

Subject pronouns in the L2 Spanish of Moroccan Arabic speakers: evidence from bilingual and second language learners

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Abstract

The goal of this study is to shed light on the conditions that regulate the interpretation of null and overt third person subject pronouns in ambiguous intra-sentential contexts in bilingual and L2 Spanish. An acceptability judgment task was administered to 26 Moroccan Arabic (MA)/Spanish bilinguals, 26 MA learners of L2 Spanish and 34 native controls. Three conditions were tested: type of pronoun (null vs. overt), antecedent choice (subject vs. object) and clause order (main-subordinate vs. subordinate-main). The results reveal an effect of pronoun and clause order. Overall, both experimental groups show native-like pronominal preferences but the L2 learners differ from natives specifically in subordinate-main order as they do not seem to benefit from microvariation between languages in the domain of pronoun interpretation.

Keywords: subject pronouns, anaphora resolution, cross-linguistic influence, bilingual acquisition, L2 acquisition

1. Introduction

The variety of referring expressions and the study of their linking properties have been examined in different frameworks such as topicality hierarchy (Givon 1984), accessibility theory (Ariel 1990; 2001) and centering theory (Gordon, Grosz & Gilliom 1993). Two key referring expressions are nominal and (null and overt) pronominal elements, which contribute to reference organization in discourse. In broad terms, a pronoun is likely to be interpreted as denoting an entity that has already been introduced by a salient category in the discourse (e.g. a nominal); conversely, nominal categories are used to refer to less salient or accessible referents.

Psycholinguistic research has also examined the factors that might influence the choice of an antecedent by the different types of pronominal anaphoric expressions and have found that speakers tend to use pronouns to refer to a prominent or salient discourse entity (Garvey, Caramazza & Yates 1975). In ambiguous referential contexts, it has also been observed that null subject pronouns refer back to topic antecedents and overt pronouns tend to express topic change (Belletti, Bennati & Sorace 2007). Additionally, recent research has shown that anaphoric elements are sensitive to different factors such as gender, order of presentation (Arnold, Eisenband, Brown-Schmidt & Trueswell 2000; Trueswell, Papafragou & Choi 2011) or the syntactic function of the antecedent (Carminati 2002; Filiaci 2011).

As far as the acquisition of reference forms is concerned, the most influential research on pronominal reference has been conducted under the Interface Hypothesis (IH) framework (Sorace & Filiaci 2006; Sorace, Serratrice, Filiaci & Baldo 2009; see Sorace 2011 for an overview). The hypothesis implies that in linguistic domains in which morphosyntax interacts with discourse-pragmatic factors –such as the use and interpretation of anaphoric expressions- L2 learners and bilingual speakers do not reach native-like performance. Sorace et al. (2009) proposed that this linguistic behaviour, characterized by instability and optionality in production, as well as in comprehension, is derived from a compensatory strategy to supersede online processing demands that speakers encounter when integrating information from different linguistic levels in a non primary language in line with the shallow processing among L2 speakers suggested by Clahsen & Felser (2006). For instance Sorace et al. (2009), among others, reported that Italian L2 speakers and bilinguals with high proficiency in the target language admitted and produced overt subjects in the target null-subject language in contexts where monolinguals would not have admitted or produced them, sometimes leading to redundancy. This redundancy is assumed to reflect the instability of overt pronouns in the production and comprehension of non-native speakers: overt pronouns would imply a less costly processing operation to implement discourse interface operations efficiently even when their use entails redundancy.

The predictions derived from the IH diminish the impact of cross-linguistic influence. When the language pairing differs in the realization of the relevant feature, for example English L2 learners of Spanish (a non-null subject language and a null one), the logical reasoning is to ascribe the overextension of overt pronouns mainly to the L1 influence at a syntactic level (Perez-Leroux & Glass 1999) or at a discourse strategy

level (Jegerski, VanPatten & Keating 2011). However, it is known that this overextension persists in the acquisition of pronouns between two null subject languages (Margaza & Bel 2006; Sorace et al. 2009, for Greek-Spanish and Italian-Spanish, respectively); this behaviour cannot be attributed to cross-linguistic influence since, due to a substantial overlap in pronoun realization patterns of the two languages, the result would be one of positive influence leaving no room for an overuse of overt pronouns. In addition, as pointed out by developmental studies, the mastery of the pragmatic conditions that regulate the distribution and interpretation of pronouns is a difficult and challenging task that comes with age and exposure even in L1 (see Shin & Cairns 2012, for Spanish, and Arnold, Brown-Schmidt & Trueswell 2007, for English). Taking all these aspects into consideration, in the present work we examine the acquisition of these features in Arabic/Spanish bilinguals and native speakers of Moroccan Arabic who are learning Spanish as a L2. Like Spanish, Arabic is a null subject language and thus we would expect a similar effect as that observed in L1/L2 null subject pairings mentioned above. Here we compare populations differing in their exposure to the target language but analogous with respect to their L2 knowledge. To do so, we will compare the performance of early sequential bilinguals living in Spain and that of L2 learners learning Spanish in a foreign language setting.

2. Theoretical background

2.1. Anaphora resolution in null subject languages: Spanish and Moroccan Arabic

Spanish, as a null subject language with rich agreement marking on verbs, has two types of pronouns: an overt pronoun and a phonologically null pronoun (*pro*). Their use, however, is not fully optional: they carry information that contributes to anaphora resolution. The distribution and interpretation of subject pronouns at the syntax-discourse interface is regulated by the [\pm topic-shift] pragmatic feature. As a general rule, it can be said that a noun phrase introduces a referent into discourse, an overt pronoun signals a shift in topic, and a null pronoun expresses topic continuity. Additionally, an overt pronoun may convey contrastive meaning –an issue that we do not address here. This is displayed in the following examples:

- (1) a. Luis_i telefoneaba a su madre cuando *pro*_i llegaba tarde. [–topic-shift]

‘Luis telephoned his mother when *pro* was late’

b. Ana vio a su vecina_i mientras *ella_i* se bañaba en el mar. [+topic-shift]

‘Ana saw her neighbour while she was bathing in the sea’

It is worth mentioning that the use of a null pronoun instead of the overt one (*ella*) in (1b) would lead to an interpretation of topic continuity (Ana was bathing) or would create ambiguity (either Ana or her neighbour would be bathing). The same is true for (1a) where, in strict terms, *pro* can refer as well to the preceding object ‘su madre’ (‘her mother’). Furthermore, in a topic continuity context the overt third-person pronoun may refer directly to an unambiguous antecedent generating redundancy as in (2) below:

(2) Julia_i dice que *ella_i* confesó la verdad.

‘Julia says that she confessed the truth’

In the last decade, some studies (Montrul 2004; Sorace & Filiaci 2006; Sorace et al. 2009) have revealed that speakers have antecedent preferences for pronouns when the context is potentially ambiguous. The most influential work has been Carminati’s (2002) study in which she formulated a processing account for the interpretation of null and overt pronouns in Italian, the ‘Position of Antecedent Hypothesis’ (PAH), according to which a null pronoun prefers an antecedent in a subject position, while an overt pronoun prefers an antecedent in a position other than subject. The following example from Carminati (2002: 222) illustrates these biases:

(3) Roberto ha insultato Ugo quando lui / *pro* era ubriaco.

‘Roberto insulted Ugo when he / *pro* was drunk’

A. Roberto era ubriaco

B. Ugo era ubriaco

A. ‘Roberto was drunk’

B. ‘Ugo was drunk’

In (3) there are two potential antecedents for the overt pronouns (*lui*) and for the null pronoun (*pro*). The results showed that Italian speakers are significantly more likely to choose the null pronoun when referring to the subject (3A) and the overt pronoun when referring to the object (3B): overt pronouns were interpreted as referring to non-subject antecedents in 83.3% of the cases whereas null pronouns were taken as referring back to subject antecedents 80.7% of the time, clearly giving support to the PAH. This

generalization holds mainly for gender-ambiguous contexts as the one in (3); on the contrary, when gender clearly identifies antecedents, speakers seem to be more flexible, accepting different antecedent positions for overt pronouns. The violation of the PAH does not generate an ungrammatical but an infelicitous sequence, and the speakers rely on it to prevent misunderstanding. Translating these findings into discourse terms, it can be said that null pronouns express topic continuity –they refer to the topic subject of the previous clause- while overt pronouns convey topic change since they occupy the subject topic position of the second clause and refer back to a prior element, the object of the previous clause that is not in topic position.

Alonso-Ovalle, Fernández-Solera, Frazier & Clifton (2002) investigated pronominal preferences in two sentence discourses in Spanish. Following Carminati's PAH, they predicted that, while a null pronoun would prefer a subject antecedent, the overt pronoun would not. Unlike the experimental sentences of Carminati's work, these authors used inter-sentential contexts in experimental sentences. An example from Alonso-Ovalle et al. (2002: 166) is given below:

- (4) a. Sara abrazó a Teresa. *pro* está emocionada.
'Sara embraced Teresa. *pro* is excited'
b. Sara abrazó a Teresa. *Ella* está emocionada.
'Sara embraced Teresa. She is excited'

In contexts as the one in (4a), in 73.2% of the cases the null pronoun was linked to the subject, *Sara*, while in examples such as (4b) the overt pronoun was assigned to either *Sara* or *Teresa* (50.2% of the total cases were linked to the subject). Even though Alonso-Ovalle et al. (2002) argued that their results supported the PAH in Spanish across-sentences, this can only be maintained for null pronouns which, similarly to Italian, prefer a subject position as their antecedent; conversely, overt pronouns do not prefer a particular antecedent, in contrast with Carminati's findings.

More recently, Filiaci (2011) has also looked into the division of labor between null and overt subject pronouns in Spanish. She replicated the original experiment from Carminati and the sentences were translated and adapted into Spanish. However, unlike the preceding research, the second sentence was manipulated so as to control the semantics of the predicate and thus favor either topic continuity (as in 5a) or topic change (as in 5b), disambiguating towards the preceding subject or object, respectively:

- (5) a. Cuando Ana visitó a María en el hospital, *ella / pro* le llevó un ramo de rosas.
'When Ana visited Mary in the hospital, she/pro brought her a bunch of roses'
b. Cuando Ana visitó a María en el hospital, *ella / pro* ya estaba fuera de peligro.
'When Ana visited Mary in the hospital, she/pro was already out of danger'

Filiaci (2011) measured reading times on these sentences and found that, in the null subject condition, participants were faster in topic continuity contexts than in topic change contexts, which suggests that null pronouns are associated with the [-topic-shift] feature, thus supporting the PAH. On the contrary, in the overt pronoun condition reading times were similar across the two contexts, a result which is in line with what Alonso-Ovalle et al. (2002) found for inter-sentential anaphora. Interestingly, the experiment was also conducted in among Italian speakers and results supported Carminati's findings, hence confirming the attested division of labor of Italian pronouns. As for clause order, although Carminati (2002) did not find differences between main-subordinate and subordinate-main clause orders, Filiaci (2011) did. Our study also attempts to shed some light on this question.

To sum up, previous research on the antecedent preferences of null and overt pronouns in Romance languages is far from showing a definite picture. On the one hand, null pronouns seem to have a specific role: they are clearly specialized in establishing co-reference with elements in subject position, giving continuity to the element –the subject– that initiated the discourse and that is the current topic. And this is so irrespective of the sentence type: subordinate intra-sentential contexts as well as inter-sentential contexts. On the other hand, the use of overt pronouns does not offer a clear picture since varying degrees of antecedent preferences are shown across languages. More precisely, while in Italian overt pronouns visibly signal a switch in subject reference, this connection seems to be much weaker in Spanish, thus suggesting the existence of microvariation among null subject languages.

Given the observation that there is cross-linguistic variation in the usage and interpretation of pronouns among null-subject languages, we asked ourselves what the preferences are in Moroccan Arabic (MA), or Darija, the Arabic vernacular spoken in Morocco. The country is linguistically heterogeneous: MA coexists with Amazigh (or Berber) languages, and Modern Standard Arabic (MSA) and French, the languages of education, administration and the media.

MA, as described by Aoun, Benmamoun & Choueiri (2010), is a language with rich verbal morphology that marks person, number and gender on verbs. As a null subject language, it has two types of pronouns: null and overt. Null pronouns are licensed by rich *phi*-features on the verb and it is predicted that they can be identified or recovered when verbs display person marking since in MA, unlike other Arabic dialects, agreement is obligatory regardless of word order variation (Benmamoun 2000). Overt pronouns are used in pleonastic and emphatic contexts as well as in copulative sentences, since MA lacks the present-tense copular form.

MA, like other Arabic dialects and MSA, has relatively free canonical word order. It is predominantly VSO, though SVO is a possible alternative basic word order. VOS is a marked word order used in specific pragmatic contexts where the subject conveys new information, that is generally undetermined, or contrast (this meaning can be expressed by a Determiner Phrase, DP, or an overt pronoun). The following examples, from Kortobi (2002: 218), reflect these contrasts (note that the determined DP in (c) renders the sentence ungrammatical):

- (6) A. I-wəld qra ktab.
 The-boy read book
 ‘The boy read a book’
 b. qra I-wəldktab.
 read the-boy book
 c. *qra ktab I-wəld.
 read book the-boy

As for the interpretative properties of pronouns in discourse, there is a lack of studies based on empirical findings that address this issue in MA and other Arabic dialects. Only a few studies have examined the topic in Egyptian Arabic, EA (Farghaly 1982 and Schulte-Nafeh 2004). Looking at subordinate contexts, such as those analyzed in the present research study, Farghaly (1982) proposed that third person overt pronouns convey contrast and emphasis functions; he also addressed the interpretation of overt pronouns in complex main-subordinate sentences and claimed that overt pronouns tend to be interpreted as referring to the preceding subject as antecedent whereas null pronouns tend to be interpreted as referring to the object (i.e. the closest NP). This seems counterintuitive and goes against the PAH, as null pronouns would signal topic

change whereas overt pronouns would express topic continuity. More recently, in a very detailed study based on both spoken data and acceptability judgments in different sentence types and person contexts, Schulte-Nafeh (2004) noticed that “the motivations to use an overt pronoun are not strong” (p. 161). It was found that there is a rather opposite role for overt pronouns in subordinate clauses in EA since they tend to express subject switch, particularly with ambiguous verbal predicates, while null pronouns convey topic or subject continuity (pp. 184-5). Returning to the current study of L1 MA, two native informants were asked to evaluate some main-subordinate sentences that contained a null or an overt pronoun and judged them in this same exact way. Consequently, an experiment was conducted to provide empirical data and to examine the existence of a relationship between pronouns and discourse functions in MA; in other words, we aimed to determine to what extent (if any) MA pronouns also fit into the patterns constrained by the PAH. The procedure and findings of this experiment are summarized later in section 4.

2.2. Studies on the acquisition of pronominal anaphora

Sorace and collaborators initiated the current growing body of research on the acquisition of pronominal anaphora. Based on intra-sentential contexts, their work focused in how Italian [null-subject language]-English [non-null-subject language] bilinguals and L2 learners managed this phenomenon in Italian according to Carminati’s (2002) PAH. Among their work, the most influential and widely cited in the bilingual acquisition literature is perhaps Sorace et al. (2009). The main objective of this study was to assess the acceptability of Italian (null and overt) and English pronominal subjects in [\pm topic-shift] contexts. The performance of English-Italian and Spanish-Italian children aged 6-7 and 8-10 was compared to that observed among age-matched monolingual children and monolingual adults. The authors considered the potential impact of language exposure and, consequently, two subgroups were included: 1) English-Italian bilinguals living in Italy and 2) English-Italian bilinguals living in the UK. An acceptability judgement task that followed a short video clip was devised. The experiment dealt with two conditions each having two levels: type of pronoun (null vs. overt) and discourse function (+topic-shift vs. –topic-shift). For Italian, the patterns of results yielded more pragmatically inappropriate overt subject pronouns among younger monolingual and bilingual children than among older monolingual children and adults.

Moreover, in line with previous findings (Montrul & Rodríguez Louro 2006 and Rothman 2009), the trouble experienced by bilingual children was not solely restricted to the interpretation of overt pronouns. The results showed that bilingual children also accepted more null subject pronouns in [+topic-shift] than monolingual Italian children, although they committed proportionally more errors involving redundancy than ambiguity. In addition, 6-7 old English-Italian bilinguals living in the UK over-accepted significantly more redundant overt subject pronouns in [-topic-shift] than the rest of child groups, while in the 8-10 age group it was the Spanish-Italian bilingual group that performed less accurately than all other groups of children. The fact that the overacceptance of overt pronouns increases with age in Spanish-Italian bilinguals may be pointing to a high sensitiveness to Spanish pronoun interpretation, since, as shown by previous work, the scope of the overt pronoun in Spanish seems to be wider than in Italian. The overuse of overt pronouns in bilingual children has also been attested in Dutch-Italian bilinguals (Pinto 2006), German-Italian bilinguals (Müller, Kupisch, Schmitz & Cantone 2006), English-Italian bilinguals (Serratrice, Sorace & Paoli 2004; Serratrice 2007), Spanish-English bilinguals (Paradis & Navarro 2003), and Turkish-English bilinguals (Haznedar 2006).

As far as L2 is concerned, many studies also reported a notable proportion of pragmatically infelicitous overt subject pronoun (Belletti et al. 2007; Liceras 1988; Lozano 2006; Sorace & Filiaci 2006), and null subject pronouns (Keating, VanPatten & Jegerski 2011; Lafond, Hayes & Bhatt 2001; Montrul 2004; Montrul & Rodriguez Louro 2006; Rothman 2009).

Rothman (2009) examined the syntax-before-discourse hypothesis through null vs. overt subject pronoun interpretation in L2 Spanish. Spanish learners at intermediate and advanced levels and two groups of native English and Spanish speakers were analyzed. The results showed, in line with Montrul & Rodriguez Louro (2006), but against Sorace & Filiaci's (2006) predictions, an overuse of both overt and null subject pronouns.

Also, more recently, Jegerski et al. (2011) have attempted to ascertain whether cross-linguistic influence is a major factor in explaining divergences in anaphora resolution between L2 and native speakers of Spanish. Offline interpretation of ambiguous subject pronouns in temporal intra-sentential contexts was examined in English and Spanish. Two experimental groups were analyzed: intermediate and advanced English learners of Spanish. The results revealed that both groups failed to

show native-like PAH strategy when interpreting Spanish sentences; on the contrary, they resorted to English discourse structure as a cue when interpreting ambiguous pronouns in Spanish. As the authors point out, this cross-linguistic influence does not seem to be unique among English dominant speakers; it is supposed to be rather universal strategy and, thus, applies to any language, be it pro-drop or non-pro-drop.

Finally, a reference must be made to a recent study on the acquisition of null subjects in L2 Arabic by Spanish and English speakers conducted by Alhawary (2007, 2009). Their results show that L2 learners produce subjectless sentences early on in the acquisition process, that English speakers are able to switch the value from a non-null subject language to a null-subject one and that there is some evidence of positive transfer according to the performance of Spanish learners.

In sum, from the previous literature it seems that the overuse and overacceptance of overt pronouns in [–topic shift] contexts, i.e. in contexts in which they take a subject as their antecedent, is a very common strategy among bilingual and L2 speakers but not among natives. On the contrary, the null pronoun’s occurrence appears to be consistent across different type of speakers and learners and different language pairs given that they are rarely linked to [+topic shift] contexts. The present research aims to contribute to a better understanding of these issues through the study of two null subject languages –L1 Moroccan Arabic / L2 Spanish, an unexplored linguistic combination so far.

3. Research questions

In this study, our goal is to better understand the distinction between null and overt pronouns in ambiguous intra-sentential contexts in bilingual Spanish and in the acquisition of L2 Spanish by MA speakers, whose L1 (as it will be examined in section 4) also distinguish between null and overt pronouns. In particular, we want to investigate the following questions:

1. Is the PAH operative in non-biased ambiguous intra-sentential contexts in Spanish? Does sentence clause order have an effect on the resolution of pronouns?
2. Do MA speakers of Spanish know the differences in the interpretative properties of null and overt third person subject pronouns in Spanish?

3. Is there any cross-linguistic influence with respect to this issue due to cross-linguistic microvariation?
4. Do MA-Spanish bilinguals (i.e. early sequential bilinguals) differ from L2 learners in their mastery of these properties? Furthermore, have the different amounts of language exposure that bilinguals and L2 learners receive had an impact on their knowledge of null and overt pronouns?
5. Additionally, in order to perform an effective comparison and discover potential cross-linguistic effects, what are the main factors that affect pronoun resolution preferences in ambiguous intra-sentential contexts in MA?

We first address question 5 and report the corresponding results for MA in the next section.

4. Experiment 1: Anaphora resolution pre-test in Moroccan Arabic

4.1. Design and procedure

To determine how pronominal anaphora resolution works in ambiguous contexts in MA, we recruited 45 students from the *Instituto Cervantes* of Marrakech, native speakers of MA who did not participate in the main study reported on section 5. The participants completed a sentence interpretation task in order to ascertain the antecedent preferences of subject pronouns in two sentence discourses in MA.

The task was administered orally in order to avoid artificiality. MA language is rarely written; it is associated with spoken registers because MSA, as well as French, is the language used in written, administrative and academic settings. The participants also completed a sociolinguistic background questionnaire. The mean age was 25.7 (range 17-42). All had a minimum of a secondary level education; some of them were studying at the university and the rest were workers and professionals. The students reported MA as being their familial language, but also reported knowledge of MSA, French and some Spanish (they were recruited from the beginners' levels in the *Instituto*, corresponding to A.2 level of the Common European Framework of Reference for Languages (CEFR). A number of them also reported (some) knowledge of English.

A two-option forced-choice preference task was designed. The participants heard two-sentence ambiguous discourses. The first sentence contained a transitive verb

with two characters, designated by proper names of the same gender, in subject and object position; this sentence was followed by a second sentence containing a null or an overt pronoun in subject position that could refer to one of the two previous referents. Participants were asked to answer who was the ‘doer’ of the action expressed in the second sentence, thus choosing between competing antecedents in subject or object position; recall that, given that the antecedents were of the same gender, the (null or overt) pronoun was fully ambiguous. Although some sentences may sound rather strange or unnatural, we tried to lessen the influence of semantic and discourse cues –as these play an important role during anaphoric inferencing in real discourse- by keeping contexts completely ambiguous in order to determine if pronouns have clearly identifiable biases.

In total there were 50 items, which included 20 experimental items (5 items per condition) and 30 fillers. Two experimental conditions with two levels each were tested: sentence order (main-subordinate vs. subordinate-main) and type of pronoun (null vs. overt). The sentence was followed by a comprehension question that asked for the preferred antecedent for the pronoun. Each item was recorded by a male native speaker of MA, who produced them with neutral intonation and in loud, clear voice. An example of each condition is given in (7):

- (7) a. Maria faɣɣt hanan melli tzewɣt. ɟɟkun li tzewɣ? A. hanan B. Maria
 Maria surprised-3s-F hanan when *pro* married-3s-F Who ASP married? A. hanan B. Maria
 ‘Maria surprised hanan when she was getting married. Who was getting married? A. hanan B. Maria’
- b. Hifjam ɣallem ɣabdelwahed melli howa tɣafa men l-ksida.
 Hifjam taught -3s-M ɣabdelwahed when he ASP recovered-3s-M the accident
 ɟɟkun li tɣafa men l-ksida? A. ɣabdelwahed B. Hifjam
 Who ASP recovered the accident? A. ɣabdelwahed B. Hifjam
 ‘Hifjam taught ɣabdelwahed when he was recovered from the accident. Who was recovered from the accident? A. ɣabdelwahed B. Hifjam’
- c. Melli Ihsan ddat vizlan, bdat katebki. ɟɟkun li bda kibki?
 When Ihsan picked up-3s-F vizlan, *pro* started-3s-F crying Who ASP started crying?
 A. Ihsan B. vizlan
 A. Ihsan B. vizlan

‘When Ihsan picked up vizlan, she started crying. Who started crying? A. Ihsan B. vizlan’

- d. Melli Fatiha gatset Nadia, hiya bdat katedhak. ¿kún li bda kidhak?
 When Fatiha interrupted-3s-F Nadia, she started-3s-F laughing Who ASP started laughing?
 A. Nadia B. Fatiha
 A. Nadia B. Fatiha

‘When Fatiha interrupted Nadia, she started laughing. Who started laughing? A. Nadia B. Fatiha’

4.2. Main findings

Proportions of responses were evaluated. Comparing mean scores (see Figures 1 and 2), different proportions of responses were attested depending on the type of pronoun.

Subjects were more frequently chosen as antecedents for null pronouns. This preference was even more pronounced in the subordinate-main order (66.89% subordinate-main vs. 58.37% main-subordinate). As for overt pronouns, subjects and objects were selected as antecedents, regardless of sentence order (44.33% of subjects in main-subordinate vs. 46.67% of subjects in subordinate-main).

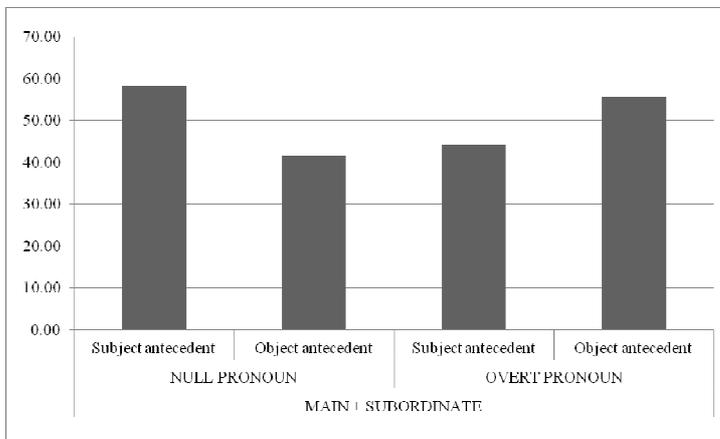


Figure 1. Percentage of antecedent preferences of pronouns in MA (native speakers); main-subordinate order

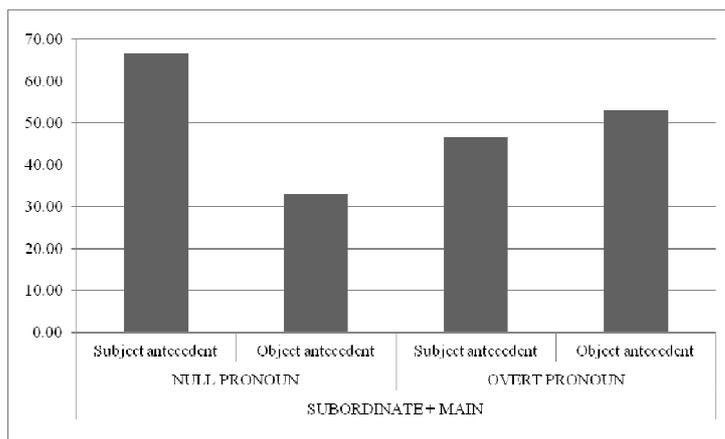


Figure 2. Percentage of antecedent preferences of pronouns in MA (native speakers); subordinate-main order

The data were submitted to a 2 x 2 repeated measures ANOVA with type of pronoun (null vs. overt) × sentence order (main-subordinate vs. subordinate-main) as within-subject factors on the basis of mean proportions. The analysis yielded a main effect of type of pronoun, $F(1, 44) = 18.983, p = .000$, no main effect of sentence order, and no interaction between the two factors. This reflects the stronger preference to associate null pronouns with subject antecedents in both sentence orders though there were a number of them that referred back to objects. On the other hand, overt pronouns showed no significant preferences since they were assigned freely to either subject or object antecedents. In short, these results reveal that the interpretation of null pronouns is highly biased toward the subject, while overt pronouns display a more varied pattern.

To further confirm these results, paired-samples t-tests –one for each type of pronoun– were conducted on the proportions to identify differences between pronouns regarding antecedent preferences for the two orders; the results were significant for null pronouns ($t(44) = 2.369; p = .022; t(44) = 5.135; p = .000$) but not for overt pronouns.

These results reveal that the interpretation strategy for null and overt pronouns in MA intra-sentential ambiguous contexts partially fits in with Carminati’s PAH in that a different behaviour has clearly been discovered between the two pronouns: null pronouns show a strong tendency towards topic continuity since they select subjects as antecedents whereas overt pronouns remain neutral about topic continuity or change and select antecedents by chance. Moreover, the order of presentation of clauses does not influence the choice of antecedent as suggested by Carminati (2002) but in contrast to Filiaci (2011). However, although interpretive behaviour regarding null pronouns in

MA does not differ from other null subject languages that have been examined within the framework of the PAH (Italian, Spanish, etc.), overt pronouns are more unpredictable. The pattern observed for MA overt pronouns is similar to that observed in Spanish by Alonso Ovalle et al. (2002) and Filiaci (2011) but differs substantially from the results observed by Carminati for Italian; this leads us to conclude that the PAH can only describe a portion of the MA data, as in the case of Spanish. Having obtained this information, it is easier to address the role of transfer of L1 MA to L2 Spanish.

5. Experiment 2: The interpretation of subject pronouns in bilingual and L2 Spanish

5.1. Participants

Twenty-six early sequential MA-Spanish bilinguals and 26 MA L2 learners of Spanish participated in the experiment, together with a control group of 34 native speakers of Spanish. All the participants participated voluntarily. They were asked to fill out a language background questionnaire in which they provided linguistic and sociolinguistic background information.

The sequential MA-Spanish bilinguals were teenagers recruited from secondary schools (from 7th to 10th grade). They had early contact with Spanish: some of them were born in Spain and others started the contact before age 6 in their pre-school period. Their familial language is MA and the environmental language is Spanish, together with Catalan. All of them report having a good knowledge of their first language as well as Spanish (see Table 1). The participants of this group were selected from a large pool of bilinguals who produced two texts in oral and written modalities. A judge specialized in the evaluation of Spanish as a foreign language assessed the two production tasks. Only those with a Spanish proficiency level of B2 or higher on the CEFR scale (independent user: vantage or upper intermediate level) were selected.

Table 1. Early sequential MA-Spanish bilinguals' sociolinguistic background

<i>Speakers information</i>	<i>Mean</i>	<i>Range</i>	<i>SD</i>
Age (years)	13.88	12-17	1.39
Arrival age (years)	1.19	0-5.5	2.16
Self-reported Spanish level (out of 100)	91	75-100	0.12
Self-reported MA level (out of 100)	82	50-100	0.17
Average daily use of Spanish (out of 100)	75	58-91	0.09

The L2 learners were students of Spanish at the *Instituto Cervantes* of Marrakech (Morocco) (see table 2). Their first language is MA and all participants were placed in general Spanish courses for a B2 level. As we mentioned earlier, Morocco is a multilingual country so our learners had knowledge of various languages: in addition to French, MSA, Spanish and MA (their first language), they also report different levels of knowledge of other languages such as English, among others. Importantly, none of them reported high proficiency in a different null subject language (besides MA and Spanish).

Table 2. L2 learners' sociolinguistic background

Age (mean in years)	28.08
Onset age of acquisition of Spanish (mean in years)	24.19
Language(s) spoken at home in early childhood	MA
Language of schooling at elementary level	MSA-French
Language of schooling in middle and high school	MSA-French-English
Travelled to Spanish-speaking country	Yes (34.61%)
Length of stay in Spanish-speaking country	1 week-1 month

The control group was formed by 34 university students from Barcelona (average age 22.9; range 20-25), native speakers of Spanish; they all had knowledge of Catalan, a language that share many similarities with Spanish. In fact, Spanish and Catalan have similar discourse realization of pronouns because of the closeness of the two languages; studies on the comprehension and production of null and overt pronouns in Catalan confirm this closeness and do not reveal a very different picture from that of Spanish (Mayol & Clarck 2010; Bel, Perera & Salas 2010). In addition, according to de Prada Pérez (2009) contact language contexts favor convergent outcomes. Therefore, these results do not seem to suggest that the knowledge of Catalan greatly interferes with the knowledge of Spanish in this specific domain.

5.2 Procedure and materials

An acceptability judgment task (AJT) was completed by all participants. The AJT was an untimed pencil-and-paper task in which each token consisted of two discourse sentence items. The first of the pair contained two characters of the same gender

introduced by proper names while the second contained either a null or overt pronoun in subject position. Each item was followed by a third sentence continuation conveying a possible interpretation favoring either the character in subject or object position. The participants were asked to judge the plausibility of the continuation according to a four-value Likert scale, ranging from 1 (totally unacceptable) to 4 (perfectly acceptable).

The experimental sentences were completely ambiguous and there were no semantic clues that helped to disambiguate the pronoun, a feature that distinguishes our work from previous research reported above. To ensure this, the first sentence verbs were selected taking into account the implicit causality of transitive interpersonal verbs in Spanish according to Goikoetxea, Pascual & Hacha's (2008) normative study. In this way we avoid obtaining results with a preference toward causally implicated referents. We selected 16 verbs showing a neutral or almost neutral bias towards either the subject or the object. The list of verbs is shown in Table 3.

Table 3. Implicit causality of experimental verbs (bias towards subject in percentages; from Goikoetxea et al. 2008)

Verb	Bias towards subject	Verb	Bias towards subject
<i>Abandonar</i> (to abandon)	48.1	<i>Investigar</i> (to investigate)	47.1
<i>Aguantar</i> (to withstand)	52.0	<i>Recoger</i> (to pick up)	37.5
<i>Asustar</i> (to scare)	54.7	<i>Saludar</i> (to greet)	54.3
<i>Desmentir</i> (to deny)	58.3	<i>Seguir</i> (to follow)	51.1
<i>Evitar</i> (to avoid)	59.3	<i>Servir</i> (to serve)	39.2
<i>Formar</i> (to prepare)	56.9	<i>Sorprender</i> (to surprise)	52.5
<i>Hablar</i> (to speak)	62.3	<i>Soportar</i> (to stand)	52.9
<i>Interrumpir</i> (to interrupt)	53.7	<i>Ver</i> (to see)	46.9

Three conditions, with two levels each, were tested: type of pronoun (null vs. overt), position of the antecedent (subject vs. object) and order of sentence (main-subordinate sentence vs. subordinate-main sentence). Sixty-four experimental items were constructed (8 for each condition level); they were afterwards combined with 80 fillers. The characters' gender was also balanced across conditions. The subordinate clause was introduced by a temporal conjunction (half by *cuando*, 'when', and half by *mientras*, 'while'). The resulting items were counterbalanced and randomized across two lists. Participants were randomly assigned either to list 1 or list 2. Table 4 provides an example of each experimental condition.

Table 4. Sample set of stimulus items

Main-subordinate clause. Null pronoun. Subject antecedent	<i>Iker evita a Iván cuando tiene problemas. Iker tiene problemas.</i> 'Iker avoids Ivan when pro has problems. Iker has problems'
Main-subordinate clause. Null pronoun. Object antecedent	<i>Ángel asustó a Héctor mientras entraba en la habitación. Héctor entraba en la habitación.</i> 'Angel scared Hector while pro came in the room. Hector came in the room'
Main-subordinate clause. Overt pronoun. Subject antecedent	<i>Fernando investigó a Antonio cuando él trabajaba para el gobierno. Fernando trabajaba para el gobierno.</i> 'Fernando investigated Antonio when he worked for the government. Fernando worked for the government'
Main-subordinate clause. Overt pronoun. Object antecedent	<i>Sebastián sorprendió a Marcos mientras él se casaba. Marcos se casaba.</i> 'Sebastian surprised Marcos while he was getting married. Marcos was getting married'
Subordinate-main clause. Null pronoun. Subject antecedent	<i>Mientras José interrumpía a Miguel, se empezó a reír. José se empezó a reír.</i> 'While José interrupted Miguel, pro started laughing. José started laughing'
Subordinate-main clause. Null pronoun. Object antecedent	<i>Cuando Sheila vio a Natalia, estaba nerviosa. Natalia estaba nerviosa.</i> 'When Sheila saw Natalia, pro was nervous. Natalia was nervous'
Subordinate-main clause. Overt pronoun. Subject antecedent	<i>Mientras Leo servía a Lorenzo, él tiró la bebida. Leo tiró la bebida.</i> 'While Leo was serving Lorenzo, he threw the drink. Leo threw the drink'
Subordinate-main clause. Overt pronoun. Object antecedent	<i>Mientras Susana seguía a Sandra, ella se encontró una moneda. Sandra se encontró una moneda.</i> 'While Susana was following Sandra, she found a coin. Sandra found a coin'

5.3. Results

In this section we report the general results of our study. We first describe the results of the whole set of participants and then we refer separately to our control group. Finally, comparisons between groups are reported.

Table 5 shows mean rates and standard deviations for the three groups analysed (natives, bilinguals, L2 learners) and the three conditions tested (order, type of pronoun and antecedent choice).

Table 5. Mean rates (and SDs) in the acceptability preference of pronouns in Spanish (maximum score = 4)

Group	Main-subordinate			
	Null pronoun		Overt pronoun	
	<i>Subject Antecedent</i>	<i>Object Antecedent</i>	<i>Subject Antecedent</i>	<i>Object Antecedent</i>
Spanish native (control)	2.75 (0.28)	2.96 (0.46)	2.14 (0.42)	3.03 (0.47)
Early sequential bilinguals	2.85 (0.30)	3.00 (0.50)	2.61 (0.44)	3.03 (0.61)
Spanish L2 learners	2.74 (0.38)	2.54 (0.48)	2.16 (0.48)	2.81 (0.63)

	Subordinate-main			
	Null pronoun		Overt pronoun	
	<i>Subject</i>	<i>Object</i>	<i>Subject</i>	<i>Object</i>
	<i>Antecedent</i>	<i>Antecedent</i>	<i>Antecedent</i>	<i>Antecedent</i>
Spanish native (control)	3.46 (0.41)	2.17 (0.49)	2.40 (0.43)	3.22 (0.46)
Early sequential bilinguals	3.25 (0.53)	2.46 (0.75)	2.74 (0.72)	2.78 (0.49)
Spanish L2 learners	2.64 (0.70)	2.39 (0.39)	2.40 (0.69)	2.63 (0.74)

Starting with main-subordinate sentence order, Spanish native speaker controls rated subject and object antecedents as equally probable; from Table 5, a near neutral difference of -0.21 between the choice of an antecedent in subject and object position arises, with a very subtle tendency towards objects as the negative value indicates (the differences are calculated subtracting the mean rate of object and subject antecedent columns). As for overt pronouns, the difference between the two options is almost 1 negative bias point (-0.89), which reveals a non-trivial preference to refer back to an object antecedent. Turning to subordinate-main sentence order, the results are skewed in the opposite direction: the native speakers' interpretation of null pronouns is clearly biased toward referents in the preceding subject position as this strong difference shows (more than 1 positive point, 1.29, the most pronounced discrepancy) and L2 speakers, once again, show a predisposition to assign overt pronouns object antecedents (a negative difference of -0.82 , similarly to what has been attested for the opposite clause order).

The two experimental groups behave in similar ways: the patterns for bilinguals and L2 learners generally follow those of native speakers described above; the most striking discrepancies between the experimental groups and the control group are attested in the case of overt pronouns in subordinate-main clause order: while controls show a clear bias towards object antecedents (nearly a -0.80 distinction), the two experimental groups remain rather neutral in their antecedent choices in this specific condition (a mere -0.08 distinction for bilinguals and -0.23 for L2 speakers).

We performed a repeated measure ANOVA on the overall $2 \times 2 \times 2 \times 3$ design with sentence order (main-subordinate vs. subordinate-main) \times type of pronoun (null pronoun vs. overt pronoun) \times antecedent choice (subject vs. object) and group (natives, bilinguals and L2 learners) as between-subjects factor. The analyses gave a significant main effect of pronoun ($F(1, 40) = 7.157, p = .011$) and the corresponding interactions: order*pronoun $F(1, 40) = 4.430, p = .042$; order*antecedent $F(1, 40) = 29.137, p = .000$; pronoun*antecedent $F(1, 40) = 74.430, p = .000$; pronoun*antecedent*group $F(1, 40) =$

7.374, $p = .002$; order*pronoun*antecedent $F(1, 40) = 12.867, p = .001$;
 order*pronoun*antecedent*group $F(1, 40) = 12.224, p = .000$. No significant main
 effect for antecedent alone was detected, nor was there an effect found for order. Finally,
 the effect of group was not found to be significant. The main effect of pronoun confirms
 the previously reported differentiation of behaviour between null and overt pronouns.

To further interpret the main effects and the interactions found, we conducted
 separate analyses. First, a repeated measures ANOVA was conducted for our native
 control group (see Figures 3 and 4). The analysis yielded a main effect of pronoun ($F(1,$
 $16) = 7.900, p = .013$); no main effect of sentence order or antecedent was found. There
 were also significant interactions between order*antecedent ($F(1, 16) = 82.105, p$
 $= .000$), pronoun*antecedent ($F(1, 16) = 64.514, p = .000$) and
 pronoun*antecedent*order ($F(1, 16) = 33.008, p = .000$).

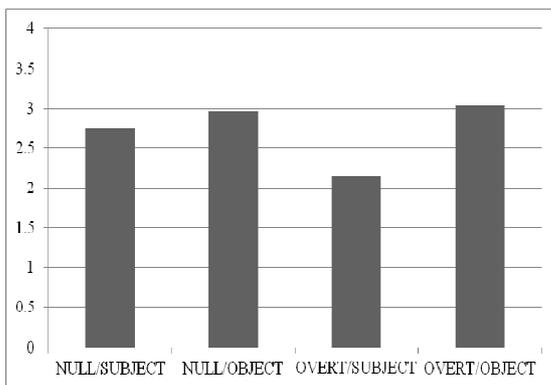


Figure 3. Antecedent preferences for
 main-subordinate order (native speakers)

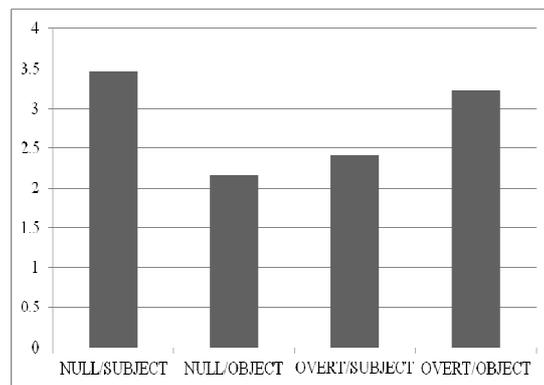


Figure 4. Antecedent preferences for
 subordinate-main order (native speakers)

Independent analyses inside each order revealed an effect both for pronoun ($F(1, 16) =$
 $10.108, p = .006$) and antecedent ($F(1, 16) = 32.859, p = .000$) in main-subordinate
 order, whereas only antecedent ($F(1, 16) = 7.095, p = .017$) –as well as the interaction
 between antecedent and pronoun ($F(1, 16) = 65.935, p = .000$)- was found to be
 significant in subordinate-main order. As the results in Figure 3 and 4 reveal, overt
 pronouns show a constant pattern across different sentence orders while null pronouns
 present a different behaviour depending on sentence order: only a null subject pronoun
 in a main clause that follows the subordinate clause seems to straightforwardly fit in the
 PAH as proposed for null subject languages, i.e. null pronouns display a strong bias
 towards subject antecedents only in this order.

To confirm these findings in detail, we calculated paired t-tests for null and overt pronoun antecedent preferences in the two different orders separately. While in main-subordinate order the results were significant only for overt pronouns ($t(16) = -6.735$; $p = .000$), in subordinate-main order the results were significant for both null pronouns ($t(16) = 9.488$; $p = .000$) and overt pronouns ($t(16) = -4.616$; $p = .000$).

In a nutshell, these results indicate that native speakers of Spanish display a strong preference toward associating overt pronouns with object antecedents regardless of sentence order. On the other hand, null pronouns only show a preference pattern when the subordinate clause precedes the main clause. Surprisingly, this is not in accordance with previous findings for Spanish (Alonso-Ovalle et al. 2002; Filiaci 2011). We can attribute this divergence to the different nature of our task: recall that our participants are not forced to make a choice as in Alonso Ovalle et al.'s experiment: they are asked to judge how probable both pronouns are in different syntactic but semantically neutral contexts. Moreover, in their task the experimental sentences were not linked by a subordinate conjunction; instead they were juxtaposed.

Once the native speaker results were obtained, two one-way between-groups ANOVA, one for each order (main-subordinate vs. subordinate-main), were run on the data to compare the group's mean scores for pronoun and antecedent conditions. For main-subordinate order the results revealed a main effect of group for null pronouns referring to an element in object position ($F(2, 40) = 3.811$, $p = .031$) and for overt pronouns referring to an element in subject position ($F(2, 40) = 4.907$, $p = .012$). Post hoc Tukey tests confirmed that the bilingual group significantly differed from the L2 learners group in the null pronoun-object antecedent condition ($p = .049$) and in the overt pronoun-subject antecedent condition ($p = .036$). This last condition was found to be also significant between bilinguals and natives ($p = .017$). In Figure 5 bilinguals' higher mean ratings in relation with L2 learners and native speakers demonstrate these divergences.

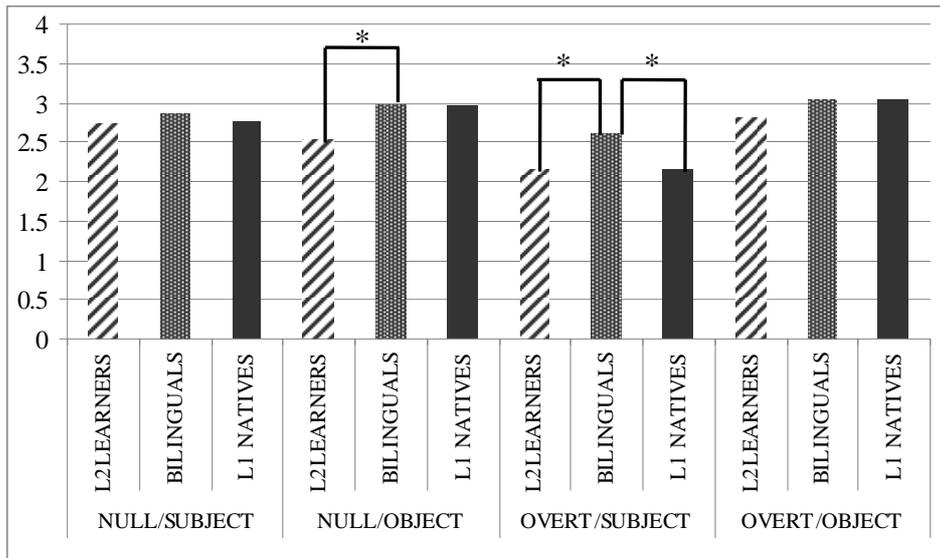


Figure 5. Antecedent preferences for main-subordinate order

On the other hand, in subordinate-main order a main effect of group was found in the two remaining conditions. Significant results were found for null pronouns referring to subject antecedents ($F(2, 40) = 8.628, p = .001$) and for overt pronouns referring to object antecedents ($F(2, 40) = 4.417, p = .018$). Post hoc Tukey tests confirmed that L2 learners differed from both the natives ($p = .001$) and the bilinguals ($p = .019$) in the null pronoun-subject antecedent condition and from natives in the overt-pronoun-object antecedent condition ($p = .020$) (see Figure 6).

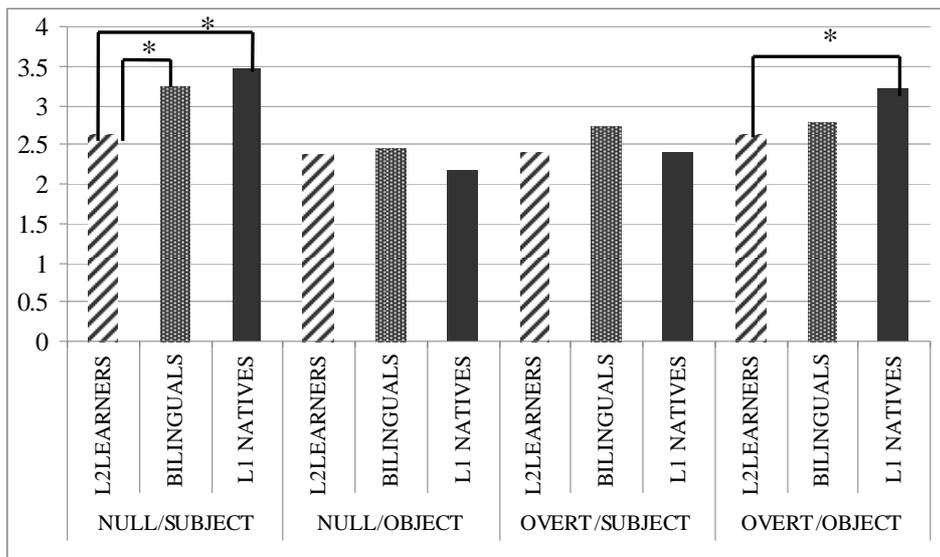


Figure 6. Antecedent preferences for subordinate-main order

In summary, the effect of pronoun type is significant for all groups; this effect is stronger in subordinate-main clause order where null and overt pronouns display a marked division of labour. In this specific clause order, some differences have been found between the experimental and control groups. Finally, some discrepancies have also been attested between bilinguals and L2 speakers in both clause orders but in complementary conditions: in the former case, null pronouns refer back to object antecedents and overt pronouns to subject antecedents in main-subordinate order and, in the latter case, null pronouns refer back to subjects and overt pronouns to objects in subordinate-main order.

6. Discussion and conclusions

We first address research question 1 concerning the results of our native speakers, who offer a picture of the factors governing the interpretation of pronouns in totally ambiguous contexts in Spanish. When native speakers were asked to judge the plausibility of the continuation given for a (null or overt) pronoun, their average answer rating displayed a clearer pattern when the sentence order was subordinate-main. In this case, their answers were remarkably biased as they interpreted null pronouns as referring to the subject of the previous subordinate sentence and overt pronouns to the object. These results are congruent with the PAH. Nevertheless, the main predictions of the PAH for Spanish focused on the opposite sentence order (Filiaci 2011) or on two main juxtaposed sentences (Alonso-Ovalle et al. 2002). However, our results for main-subordinate order do not straightforwardly fit into the PAH approach. Let us try to shed some light on these findings.

Overall, the strongest preferences we found are the following. On the one extreme, null pronouns in subordinate-main order are clearly interpreted as referring to subjects. On the other extreme, overt pronouns in main-subordinate order show a visible tendency to be linked to referents in object position. In between these two poles, two intermediate patterns are attested: a slight or almost neutral bias in the null pronoun-subject antecedent condition in main-subordinate order, and a subtle bias in the overt pronoun-object antecedent condition in subordinate-main order.

These findings point to a non categorical division between null and overt pronouns. As reported in the literature review section, the pronominal choices that null subject languages display are far from consistent across languages. This is particularly

true as far as overt pronouns are concerned since a great variability has been observed. Furthermore, the more contextual conditions are included, the more variability seems to occur. Carminati (2002) argued in similar fashion. In discussing different degrees of flexibility in pronoun patterns, mainly in ambiguous contexts, she suggested that the flexible behavior of overt pronouns could be better explained by adopting a continuum in which a certain degree of variability in the uses of the overt pronouns must be allowed.

One salient contrast between our sentence stimuli and the ones used in the studies reported is that we have carefully controlled the implicit causality of the verb in order to ensure that the (null or overt) pronoun is assessed in a completely ambiguous environment. This could arguably explain some discrepancies among the experiments. Carminati for Italian only tested globally ambiguous complex sentences in the main-subordinate order. For the opposite order (subordinate-main), the sentences were constructed allowing semantic-pragmatic disambiguation so that the lack of global ambiguity can serve to explain the division attested between the two pronouns. On the contrary, when ambiguity is at play at all levels (as is the case in our experiment) the distinctions may be attenuated leading to non-categorical gradient patterns.

Likewise, our results differ from Jegerski et al. (2011) and Alonso-Ovalle et al. (2002). In the former study complex subordinate sentences with preposed main clauses were tested and, in the latter, juxtaposed inter-sentential utterances were evaluated. Even though all these studies deal with ambiguous anaphora, none of them controlled for implicit causality of verbs. This could be a source of the discrepancies found in our experimental results.

Having maintained ambiguity constant through all conditions, one could ask why null pronouns display the most solid preference when the subordinate clause precedes the main clause showing a clear association with the subject antecedent (see Figure 4). From a processing point of view, it has been widely shown that the speaker has access to the structural representation of a sentence and that the processor is sensitive to main and subordinate clause order. The classic work of Bever & Townsend (1979) and Garnham, Oakhill & Cain (1998) supported the idea of a basic processing difference between main and subordinate clauses. Given that the computation of a preposed subordinate clause consumes many cognitive resources, when in the following main clause a null pronoun occupies the subject position, the same reference reading is favored because it is the neutral and less demanding reading; hence the null pronoun is

linked to the preceding subject. As for overt pronouns, due to the large resources employed in computing a first subordinate clause, when the overt pronoun comes the information remains active and consequently the two preceding referents are equally potential candidates to be recovered by the overt pronoun. Thus the interpretation of the overt pronoun is more likely due to chance albeit there is some bias to refer back to object antecedents, in accordance with the general trend for overt pronouns.

Finally, a note on the nature of the task should be made. A forced choice task was used in the majority of offline experiments reported in the literature. Obviously, this task is simpler for participants than an acceptability judgment task. What is more, an AJT may obscure the results and lead to wider variability in answers and often make them more difficult to interpret; nevertheless judging all options by means of a numerical scale can capture finer-grained contrasts and help uncover subtle distinctions: it is possible that the participants considered interpretations that would not be considered otherwise. Thus, the interpretive optionality reflected in our results may strongly depend on the task and on our effort to hold all factors as ambiguous as possible. For these reasons we believe that our experimental proposal complements previous findings in Spanish.

While we have discussed anaphora resolution in Spanish, we have not yet addressed the pronominal choices in native Moroccan Arabic (research question 5). The pre-test on anaphora resolution conducted for MA provided new empirical data and revealed that the PAH is only partially applicable in this language. Null pronouns show a strong tendency towards topic continuity since they prefer to establish co-reference with elements in subject position regardless of sentence order. These results confirm a relatively steady interpretative behavior with regard to null pronouns among the different null subject languages that have been approached from the perspective of the PAH (Italian, Spanish and Catalan). On the other hand, overt pronouns show a more unpredictable behavior since they were assigned to either subject or object antecedents. Thus, the pattern observed for MA is more in line with Alonso-Ovalle et al. (2002) and Filiaci's (2011) findings for Spanish, as well as with our results for Spanish, than those reported by Carminati (2002), for Italian, and Mayol & Clarck (2010) for Catalan, which showed evidence of a division of labor between null and overt pronouns. Nevertheless, if we observe preferences by clause order, the results for MA do not entirely align with our findings for Spanish: while MA shows a parallel pattern in both clause orders, Spanish only shows a clear preference pattern in subordinate-main clause

order and particularly for null pronouns. It is worth remembering that the two tasks differ: a forced-choice task for MA and an AJT for Spanish. Summing up, the preference of null pronouns in same-reference intra-sentential contexts seems to be a robust and steady phenomenon among different null-subject languages, even typologically distinct (Romance and Arabic), whereas overt pronouns are more unpredictable.

In light of the IH (Sorace 2011), pronominal anaphora resolution, as a phenomenon at the syntax-discourse interface, is a vulnerable domain that could also be affected by cross-linguistic influence according to the proposal by Hulk and Muller (2000), as there is structural overlap in the two languages involved. Given that pronoun preferences seem to work in similar directions in MA and Spanish (with the mentioned exception of null pronouns in main-subordinate clause order), one would expect a positive transfer, thus reinforcing the favorite options of the target language.

We turn now to research question 2. Based on the outcomes identified above for our control group, how do our bilingual speakers and L2 learners perform when solving ambiguous pronouns in Spanish?

As reported in section 5.3, no differences among groups were attested. The lack of significant differences suggests that both bilinguals and L2 learners have attained native-like processing strategies when solving anaphora in Spanish. Nevertheless, some discrepancies are found in some conditions but this is not strange when we remembered that some residual indeterminacy has been observed even in bilinguals and in near-natives when interpreting pronominal forms (Sorace & Filiaci 2006; Sorace et al. 2009, among others). To be more specific, the clearest division of labor between null pronouns (selecting a subject antecedent) and overt pronouns (selecting an object antecedent) has been observed in subordinate-main order. And it is precisely here where the experimental groups (early bilinguals and L2 learners) differ from native controls. While bilinguals seem to have discovered the reported associations, L2 learners do not seem to show in-depth pragmatic knowledge of the properties that regulate the use of both null and overt pronouns. For the opposite clause order, main-subordinate, the three groups display similar profiles. Comparing the patterns between native MA and L2 Spanish in order to grasp a potential transfer effect, the L2 learners do not seem to take advantage of their first language: if they would have projected the choices of MA for null pronouns –the element that shows most consistent choices–, higher rates of acceptance should have been attested in L2 Spanish. Null pronouns in the subordinate-

main order are particularly striking and illuminating: null pronouns display the most extreme choice towards subject antecedents both in L1 MA (almost 70%; see Figure 2) and in L1 Spanish (3.5 mean rate out of 4; see Figure 6) but L2 learners behave differently from natives (see Figure 6); thus they do not seem to apply the L1 MA rules to L2 Spanish. Bilinguals, on the other hand, pattern typically with natives, except in the case of overt pronouns. We will return to this issue shortly.

As for research question 3, the difficulties that L2 learners seem to encounter in facing a linguistic domain where syntax and pragmatics converge are not new and have also been reported in the literature. For English learners of L2 Spanish, Keating et al. (2011) found that there was nearly free variation between null and overt pronouns in continuity of reference contexts. This could be explained by the residual indeterminacy in the linguistic phenomena at the interfaces shown by L2 learners or by cross-linguistic influence from L1. In our particular linguistic combination, as discussed in the previous paragraph, the impact of positive transfer is ruled out because learners seem not to benefit from microvariation. Consequently, the optionality in pronoun usage, manifested by a wide tolerance in the acceptance of different pronouns for different pragmatic roles, is best explained by the IH framework.

Nevertheless, to confirm the minor weight of cross-linguistic influence, evidence of Spanish learners whose L1 is not a null subject language should be tested. In this respect, Jegerski et al. (2011) discovered an English-like strategy in the acquisition of antecedent choices in temporal subordinated sentences in Spanish by English speakers but not in coordinate sentences. Similarly, Roberts, Gullberg & Indefrey (2008) detected patterns of L1 effects in offline anaphora resolution data but not in online data in the L2 Dutch of German and Turkish learners. These results, together with the results of the present research, seem to point to a possible effect of negative cross-linguistic transfer in interpreting pronouns, as seen for English-Spanish and Dutch-Turkish combinations, but not to a positive transfer as Spanish-Moroccan Arabic and Dutch-German combinations evidence. Sorace (2004) also points out that cross-linguistic influence seems to be unidirectional: from the less complex to the most complex grammar. As a partial conclusion, the role of L1 influence is still far from clear-cut and further research is needed in order to glimpse its scope.

Another important issue to highlight is the overuse of overt pronouns in [-topic shift] contexts detected in bilinguals in main-subordinate order. This finding has been broadly attested among bilinguals in previous literature (Sorace 2004; Serratrice 2007),

but goes against Rothman (2009) and Montrul & Rodriguez Louro (2006), who found that both null and overt pronouns were affected by overproduction/overacceptance in advanced developing grammars. No overacceptance of neither null nor overt pronouns was found for L2 learners in the present study. The question why overextension of overt pronouns especially affects bilinguals still remains an open question.

Next we will address research question 4: Is there an effect of the different amount of exposure on the acquisition of pronominal anaphora resolution in Spanish? Even though the between-subjects analysis did not detect significant differences, some specific differences appeared between sequential bilinguals and L2 learners in the interpretation of pronouns. Since they belong, as noted above, to similar levels of proficiency in Spanish, the discrepancies detected in some conditions might be attributed to different input exposure rates. It is known from previous research (Montrul 2008; Pires & Rothman 2009; Unsworth 2013, among others) that, one of the sources of variability outcomes in bilinguals relies on the quantity and quality of the language they are exposed to. Together with language proximity –a topic that will be addressed soon in this section–, the amount of exposure has been proposed as a facilitator, particularly for those linguistic domains at the syntax-pragmatic interface (Sorace 2011), as it is the case for the one studied here. The amount of exposure is clearly variable in our participants. Our bilingual teenagers are regularly engaged in casual and everyday conversations whereas L2 learners' Spanish practice is confined to the language classroom space and time; only a third of them have visited a Spanish-speaking country but only for an average period of one month.

This set of observations suggests that, like in the case of children (Shin & Cairns 2012), development has an impact on the acquisition of pronominal interpretation properties and that practice is crucial when learners are faced with complex form-function mappings that depend on a variety of factors that the speaker has to integrate together, even further when ambiguity is involved.

There is also another factor that differentiates our two experimental groups and can bring some light to the divergences observed. It is known that starting to learn an L2 at an earlier age, which correlates with earlier and more extensive exposure, leads to superior outcomes. This has often been used to argue in favor of the critical period hypothesis (see Bialystok 2001 for an overview). It is obvious that our groups differ considerably in this respect; recall that the mean age of onset for the L2 speakers sample is 24 years, clearly after whatever age is considered 'critical'.

Of course, it is impossible to identify the amount of input ‘exemplars’ needed for a successful acquisition. However, as pointed out above, if the appropriate use of pronouns is constrained by a number of complex features, then it appears reasonable to think that a notable frequency of occurrences will be necessary. What is more, it is well attested that overt third person pronouns are relatively infrequent in natural input whereas null pronouns, on the other hand, are numerous. The scarcity of pronouns in spontaneous data has been invoked to explain the delay in the L1 acquisition of overt pronouns (Shin & Cairns 2012). Thus, in the case of our L2 learners, the underrepresentation of a linguistic element whose acquisition is highly dependent on input practice must definitely have some cost. As a final note, it should be added that neither formal instruction nor instructional input address this issue explicitly.

Summing up our findings, we have given evidence that the interpretation of ambiguous pronouns in Spanish seems to be very sensitive to different contextual conditions particularly when the semantic and pragmatic contexts are unbiased in which case it is likely that all options remain opened to interpretation. The experimental design devised in the present piece of research provides a complementary perspective to the previous research on pronoun resolution in Spanish. We have also provided some empirical evidence that MA exhibits remarkable parallels with antecedent preferences of pronouns in Spanish neutral non-biased intra-sentential contexts.

With respect to comparison of groups, we did not find widely diverging patterns of pronoun interpretation overall, although some deviations in some conditions are observed. Despite the parallelisms in subject pronoun interpretation in the two languages involved, L2 learners do not take advantage of cross-linguistic influence from L1. This finding is consistent with the predictions derived from the IH as well as the indeterminacy of overt pronouns attested among bilinguals.

To close our conclusions, it deserves mentioning that the data and methods afforded here cannot address the distinction of topichood and subjecthood. Two factors that are in competition with one another and are different in nature have been shown to influence antecedent choices of pronouns. Subjects and topics can differ structurally since not all preverbal subjects are topics in Spanish but they appear in the same linear order, in first sentence position. Our experimental sentences, as well as the ones of the literature reported, conflate subject and topic in placing one of the potential antecedents of the pronoun in first position. A possible way to overcome this limitation is to use presentational or topicless constructions in which the postverbal subjects are introduced

or presented into existence in discourse, thus separating subjects from topics. This is not included in the scope of the current paper and should certainly be considered for future research.

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