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# **The Impact of Bilingualism on Critical Thinking – Insights from a Comparative Study among Secondary School Students in Germany**

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## **Abstract**

This article explores the relationship between bilingualism and critical thinking. To investigate this, monolingual and bilingual participants from various public secondary schools in Germany were invited to take part in the experiment through purposive sampling. Data for this quantitative study were gathered using the Critical Thinking Disposition Scale (Semerci, 2016), a 49-statement, five-point Likert-type scale. This multidimensional scale assessed the extent to which participants could use metacognition, flexibility, systematicity, tenacity and patience, and open-mindedness to reflect their critical thinking dispositions. When analysing the correlation between bilingualism and the critical thinking dispositions of the participants, these five subscales were used as a basis. The data were analysed using the SPSS software and an Independent Two Samples t-test. The critical thinking dispositions of bilingual children were also compared in terms of gender and age. The study's findings showed that bilingual children seem to have performed better in all five of these critical thinking disposition subscales. According to these findings, it can be concluded that there is a correlation between bilingualism and critical thinking dispositions.

*Keywords: Bilingualism, critical thinking, critical-thinking dispositions, language acquisition*

## **1 Introduction**

Bilingualism is a growing phenomenon worldwide in our modern era. There are many reasons for the growing population of bilingual people, such as emigration, international mobility, professional or personal reasons. Bilingual people are present in a variety of age ranges and with different backgrounds all around the world. As Brown (1994: 1) stated, bilingualism is a way of life for people. Bilingual people not only speak two different languages but also think in two different ways. What is more, they are closely familiar with two different cultures and traditions. In their endeavour to exceed the limits of their mother tongue, bilinguals undergo significant cognitive, cultural, and communicative influences.

This study is theoretically based on the theories of Whorf (1956), Vygotsky (1934, 1962) and Cummins (1979). Whorf (1956) hypothesises that people who

can speak different languages think in different patterns. Studies show that various cognitive factors are in a positive relationship with bilingualism. For instance, Hakuta (1990) asserts that one of the skills bilinguals seem to be better at is metalinguistic ability, which refers to the ability to think flexibly and abstractly about language and appreciate linguistic form rather than content. Bilingualism is positively associated with higher levels of cognitive functioning. Among these intellectual skills is critical thinking, which is defined as 'reasonable and reflective thinking focused on deciding what to believe' (Ennis, 2018: 166). Critical thinking is crucial in that one can apply it to different areas of life and learning (American Philosophical Association, 1990). In the Delhi Report, Facione (1990: 3) concludes that there are two dimensions of critical thinking which are *skills* and *dispositions*. Critical thinking skills are defined as competences that are applied while making decisions and judgments, while thinking dispositions are the inclination and willingness to use critical thinking skills.

This study is based on the following research questions:

1. Is there a statistically significant difference between the critical-thinking dispositions of monolingual and bilingual children?
2. How do children's critical thinking dispositions differ across the subscales of Semerci's (2016) Critical Thinking Disposition Scale (metacognition, flexibility, systematicity, tenacity-patience and open-mindedness)?
3. Is there a statistically significant difference between critical thinking dispositions of monolingual and bilingual children in terms of gender?
4. Is there any statistically significant difference between critical thinking dispositions of monolingual and bilingual children in terms of age?

## 2 Methodology

### 2.1 Participants

This study, utilising purposive sampling, was conducted with a sample of 196 children aged between 10 and 14, who were 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> graders enrolled in three different public secondary schools in Aschaffenburg, Germany during the 2017-2018 Academic Year. The participants were divided into two groups as monolingual children of German and bilingual children. There were 82 participants in the monolingual group while there were 114 participants in the bilingual group. The monolingual group consisted of 34 female and 48 male students, while the bilingual group consisted of 50 female and 64 male students. In the bilingual group, the children's mother tongues were varied, such as Turkish, Italian, Russian and Arabic while their second language was German. The bilingual participants were chosen from among children born and residing in Germany who were fluent in the German language. To create a balanced distribution, students from rural public schools with similar socio-economic status and educational backgrounds were selected. Therefore, the results may be biased, as students from private or high schools are not repre-

sented in the study

The demographic information of the participants is presented in the table below:

Category	Subcategory	Count	Percentage
Gender	Female	84	42,9
	Male	112	57,1
Age	10-11	33	16,9
	12-13	79	40,3
	13+	137	69,8
Languages	German	82	41,8
	Turkish	51	26,0
	Other (Italian, Russian and Arabic)	63	32,2
Groups	Control	82	41,8
	Experimental	114	58,2

Table 1: Distribution of Participants' Demographic Information

## 2.2 Instruments

This descriptive study is based on quantitative data collected through a questionnaire consisting of two main parts: A Personal Information and Critical-Thinking Disposition Scale (Semerci 2016). The Personal Information part, developed by the researchers, was used in order to gather data about the independent variables of the study. In this part, the participants indicated their gender, age, grade, and place of birth. In order to create a balanced sample group, only participants who were born in Germany were chosen for the study. The participants also indicated their mother tongue and second language in the questionnaire. This enabled the creation of control and experimental groups. This study did not employ objective language proficiency tests due to the impracticality of administering assessments for each participant's language.

The second part of the questionnaire was the Critical Thinking Disposition Scale, which is a Likert-type item scale. This Instrument comprised 49 items, each rated on a five-point scale. Participants responded to each item based on the degree to which they agreed, with options ranging from 1 (strongly disagree) to 5 (totally agree). It is evident that the numerical coding system is arbitrary in nature. Its primary function is to facilitate the quantitative analysis of participants' responses, thereby enhancing the objectivity of data interpretation and facilitating efficient management of large datasets. The scale employed in this study was multi-dimensional. There were five subscales: metacognition (14 items), flexibility (11 items), systematicity (13 items), tenacity-patience (8 items) and open-mindedness (3 items). The critical-thinking dispositions of mono-

lingual and bilingual children were compared in terms of these five subscales.

### **2.3 Data Collection**

The questionnaire was administered in three languages: The languages under consideration are German, English and Turkish. The establishment of a supportive and relaxed atmosphere was of paramount importance in ensuring that participants felt comfortable while completing the questionnaire. Furthermore, participants were encouraged to ask questions if they encountered any difficulties. The study was conducted with no time constraints imposed on the participants, thus allowing them to respond at their own pace. Throughout the data collection process, the classroom teachers collaborated closely with the researchers, providing assistance as required. The researchers and classroom teachers collaborated to clarify any ambiguous items or instructions, thereby ensuring the comprehension of the participants and the veracity of their responses.

### **2.4 Data Analysis**

The data obtained from a total of 196 participants were analysed quantitatively utilising the Statistical Package for the Social Sciences (SPSS), version 23. The analysis was performed at 95% confidence level. Descriptive statistics, including frequencies and percentages, were calculated for all demographic variables and Likert-scale items. In addition, the responses to the Likert-scale items were summarised using descriptive measures, such as means and standard deviations. To examine potential differences in scale scores based on gender and age, Independent Two Samples t-test were conducted. These tests were used to compare the means between independent groups and assess whether statistically significant differences existed between them.

## **3 Results and Discussion**

The results were interpreted in consideration of the aforementioned research questions. The objective of the present study was to ascertain the critical thinking dispositions of monolingual and bilingual children. In addition, the study sought to evaluate the impact of gender on critical thinking dispositions and to examine the correlation between bilingualism and critical thinking dispositions. The findings are presented in the subsequent tables and are discussed in detail below.

In order to address Research Question 1, which pertains to the potential existence of a statistically significant discrepancy between the critical thinking dispositions of monolingual and bilingual children, an Independent Two Samples t-test was conducted. This test was utilised to undertake a comparative analysis

of the critical thinking dispositions between the control and experimental groups:

Groups	N	M	SD	t	p*
Control	82	163.11	23.61	-2.794	0.006
Experimental	114	172.09	21.11		

Table 2: The Difference between Critical Thinking Dispositions of Control and Experimental Group ( $p < \alpha=0,05$ )

As demonstrated in Table 2, the experimental group exhibited a higher mean score on the scale ( $M= 172.09$ ) in comparison to the control group ( $M=163.11$ ). Consequently, it can be concluded that, among the two groups examined, bilingual children exhibited superior critical thinking dispositions in comparison to monolingual children.

The data obtained for Research Question 2, which examined potential differences in critical thinking dispositions among children across the subscales (metacognition, flexibility, systematicity, tenacity and patience, and open-mindedness), are presented in Table 3:

Subscales	Groups	N	M	SD	t	p*
Metacognition	Control	82	49.66	7.01	-1.521	0.130
	Experimental	114	51.19	6.93		
Flexibility	Control	82	36.38	6.36	-2.919	0.004
	Experimental	114	38.83	4.93		
Systematicity	Control	82	41.83	7.89	-2.592	0.010
	Experimental	114	44.59	6.94		
Tenacity patience	Control	82	24.43	5.34	-2.965	0.003
	Experimental	114	26.68	5.16		
Open-minded- ness	Control	82	10.82	2.28	-0.060	0.953
	Experimental	114	10.80	2.11		

Table 3: Differences in Critical Thinking Disposition Subscales between Control and Experimental Groups (\*  $p < \alpha=0,05$ )

The data indicate that the experimental group outperformed the control group across all subscales in terms of mean scores. However, while significant differences were observed in the subscales of flexibility, systematicity, and tenacity-patience, no significant differences were found in the metacognition and

open-mindedness subscales. With regard to these results, it can be said that bilingual children have better scores in critical thinking dispositions than monolingual children, as the bilingual participants scored better than the monolingual children in three out of five subscales.

The t-test results show that there is a statistically significant difference in flexibility score between monolingual and bilingual children. Bilingual children have a higher flexibility level ( $M=38.83$ ) than monolingual children. Many researchers allege that bilingual people have more cognitive flexibility than monolingual people (Peal & Lambert, 1962; Ben-Zeev, 1977; Bialystok, 2001; Bialystok & Senman, 2004; Prior & MacWhinney, 2010; Xia et al., 2022).

The term *flexibility* has been employed in a variety of studies to describe different cognitive abilities, including the performance of bilinguals on general reasoning tests (Peal & Lambert, 1962); their ability to pay attention to structure and detail (Ben-Zeev, 1976, 1977a); their performance on perceptual and 'set-changing' tasks (Balkan, 1970); and their performance on creativity tests measuring divergent thinking skills (Landry, 1974). The findings of these studies indicate that bilinguals appear to demonstrate superior cognitive flexibility. In this study, flexibility is defined as an individual's capacity to adapt by shifting between various tasks and mental frameworks (Miyake et al., 2000). A plethora of studies have indicated that individuals who are bilingual and possess an equilibrium in their linguistic abilities exhibit a higher degree of flexibility in their performance on diverse cognitive tasks when compared to monolingual individuals (Balkan, 1970). The term *balanced bilingual* refers to an individual who possesses a reasonable degree of proficiency in both languages (Baker, 2006). At this point, the present study is not an exception, insofar as the results indicate that bilingual children have greater flexibility in problem solving and decision making than monolingual children. The results of the study indicate that bilingual children exhibit a superior ability to propose multiple solutions to problem-solving tasks. This finding aligns with the conclusions of the study conducted by Diaz & Klingler (1991), which demonstrated that bilingual individuals exhibited superior performance in non-verbal problem-solving tasks when compared to monolingual individuals. The bilingual experience of managing two language systems, which demands that children frequently switch between languages and inhibit the non-target language, leads to these advantages (Bialystok, 2012). It is hypothesised that this constant practice in language control may strengthen broader executive functions, particularly flexibility and attentional control (Adesope et al., 2010). It can be concluded that bilingual individuals tend to exhibit greater cognitive flexibility.

As demonstrated in Table 3, a statistically significant discrepancy is evident between monolingual and bilingual children with regard to the systematicity subscale. Specifically, bilingual children exhibit higher mean scores ( $M=44.59$ ) in comparison to monolingual children ( $M=41.83$ ). This result is consistent with Wenner's (2009) study, which claims that monolingual and bilingual people think in different ways and that bilingual children are able to solve problems more easily than monolingual ones. Furthermore, there is a statistically significant difference between monolingual and bilingual children in the tenacity-patience



subscale, with bilingual children having a higher tenacity-patience level ( $M=26.68$ ) than monolingual children ( $M=24.43$ ). However, a statistically significant difference has not been detected between the monolingual and bilingual children in terms of metacognition and open-mindedness.

For Research Question 3, the Independent Two Samples t-test was carried out to compare the critical thinking dispositions of the monolingual and bilingual children in terms of gender:

Subscales	Groups	N	M	SD	t	p
Metacognition	Control	34	48,97	6,74	-1,195	0,236
	Experimental	50	50,72	6,48		
Flexibility	Control	34	36,41	5,63	-1,821	0,072
	Experimental	50	38,36	4,18		
Systematicity	Control	34	42,35	7,24	-0,987	0,327
	Experimental	50	43,78	5,96		
Tenacity-patience	Control	34	22,91	5,79	-2,582	0,012*
	Experimental	50	26,06	5,27		
Open-mindedness	Control	34	10,62	2,37	-0,415	0,680
	Experimental	50	10,82	2,07		

Table 4: Difference of Critical Thinking Dispositions of the Female Monolingual and Bilingual Children (\*:  $p < \alpha=0,05$ )

Table 4 presents a cross-tabulation of the differences in subscales between female monolingual and bilingual children. The t-test results are presented to facilitate a comparison between the subscales of female monolingual and bilingual children. The t-test results indicate a statistically significant difference in terms of tenacity-patience scores between female monolingual and bilingual children. Bilingual girls have been shown to exhibit a higher level of tenacity and patience ( $M=26.06$ ) in comparison to monolingual girls ( $M=22.91$ ). Conversely, the analysis yielded no statistically significant disparities in terms of metacognition, flexibility, systematicity, and open-mindedness scores. Therefore, it can be interpreted that there is no statistically significant difference in the critical thinking dispositions of the female monolingual and bilingual children. These results align with the findings of studies conducted by Çekin (2015) and Topoğlu & Öney (2013), which revealed no significant differences in students' critical thinking dispositions based on gender.

Table 5 illustrates the differences in critical thinking dispositions between male monolingual and bilingual children:

Group	N	M	SD	t	p
Control	48	164,42	24,65	-2,086 0,039*	
Experimental	64	173,92	23,27		

Table 5: Differences of Subscales of the Female Monolingual and Bilingual Children (\*:  $p < \alpha=0,05$ )

Table 5 illustrates the differences in critical thinking dispositions between male monolingual and bilingual children. The findings reveal a statistically significant difference in the critical thinking dispositions of male monolingual and bilingual children. Bilingual boys have higher critical thinking disposition levels ( $M = 173.92$ ) than monolingual boys ( $M = 164.42$ ). To further explore this difference, the critical thinking dispositions of male children in the control and experimental groups were compared according to the five subscales.

Table 6 shows a cross table for the differences of subscales of the male monolingual and bilingual children. It presents independent Two Samples t-test results comparing male monolingual and bilingual children with respect to the subscales:

Subscales	Groups	N	M	SD	t	p*
Metacognition	Control	48	50.15	7.23	-1.021	0.310
	Experimental	64	51.56	7.29		
Flexibility	Control	48	36.35	6.90	-2.361	0.020
	Experimental	64	39.20	5.45		
Systematicity	Control	48	41.46	8.37	-2.480	0.015*
	Experimental	64	45.22	7.61		
Tenacity-patience	Control	48	25.50	4.78	-1.755	0.082
	Experimental	64	27.16	5.06		
Open-mindedness	Control	48	10.96	2.22	0.425	0.672
	Experimental	64	10.78	2.16		

Table 6: Differences of Subscales of the Male Monolingual and Bilingual Children (\*:  $p < \alpha=0,05$ )

According to the results of the t-test, there is a statistically significant difference in flexibility and systematicity scores between monolingual and bilingual male children. Bilingual male children show a higher flexibility level ( $M=39.20$ ) than monolingual children ( $M= 36.35$ ). Moreover, a statistically significant difference

has been found in systematicity subscales, and bilingual male children have a higher systematicity level ( $M=45.22$ ) than monolingual children ( $M=41.46$ ). However, no statistically significant differences were found in the other subscales, such as metacognition, tenacity, patience and open-mindedness. According to these results, a statistically significant difference in critical thinking dispositions was found between monolingual and bilingual boys, whereas no such difference was observed between monolingual and bilingual girls. This may be due to differences in cognitive development between girls and boys during adolescence (Willingham, 2007).

With regard to Research Question 4, which focused on potential differences in the critical thinking dispositions of monolingual and bilingual children by age group, an independent two-sample t-test was used to compare the critical thinking dispositions of monolingual and bilingual children in the following age groups: 10–11, 12–13, and over 13:

Subscales	Groups	N	M	SD	t	p*
Metacognition	Control	21	49.71	6.14	-2.110	0.043
	Experimental	12	54.00	4.49		
Flexibility	Control	21	35.71	6.43	-1.753	0.089
	Experimental	12	39.33	4.08		
Systematicity	Control	21	42.67	8.59	-0.648	0.522
	Experimental	12	44.67	8.40		
Tenacity-patience	Control	21	26.14	5.94	-1.106	0.277
	Experimental	12	28.33	4.52		
Open-mindedness	Control	21	11.43	2.27	0.015	0.988
	Experimental	12	11.42	1.93		

Table 7: Differences of Critical Thinking Dispositions of the Monolingual and Bilingual Children aged 10-11 (\*:  $p < \alpha=0,05$ )

According to the t-test results shown in Table 7, there is no statistically significant difference between the flexibility, systematicity, tenacity-patience and open-mindedness subscales. However, there is a statistically significant difference in the metacognition scores of 10-11 year old monolingual and bilingual children, with the latter having higher metacognition levels ( $M=54.00$ ) than the former ( $M=49.71$ ). Accordingly, Siegal et al. (2010) conclude that exposure to multiple languages facilitates children's metalinguistic awareness, positively affecting their cognitive development. They argue that, although children may sometimes have difficulties with vocabulary comprehension, they overcome this with age.

In Table 8, Independent Two Samples t-test results are presented to compare the subscales of monolingual and bilingual children aged 12-13:

Subscales	Groups	N	M	SD	t	p
Metacognition	Control	31	49,97	6,94	-0,019	0,985
	Experimental	48	50,00	7,63		
Flexibility	Control	31	36,94	6,70	-1,011	0,317
	Experimental	48	38,33	4,71		
Systematicity	Control	31	41,74	7,55	-1,999	0,049*
	Experimental	48	44,75	5,79		
Tenacity-patience	Control	31	24,48	4,56	-2,490	0,015*
	Experimental	48	27,15	4,69		
Open-mindedness	Control	31	10,39	2,19	-0,098	0,922
	Experimental	48	10,44	2,26		

Table 8: Differences of Subscales of Critical Thinking Dispositions of the Monolingual and Bilingual Children aged 10-11 (\*:  $p < \alpha=0,05$ )

The results indicate a statistically significant difference in the systematicity and tenacity-patience subscales, with higher scores in the experimental group. However, no such difference was found in the metacognition, flexibility, or open-mindedness subscales. Therefore, it is concluded that there is no statistically significant difference between the critical thinking dispositions of monolingual and bilingual children.

Table 9 shows the statistical analysis of the critical thinking dispositions of monolingual and bilingual children aged over 13:

Groups	N	M	SD	t	p*
Control Group	30	160,90	23,37	-2,127	0,036
Experimental Group	54	172,09	22,96		

Table 9: Differences of Critical Thinking Dispositions of the Monolingual and Bilingual Children aged 12-13 (\*:  $p < \alpha=0,05$ )

According to the above results, the difference between the two groups is considered statistically significant. The results show that the critical thinking disposition level of bilingual children ( $M=172.09$ ) is higher than that of monolingual children ( $M=160.90$ ). This difference may be attributed to the onset of adolescence, which generally begins at around the age of 12 or 13. During this period, cognitive abilities advance significantly and logical thinking reaches a level similar to that of adults. Whitmire (2000) describes adolescence as a period of significant cognitive and social development. As children progress from adoles-

cence into adulthood, the bilingual individuals benefit from their ability to communicate in two languages and their experience of diverse cultural and social environments.

As shown in Table 10, the results of the independent two-sample t-test are presented to compare 13-year-old monolingual and bilingual children in terms of the subscales:

Subscales	Groups	N	M	SD	t	p*
Metacognition	Control	30	49,30	7,83	-1,450	0,151
	Experimental	54	51,63	6,59		
Flexibility	Control	30	36,27	6,12	-2,265	0,026
	Experimental	54	39,17	5,33		
Systematicity	Control	30	41,33	7,95	-1,754	0,083
	Experimental	54	44,43	7,63		
Tenacity-patience	Control	30	23,17	5,50	-2,145	0,035
	Experimental	54	25,89	5,63		
Open-mindedness	Control	30	10,83	2,35	-0,307	0,760
	Experimental	54	10,98	1,99		

Table 10: Differences of Subscales of Critical Thinking Dispositions of the Monolingual and Bilingual Children aged 12-13 (\*:  $p < \alpha = 0,05$  )

According to the results of the t-test, there is a statistically significant difference in flexibility scores: the bilingual children have a higher level of flexibility ( $M = 39.17$ ) than the monolingual children ( $M = 36.27$ ). Furthermore, a statistically significant difference was found in tenacity-patience scores, with the bilingual children achieving higher scores ( $M = 25.89$ ). However, no statistically significant difference was found in the metacognition, systematicity and open-mindedness subscales.

Regarding the participants' age, the results of this study show a meaningful correlation between age and critical thinking dispositions after adolescence. As participants' age increases, their critical thinking levels also increase, and the difference in critical thinking disposition scores between monolingual and bilingual children widens. Examining the existing literature on the relationship between age and critical thinking ability reveals inconsistent findings. Kelly's (2003) research on trainee teachers indicates that critical thinking levels increase with age, which is consistent with the present study. However, Güleler (2007) concludes that the relationship between age and critical thinking ability is not statistically significant in his study of students at the Faculty of Education. Emir (2012) reports that critical thinking skills tend to decline with age.

## 4 Conclusions

This study investigates the correlation between bilingualism and critical thinking dispositions. It also discusses critical thinking dispositions in monolingual and bilingual children, categorised by gender and age. The results suggest that there is a correlation between bilingualism and the critical thinking dispositions of bilingual speakers. These dispositions have been analysed in accordance with five critical thinking subcategories: metacognition, flexibility, systematicity, tenacity and patience, and open-mindedness. Bilingual speakers were found to outperform monolingual speakers in all five of these subscales. Furthermore, statistically significant differences were observed in three of these subscales: flexibility, systematicity, and tenacity-patience. Based on these results, it can be concluded that bilingual children have better critical thinking dispositions than monolingual children. These findings are consistent with previous research, such as Konaka's (1997) study, which suggests that bilingualism positively impacts divergent thinking skills, and Kharkhurin's (2012) study, which concludes that bilingualism enhances creative thinking and reasoning abilities.

This study compared the critical thinking dispositions of monolingual and bilingual children in terms of gender and age. Firstly, when comparing the critical thinking dispositions of female monolingual and bilingual children, only a statistically significant difference in tenacity-patience scores was documented, with bilingual girls demonstrating higher levels of tenacity and patience. However, no statistically significant differences were found between female monolingual and bilingual children in terms of metacognition, flexibility, systematicity and open-mindedness. When comparing the critical thinking dispositions of male monolingual and bilingual children, a statistically significant difference was found in two out of the five critical thinking disposition subscales, namely flexibility and systematicity. In both of these subscales, the bilingual boys demonstrated higher levels. Thus, in these subscales, bilingual boys displayed higher levels of critical thinking than monolingual boys. For the other three subscales of critical thinking dispositions: metacognition, tenacity-patience, and open-mindedness, no significant difference was found.

The results of the study were also evaluated in terms of three age groups. A statistical difference was found in the critical thinking dispositions of monolingual and bilingual children aged 10–11. According to the results, the only statistically significant difference was in metacognition scores, with bilingual children aged 10–11 having a higher metacognitive level. In the second age group, however, no statistically significant difference was found in the critical thinking dispositions of monolingual and bilingual children aged 12–13. However, a statistically significant difference was found in terms of systematicity and tenacity-patience levels, with bilingual children aged 12–13 achieving higher scores than their monolingual counterparts. Unlike the previous two comparisons of age groups, a statistically significant difference in critical thinking disposition scores was detected in the final group of children aged over 13. The results indicate a statistically significant difference in flexibility and tenacity/patience scores, with bilingual children over 13 having higher flexibility and tenacity/patience levels.

In conclusion, the findings of the present study suggest that there is a relationship between bilingualism and critical thinking dispositions. Previous studies, including this one, have shown that bilingualism has a positive effect on critical thinking (Bialystok, 2001; Adesope et al., 2010; Yang et al., 2011; Kharkhurin, 2012). Since critical thinking is one of the 21st-century skills included in school curricula, children must be prepared to raise their awareness of critical thinking and develop their ability to understand oral and written discourse. Moreover, as the world becomes increasingly interconnected, children are likely to become bilingual naturally. Therefore, the correlation between critical thinking and bilingualism is of the utmost importance in education and social life. As the number of bilingual children worldwide is increasing day by day, incorporating bilingualism into education systems is essential (UNESCO, 2023; Eurostat, 2024). Last but not least, the mother tongues of bilingual children should be given importance in their formal education.

### **Ethics Committee Approval**

The authors confirm that ethical approval was obtained from The Council of Higher Education (Approval Date and Number 2018-178).

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