Moreover, major problems arise if such children cannot overcome their disadvantaged situation (Ponzo&Scoppa, 2011). In Türkiye, for example, students taking both school exams and LGS at different ages compete in different conditions. While even a month in child development creates significant differences in cognitive, affective, and psycho-motor domains, teaching students in different age ranges at the same grade level may cause great harm for younger groups.

Admission of children aged 66-69 months cannot be expected to yield success stories unless the curriculum and physical conditions of schools are adjusted to the developmental characteristics of these children. Even if all external conditions are adjusted appropriately, the mental development of such children may not have sufficient maturity, except for exceptional cases (Gündüz&Çalışkan, 2013). Whether a child is ready for primary school depends on their readiness and skills, as well as school expectations and support. It is widely accepted that child development can exhibit differences by hereditary factors, nutrition, environmental factors, and seasonal changes. Despite an age criterion set for children to start school, they show great differences in their developmental characteristics (Buldu& Er, 2016). However, it is necessary to set specific standards for education for the sake of the principle of unity.

Every child is born to have equal rights and opportunities; however, unfortunately, many children start and continue their lives under unequal conditions today. When it comes to education, the chance of every child to receive sufficient education under equal conditions depends on offering them similar conditions, starting from preschool, since it is inevitable that discrimination and inequality from the very beginning of life will lead to a gap that cannot be closed again. It is, of course, possible for children starting school early to overcome all kinds of difficulties and be successful throughout their school life. Nevertheless, the chance of this story remains negligible when compared to those starting school on time. Overall, it is consistently highlighted that teaching different age groups in the same classroom is likely to result in cognitive, affective, and social problems among the younger ones. For example, children starting school with their older classmates in 2012 were assessed with the same nationwide examination in 2020 (ResmîGazete, 2012).

Aim of the Study

The present study attempted to investigate the impacts of gender and age on the percentiles of the 2020 LGS scores of freshly-graduated 8th-grade students. Accordingly, answers were sought to the following research questions:

- Do the percentiles of the students' LGS scores significantly differ by their gender?
- Do the percentiles of the students' LGS scores significantly differ by their school starting age?
- Do the percentile of the students' LGS scores significantly differ by the interaction of their age and gender?

Methods

Research Design

This causal-comparative research examined the associations between the percentiles of the 2020 LGS scores of students starting school in different age groups in the 2012-2013 academic year in Isparta and their demographic characteristics. In a basic causal-comparative design,the researcher selects two or more groups differing on a specific variable and compares them by the target and non-manipulated variables(s) (Fraenkel et al., 2012).

Sample

The target population of the research consisted of about 6,500 students who had just graduated from the 8th grade in Isparta in the 2019-2020 academic year and took LGS. Accordingly, it was attempted to reach the whole population and included 6,039 conveniently selected students, 2,981 girls and 3,058 boys, in the study.

Data Collection

The research data that covered the students' demographic characteristics (except for their personal information) and the percentiles of their LGS scores, referring to their exam achievement, were obtained from the Isparta Provincial Directorate of National Education upon necessary permissions.

Data Analysis

The demographic characteristics of the students were first examined on the data (Table 1). The last amendment to the regulation on Basic Education Institutions was made on 07.10.2019 regarding the school starting age. Accordingly, children completing 69 months as of the end of September of that academic year are admitted to primary school. Children 66, 67, and 68 months old are also admitted to school upon their parents' written request. In addition, the enrollment of children 69, 70, and 71 can

be postponed for one year upon their parents' written request (ResmiGazete, 2019). Finally, it is still the case since 2012 that the compulsory school starting age is 72 months as of September of that academic year. In this study, the age groups were determined based on the regulation above, and the percentiles of the students' LGS scores were compared by these age groups and gender using a two-way analysis of variance (ANOVA). The source(s) of significant difference was sought through a post-hoc (Tukey HSD) test.

Table1 Participants' Demographic Characteristics

GENDER	N	%
MALE	3,058	50.6
FEMALE	2,981	49.4
AGE	N	%
60-65 MONTHS	243	4
66-68 MONTHS	818	13.5
69-71 MONTHS	716	11.9
72 MONTHS AND OLDER	4262	70.6

Findings

Frequencies and percentages of the participants' demographic characteristics (gender and age) are shown below.

While 50.6% of the participants were boys, 49.4% were girls. When starting school, 4% were 65-65 months, 13.5% were 66-68 months, 11.9% were 69-72 months, and 70.6% were 72 months and older.

Table 2 Percentiles of the Students' LGS Scores by School Starting Age and Gender

SOURCE	TYPE III SUM OF SQUARES	DF	MEAN SQUARE	F	P	PARTIAL H2
CORRECTED MODEL	188056.45	7	26865.208	33.002	.000	.037
INTERCEPT	5838845.55	1	5838845.554	7172.630	.000	.543
AGE	50999.81	3	16999.938	20.883	.000	.010
GENDER	76429.75	1	76429.752	93.889	.000	.015
AGE* GENDER	4054.96	3	1351.655	1.660	.173	.001
ERROR	4909506.88	6031	814.045			
TOTAL	18674000.29	6039				
CORRECTED TOTAL	5097563.34	6038				

Two-way ANOVA was performed to reveal if the percentiles of the students' LGS scores significantly differ by their school starting age and gender. To do so, the assumptions of normality, linearity, and homogeneity of the variables (Tabachnick & Fidell, 2013). The result of Levene's test was considered for testing equality of variances. Moreover, skewness and kurtosis values of the relevant variables were checked to reveal whether the da showed a normal distribution. Accordingly, the normality assumption was satisfied since the values above ranged between +1.5 and -1.5.

The results of the analysis yielded that the percentiles of the students' LGS scores significantly differed by their school starting age ($F(3,6031) = 20.88$, $p < .05$). Moreover, the mentioned percentiles significantly differed by gender ($F(1,6031) = 93.88$, $p < .05$). However, there was no significant association between the percentiles of the students' LGS scores and the interaction of their school starting age and gender ($F(3, 6031) = 1.66$, $p > .05$) (Table 3).

Table 3 Mean Percentiles of the Students' LGS Scores by Their School Starting Age and Gender

AGE	GENDER	N	M	SD
60-65 MONTHS	MALE	115	61.28	27.65
	FEMALE	128	46.17	27.64
	TOTAL	243	53.32	28.61
66-68 MONTHS	MALE	391	58.61	28.07

66-68 MONTHS	FEMALE	427	46.53	27.30
	TOTAL	818	52.30	28.31
69-71 MONTHS	MALE	347	55.24	28.30
	FEMALE	369	44.93	26.72
	TOTAL	716	49.93	27.96
72 MONTHS AND OLDER	MALE	2205	49.92	30.32
	FEMALE	2057	41.22	27.31
	TOTAL	4262	45.72	29.23

Tablo 3 present the mean percentages of the students' LGS scores by their school starting age and gender. The results showed that the percentiles of the students' LGS scores significantly differed by their school starting age ($F_{(3, 6031)}$ = 20.88, p< .05). Tukey HSD test was performed to explore the source(s) of thissignificant difference. Accordingly, it was discovered that the LGS scores of the students starting school at 72 months and older brought significantly better percentiles (*M*=45.72) when compared to the scores of those starting school at 60-65 months (*M*=53.32), 66-68 months (*M*=52.30), and 69-71 months (*M*=49.93).At the same that, the findings showed that the students' achievement in the 2020 LGS significantly differed by gender. Accordingly, the percentiles of the LGS scores of the girls were better than those of the boys.

Discussion, Conclusion, and Recommendations

This study explored the achievement of the students, who started school in the 2012-2013 academic year, in the 2020 LGS by their school starting age and gender. The results showed that the LGS achievement of the students starting school at 72 months and older significantly differed from that of the students starting school at 60-65 months, 66-68 months, and 69-71 months, respectively. In other words, the students starting school early (60-71 months) demonstrated lower achievement in the 2020 LGS than those starting school at an older age (72 months and older), overlapping the previous findings in the literature.

In their study, Şahin et al. (2022) reported a significant difference in LGS achievement between students starting school at 71 months and younger and 72 months and older in favor of the older group. Kapci et al. (2013) also uttered that students starting school at an early age often have poorer academic perceptions than older age groups. Şahin and İşGüzel (2018) discovered that the participating students starting school at an early age demonstrated poorer improvement in math, Turkish, and life science lessons in the first and second grades than the older groups. Yavuz (2019) found that students starting school at an older age (months) scored higher on the TIMSS 2015 math and science tests. Bedard and Dhuey (2006) compared the TIMSS math and science scores of younger and older children who started school in the same academic year and discovered that the younger age group scored in the mentioned tests significantly lower than the older age group.

At the same that, the findings showed that the students' achievement in the 2020 LGS significantly differed by gender. Accordingly, the girls achieved better percentiles in their LGS scores than the boys. Similar to this finding. Ramey et al. (1998) implied that girls have higher academic achievement and adjustment levels than boys. Çimen (2000) stated that gender is a significant parameter in psycho-social development and that female students often take on more responsibilities and engage in independent activities more than their male peers. In addition, Bahalıet al.(2009) showed that girls often have positive outcomes in school maturity in the preschool period compared to boys. Kaya and Akgün (2016) found that the participating girls had greater school adjustment than boys.

Overall, it can be proposed that students starting school at a younger age may experience academic disadvantages compared to those starting school at an older age. Indeed, it was found in this study that students starting school at 72 months and older were more successful in the 2020 LGS than the younger groups. It would be not surprising that students starting school at a younger age would have

a similar disadvantageous outcome in the university admission examination compared to their older peers. Therefore, it may confidently be asserted that it would be appropriate to amend the provision of the relevant regulation as the minimum age for starting school to be 72 months as of the fall semester.

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