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Effect of bilingualism on automatic word retrieval in the first years of elementary school

Efeito do bilinguismo no resgate automático das palavras nos anos iniciais do ensino fundamental

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ABSTRACT

Purpose: Investigate the effects of bilingualism on the speed and accuracy of access to the mental lexicon, according to the time of exposure to the second language, in students of the first years of elementary school. **Methods:** Eighty-three children between six and eight years old (M = 6.8y, SD = 0.72), in the first two years of elementary school in private schools with matching curricula, were assessed: bilingual (Portuguese/English), monolingual (Portuguese). Teachers indicated that they did not present sensory, motor, neurological, or psychiatric problems. Participants had Brazilian Portuguese (L1) as their native language and were grouped by school and grade (1st and 2nd). Bilingual Groups (BG: schoolchildren with at least two years of exposure to English; N = 44, 57% girls) and Monolingual Groups (MG: N = 40, 52.5% girls) were considered. A Rapid Automatized Naming task was used to evaluate the speed and accuracy of access to the mental lexicon. BG was evaluated in Portuguese and English (01 month interval); MG, in Portuguese. A MANOVA was conducted, and Wilks lambda (l) used to verify the effect of each variable (significance level: $p < 0.05$). **Results:** The paired samples ($c2 (1) = 0.310$, $p = 0.577$) showed a general effect for group and grade (L1 or L2) for speed and accuracy. Differences in speed were observed between MG and BG for L2. **Conclusion:** L2 exposure did not interfere with the speed or accuracy in rapid naming of L1 in BG. School progression had a positive influence on both groups.

Keywords: Language development; Multilingualism; Cognition; Child; Automatism

RESUMO

Objetivo: Investigar, em escolares das séries iniciais do ensino fundamental (EF), efeitos do bilinguismo na velocidade e precisão do acesso ao léxico mental, conforme o tempo de exposição ao segundo idioma. **Métodos:** Participaram 83 crianças entre 6 e 8 anos de idade, matriculadas nos dois primeiros anos do EF de escolas particulares, uma bilíngue (Português/Inglês), outra monolíngue (Português), com currículos pareados. Os professores indicaram os participantes que não apresentavam problemas sensoriais, motores, neurológicos, ou psiquiátricos. Todos tinham, como língua materna, o Português Brasileiro. Foram agrupados por escola e ano escolar (1º e 2º). Constituíram-se dois grupos: Grupo Bilíngue - GB - 43 escolares (53,3% meninas) com, pelo menos, dois anos de exposição ao Inglês, média de idade = 6,6 e Grupo Monolíngue – GM - 40 escolares (46,7% meninas), média de idade = 6,9. Foram avaliados em prova de nomeação rápida de objetos, quanto à velocidade e precisão de acesso ao léxico mental. O GB foi avaliado em Português e Inglês (um mês de intervalo) e o GM, em Português. As distribuições foram comparadas pelo teste Qui-quadrado e as médias corrigidas pelo teste de Bonferroni (nível de significância fixado em $p<0,05$). As comparações entre GB e GM foram feitas por análise de variância. **Resultados:** As amostras pareadas apresentaram, nas condições de nomeação rápida (Português ou Inglês), efeito geral para grupo e ano escolar, quanto à velocidade e precisão. A ANOVA mostrou melhor desempenho em tempo do GM, somente na comparação com GB, em Inglês. **Conclusão:** A exposição ao Inglês não interferiu na velocidade ou precisão de nomeação em Português, no GB. A progressão escolar influenciou positivamente os grupos.

Palavras-chave: Desenvolvimento da linguagem; Multilinguismo; Cognição; Criança; Automatismo

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INTRODUCTION

Our native language (L1) is learned through social interaction, and the first words are uttered, usually, within the first year of life, with new words being added progressively throughout life. Regarding bilingualism, different possibilities of development should be considered: acquisition of the second language (L2) can occur either simultaneously with L1, from birth, or sequentially, between three and five years, when the child is exposed to L2 after having acquired, partially or totally[1] the linguistic bases of L1. The simultaneous acquisition makes the linguistic systems differentiated from the beginning, and each language is acquired as L1[2]. Additionally, it is possible to classify sequential learning into early or late. Early sequential learning occurs when L2 is acquired in childhood, and late learning occurs as of, approximately, 10 years of age, in adolescence or adulthood[3,4].

Currently, bilingual individuals are characterized as those who use, socially, two (or more) languages in their everyday lives[5], prompting the development of different language skills. The influence (positive or negative) that the period in which the individual is exposed to L2 has on development and learning is still being investigated.

Historically, the scientific literature has discussed whether bilingual individuals have linguistic advantages over monolinguals[6]. Some studies report that bilinguals have restricted vocabulary when compared to monolinguals[4,7], although it is known that when the lexical representations in both languages are computed, the numerical disadvantage of the bilingual vocabulary disappears[8]. Moreover, in studies already conducted in the field of bilingualism, results have often been attributed without considering the socioeconomic differences between groups, leading to misinterpretations of the attributed performances as a result of a bilingual education[9].

Advantages would probably develop due to bilinguals being more capable of storing information, separating linguistic symbols from their referents, and/or showing better ability to identify phonemes in sequential speech[10,11]. Bilinguals would, therefore, be more efficient at tasks requiring the processing of phonological information. However, other studies show disadvantages in terms of vocabulary and speed of access to lexical items, although they acknowledge that cognitive superiority, related mainly to the development and control of executive functions, can help bilinguals overcome the difficulty of access speed[6,11-22]

Science does not offer a single and conclusive answer to explain the organization and lexical processing in bilinguals[23]. It seems understandable to consider that the greater the vocabulary and the better its semantic organization, the faster and more automatic would be the access to the phonological word and the retrieval of its meaning[24]. That said, it is assumed that bilinguals exhibit slower lexical access in each one of their languages, reflecting the competition existing between two constituent lexicons[4,6], regardless of the control of executive functions.

One of the ways to evaluate the speed and accuracy of lexical retrieval, that is, access to the mental lexicon, is through tests or tasks of Rapid Automatized Naming that consist of naming, as quickly as possible, objects presented sequentially. One should choose familiar objects for this evaluation (colors, digits, letters and objects), and training is necessary before the test, to ensure that the individual is familiar with the words[25].

When compared to monolinguals (Brazilian Portuguese), children from 3rd to 5th grades of a bilingual elementary school (taught to read first in English, then in Portuguese) showed a similar total time spent for rapid naming in L1 (Portuguese), independent of school year, i.e. years of exposure to L2 (English)[26].

The growing number of bilingual children who migrate to Brazil, or who have been exposed to two languages from birth, as well as the ever-increasing interest in children enrolled in bilingual schools, generates a need to adapt the educational provision and increase clinical support and/or educational guidance regarding the development of language and learning. Knowing how sequential bilinguals organize their linguistic information and how quickly and accurately they catch-up is also important, as these are elements that guarantee linguistic competence, oral fluency, and are the foundations of school learning. In the midst of the theoretical discussion, the hypothesis of this study is that the speed and accuracy of access are similar in monolingual and bilingual children, providing evidence that bilingual stimulation does not detract from the development of school language as questioned by parents of children exposed to this reality. Therefore, this study investigated whether the learning or exposure to two systems of rules (phonological, syntactic and orthographic), with the same subjacent underlying symbolic and semantic system, can be associated to an increase in the processing speed of oral language.

These aspects are dealt with throughout this study, the aim of which was to investigate the effects of bilingualism on the speed and accuracy of access to the mental lexicon in lower elementary grade students, according to the time of exposure to the second language.

METHODS

Subjects

A total of 83 children (boys and girls between 6y and 8y11m) enrolled in two schools took part in this study: 1. Bilingual school - Portuguese / English, with approximately 17 hours of activities in English and 17 hours in Portuguese per week; 2. Monolingual school - Brazilian Portuguese, with 50 minutes of English lessons per week. The curricula of both schools follow the Brazilian National Curricular Parameters[27] and were, therefore, paired. Bilingual students learned to read formally in Portuguese and then in English; monolingual students learned to read in Portuguese. The teachers recommended the participants who met the inclusion criteria: no neurological or psychiatric problems, as well as normal hearing, vision, speech, and language conditions. To compose the Bilingual Group (BG), students who had been exposed to at least two years of English, outside the family environment, were selected.

All participants had Brazilian Portuguese (L1) as their native language. The Bilingual Group - BG was distributed as follows: BG 1st grade and BG 2nd grade. The Monolingual Group (MG), paired by age and school grade to BG, was distributed as follows: MG 1st grade and MG 2nd grade. The distribution of the total sample according to group, gender and grade is presented in Chart 1.

Chart 1. Sample distribution according to gender, grade level and group

Sample		Bilingual	Monolingual	Total
Grade level	1st grade	25	20	45
	2nd grade	18	20	38
	Total	43	40	83
Gender	Female	24	21	45
	Male	19	19	38
	Total	43	40	83

Experimental design

To evaluate the efficiency of the automatized lexical retrieval, we used the CTOPP - Comprehensive Test of Phonological Processing[28] - Rapid Automatized Naming. In this study, only two plates with pictures of objects that are familiar to school children were used (the presentation of the training plate confirmed the hypothesis that the objects were familiar). Each student was instructed to name the presented objects as quickly as possible, keeping the order of presentation of items from left to right and top to bottom. The time taken to name the objects was recorded for each plate and possible errors or hesitations of more than 2 seconds were recorded on the answer sheet, being computed as errors. The tasks were recorded for later analysis and measurement of responses. The total time taken for the naming of objects in both plates was calculated per child, as well as the total number of errors made. Performance means were calculated by group and grade, and the analyses were performed intra- and inter-groups.

BG was assessed in Portuguese (BGL1) and in English (BGL2) with a one-month interval between assessments. MG was assessed in Portuguese. The children were evaluated individually, at their own schools at the end of the school year, at times and in rooms determined by the school administrators. The classrooms were well lit and the children were seated at a table on which the plates rested. The assessments lasted an average of five minutes.

This study followed the regulatory standards for research involving human beings and all participants submitted an informed consent form signed by their parents or guardians. The Project was approved by the Comitê de Ética em Pesquisa da UNIFESP – CEP-UNIFESP with the following document: 0709/06.

Statistical analyses

The Chi-square test was applied in both groups (BG and MG), to compare the distributions of age, sex and schooling.

With the purpose of comparing the means of time and the number of errors in the BGL2, BGL1 and MG, BGL2 and BGL1 were composed by the same individuals, that is, the Portuguese and English tests were applied to the same students. On the other hand, MG was made up by a sample of individuals, independent of the BG sample. The following strategy was then adopted: the groups were compared two by two and the "p" values obtained were corrected according to Bonferroni inequalities. Mixed models techniques contemplates correlated observations in the same individual[29] and, therefore, was selected for the comparison between BGL2 and BGL1. Comparisons of BGL2xMG and BGL1xMG were performed using analysis of variance (ANOVA). The assumptions of the adopted methods were verified by residual analysis. When necessary, the differences between the means were located by the Bonferroni procedure.

In the hypothesis tests, a significance level of 0.05 was set.

The analysis was performed using Minitab (version 18) and SPSS (version 18).

RESULTS

The chi-square test ($\chi 2$) showed no differences between the groups for age ($p=0.171$), gender ($p=0.762$) and schooling ($p=0.457$). As a result, the differences found in the study cannot be explained by the different proportions of age group and/or gender of the participants.

The descriptive summary of means and standard deviations of time taken and number of errors in the rapid naming of objects, distributed according to group and grade, are shown in Table 1.

The mean and standard errors of these variables, by group and grade, are shown in Figure 1.

In the BGL2 x BGL1 comparison, repeated measures were considered for the same individual. On the other hand, the comparison between grades involved different individuals, that is, the time difference between the two groups depended on the grade level and the difference between the means of time taken in the two grade levels was not the same. The results of the interaction effect between schooling and group ($p = 0.048$), for the analysis of the time taken, are described in Table 2.

To find the differences between the averages of time taken, the time taken means in the two groups were compared for each grade and the means in the two gardes were compared in each group. The results indicated that in the 1st grade the mean time taken in the English test was higher than in the Portuguese test ($p = 0.009$) and in the 2nd grade there was no significant difference between the means ($p> 0.999$). The mean time taken in the English test in the 1st grade was higher than in the 2nd grade ($p = 0.002$). No significant differences were found between the mean time taken in the Portuguese test, between grades ($p> 0.999$). The analysis of the residuals pinpointed a child (number 12) with a discrepant result and after reassessing the data, without this child, the findings did not change (Table 3).

The results obtained between BGL2 and MG in the analysis of variance with the time taken as the response variable showed that there was a significant difference between the means of time taken in each group ($p = 0.003$), the mean in BGL2 being higher than in MG, regardless of grade level ($p = 0.342$). That is, there was no interaction effect between group and schooling. Significant differences between the means of time taken in

Table 1. Descriptive Analysis of execution times and errors (mean and standard deviation) in the task of rapid object naming

			Group								
			BGL2			BGL1			MG		
Variable	gender	Grade level	N	mean	SD	N	mean	SD	N	Mean	SD
time	female	1st grade	13	110.5	26.6	13	95.7	22.0	9	90.1	15.1
		2nd grade	11	87.9	20.6	11	89.7	22.7	12	75.9	11.0
		Total	24	100.2	26.2	24	93.0	22.0	21	82.0	14.5
	male	1st grade	12	118.9	40.7	12	97.2	26.9	11	96.2	15.9
		2nd grade	7	78.0	5.7	7	81.4	13.0	8	83.3	16.5
		Total	19	103.8	37.9	19	91.4	23.7	19	90.7	17.0
	Total	1st grade	25	114.6	33.7	25	96.4	24.0	20	93.5	15.5
		2nd grade	18	84.1	16.9	18	86.5	19.5	20	78.9	13.6
		Total	43	101.8	31.5	43	92.3	22.5	40	86.2	16.2
Error	female	1st grade	13	14.1	5.0	13	10.6	5.5	9	8.0	3.9
		2nd grade	11	7.9	5.0	11	5.9	4.1	12	7.8	3.9
		Total	24	11.3	5.8	24	8.5	5.4	21	7.9	3.8
	male	1st grade	12	14.0	6.9	12	9.7	5.0	11	11.0	4.1
		2nd grade	7	9.7	5.6	7	6.0	2.8	8	9.8	5.8
		Total	19	12.4	6.7	19	8.3	4.6	19	10.5	4.8
	Total	1st grade	25	14.0	5.9	25	10.2	5.2	20	9.7	4.2
		2nd grade	18	8.6	5.2	18	5.9	3.5	20	8.6	4.7
		Total	43	11.8	6.1	43	8.4	5.0	40	9.1	4.4

Subtitle: N = number of individuals; BGL1= Bilingual group assessed in Portuguese; BGL2= Bilingual Group assessed in English; MG = Monolingual group; SD= Standard Deviation

Tabela 2. Analysis of variance for the mixed model fixed effects in the comparison of time and errors in the Bilingual group, assessed in Portuguese and English

group	variable	term	fl numerator	fl denominator	F	p value	Corrected p value
BGL2 x BGL1	time	Grade level	1	41	9.26	0.004	0.012
		group	1	41	3.66	0.063	0.189
		grade*group	1	41	6.29	0.016	0.048
	Errors	Grade level	1	41	13.76	0.001	0.003
		group	1	41	13.22	0.001	0.003
		grade*group	1	41	0.45	0.504	>0.999

Subtitle: fl: freedom levels; F = mixed effect; BGL1 = Bilingual group assessed in Portuguese; BGL2 = Bilingual Group assessed in English

Table 3. Results obtained in the comparison of mean naming times in the Bilingual group in Portuguese and English in 1st and 2nd grades, two by two, using the Bonferroni procedure

Comparison	Difference	Standard Deviation	freedom levels	P value
(2nd grade BGL2)-(1st grade BGL2)	-30.5	7.8	68	0.002
(1st grade BGL1)-(1st grade BGL2)	-18.2	5.3	41	0.009
(2nd grade BGL1)-(2nd grade BGL2)	2.4	6.3	41	>0.999
(2nd grade BGL1)-(1st grade BGL1)	-9.9	7.8	68	>0.999

Subtitle: BGL1 = Bilingual group assessed in Portuguese; BGL2 = Bilingual Group assessed in English

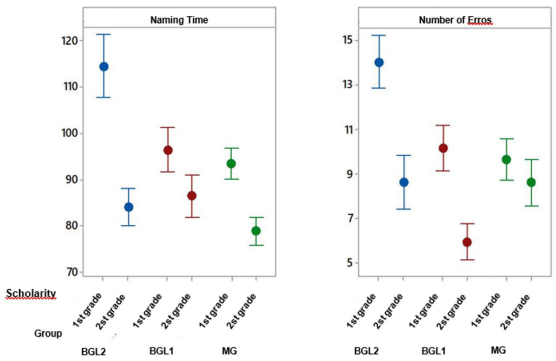

Figure 1. Mean and standard errors in naming time and number of errors in the Bilingual group assessed in English, in the bilingual group assessed in Portuguese and in Monolingual group, in the 1st and 2nd grades.
Subtitle: BGL1 = Bilingual group assessed in Portuguese; BGL2 = Bilingual Group assessed in English, MG = Monolingual group.

each grade level (p <0.001) were found, with the mean in the 1st grade being higher than in the 2nd grade, regardless of the group (p> 0.342).

A similar result occurred in the analysis of variance of the time taken in BGL1 and GM. No significant differences were found between the means of the time taken in each group (p = 0.627), regardless of grade level (p> 0.999), that is, there was no interaction effect between group and schooling. Significant differences between the means of time taken in each grade level (p = 0.012) were found, with the mean in the 1st grade being higher than in the 2nd grade, regardless of the group (p> 0.999). The analysis of the residues did not indicate gross deviations from the assumptions of normality and equality of variances (Table 4).

Table 2 shows the analysis of the number of errors between BGL1 and BGL2, with a significant difference between the means in each group (p = 0.003), the mean of BGL2 being higher than that of BGL1, regardless of grade level (p> 0.999).

Table 4. Results obtained in the comparison of mean naming times by group, through analysis of variance

group	source	fl	sum-of-square	Mean sum-of- square	F	P value	Corrected p value
BGL1 x MG	group	1	574.6	574.6	1.6	0.209	0.627
	grade level	1	3069.5	3069.5	8.57	0.004	0.012
	group*grade	1	113	113	0.32	0.576	>0.999
	error	79	28306	358.3			
	Total	82	32235.9				
BGL2 x MG	group	1	3541	3541.2	6.98	0.010	0.030
	grade level	1	10403	10403.2	20.5	<0.001	<0.001
	group*grade	1	1294	1293.5	2.55	0.114	0.342
	error	79	40097	507.6			
	Total	82	57036				

Subtitle: fl: freedom levels; F = mixed effect; BGL1 = Bilingual group assessed in Portuguese; BGL2 = Bilingual Group assessed in English, MG = Monolingual group

Table 5. Results obtained in the comparison of the means of errors in naming between groups, through analysis of variance

groups	source	fl	sum-of-square	Mean sum-of- square	F	P value	Corrected p value
BGL1 x MG	group	1	23.54	23.54	1.15	0.287	0.861
	grade level	1	141.78	141.78	6.91	0.01	0.030
	group*grade	1	51.24	51.24	2.5	0.118	0.354
	Error	79	1621.65	20.53			
	Total	82	1829.69				
BGL2 x MG	group	1	99.05	99.05	3.85	0.053	0.159
	grade level	1	214.65	214.65	8.33	0.005	0.015
	group*grade	1	98.05	98.05	3.81	0.055	0.165
	Error	79	2034.59	25.75			
	Total	82	2498.75				

Subtitle: fl: freedom levels; F = mixed effect; BGL1 = Bilingual group assessed in Portuguese; BGL2 = Bilingual Group assessed in English, MG = Monolingual group

That is, there was no interaction effect between group and schooling. Significant difference between the means of the number of errors in each grade level (p = 0.003) were found, with the mean in the 1st grade being higher than that of the 2nd grade, regardless of the group (p> 0.999). The analysis of the conditional residues did not point to gross deviations from the assumptions of the model.

The number of errors between BGL2 and MG showed a significant difference between means (p = 0.159), regardless of grade level (p = 0.165). Group and schooling did not show a significant effect. The mean number of errors in each grade level (p = 0.015) indicated that the 1st grade had more errors than the 2nd grade, in both BGL2 and MG (p = 0.165).

The comparison between BGL1 and MG did not show a significant difference between means (p = 0.861), regardless of the grade level (p = 0.354), that is, there was no interaction effect between group and schooling. Mean errors in grade levels (p = 0.030) showed higher numbers in the 1st grade, in relation to the 2nd grade, in both BGL1 and MG (p = 0.354).

The results showed that there was no interaction effect between group and schooling for the conditions of BGL1 x MG and BGL2 x MG. Moreover, the residue analysis did not point to gross deviations from the assumptions of normality and equality of variances (Table 5).

DISCUSSION

The effect of bilingualism on the automatic retrieval of words and their meanings was investigated through the application of the Rapid Automatized Naming (RAN) test with the measurement of two parameters: speed and accuracy in the retrieval of object names. The analyses compared performances of early sequential bilingual (BG) students[1,3-5] and monolingual (MG) students.

Participant groups were selected according to schooling (1st and 2nd grades). This range was chosen with the objective of preserving the minimum daily exposure time to L2 of at least two years (considering that pre-school occurred in a bilingual teaching institution).

After collecting the data on object naming speed and the number of errors presented in this task, comparisons were conducted in order to test for significant interactions. The analysis of time taken and number of errors on the rapid automatized naming of objects task performed according to group (BGL1 and BGL2), grade and group/grade showed significant results regarding speed for grade and group/grade and number of errors for grade and group, summarized in Tables 2 and 5. The group/grade interaction showed significant effects only for time taken.

The intra- and inter-group analyses were performed and the mean speed and number of errors were computed. When BGL1 was

compared with BGL2, naming speed differences were found between grade levels (1st and 2nd grades in L2) and among the languages evaluated (L1 and L2, in 1st grade). The comparison of the individuals of the 1st and 2nd grades showed that 2nd graders were faster at naming the objects in English. The difference in performance in 1st grade was also found when the same individuals were evaluated in both languages, taking a longer time to access the names of the objects in English (Table 3).

Differences regarding the time spent in naming the plates, between BGL1 and MG, were found only on the basis of schooling (Table 4). Exposure to the second language does not seem to have interfered either positively, or negatively, in the speed of access to the lexicon in Portuguese. In a study conducted with older Brazilian children (3rd to 5th grade), there were also no observed differences in performance between languages[26].

That said, when MG and BG2 were compared, the former showed better performance. Although the length of the words for naming the objects (star, pencil, key, fish, chair and boat) is greater in Portuguese (estrela, lápis, chave, peixe, cadeira and barco), MG spent, on average, less time to name the objects of the two plates, indicating that access to the lexicon stored in English, in BGL2, was not as rapid as that developed in the native language. Longer time taken to achieve access to the lexicon has already been found in previous research[6,13,18]. Rapid naming tasks depend on the automaticity of the retrieval of each element individually stored in the naming circuit[25]. Sequential bilinguals are in the process of acquiring vocabulary, at least in English. Therefore, access to the mental lexicon should be less automatic[24].

Different hypotheses can be raised about the results obtained relative to naming speed: the exposure time to L2 may not have been sufficient for the fluent use of the language for the BG. Or, the fact that these children live and learn L2 (English) in their country of origin (Brazil) minimizes the need to face new situations for using L2 (outside the school environment), and slowed down the process of making phonological representations of words automatically available. Or, still, the L2 teaching method used interfered in the construction of the access to the lexicon and, consequently, in its speed of access. Bilinguals exhibit slower lexical access in each of their languages, perhaps reflecting the competition between two lexical constituents[30].

On the other hand, bilingualism should improve the monitoring of linguistic conflicts and cognitive control[12,16,21,22,30], and its apparent disadvantages in lexical access (Table 4) can probably be explained by the fact that there are areas of cognitive functioning in which bilingual children differ from monolinguals.

When the number of errors were computed in the intra-group comparison, it was possible to observe a better performance of BG1 in relation to BG2 (Table 2). These differences corroborate the data found in relation to speed. The time of exposure to the second language for these children has certainly not been enough yet for access to L2 to be automatic. Therefore, they were less accurate when evaluated in this language compared to their performance in L1. Similar performances of BG2 and MG provide evidence on more developed inhibitory control in bilingual children, as has been discussed in the literature[14,20]. The same inhibitory control associated with the acquisition process of the second language should have favored the longer time spent on the test, because in order to correctly retrieve the selected word, bilingual children, not yet fluent in L2, spent more time to perform the precise retrieval. Since a bilingual individual is often faced with situations that require selection or resolution of conflicts (i.e. the joint activation of two languages), she develops executive control through practice[21].

This study found an absence of any bilingual effect (positive or negative), considering speed and accuracy, in the ability to access the mental lexicon when students were evaluated in L1, in the comparison between groups. Also, although the RAN in L2 was not faster or more accurate, there was a decrease in time taken and number of errors as the school grades increased. This shows that perhaps the time of exposure to L2 has not yet been sufficient to reach the expected effect.

The existence of a critical period that interferes with second language learning has been discussed in several studies[3,4]. Unlike other studies[13,15,17] that showed that bilinguals performed slower, the results found in this research show that bilingualism had no effect on the speed or accuracy in L1 when evaluating the ability to access the mental lexicon.

In the study[7] conducted with Brazilian school children (8 to 10 years old) who were taught to read first in English and then in Portuguese, similar performance was found between the groups (BG and MG) when evaluated in Portuguese. It was also possible to observe that in the intra-group comparison, BG spent less time on the rapid naming in English. Moreover, no interaction effects of grade were observed on the rapid naming speed.

In this study, the differences between 1st and 2nd grades showed that school progression improved speed and accuracy of access to the lexicon, corroborating the fact that this ability is influenced by the development and organization of language. Thus, despite the restrictions of sample size and non-variability of participants' sociocultural conditions, the results showed that exposure to L2 did not negatively affect the task performed in L1, in BG, and that there had not been sufficient exposure to L2 for the access to the mental lexicon to be faster. In addition, school progression had a positive effect on the groups. These results may contribute to research on bilingualism since the similarity in the results obtained by bilingual and monolingual children in L1 shows that the first language did not suffer interference from exposure to the second language in 1st and 2nd grade Brazilian students.

CONCLUSION

The Bilingual Group, when assessed in their native language, did not differ from their monolingual peers in the time taken, or in the number of errors made, which leads to the conclusion that exposure to the second language did not interfere with the speed or accuracy of rapid naming in the native language. When assessed in the second language, this group was less precise than in the native language and slower than the Monolingual Group, in naming the figures. School progression positively influenced bilingual and monolingual school groups.

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