ANAPHORA RESOLUTION IN 2L1 ROMANIAN. EVIDENCE FROM ROMANIAN-HUNGARIAN BILINGUALS

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Abstract: The paper reports the results of an experimental study on intra-sentential anaphora resolution in 2L1 Romanian, by Romanian-Hungarian bilingual children. I investigated the interpretation of null, overt and demonstrative pronoun subjects by means of a picture selection task. Two bilingual groups aged 5-6 years and 8-9 years were compared to two age-matched Romanian control groups. While the monolinguals show progress from the younger to the older age group regarding the interpretation of the null pronoun, the bilinguals give at chance responses in both age groups. In the overt pronoun condition, with the exception of the younger monolinguals who showed a non-adult-like subject bias, none of the groups showed any antecedent preference. It is only in the demonstrative condition that a clear object bias was obtained with all four groups. I accounted for the observed delay in terms of an insufficient grasp of the relevant discourse properties, as a result of bilingualism effects.

Keywords: anaphora resolution, null pronominal subject, demonstrative, personal pronoun, Romanian-Hungarian bilinguals.

1. Introduction

The syntax/discourse interface has been identified as a challenging area in bilingual acquisition (Sorace and Filiaci 2006, Sorace 2011). In its strongest version, the Interface Hypothesis predicts that structures at the syntax-pragmatics interface will present optionality (residual in L2 acquisition and emerging in L1 attrition) or indeterminacy in bilingual acquisition. By contrast, structures that only require syntactic formulations will be acquired unproblematically in L2 and 2L1, and will remain stable despite L1 attrition (Sorace 2011).

Initially, the Interface Hypothesis (Sorace and Filiaci 2006) was meant to account for the differences between native speakers and highly proficient L2 speakers of Italian regarding the interpretation of overt subject pronouns, differences which were not related to strict syntactic patterns but contextual antecedent preferences. In time, research on bilingual acquisition has shed light on developmental difficulties in the acquisition and interpretation of overt pronominal subjects in null subject languages in a bilingual context (Sorace et al. 2009, Paradis and Navarro 2003, Tsimpli et al 2004, Belletti et al. 2007, Serratrice 2007, Argyri and Sorace 2007). However, of interest is the fact that this redundancy is not necessarily a result of cross-linguistic influence (Müller and Hulk 2000), since it has been recorded even with combinations of languages with identical constraints (Sorace et al. 2009, Bonfieni 2018). It has been proposed that the delay is due to processing difficulties inherent in bilingualism (Sorace and Filiaci 2006, Sorace and Serratrice 2009).

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The present study examines the antecedent choice of null pronoun, overt pronoun and demonstrative subjects in embedded clauses in child 2L1 Romanian, in a Romanian-Hungarian bilingual context, on the basis of a picture selection task. Since both Romanian and Hungarian allow null subjects and have similar antecedent preferences, it is expected that any differences between the monolingual and bilingual groups will be a result of bilingualism effects and not of cross-linguistic interference.

2. Antecedent preferences in Romanian and Hungarian

2.1 Romanian

According to Carminati's (2002) Position of Antecedent Hypothesis, null pronouns prefer the most prominent antecedent. Prominence is syntactically determined; the preferred antecedent for the null pronoun will be the subject in the matrix, which occupies Spec IP. Overt pronouns, on the other hand, are usually interpreted as coindexed with a less prominent antecedent. It must be remarked that this is not a syntactic condition, but rather a tendency resulting from the interaction between the pragmatic properties of the anaphor and the syntactic position of the antecedent. Thus, in (1) below, the null pronoun in the temporal subordinate clause will preferentially choose the subject (*Maria*) as antecedent, while in the case of the personal pronoun (*lei*) it will preferentially be coindexed with the object (*a Vanessa*).

(1) Maria$_i$ scriveva spesso a Vanessa$_j$ quando pro$_i$/lei$_j$ era negli Stati Uniti.
Maria wrote often to Vanessa when pro/she was in States United
'Maria often wrote to Vanessa when she was in the United States.'
(from Carminati 2002)

Additionally, language-specific properties may interfere with this hypothesis. In Italian, for example, overt pronominal subjects can only signal the switching of reference. In Spanish on the other hand overt pronouns may also be interpreted as signalling topic continuity (Filiaci et al. 2014, Filiaci 2011); therefore, the overt pronominal subject in an embedded clause may be coindexed with the subject rather than with the object of the preceding main clause. This explains why Carminati's (2002) hypothesis does not seem to work for Spanish.

Romanian is a null subject language in which the verb moves to Inflection (Dobrovie-Sorin 1994, Alboiu 2002). The preverbal subject moves to Spec IP (Alboiu 2002, Dobrovie-Sorin 1994) and is thus structurally more prominent than the object. According to Carminati's (2002) Position of Antecedent Hypothesis, the null subject in an embedded clause will preferentially be interpreted as coindexed with the subject, as illustrated in (2): the null subject is more likely to be understood as referring to the subject *Ion* – and signalling topic continuity – than to the object 'the child'.

(2) Ion$_i$ a văzut copilul$_j$ în timp ce pro$_{i/j}$ se plimba cu bicicleta.
Ion has seen child-the while pro REFL walked with bicycle-the
'Ion saw the child while he was riding the bicycle.'

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With an overt personal pronoun anaphor, Carminati's (2002) hypothesis would predict that the preferred antecedent would be the direct object: 'the child', in example (3) below.

(3) Ion_i a văzut copilul_j în timp ce $\text{el}_{j/i}$ se plimba cu bicicleta.
Ion has seen child-the while he REFL walked with bicycle-the
'Ion saw the child while he was riding the bicycle.'

Crucially, this is merely a matter of preference and both interpretations are acceptable. Carminati's hypothesis was confirmed for Romanian by Pagurschi (2010). She administered a replica of Carminati's (2002) study: a 10 sentence written questionnaire with temporal and conditional clauses with null/overt pronoun subjects to 42 native speakers of Romanian, age range 20-50 years. In the null pronoun condition, the respondents chose the subject as an antecedent in 91% of the cases. In the overt pronominal subject condition, the matrix object was selected as an antecedent in 81% of the cases.

More recently, in a picture selection task comprising 12 test sentences with a null/personal pronoun/demonstrative subject in a temporal clause, Teodorescu (2016, *this issue*) found an 80% subject bias with the adult control group (n=48, age range 19-68) when the subject in the temporal clause was a null pronominal subject but no bias in the case of the overt pronoun anaphor.

Importantly, unlike Italian, Romanian allows pronominal subjects with the interpretation of topic continuity. Zafiu (2005) argues that the third person pronoun can appear optionally alternating with the zero pronoun (see example 4a, from Zafiu 2005:667). However, she mentions that the overt pronoun is less likely than the null pronoun to be coindexed with the subject of the previous clause. The overt pronoun is appropriate especially when it serves as a means of clarification. See (4b, adapted from Zafiu 2005:667), where the absence of the pronoun renders the sentence less easy to interpret.

(4) a. Dan a plecat. **El** avea dreptate.
'Dan left. He was right.'
b. Copiii nu-şi pierd vremea cu jocuri fără rost. **Ei** învaţă de mici ce înseamnă munca.'
'Children don't waste time with pointless games. They learn the importance of work early.'

Teodorescu (2017, *this issue*) proposes that Romanian patterns rather with Spanish than with Italian with respect to the object bias of the overt pronominal subject, or at least that the interpretation of the overt personal pronoun subject is less unambiguous than in Italian.

Demonstratives on the other hand are generally coindexed with the less salient antecedent, that is the object in the matrix (Bosch et al. 2007, Kaiser and Trueswell 2004, 2008). According to Ariel's (1990) Accessibility Scale, demonstratives occupy a position lower than personal pronouns and null pronouns. Giurgea (2010) argues that in Romanian

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demonstratives have a very low degree of accessibility. Therefore the hearer will preferentially interpret a demonstrative subject in the embedded clause as coindexed with the object rather than the subject. This tendency was confirmed experimentally in Teodorescu (2017, *this issue*): the adult group in her experiment chose the object as an antecedent for the demonstrative in 75% of the cases. In example (5) below, the demonstrative subject of the subordinate clause is likely to be understood as being coindexed with the object of the main clause (‘the cat’).

(5) Caracatiţa$_i$ a văzut pisica$_j$ în timp ce aceasta$_j$ se plimba cu bicicleta.
octopus-the has seen cat-the while this REFL walked with bicycle-the
‘The octopus saw the cat while it was riding its bicycle.’ (from Teodorescu 2017)

2.2 Hungarian

Hungarian is a null subject language, allowing both pre- and postverbal subjects and objects, depending on the presence of focus and on other pragmatic considerations (É.Kiss 2004). The leftmost and structurally highest position in the sentence is occupied by the topic, which may be the syntactic subject, but it can also be another constituent. The topic may also be absent. Focused constituents (contrastive, inherent or identificational focus) must necessarily move to the Specifier position of the Focus Phrase whose head hosts the verb, therefore c-commanding every other constituent except for the topic. Therefore, in a SVO sentence, the subject, whether topic or focused, is structurally more prominent than the object, which remains in situ in the VP.

A null subject will preferentially indicate topic continuity and will be coindexed with the subject/topic (most prominent antecedent) of the previous utterance. Demonstratives, by contrast, indicate topic-shift and are usually coindexed with the least prominent antecedent (Pléh and Radics 1976, Tolcsvai 2000, Pléh 1982). Thus, in (6a) below, the null subject in the second sentence will be understood as referring to ‘the boy’, the subject (topic) in the first sentence, while the demonstrative will indicate topic shift and be coindexed with the – less prominent and closest – object: ‘the man’. That demonstratives have a preference for the closest and not only the least prominent antecedent is made clear by a reversal in word order (Pléh 1982, Tolcsvai 2000). In case of OVS order in the first clause (such as in 6b), the antecedent of the demonstrative is no longer unambiguously the object and the sentence becomes less informative. But word order changes seem to have little effect on the interpretation of the null pronoun, which consistently prefers the syntactic subject as antecedent.

(6) a. A kisfiú$_i$ meglátta a bácsit$_j$. pro$_i$/ Az$_j$ oda-ment hozzá.
the little-boy saw the man-A pro/ DEM there-went to-him
‘The little boy saw the man. He (the boy/the man) went to him.’

b. A bácsit$_j$ meglátta a kisfiú$_i$ pro$_i$ /Az$_{j/i}$ oda-ment hozzá.
the man-A saw the little-boy pro DEM there-went to-him
‘The little boy saw the man. He went to him.’

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The overt personal pronoun seems to have a dual value. It can be equally interpreted as anaphor for both the subject and the object of the previous sentence. Certain considerations may contribute: for example, with contrastive topic stress, it will indicate topic continuity and refer to the subject. If unstressed, it will function as topic shift and be coindexed with the object (Kocsány 1995). In (7), if the pronoun is stressed, it becomes contrastive topic, indicating topic continuity and will refer to the girl (The girl was telling the boy to hurry, as she, for her part, had immediately understood). By contrast, if the pronoun is unstressed, and stress falls on the verb or the adverb, it is a case of topic shift and the pronoun will be understood as referring to the object (The girl was telling the boy to hurry up. He immediately understood.)

(7) A lány már sürgette a fiút. Ő rögtön megértette,
the girl already hurried the boy he/she immediately understood
miről van szó.
what-about is word
'The girl was already telling the boy to hurry up. She had/He immediately understood.'

3. Previous research on antecedent preferences in bilingual acquisition

Most acquisition studies report that overt pronominal subjects are vulnerable in bilingual acquisition. In combinations of a null-subject language and a non-null subject language, the infelicitous use of the overt pronoun may have been the result of cross-linguistic interference (Müller and Hulk 2000). In an experimental study testing the interpretation of overt pronominal subjects in 2L1 Italian, Serratrice (2007) found differences between a group of Italian-English 8-year-olds and the Italian control group, which she accounted for in terms of cross-linguistic influence. Subject antecedents were chosen more often than object antecedents for overt pronouns by English-Italian bilingual children, although no delay was observed in the interpretation of null pronouns. Sorace and Filiaci (2006) and Belletti et al. (2007) found that English near-native L2 speakers of Italian had a greater preference for the subject of the matrix clause as a possible antecedent for the overt pronoun subject of the embedded clause than native Italians; with respect to the null pronoun subject however the two groups performed in a similar manner. Tsimpli et al. (2004) discover attrition effects in the interpretation of overt pronouns with Italian near-native L2 speakers of English: the bilinguals were more inclined than the control group to assign the topic continuity interpretation to the overt pronoun, but no differences were recorded in the case of the null pronoun. More generally, Argyri and Sorace (2007) found that child English-Greek bilinguals had a higher acceptability ratio for overt pronominal subjects in non-felicitous contexts than the monolingual Greek control group.

Other studies reveal that even when the two languages in question are both null subject languages, bilinguals perform differently from monolinguals with respect to the use and interpretation of null and overt pronouns (Sorace et al. 2009, Bonfieni 2018). For example, a group of Italian-Sardinian bilinguals (Bonfieni 2018) exhibited a preference

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for the subject antecedent for overt pronouns more often than Italian-dominant speakers. The Spanish-Italian bilinguals in Sorace et al. (2009) patterned with the Italian-English bilinguals in that they were significantly more likely to accept redundant overt subject pronouns than monolingual children and adults.

Since bilinguals perform worse or differently than monolinguals even when no cross-linguistic influence can be identified, it has been proposed that the differences are actually due to processing difficulties inherent in bilingualism (Sorace and Filiaci 2006, Sorace and Serratrice 2009). Pronominal subject realization is an interface phenomenon: aside from syntactic knowledge, it builds on discourse-pragmatic knowledge, that is the assessment and continual updating of the context (Sorace et al. 2009). This implies that pronoun interpretation requires considerable computational resources. But bilinguals already have fewer processing resources at their disposal, since part of these resources are constantly needed to suppress the unwanted language (Sorace 2011, 2018, Sorace and Serratrice 2009, Sorace et al. 2009). They constantly need to exercise executive control to avoid interference. Context interpretation and updating require more resources than automatic syntactic processes (Sorace 2011).

4. Previous research on antecedent preferences in child Romanian

Teodorescu (2017, *this issue*) investigates intra-sentential anaphora resolution in child Romanian. She tested the interpretation of null, personal and demonstrative pronoun subjects in embedded adjunct clauses with two kindergarten age groups: 31 children aged 3;1-4;11, 37 children aged 5;0-6;11, and one group of schoolchildren, aged 7;0-9;5.

She finds that all three age groups had a clear object bias with demonstrative pronouns (62%, 67% and 73% respectively, in order of age), which matches the results for the adult control group (75%), as well as the expectations linked to the degree of accessibility for demonstratives in Romanian (Giurgea 2010).

The youngest group shows no bias for the other two conditions, overt personal pronoun and null pronoun subject, indicating that their antecedent preferences are not yet fully developed at age 4. In fact, in a longitudinal study, Teodorescu (2017, *this issue*) found a slight overuse of the overt pronoun in non-felicitous contexts before the age of 3;0, suggesting that adult-like awareness of the pragmatic rules governing the null/overt pronoun alternation is delayed in L1 Romanian.

Not even the 5-6-year-olds are adult-like in the overt pronoun condition, showing a surprising 62% subject bias. As for the 8-9-year-olds, they showed no bias for overt pronominal subjects, but neither did the adult controls. This contradicts Carminati's (2002) hypothesis, as well as previous experimental results for Romanian (Pagurschi 2010). Teodorescu (2017) accounts for the results in terms of language specific properties. In Romanian, the overt pronoun is allowed with both a topic shift and a topic continuity function, thus differing from Italian, but in a way similar to Spanish (see section 2.1 above).

By contrast, in the null pronoun condition, the 5-6-year-olds and the 8-9-year-olds show a clear subject bias (63% for both groups), slightly lower than the results from the

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adult control group (who exhibited 80% bias), but confirming Carminati's (2002) antecedent hypothesis.

5. The study

5.1 Aim and predictions

The present study investigates the interpretation of the null pronoun subject, personal pronoun subject and demonstrative pronoun subject in a time clause following an SVO main clause.

According to Carminati's (2002) hypothesis, null pronominal subjects should show a matrix subject bias, as confirmed by previous research on adult native speakers of Romanian (Pagurschi 2010, Teodorescu 2017, *this issue*), as well as on child speakers (Teodorescu 2017, *this issue*). If Hungarian-Romanian bilingual children are sensitive to the properties of null pronouns in Romanian, they should also show a subject bias.

As for overt pronominal subjects, Carminati's (2002) prediction that they show a matrix object bias has not been unambiguously supported by previous research in the case of Romanian. Pagurschi (2010) confirms but Teodorescu (2017) disproves this hypothesis. Teodorescu (2017) explains the differences between her findings and those in Pagurschi's study in terms of differences between the administered tasks. Since I used the same task as the one used by Teodorescu (2016, 2017, *this issue*), I took these results as a point of comparison.Therefore, if the Hungarian-Romanian behave like Romanian monolinguals with respect to the discourse differences between null and overt pronominal subjects, the expectations are that they may not show a clear bias in this condition. But, as often pointed out in the literature, the interpretation of both the overt and the null pronoun is context dependent and it might be vulnerable in 2L1 as a phenomenon at the syntax-pragmatics interface (Sorace and Filiaci 2006, Sorace 2011). Previous research has shown that the interpretation of the overt pronoun in null subject languages represents a challenge in bilingual acquisition (Tsimpli et al. 2004, Sorace and Filiaci 2006, Belletti et al. 2007, Sorace et al. 2009, Bonfieni 2018). As for the interpretation of null pronouns, it has been shown to be relatively unproblematic in 2L1 acquisition (Tsimpli et al. 2004, Sorace and Filiaci 2006, Belletti et al. 2007). But the children in the present study are younger than the children in the studies mentioned above. A longitudinal study (Tomescu, *this issue*) has shown overuse of the personal pronoun subject in a Romanian-Hungarian bilingual context. Therefore some difficulties may be expected with both the interpretation of the null and the overt pronoun with the bilingual children in the present experiment, compared to the monolingual control group.

As for demonstratives, the expectations are that they will be less problematic to the participants than personal pronouns. They are acquired early in 2L1 Romanian (Tomescu, *this issue*).

No cross-linguistic influence is to be expected: in the particular syntactic configuration of the test sentences in the experiment (SVO main clause preceding the anaphor) Hungarian has similar antecedent preferences with Romanian (Pléh and Radics 1976, Tolcsvai 2000, Pléh 1982, Kocsány 1995): the null pronoun is preferentially

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coindexed with the subject, the demonstrative with the object, while the overt personal pronoun can have dual interpretation.

5.2 Participants

The study investigated the comprehension of null and overt pronouns in Romanian with two groups of Romanian-Hungarian bilinguals: a younger group, aged 5-6 years, and an older one, aged 8-9 years. They both attend Hungarian kindergarten and school respectively in Bucharest, where the language of instruction is primarily Hungarian and where they spend 8 hours per day. The language of the community is Romanian.

The bilinguals were compared to two age-matched monolingual groups, who also live in Bucharest and attend (Romanian) kindergarten and school in the city. Table 1 summarizes the data.

Table 1. Participants

Group	Age range	Mean age	Number of participants
2L1	5;0 – 6;4	5;7 (SD 4.6)	16
L1	5;0 – 6;4	5;7 (SD 4.897)	16
2L1	8;6 – 9;11	9 (SD 5.186)	13
L1	8;6 – 9;5	9 (SD 3.094)	13

5.3 Task design and procedure

The task (the one also used in Teodorescu 2017, *this issue*) consists in a binary picture selection task with 12 test sentences and 3 control sentences. The task tests three conditions: (i) null subject; (ii) overt personal pronoun subject; (iii) demonstrative subject. Each test sentence contains a main clause with SVO word order, with a nominative subject and an accusative object, followed by a time clause (*while*), whose subject is a null/overt/demonstrative pronoun (see example 8). The referents of the subject and the object in the matrix are all [+animate] and perform non-specific pragmatically plausible activities. The two possible antecedents have identical gender and number features as the overt subject in the time clause.

(8) Caracatiţa a văzut pisica în timp ce 0/ea/aceasta se plimba
octopus-the has seen cat-the while 0/it/ this REFL walked
cu bicicleta.
with bicycle-the
'The octopus saw the cat while it was riding its bicycle.'
(from Teodorescu 2017)

The participants were presented with pairs of pictures and were requested to point to the picture which best matched the sentence read aloud by the experimenter. In one picture it is the matrix object, in the other it is the matrix subject that is performing the action. For example, the participants viewed the pair of pictures in Figure 1, while the experimenter read aloud sentence (9).

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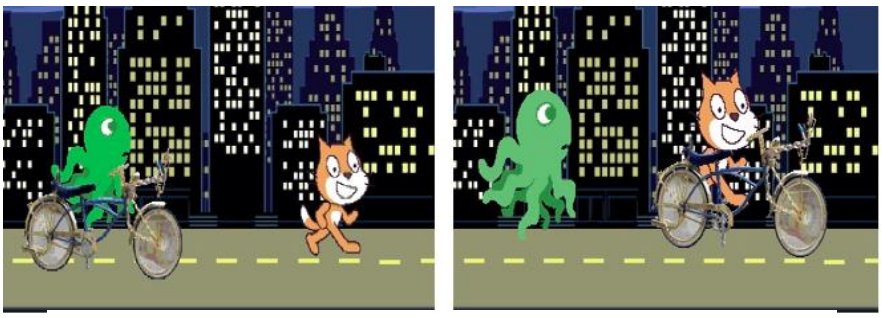


Figure 1. Picture selection task. Example. (from Teodorescu 2017)

(9) Caracatița a văzut pisica în timp ce ea se plimba cu bicicleta.
octopus-the has seen cat-the while she REFL walked with bicycle-the
'The octopus saw the cat while it was riding its bicycle.'

5.4 Results

5.4.1 5-6-year-olds

In the null subject condition, the Hungarian-Romanian bilinguals in this age group showed no bias. A standard two-sample t-test at the alpha 0.05 level revealed no significant difference between the subject and object responses (subject M = 1.87, SD = 1.02, object M = 2.12, SD = 1.02: t(15) = 0.69, p = 0.49, two-tailed). The bilingual children behaved like the age-matched Romanian monolinguals, who showed no bias either, as shown by a standard two-sample t-test at the alpha 0.05 level (subject M = 2, SD = 1.31, object M = 2, SD = 1.31, t(15) = 0, p = 1, two-tailed). The results are compared in Figure 2.

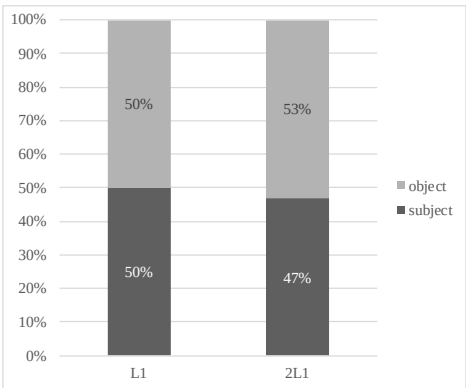


Figure 2. 5-year-olds. The null pronoun condition

In the personal pronoun condition, the 5-year-old bilinguals showed no bias either, as shown by a standard two-sample t-test at the alpha 0.05 level (subject M = 1.93, SD = 1.16, object M = 2.18, SD = 1.22, t(15) = 0.86, p = 0.3927, two-tailed). The slight object bias (55%) in the answers of the bilingual group was not revealed to be significant. The

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monolingual group chose the subject as antecedent in 61% of the cases, significantly more often than the object (subject M = 2.43, SD = 1.15, object M = 1.56, SD = 1.15, t(15) = 2.14, p = 0.04, two-tailed). The results can be seen in Figure 3.

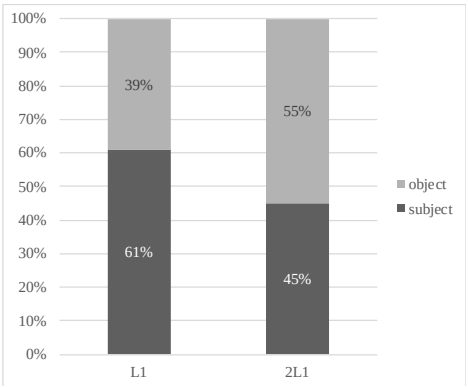


Figure 3. 5-year-olds. The overt pronoun condition.

In the demonstrative pronoun condition, a standard two-sample t-test at the alpha 0.05 level showed an obvious object bias with both groups (2L1 subject: M = 1.71, SD = 0.91, object M = 2.43, SD = 0.96: t(15) = 2.65, p = 0.01, two-tailed; L1: subject M = 1.56, SD = 1.2, object M = 2.43, SD = 1.2: t(15) = 2.04, p = 0.04, two-tailed). Moreover, both groups have nearly identical percentages: 61% (L1) and 62% (2L1), as is visible in the graph in Figure 4. A standard two-sample t-test at the alpha 0.05 level revealed no significant difference between the bilingual and the monolingual group in this condition (t(15) = 0, p = 1).

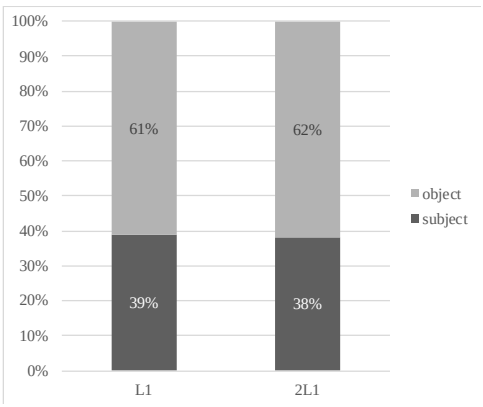


Figure 4. 5-year-olds. The demonstrative pronoun condition

A one-way repeated measures ANOVA showed no significance across conditions with either of the groups (2L: F (2,30) = 0.46, p = 0.63; L1: F (2,30) = 2.15, p = 0.13).

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5.4.2 8-9-year-olds

The bilinguals had no preference for either antecedent in the null pronoun condition. A standard two-sample t-test at the alpha 0.05 level revealed no significance between subject and object responses (subject M = 2 SD = 1.35, object M = 2 SD = 1.35, t(12) = 0, p = 1, two-tailed). The monolingual control group showed an evident subject bias for the null pronoun in the subordinate clause (subject: M = 3.15, SD = 1.14, object: M = 0.84, SD = 1.14: t(12) = 5.14, p = 0.00, two-tailed). Figure 4 shows the results.

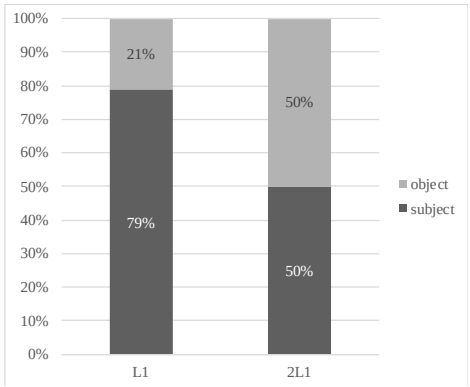


Figure 5. 8-year-olds. The null pronoun condition

With respect to the overt personal pronoun condition, neither group showed any bias. The bilinguals preferred the object in 56% of the cases, and the monolinguals the subject in 63% of the cases, but with neither group were the results statistically significant (2L1: subject M = 1.76, SD = 1.36, object M = 2.23, SD = 1.36: t(12) = 0.86, p = 0.39, two-tailed; L1: subject M = 2.53, SD = 1.39, object M = 1.46, SD = 1.39: t(12) = 1.97, p = 0.06, two-tailed). The graph in Figure 6 shows the results.

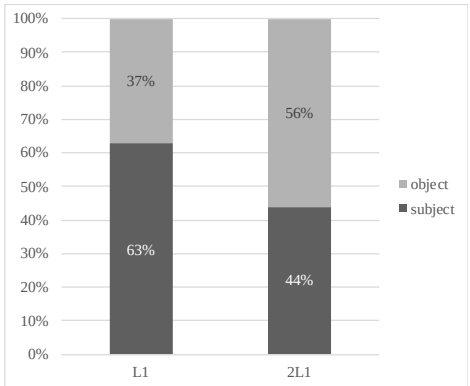


Figure 6. 8-year-olds. The overt pronoun condition.

Both groups had an obvious preference for the object antecedent for the demonstrative subject in the embedded clause. A standard two-sample t-test at the alpha

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0.05 level revealed that the bias is statistically significant: 2L1: subject M = 1.3, SD = 1.18, object M = 2.69, SD = 1.18: t(12) = 2.98, p = 0.00; L1: subject M = 1.07, SD = 1.55, object M = 2.93, SD = 1.55: t(12) = 3.03, p = 0.00, two-tailed. The bilinguals chose the object in 67% of the cases and the monolinguals in 73% of the cases (see Figure 6). A standard two-sample t-test at the alpha 0.05 level revealed no significant difference between the bilingual and the monolingual group in this condition: t(12) = 0.18, p = 0.67.

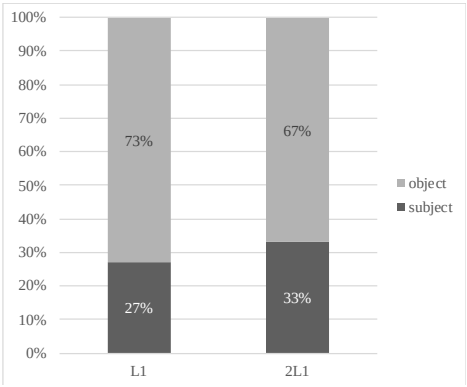


Figure 7. 8-year-olds. The demonstrative pronoun condition

A one-way repeated measures ANOVA at the alpha level 0.05 showed no significance across conditions in the bilingual group (F (2,24) = 1.31, p = 0.2). However, a similar test conducted in the monolingual control group did show significance: F (2,24) = 8.78, p = 0.001. Multiple t-tests with Bonferroni correction (significance reported at 0.017) revealed that the 8-9-year-old monolinguals gave more subject responses in the null pronoun condition than in the demonstrative pronoun condition: null M = 3.15, SD = 1.14, demonstrative M = 1.07, SD = 1.55: t(12) = 15.08, p = 0.0007.

5.5 Discussion

The present study found that at age 5 (mean age 5;7), neither the bilinguals nor the monolinguals showed any bias for the interpretation of the null pronoun. Interestingly, Teodorescu (*this issue*) shows that 5-year-old Romanian monolinguals have a subject bias in their interpretation of null pronouns. But they also show a subject bias in the overt pronominal subject condition, which indicates, on a par with the findings in the present study, that they do not distinguish between these two types of subjects.

The Hungarian-Romanian bilinguals do not show adult-like antecedent preferences even at the age of 8-9 years. Their responses were at chance in the null pronoun condition. The Romanian monolinguals in the present study have a clear subject bias in the null pronoun condition at age 8-9, as the results indicate: they chose the subject antecedent in 79% of the cases (see Teodorescu, *this issue*, for similar results). The different biases of the bilingual and of the monolingual groups reveal a delay with the former. Since the interpretation of the null pronoun is a discourse phenomenon, at the syntax-pragmatics interface, one expects it to be vulnerable in bilingual acquisition

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(Sorace and Filiaci 2006, Sorace 2011); this delay with the bilingual group is not unexpected. The lack of any preference for the null pronoun with the bilinguals could not have been the result of cross-linguistic interference, since in Hungarian the null subject is also preferentially coindexed with the most prominent antecedent of the previous clause (Pléh and Radics 1976, Pléh 1982, Tolcsvai 2000).

The results differ from those reported with bilinguals of the same age as the older group in the present experiment. English-Italian (Serratrice 2007) or English-Greek bilinguals (Argyri and Sorace 2007) aged 8 years did not perform differently from their monolingual peers regarding the antecedent choice for the null pronoun subject. Further research with older Romanian-Hungarian bilinguals would be of interest.

In the overt personal pronoun condition, the bilinguals exhibited no statistically significant bias in either age group (though there is a slight preference for the matrix subject: 55% and 56% respectively). In this condition, they performed differently from the Romanian monolingual group. The 5-year-old monolinguals preferentially chose the subject antecedent. The 8-year-old monolinguals did not show any statistically significant bias, although the percentage for the subject antecedent was still higher (63%). Whereas the bilinguals showed, apparently, adult-like preferences in this condition, it remains true that their responses were at chance. If we also take into account their at-chance responses in the null pronoun condition, the more likely explanation is that the response pattern reflects a developmental delay. The interpretation of the null pronoun is a matter of pragmatics and therefore vulnerable in 2L1 acquisition as an interface phenomenon (Sorace 2011). The personal pronoun has ambiguous behaviour in Romanian: Teodorescu (2017) found no subject or object bias with an adult group. Importantly, the personal pronoun has a dual interpretation in Hungarian as well (Kocsány 1995): according to the phonological stress, it may refer to either the subject or the object of the previous clause. While it is tempting to assign an adult-like interpretation to the bilingual groups in the overt pronoun condition, their at-chance responses in the null pronoun condition make it more likely that the lack of bias in both conditions is due to a delay in the acquisition of anaphora resolution. The interpretation of both the overt and null pronoun, as an interface phenomenon, has indeed been found to pose difficulties to bilinguals in other studies (Serratrice 2007, Argyri and Sorace 2007, Sorace et al. 2009, Bonfieni 2018).

As regards the antecedent choice for the demonstrative subject in the embedded clause, all four groups showed a clear preference for coindexing it with the object of the main clause, as predicted by research on the degree of accessibility for demonstratives (Giurgea 2010). The results matched those of the adult control group in Teodorescu (2017, *this issue*). The preference seems to increase slightly with age, thus the bilinguals tended to choose the object in 62% of the cases at age 5 and 67% at age 8. The percentages for the monolinguals are 61% and 73% respectively. Note that Hungarian demonstratives will preferentially be coindexed with the least prominent antecedent as well (Pléh 1982, Pléh and Radics 1976, Tolcsvai 2000). The (Romanian) demonstrative is not vulnerable in bilingual acquisition.

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6. Conclusion

The study brought further confirmation that anaphora resolution with null pronouns and overt personal pronouns is delayed in bilingual acquisition. The responses of 5-6 and 8-9-year-old Hungarian-Romanian bilinguals were at chance in these two conditions In this they differed from the monolingual group where a clear progress was observable from the younger to the older age group. At age 5, neither the Hungarian-Romanian bilinguals nor the Romanian monolinguals distinguish between null and overt pronominal subjects in terms of antecedent choice. But at age 8, only the Romanian monolinguals have adult-like antecedent preferences. The bilinguals continue to give at chance responses at this age. Crucially, Romanian and Hungarian are identical with respect to antecedent preferences for the conditions tested in the study (Pléh and Radics 1976, Tolcsvai 2000, Pagurschi 2010, Teodorescu 2017), therefore the poorer performance of the bilinguals cannot be ascribed to cross-linguistic interference effects. I suggested that the observed delay reflects an insufficient grasp of the relevant discourse properties, as a result of bilingualism effects.

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