The role of bilingualism, age of onset of L2 acquisition & literacy in sentence repetition: The case of Albanian-Greek speaking children

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Abstract
The present study examines how bilingualism, age of onset (AoO) of exposure to Greek and degree of literacy affect the performance of Greek/Albanian bilingual children on a Sentence Repetition (SR) task. Sixty 8 to 10-year-old children were tested, twenty per group, i.e. monolinguals, simultaneous bilinguals and late-sequential bilinguals. The analysis showed that (a) the monolingual group outperforms the bilingual groups, (b) there is strong relationship between vocabulary development and SR performance and (c) the amount of early and current oral input in Greek affects SR performance.

Keywords: sentence repetition, bilingualism, input, age of onset

1 Introduction

Sentence repetition (SR) has been shown to be a complex linguistic task that reflects the language processing systems at a variety of levels. Acknowledging the fact that there is an on-going debate as to what exactly SR measures (see Baddeley 2012; Polišenska et al. 2015), for this study we adopt Klem et al.’s (2015) approach in that SR is employed as an overall language measure that taps on grammatical development. Despite the limited use of SR with bilingual children compared to its use with monolingual (Komeili & Marshall 2013) and SLI children (Conti-Ramsden et al. 2001), recent research has shown that the errors committed by bilinguals are of
the same type as the errors committed by monolinguals despite the overall lower performance of the bilingual population. In particular, Komeili and Marsall (2013) examined the performance of monolingual English and bilingual Farsi-English children on a SR task and found that despite the fact that monolingual children outperformed bilingual children, the bilingual children’s function and content word error rates did not differ from those of monolingual children. Meir et al.’s study (2015) points to the same direction; no differences on SR performance were detected between the monolingual Russian and Hebrew children and the bilingual Russian-Hebrew speaking children.

Turning to the factors that affect bilingual performance in SR, reduced quantity of input has been shown to negatively affect scores. Komeili and Marshall (2013) found that limited exposure to L2 English was associated with a general language delay in the bilingual Farsi-English speaking children compared to their monolingual peers which caused lower accuracy scores in the SR task. Thordardottir & Brandecker (2013) have also examined the accuracy of bilingual children on a SR task and found that the amount of language exposure affected bilingual children’s performance on the SR task more than their performance on a pseudo-word task did. Generally, measures of input quantity have been employed to explain variation in several grammatical phenomena (Gathercole 2002; Montrul & Potowski 2007; Unsworth et al. 2014) or in the overall development of grammatical abilities (Chondrogianni & Marinis 2011; Jia & Fuse 2007) in bilingual children. Language proficiency has been identified as another factor that impacts on SR performance (Chiat et al. 2013; Thordardottir & Brandecker 2013). A recent study by Meir et al. (2015) reported that both L1 and L2 proficiency correlated with L1 Russian – L2 Hebrew bilingual children’s performance on an ST task. With respect to Greek, a recent research by Chondrogianni et al. (in press examined) German-Greek and Albanian-Greek bilingual children and found that higher vocabulary scores were associated with better SR performance in the bilingual group.

Regarding, AoO some studies report that AoO affects SR performance, in the sense that exposure to the L2 early in life brings better SR scores. For example, recently Chiat et al. (2013) examined Russian-Hebrew, English-Hebrew and English-Turkish bilingual groups and report an effect of AoO for the two first groups since in these groups participants with higher AoO performed below the monolingual norm while participants with lower AoO performed as successfully as monolinguals in the
SR task. Another study by Semel et al. (2000) reported no effect of AoO on SR performance. Semel et al. (2000) examined 17 sequential bilingual Turkish-English children and found that AoO differences did not affect the bilingual participants’ performance. Similar results were attested in Grimm’s study (2003) which examined 61 Russian-German preschool bilingual children with different AoO on a SR task. Although a length of exposure of more than four years was found to be necessary for monolingual standard scores to be achieved, the researchers report that two thirds of the bilingual children performed within the monolingual norm.

Regarding literacy, previous recent research has shown that it affects bilingual performance on grammar-related tasks. Biliterate and monoliterate Greek-Albanian and Greek-German bilingual groups were tested on a narrative task by Andreou et al. (2017). The researchers found that the biliterate groups of both bilingual populations tested exhibited greater syntactic complexity in narrative production than the monoliterate bilingual groups. Additionally, Kaltsa et al. (2017) tested bilingual Greek-Albanian children on a Greek gender task and found that bilingual children attending bilingual schools where there is balanced oral and written input in the two languages of the bilinguals, namely Greek and Albanian, are more accurate in gender marking than bilinguals attending monolingual Greek schools.

The overview of the relevant literature shows that input-related measures impact on SR performance positively, in the sense that more input is associated with better performance. The effect of vocabulary development is also strong, since better vocabulary scores are associated with better SR performance. The impact of AoO on SR performance is not yet clear while literacy appears to affect positively the grammatical development of bilinguals, although research on the matter is still limited.

2 The languages of the bilinguals tested: Greek & Albanian

Greek and Albanian are morphologically rich languages that mark person and number on verbs among other functional categories such as tense, aspect etc. Both languages also mark gender, number and case on nouns. Greek has strong pronouns and clitic pronouns. Both clitic doubling (CD) and clitic left dislocation (CLLD) are allowed in
Greek, while Albanian allows only clitic doubling (Demiraj et al. 2002), as illustrated in (1):

(1)  

a. O papus ton ipje viastika ton kafe sto kafenio. [CD] (Greek)  
the grandpa him\(^{\text{MASC.ACC.SG}}\) drank quickly the\(^{\text{MASC.ACC.SING}}\) coffee in the cafe  
“The grandfather drank his coffee at the cafe in a hurry”.

b. Ton kafe ton ipje vjastika o papus sto kafenio. [CLLD] (Greek)  
the\(^{\text{MASC.ACC.SG}}\) coffee him\(^{\text{MASC.ACC.SG}}\) drank quickly the grandpa at the cafe  
“Grandfather drank quickly the coffee at the cafe”.

c. Gjyshi e piu me nxitim kafen dje në kafene [CD] (Albanian)  
the-grandfather it\(^{\text{MASC.ACC.SING}}\) drank quickly the coffee\(^{\text{MASC.ACC}}\) it at the coffee shop  
“Grandfather drank quickly the coffee at the coffee shop”.

Greek also exhibits subordinate clauses of various types (see Roussou & Tsaggalidis 2010). For the design of the SR task of this study we included Greek complement clauses (declarative and interrogative), adverbial clauses and relative clauses. Subordinate clauses of the type exhibited in Greek are also found in Albanian (Koça & Pojani 2016), as shown in (2):

(2)  

a. Artisti dëshiron të mos kapur shokët pikturat e tij [NEG]  
painter\(^{\text{NOM}}\) the-\(^{\text{NOM}}\) want\(^{\text{PRES}}\) to not touch his-friends\(^{\text{ACC}}\) pictures- his-\(^{\text{ACC}}\)  
“The painter does not want his friends to touch his pictures”

b. Kur shkolla ka mbyllur për pushimet e verës fëmijët vrapuan në rrugë [ADV]  
when school\(^{\text{NOM}}\)-the\(^{\text{NOM}}\) close\(^{\text{PRES}}\) for summer\(^{\text{ACC}}\) the-\(^{\text{ACC}}\) children\(^{\text{NOM}}\) the-\(^{\text{NOM}}\) run\(^{\text{PRES}}\) in street\(^{\text{ACC}}\)-the-\(^{\text{ACC}}\)  
“When the school closed in summer, the children were running to the streets”.

Although research on bilingual acquisition has shown that the rate of morphosyntactic development is similar to that of monolingual children (see Genesse & Nicoladis 2009 for an overview), the acquisition of object clitics appears to lag behind, especially in children whose L1 does not exhibit clitics (Tsimpli & Mastropavlou 2008). However, research has shown that successful mastery of clitic structures is possible (Chondrogianni 2008; Chondrogianni et al. 2014). Although the examination of
structure related errors in the SR task is beyond the scope of the present study which examines overall accuracy, the above point needs to be made since clitics, a challenging structure for bilinguals, is a sentence type that was included in our SR task.

3 The experiment

3.1 The participants

Sixty 8 to 10 year-old children participated in the study; 20 monolingual (M=8.9 and SD= 0.7; 11 girls, 9 boys) and 40 Albanian-Greek bilinguals. For the profiling of our bilinguals an extensive background questionnaire was administered to parents and children (Mattheoudakis et al. 2014). This included biographical questions, as well as questions about early and current oral input as well as about early and current literacy practices. The questionnaire measures of oral and written input provided information for practices in both languages, i.e. Greek and Albanian. However, for the purposes of this paper, we will focus our attention on the input measures targeting the use/preference of Greek.

Questions on the child’s country of birth and/or arrival to Greece allowed us to categorize our bilinguals into simultaneous bilinguals (N=20, M= 8.8, SD= 0.6; 11 girls, 9 boys) with an AoO of exposure to Greek from birth up to 3 years old and sequential bilinguals (N=20, M= 8.6, SD= 0.4; 12 girls, 8 boys) with an AoO of exposure to Greek from 6 years old onwards. All bilinguals attended Greek monolingual state schools.

Questionnaire information pertaining to the bilinguals’ Greek language oral and written practices is presented in Table 1. The Home Language measure refers to the children’s frequency of Greek language exposure from birth up to the age of schooling, i.e. around 6 years old. The Current Language Use measure concerns the participants’ current use of Greek in daily oral tasks (i.e. interaction with family members/friends, memorizing phone numbers, telling the time, mental counting/calculating, watching TV/movies). The Early Literacy measure concerns the degree to which Greek was used when family members read books to children in the preschool age. The Current Literacy measure targets children’s current language use
of Greek in writing/reading tasks (i.e. writing lists/letters/cards, reading aloud, texting, emailing, visiting websites, video-gaming, book/magazine reading).

<table>
<thead>
<tr>
<th>Frequency Measures</th>
<th>Simultaneous</th>
<th>Sequential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Language</td>
<td>56.4%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Current Language Use</td>
<td>59.4%</td>
<td>51.7%</td>
</tr>
<tr>
<td>Early Literacy</td>
<td>45.9%</td>
<td>37.2%</td>
</tr>
<tr>
<td>Current Literacy</td>
<td>66.2%</td>
<td>58.2%</td>
</tr>
</tbody>
</table>

Table 1. Bilingual’s oral input & literacy practises in Greek (frequency measures)

The analysis showed significant between-group differences only for the Home Language measure since the frequency with which simultaneous and sequential bilinguals used Greek as a home language differed (F(1,39)=11.765, p=.001) with the simultaneous bilinguals using Greek significantly more often than the sequential bilinguals, as it was expected since it was one of the measures used to identify AoO of exposure to Greek.

To measure children’s vocabulary abilities all bilingual participants were administered a standardized expressive vocabulary task in Greek (Vogindroukas et al. 2009). The expressive vocabulary test consists of 50 black-and-white pictures depicting common objects that each child is requested to name. Each correct response is given one point with a maximum score of 50 points. Table 2 presents the scores of the two bilingual groups:

<table>
<thead>
<tr>
<th>Vocabulary Scores</th>
<th>Simultaneous</th>
<th>Sequential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw numbers</td>
<td>34.7/50</td>
<td>36.3/50</td>
</tr>
<tr>
<td>(%)</td>
<td>69.4</td>
<td>72.3</td>
</tr>
</tbody>
</table>

Table 2. Greek vocabulary scores of bilingual children

The simultaneous bilinguals scored 34.7 (SD: 7.3) which corresponds to 69.4% (SD: 7.3) while the sequential bilinguals 36.3 (SD: 6.6) which corresponds to 72.3% (SD: 6.6). The analysis showed that the two bilingual groups did not differ in their lexical abilities as measured by the expressive vocabulary task (F(1,39)=.556, p=.460), despite the different AoO of the two groups.
3.2 The sentence repetition task

The SR task was developed within the COST Action following the guidelines outlined in Marinis & Arnem-Lotem (2015). Eight structures were examined: SVO sentences, sentences containing factual and non-factual negation (NEG), structures with clitics in clitic left dislocation (CLLD) and clitic doubling (CD) contexts, complement clauses (COMPLCL) introduced with the complementizes oti and pu, coordinated sentences (COORD), adverbial clauses (ADVCL), referential and non-referential wh-questions (WHQ), and subject and object relative clauses (RC). Each sentence type included four sentences making a total of 32 test items. All sentences were matched for length and word frequency. Table 3 presents some examples of the tested structures. For examples of all structures see the Appendix.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVO</td>
<td>O turistas ksexase ton oðiγo ton ñjakopon sto spiti. the tourist forgot the guide of the vacation at the house. “The tourist forgot the vacation guide at home.”</td>
</tr>
<tr>
<td>CD</td>
<td>O γeorγos ton fitepse ton kipo tu θiu μu me mikres kerasies. the farmer planted the garden of my uncle with small cherry trees. “The farmer planted mu uncle’s garden with small cherry trees.”</td>
</tr>
</tbody>
</table>

Table 3. SR task items

Children were tested individually. They sat in front of a computer screen and listened to the sentences via headphones. The children were asked to repeat each sentence as accurately as possible. Following the scoring procedure of the SR subtest of the Clinical Evaluation of Language Fundamentals, CELF-4 (see Semel et al. 2003) participant performance for overall accuracy was coded and scored as follows: participants were awarded a score of 3 if they made no errors while repeating the sentence, a score of 2, if their utterance included one error, a score of 1, if their utterance included two errors, and a score of 0, if their utterance included three errors or more. This scoring resulted to a scale from 0 to 96 for each participant.
4 Results

The data obtained was analyzed in two ways, first overall accuracy was measured by group and the relevant comparison were made, and second, overall accuracy was correlated with the various input related factors and vocabulary in order to detect the factors that affect bilingual SR performance. The corresponding analyses are presented in sections 4.1 and 4.2 respectively.

4.1 Overall Accuracy

Table 4 presents participant performance with respect to overall accuracy for the three participant groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monolingual</td>
<td>83</td>
</tr>
<tr>
<td>Simultaneous Bilingual</td>
<td>67</td>
</tr>
<tr>
<td>Sequential Bilingual</td>
<td>59</td>
</tr>
</tbody>
</table>

*Table 4. Group overall accuracy scores (%)*

An analysis of variance (ANOVA) with SR task accuracy scores as the within subjects variable and Group as the between subjects variable was conducted. As regards accuracy, the analysis showed a main effect of group (F(2,58)=7.846, p=.001, \(\eta^2=.235\)). Further pair group comparisons revealed that although both bilingual groups performed significantly less accurately than the monolingual group, (simultaneous bilinguals: p= 0.41, sequential bilinguals p= 0.01) no significant differences were detected between the two bilingual groups.

4.2 Factors affecting bilingual SR performance

In order to examine the role of vocabulary development, early and current Greek oral input, as well as early and current Greek literacy practises as factors interacting with SR performance we ran a Pearson’s r data analysis for SR overall accuracy. The analysis showed that SR accuracy positively correlates with Greek Vocabulary score (r= .444, p=.004), with Home Language Greek (r=.51, p=.001) and with Current Language Use Greek (r=.416, p=.008). No significant correlations were detected
between SR accuracy and Early Literacy Greek (r=.125, p=.441) or Current Literacy Greek (r=.187, p=.248).

5 Discussion

The present study set out to examine how bilingualism, age of onset (AoO) of exposure to Greek and degree of literacy affect the performance of Greek/Albanian speaking bilingual children on a SR task. The input-related variables that our study employed were associated with the amount of early and current oral and written input in Greek, as well as with the vocabulary development of the simultaneous and sequential bilingual groups tested. More specifically, we investigated the role of Home Language, Current Language, Early Literacy and Current Literacy, as well as the role of vocabulary operationalized in our study as performance in an expressive vocabulary test.

Starting with overall accuracy we found that the monolingual group was significantly more accurate than the bilingual groups in accurately repeating the sentences that were presented to them. However, no differences were detected between the two bilingual groups. These results suggest that bilingualism affects performance in the SR task, but AoO of exposure to Greek as a discriminating factor between the two bilingual groups, does not impact on performance with respect to overall accuracy. Our results agree with findings from previous studies like that of Semel et al. (2000) and Grimm (2003) which found that despite the overall lower performance of bilinguals compared to monolinguals, bilinguals with different AoO performed alike. This finding suggests that AoO is not a discriminating factor for the bilinguals of our study.

Next, we will consider findings with respect to the factors that affect overall accuracy in the sentence repetition task. The factors that we examined were vocabulary development, home language and current oral use, early literacy and current literacy. Our analysis showed that accuracy in the SR task correlates with vocabulary development, with the amount of early oral input in Greek, as well as with the amount of current oral input in Greek, but not with the amount of written input in Greek, early or current. The positive effect of input in bilingual SR task performance has been highlighted by studies like those of Komeili & Marshall (2013), as well as
Thordardottir & Brandecker (2013). Specifically, Thordardottir & Brandecker (2013) reported that the amount of language exposure affected bilingual children more than their performance on a non-word SR task.

This brings us to another finding of the present study that needs to be addressed. The correlation analysis revealed that the Home Language measure is more strongly correlated with SR accuracy than any other measure, with Greek vocabulary exhibiting the second strongest correlation. Language proficiency, which in the current research has been operationalized as lexical knowledge, has been identified by previous research as a factor that impacts strongly on SR performance (Chiat et al. 2013; Chodorogianni et al. in press; Meir et al. 2015; Thordardottir & Brandecker 2013). The fact that in our study its effect is strong but that of Home Language is stronger, a pattern which deviates from the results of Thordardottir & Brandecker (2013), may have to do with the fact the researcher used a non-word repetition task while we used an expressive vocabulary task that involved real words. The processing of non-words involves grammatical knowledge as well, while real word vocabulary development is closely linked to input effects (see also Kaltsa et al. 2017); this difference may have strengthened the effect of Home Language.

Finally, with respect to the effect of literacy on SR performance we did not detect a significant correlation. Assuming that the SR task is an overall language measure that taps on grammatical development, these results are not in line with findings from very recent studies which show the positive role of literacy on grammatical development (see Andreou et al. 2017; Kaltsa et al. 2017). It may be the case that our findings were affected by the fact that we restricted our attention to literacy input in one of the bilinguals’ languages, namely Greek.

6 Conclusion

The present study examined how bilingualism, age of onset (AoO) of exposure to Greek and amount of oral and written input affect the performance of Greek/Albanian bilingual children on a SR task. Our results showed that although bilingual children are less accurate than monolinguals in repeating the sentences presented to them, sequential bilinguals were as accurate as simultaneous bilinguals. As regards the factors which affect bilingual performance in the SR task, we found that early and
current oral input, as well as Greek vocabulary performance impact on participant SR accuracy. The fact that sequential bilinguals fare as accurately as simultaneous bilinguals, despite the different AoO and the amount of exposure to Greek early in life, suggests that the amount of exposure over the years may have neutralized this early disadvantage. If this finding is replicated by future studies, it will provide additional support to the claim regarding the decisive role of input in sentence repetition tasks, the effect of which may override the effect of AoO.

Acknowledgments
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References


### Appendix

Examples of test items by structure

<table>
<thead>
<tr>
<th>Structure</th>
<th>Greek</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SVO</strong></td>
<td>Ο τουρίστας κ αγαπάει τον άγιο τον θαυμάσιο στο σπίτι.</td>
<td>The tourist forgot the vacation guide at the house.</td>
</tr>
<tr>
<td><strong>NEG</strong></td>
<td>Ο αθλητής ελπίζει ότι δεν κατακτά τον αγώνα.</td>
<td>The athlete hopes his opponent to not win the game.</td>
</tr>
<tr>
<td><strong>CD</strong></td>
<td>Ο γεώργος τον γήρανε τον κήπο τον θία με μικρές κεράσεις.</td>
<td>The farmer planted the garden with small cherry trees.</td>
</tr>
<tr>
<td><strong>COMPL</strong></td>
<td>Οι μαθητές εκλέγουν που ο διευθυ δίδει τον πίνακα τους.</td>
<td>The students were crying because the head teacher sold their painting.</td>
</tr>
<tr>
<td><strong>COORD</strong></td>
<td>Η μητέρα καταράσει μακάρονα και η γιαγιά καταράσει μία πίτα.</td>
<td>Mother cooked spaghetti and grandmother made a pie.</td>
</tr>
<tr>
<td><strong>ADVCL</strong></td>
<td>Ο δάσκαλος πήγε για να τον καταψύξει στον κινηματογράφο ενώ την μετέχει να παίξει το γκιθάρα.</td>
<td>The teacher went to the movies while he preferred to play the guitar.</td>
</tr>
<tr>
<td><strong>WHQ</strong></td>
<td>Η δάσκαλος δεν έχει νοημοσύνη που να διάβει το βιβλίο της μαθαίνης.</td>
<td>The teacher is not certain which book the student read.</td>
</tr>
<tr>
<td><strong>RC</strong></td>
<td>Η καθαρίστρια κλότσησε τη νοσημάτωση που βγήκε από το γραφείο.</td>
<td>The cleaning lady kicked the nurse that came out from the office.</td>
</tr>
</tbody>
</table>