

Reading literacy of bilingual and monolingual students in Turkey: A comparative study based on PISA 2018 data

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ABSTRACT

Reading literacy is regarded as one of the most crucial prerequisites for academic success in all fields. PISA surveys reading literacy with extensive demographic data in several countries to provide detailed feedback for detecting problems in their education systems. In many countries, bilingual students are facing several problems in schools, especially language-related problems. In this context, this study is causal-comparative research aiming to compare bilingual and monolingual students' Turkish reading literacies based on PISA 2018 data while controlling their economic, social and cultural status. In Turkey, 6890 students from 186 schools, who were selected through stratified random sampling, participated in PISA 2018 implementation. Bilingual and monolingual students' reading literacies were compared through ANCOVA where their economic social and cultural status is the covariate. Findings showed that monolingual students have greater reading literacy scores than bilingual students when their economic, social and cultural status were controlled. This finding indicates that there may be some problems in Turkish language teaching/learning strategies for bilingual students, which do not originate from their economic, social and cultural status. In this paper, the possible reasons for bilingual students' low reading literacy, are discussed, and some possible solutions for these problems are suggested.

Keywords: Reading literacy, bilingualism, PISA 2018.

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INTRODUCTION

Reading literacy is generally defined as the ability to respond to written texts appropriately (Bormuth, 1973). It is one of the most basic skills for success in school and professional life. Therefore, one of the most important goals of education systems in many countries is to increase students' reading literacy. To achieve this basic goal, it is necessary to measure and track students' reading literacy. Organization for Economic Cooperation and Development (OECD) measures reading literacy in many countries including its members regularly by Programme for International Student Assessment (PISA). PISA is an international survey study aiming to measure reading, mathematics and science literacies of 15-year-old students from participant countries. PISA has been

conducted every three years since 2003. In 2018, 79 countries or regions including Turkey participated in PISA (MEB, 2019).

Turkey has participated in PISA since 2003 and its reading literacy scores are regularly below OECD averages (MEB, 2019), which indicates some possible system-wide problems in Turkish language education in Turkey. There are several known and studied issues (e.g. gender inequity, socio-economic issues) in Turkish language education, however, the issues related to bilingual students' reading literacy in Turkish have not adequately been studied. Before solving the issues in the education system, first, they should be defined and described with respect to several dimensions based on

empirical data. To detect and solve possible issues about reading literacy that bilingual students face, making a comparison of bilingual and monolingual students based on a large survey may be a good start. A difference between bilingual and monolingual students' Turkish reading literacy may point out a potential system-wide issue. In this context, the general purpose of this study is to compare monolingual and bilingual students' reading literacies in Turkish based on PISA 2018 data in order to check whether there are some real or practical problems about bilingual students' reading literacy in Turkish.

What is bilingualism?

Bilingualism simply describes the situation of a person who has two languages. However, bilingualism has a complex structure; therefore it should be defined with respect to its multidimensional nature. This is because bilingualism is defined in different ways in different disciplines (e.g. psychology, sociology, linguistics and education). According to Radisoglou (1984), psychology examines bilingualism with respect to its effects on cognitive processes, sociology is interested in its involvement to social and cultural conflicts, and education discusses bilingualism on starting age of second language, bilingual school organization, teaching/learning problems in bilingual education and their solutions. An extensive definition of bilingualism is affected by these different approaches. In literature, bilingualism is classified and defined with respect to acquisition age and functions of two languages, and proficiency levels in these languages.

A bilingual person may be exposed to two languages at the same time and in the same environment or consecutively in different times and different environments (Saville-Troike, 2006; Baker, 2011; Gass and Selinker, 2008). With regard to acquisition age, bilingualism may be classified as concurrent bilingualism, consecutive bilingualism, early bilingualism and late bilingualism. Concurrent bilingualism is defined as the situation that the individual acquires both languages at the same time, consecutive bilingualism is the case that the second language is acquired just after the acquisition of the first language with a little or no time gap, and late bilingualism describes the situation that acquisition of the second language occurs after the age of six (Gass and Selinker, 2008). On the other hand, a person can use his/her languages in four language skills (listening, speaking, reading and writing) at three different levels (beginner, intermediate and advanced) (Heuchert, 1989; Türker, 2000; Şimşek Bekir, 2004). According to Bloomfield (1933), bilingualism is the situation in which a person can control two languages natively. In addition,

Haugen (1969) defines bilingualism as the status that a person can make meaningful verbal statements in his/her second language. On the other hand, bilingualism is the case in which an individual can understand a second language without constructing meaningful utterances (Diebold, 1961). With respect to these definitions of bilingualism, the proficiency level of a bilingual individual is not necessarily equal in two languages. With respect to proficiency level, bilingualism may be classified as receptive bilingualism, balanced bilingualism and passive bilingualism. In this study, bilingual participants are assumed to have two languages with a variety of acquisition ages and at different proficiency levels.

Purpose of the study

Reading is a complicated process including several steps such as word recognition, sentence analysing and comprehending the mean. It is crucial for success in school to percept, analyse and interpret the written text coded in the education language. In the world, many bilingual students are educated in one language which is not their dominant language. The students in this specific situation face several problems in reading and writing skills in the education language. Actually, in some cases in educational settings, bilingualism may be an advantage for learning, because a person with two languages is fed by the diversity of two different cultures. However, bilingualism may be a disadvantage for some people who are members of a subgroup in a society facing some economic social and cultural issues. Therefore, while investigating bilingual students' ability in any skills, it is important to control socioeconomic status to ensure that any possible problems are caused by inadequate language skills rather than having low socioeconomic status. In this context, the purpose of this study is to compare the reading literacies of monolingual and bilingual students in Turkey based on PISA 2018 data while controlling their economic, social and cultural status.

METHOD

Using a correlational research model, this study is causal-comparative research aiming to compare bilingual and monolingual students' reading literacies in Turkey based on PISA 2018 data. PISA is an international survey planned and implemented by OECD. In PISA surveys, sampling procedures, construction of instruments, data collection and data preparation procedures were designed and performed by educational research specialists with a reliable scientific approach.

Participants

PISA is an international survey study with more than 600,000 participants from 79 countries or regions. In Turkey, 6890 15-year-old students from 186 schools participated in PISA 2018 implementation. Participants were selected through stratified random sampling in order to keep gender, region and school type percentages in the sample. Table 1 shows the characteristics of Turkey sample of PISA 2018.

As shown in Table 1, gender groups are equally distributed in the PISA 2018 Turkey sample. Besides, most of the students are in 10th grade in the sample. 10th grade is the regular grade level for 15-year-old students in the Turkish education system.

Data collection instruments

In PISA 2018, the main data collection instrument is the reading literacy test. In the reading literacy test, items can be in different formats (multiple-choice, short answer, etc.) and they are related to several scenarios. For instance, the Galapagos Islands scenario includes text and images about the geographic location of the island, plants and animals living on the islands, and environmental issues about them. The reading literacy test is implemented online by using computers with internet access.

The reading literacy test is scored based on item response theory (IRT). In this regard, PISA prepares an item pool for the reading literacy test, and each student takes a test having a different set of items. In other words, students respond to a number of items some of them are common with each other and some of them are different. In the reading literacy test, each item is scored with respect to its difficulty and discrimination statistics. The difficulty of an item is related to the percentage of

students who respond to it wrongly, and discrimination of an item is related to the proportion of correct answers to the total score for each student. In this context, PISA does not compute a unique literacy score for each student, instead, 10 literacy scores are produced for each student by using different subsets of items. In addition to the reading literacy test, each student takes a questionnaire in PISA 2018. This instrument includes several items about students' demographics and opinions. This questionnaire is also implemented online.

Variables

In PISA data, each item can be used as observed variables, however, PISA creates several index variables derived from several similar observed variables. For example, ESCS (economic social cultural status) is an index variable created by PISA, which is derived from observed variables such as parent's education level and family income. In this study, observed and index variables appropriate for the research question were used.

In this study, the dependent variable is students' reading literacy (PV1READ to PV10READ). As mentioned above, each student has 10 reading literacy scores, therefore the dependent variable of the study has 10 values for the statistical analysis. The independent or grouping variable of the study is the language that students speak at home most of the time (ST022Q01TA). This variable has two categories that are test language (Turkish) and other languages. This variable was used to define the situation of monolingualism and bilingualism in the sample. In this study, students' economic social cultural status (ESCS) was selected as a covariate for the statistical control of the effect of the independent variable on the dependent variable. Table 2 demonstrates the variables of this study.

Table 1. Characteristics of Turkey Sample in PISA 2018.

	Gender		Language		Grade level					
	Female	Male	Test language	Other languages	7	8	9	10	11	12
N	3396	3494	6339	512	3	19	1295	5360	207	6
%	49.3	50.7	92.0	8.0	0.0	0.3	18.8	77.8	3.0	0.1

Statistical analysis

The research question of this study is whether there is a significant difference between monolingual and bilingual Turkish students' reading literacies while controlling the

effect of students' economic social cultural status. This research question has a dependent variable, a grouping independent variable and a control independent variable, therefore it can be answered by analysis of covariance (ANCOVA).

Table 2. Variables of the study.

Variable name	Explanation
ST022Q01TA	The language that students speak at home most of the time
PV1READ	First reading literacy score
PV2READ	Second reading literacy score
PV3READ	Third reading literacy score
PV4READ	Fourth reading literacy score
PV5READ	Fifth reading literacy score
PV6READ	Sixth reading literacy score
PV7READ	Seventh reading literacy score
PV8READ	Eighth reading literacy score
PV9READ	Ninth reading literacy score
PV10READ	Tenth reading literacy score
ESCS	Economic social cultural status

As mentioned above, students have 10 reading literacy scores due to the scoring based on item response theory. Therefore, ANCOVA is performed for each reading literacy score separately. An average p-value for this ANCOVA series is calculated and interpreted (OECD, 2009). In addition to p-values, effect size values for each ANCOVA are also calculated and interpreted similarly.

RESULTS

The results of this study are organised in three sections; descriptive results including average reading literacy scores of monolingual and bilingual students, and the

statistical results of assumptions of ANCOVA were reported below. After these preliminary results, ANCOVA results were presented in the following section.

Descriptive results

This study mainly questions the relationship between students' reading literacies and their status of being monolingual or bilingual while controlling the effect of their socio-economic status by performing ANCOVA. Before reporting the results of ANCOVA, descriptives, which may be very useful for meaningful interpretation of further analyses, are reported in Table 3.

Table 3. Descriptive statistics.

Variables	N		Mean		St. Dev.	
	Test language	Other languages	Test language	Other languages	Test language	Other languages
PV1READ	6339	512	469	408	86.2	88.1
PV2READ	6339	512	469	409	86.0	88.7
PV3READ	6339	512	469	411	85.5	87.3
PV4READ	6339	512	469	410	85.9	86.4
PV5READ	6339	512	469	407	85.4	88.9
PV6READ	6339	512	470	408	86.6	86.5
PV7READ	6339	512	469	409	85.9	85.8
PV8READ	6339	512	469	410	85.1	86.4
PV9READ	6339	512	469	409	85.8	89.2
PV10READ	6339	512	469	409	86.0	84.9
ESCS	6337	512	-1.11	-1.97	1.15	1.21

As shown in Table 3, about 7.5 percent of the participants speak a language other than Turkish at home. In

addition, the average reading literacy scores of the students who speak Turkish at home is about 469

and that of the students who speak a language other than Turkish at home is about 409 where the OECD average is 500. On the other hand, there seems to be a difference in ESCS between the students who speak Turkish and other languages at home in favour of the former group. PISA creates the ESCS index with some items such as highest education level and the number of books at home. In addition, zero ESCS is set to the OECD average. As shown in Table 3, the ESCS averages of both language groups are below the OECD average.

Assumptions

One of the assumptions of ANCOVA is the normal distribution of the dependent variable for each level of the independent variable. In this study, Kolmogorov-Smirnov was performed to check the normality assumption. Table

4 demonstrates the results of the Kolmogorov-Smirnov tests.

As shown in Table 4, the normality of the dependent variable assumption is violated for some levels of the independent variable. However, ANCOVA results are accepted as robust to violation of normality assumption (Olejnik and Algina, 1984). Therefore, it is quite safe to perform ANCOVA with PISA data, which is very large in volume.

Another assumption of ANCOVA analysis is the homogeneity of variances. In this study, Levene's Test for Homogeneity of Variances was performed to check this assumption. Table 5 shows the results of Levene's Test for Homogeneity of Variances.

As shown in Table 5, all p-values for all plausible values of reading literacy are insignificant demonstrating that all variances can be accepted as homogeneous. This means that further ANCOVA analysis can be performed on this data.

Table 4. The results of Kolmogorov-Smirnov tests.

Dependent variable	Language	Kolmogorov-Smirnov		
		Statistic	df	p
PV1READ	Test Language	.010	6339	.002
	Other Languages	.050	512	.001
PV2READ	Test Language	.010	6339	.013
	Other Languages	.039	512	.066
PV3READ	Test Language	.015	6339	.003
	Other Languages	.041	512	.044
PV4READ	Test Language	.014	6339	.006
	Other Languages	.040	512	.044
PV5READ	Test Language	.015	6339	.002
	Other Languages	.038	512	.068
PV6READ	Test Language	.014	6339	.008
	Other Languages	.043	512	.023
PV7READ	Test Language	.011	6339	.063
	Other Languages	.037	512	.091
PV8READ	Test Language	.014	6339	.007
	Other Languages	.060	512	.000
PV9READ	Test Language	.013	6339	.015
	Other Languages	.030	512	.200
PV10READ	Test Language	.012	6339	.026
	Other Languages	.043	512	.027

Table 5. Levene's test for homogeneity of variances.

Dependent variable	F	df1	df2	p
PV1READ	.862	1	6847	.353
PV2READ	.688	1	6847	.407
PV3READ	.453	1	6847	.501
PV4READ	.142	1	6847	.707
PV5READ	2.31	1	6847	.129
PV6READ	.127	1	6847	.722
PV7READ	.137	1	6847	.711
PV8READ	2.01	1	6847	.157
PV9READ	1.38	1	6847	.240
PV10READ	.0027	1	6847	.959

ANCOVA results

After checking the assumptions, ANCOVA was performed to compare bilingual and monolingual students' reading literacy while controlling their economic social cultural status. Table 6 shows ANCOVA results where the dependent variables are plausible values of students' reading literacy, the independent variable is students' home language and the covariate is students'

economic social cultural status.

As shown in Table 6, p values for all plausible values are smaller than .05, meaning that there is a significant difference in students' reading literacy between students who speak Turkish and other languages at home while controlling their economic social cultural status. In addition, partial eta squared values vary between .015 and .017 which can be interpreted as a small effect size.

Table 6. ANCOVA results.

	Sum of Sqr.	df	Mean Sqr.	F	p	Partial η^2
PV1READ-ST022Q01TA	741636	1	741636	111	<.001	.016
PV2READ-ST022Q01TA	732215	1	732215	109	<.001	.016
PV3READ-ST022Q01TA	684266	1	684266	103	<.001	.015
PV4READ-ST022Q01TA	711077	1	711077	107	<.001	.015
PV5READ-ST022Q01TA	781201	1	781201	118	<.001	.017
PV6READ-ST022Q01TA	774524	1	774524	115	<.001	.017
PV7READ-ST022Q01TA	736574	1	736574	111	<.001	.016
PV8READ-ST022Q01TA	700159	1	700159	107	<.001	.015
PV9READ-ST022Q01TA	759101	1	759101	113	<.001	.016
PV10READ-ST022Q01TA	696527	1	696527	105	<.001	.015

DISCUSSION

The statistical findings of this study pointed out that there is a meaningful difference between monolingual and bilingual students' reading literacy in favour of monolingual students while their economic social and cultural status is statistically controlled. Some of the difference in their reading literacy is inevitably caused by the difference in their economic social and cultural status, which may be one of the most crucial out-of-school factors affecting students' school-related abilities and

achievements. On the other hand, with respect to the findings of the study, there still seems to be a difference between monolingual and bilingual students' reading literacy that is not caused by their economic social and cultural status. In literature, some comparative studies have reported similar findings favouring monolingual learners. For instance, according to Scheele et al. (2010), students speaking native Dutch have higher reading comprehension scores than the bilingual immigrants speaking Dutch as a second language. Before making suggestions to solve the issues related to bilingual

students' Turkish reading literacy, the reasons for bilingual students' apparent lower reading literacy in the Turkish language, which is the test language of the PISA implementation in Turkey, should be discussed first.

In most cases, the languages of bilingual individuals interact with each other. If a bilingual individual has not adequate proficiency in the linguistic structure of his/her languages, he/she may not perform reading tasks in the school language. In this regard, one of the reasons that bilingual students have lower reading literacy in Turkish than monolingual ones may be related to the that some bilingual students have a translational understanding of the Turkish language. With respect to the related literature, it is known that if a bilingual person understands a spoken or written text in his/her second language by translating it to the first language, not surprisingly it decreases the comprehension of its meaning (Gass and Selinker, 2008). Moreover, if the first and the second language are grammatically different, the comprehension will be even lower (Smith, 1994). The non-existence of the same concepts in two languages also affects the comprehension of the second language in a negative way (Yazıcı and Temel, 2011). In addition, comprehension of the second language is also affected by when and how it is acquired. In other words, the acquisition of the second language that happens in the late ages and at school, affects its comprehension negatively (Nair et al., 2016). To sum up, all these possible reasons may be classified as linguistic reasons that are related to deficient comprehension of the second language.

In literature, it is reported that bilingual students, in some cases, may have lower self-efficacy and attitude towards their second languages than monolingual students (Hatamzade et al., 2015). Self-efficacy and attitude towards any scholastic abilities are known to be one of the most powerful factors affecting them (Choi, 2005). In this context, one of the reasons for bilingual students' low reading literacy in Turkey may be that they also have low self-efficacy and attitude towards the Turkish language. In other words, besides other reasons, bilingual students' low reading literacy may also be caused by some affective reasons, such as low self-efficacy and low attitude.

In addition to linguistic and affective reasons that bilingual students have low reading literacy in Turkish, there may be several other reasons related to the learning environment at school. For instance, Turkish language teachers may not be sufficiently aware of bilingualism in their classrooms, or at least they may not know how to deal with this situation professionally (Pilanci et al., 2020). Besides the lack of teachers' proficiency in bilingualism, some teachers' negative attitudes towards bilingual students may also be

problematic (Pilanci et al., 2020), and this attitudinal problem may be another reason for bilingual students' low reading literacy. On the other hand, the schools may not have sufficient educational resources (eg. dictionaries, stage books, audio-visuals, etc.) for bilingual students to improve language skills in formal education language. Another reason may be related to insufficient peer support at school. In literature, it is reported that bilingual students are sometimes isolated in the classroom having insufficient interaction with the other students (Scanlan, 2011).

Besides linguistic, affective and scholastic reasons for bilingual students' low reading literacy in Turkish, there may also be some other reasons related to the Turkish language course curriculum. Turkish language course curriculum simply seems to be unaware of bilingual students. In other words, in the Turkish language course curriculum, there is a lack of information or guidance for Turkish language teachers about how to overcome the potential learning problems of bilingual students. In addition, language learning activities offered by the Turkish language course curriculum do not seem to be designed for all students including bilingual students and other disadvantaged groups (Kan and Yeşiloğlu, 2017).

All of these possible reasons for bilingual students' low reading literacy in Turkish, which are classified as linguistic, affective, scholastic and curricular reasons, may have some crucial implications for educational policymakers. At first, with respect to linguistic reasons discussed above, to increase bilingual students' reading literacy in Turkish, some extra-curricular language learning activities (e.g. private lessons, coaching or tutoring) may be provided for bilingual students who are facing problems with comprehending written or spoken texts in Turkish. In addition, increasing bilingual students' participation in early childhood education may also increase the comprehension of texts in Turkish. With respect to effective reasons discussed in the previous paragraphs, to increase bilingual students' self-efficacy and attitude towards the Turkish language, difficulty level of language learning materials and activities may be chosen or designed specifically for bilingual students. With respect to school-related reasons discussed above, language laboratories equipped with necessary hardware and resources for bilingual students may be established or updated at the schools. In addition, extra-curricular activities at schools may promote students' reading literacy (Huang et al., 2019). With respect to curriculum-related reasons for bilingual students' low reading literacy; Turkish course curriculum developers may add practical suggestions about how to teach the Turkish language to bilingual students into the curriculum. They also review and update behavioural objectives in the curriculum to make the objectives appropriate for both

monolingual and bilingual students.

In literature, there are some criticisms about the use of PISA data collection instruments to compare within and between countries or regions (Liaw et al., 2018). Therefore, statistical findings based on PISA data may be justified by further research with independent datasets. In addition, the difference between monolingual and bilingual students' Turkish reading literacies is demonstrated based on PISA 2018 data, however, the reasons for this difference discussed in this study are mostly speculative and not based on data. In this context, to reveal the actual reasons for bilingual students' low Turkish reading literacy, other researchers may conduct qualitative studies based on observations and interviews.

PISA provides extensive and comparable data for participant countries that can be used as invaluable feedback for the education systems of these countries. With regard to the results of this study that is based on PISA 2018 data, bilingual students have lower reading literacy than monolingual students in Turkey indicating some system-wide problems in the Turkish education system. Among these problems, the most crucial problem may be that the main components of the education system in Turkey, which are education policymakers, administrators and teachers, seem not to be sufficiently aware of bilingualism in the schools. Before attempting to solve other problems about bilingualism in Turkish schools, the bilingualism awareness problem should be focused first. In this regard, to increase bilingualism awareness in schools, extensive reform is required in philosophical and practical aspects of teacher education in Turkey.

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