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Adult Outcomes of Early Child Second Language (L2) Acquisition: Differential Object Marking in the Child L2 Spanish of Catalan Natives

Eloi Puig-Mayenco, David Miller, and Jason Rothman

1. Introduction

Differential Object Marking (DOM) is a widely investigated topic in recent research on second language (L2) Spanish (e.g. Bowles and Montrul, 2008; Farley and McCollam 2004; Montrul, 2004; Guijarro-Fuentes and Marinis, 2007; Guijarro Fuentes, 2012). The present study further explores DOM in L2 Spanish under a novel situation, that is, we examine the adult outcomes of child L2 Spanish learners who were monolingual L1 speakers of Catalan (from North Eastern Catalonia) until being exposed to Spanish at school at roughly the age of 6. Most of the studies examining this domain have focused on the acquisition of DOM using off-line methodologies. In the present study, however, we implement a combined online (Self-Paced Reading Task) and off-line experiment (Grammaticality Judgment Task) to tap into both behavioral and processing performances simultaneously. Additionally, our study innovates by being one of a select few that tests both languages of a bilingual, potentially allowing us to understand how the languages of bilinguals interact in a context of micro-variation.

The label child L2er is used here to differentiate between simultaneous bilingualism (2L1) in which the child is exposed to both languages from birth and true sequential L2 acquisition in childhood. This is necessary since age of onset exposure is important even in early childhood precisely because the initial state of 2L1 acquisition where the child has no knowledge of a particular, specified grammar is, in principle, quite different from that of a 4 year old child who already has a specified mental grammar for her L1 (Haznedar, 2013; Meisel 2011; Schwartz 1992, 2004; Unsworth 2005). Lest there be any doubt that our

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participants qualify as child L2ers of Spanish simply because they are from a region of Spain, they meet all the inclusion criteria following Unsworth (2005) and Schwartz (2004) among others use the age range of 4-8 years at first significant exposure to an additional language as the main inclusion factor. Despite living all their lives in Spain, none of the participants were exposed to Spanish with any significance before Spanish was introduced as a specific subject in school (age 6), at which point they were highly proficient monolinguals of Catalan. Perhaps difficult to understand for someone who is not from a country where multiple languages exist in virtual monolingual enclaves for children until they are exposed to the other(s) in school, much of Catalonia qualifies as natively monolingual (e.g. large metropolitan areas are not). Spanish does exist, even in rural parts of Catalonia to be sure, but young children have very little exposure to it unless their family contains native, dominant Spanish speakers. There is, therefore, no question that children in rural Catalonia are typically monolingual even though they will surely grow up to be highly proficient bilinguals of both languages.

The present study provides data from a group of Catalan-Spanish bilinguals born and raised in Osona, Catalonia (Spain), a rural North Eastern part of the province. Due to the relatively unique situation of Catalonia as described above, the present study offers a clear qualitative difference from other child L2 contexts studied to date on an additional front. Most of the Spanish that is spoken in Catalonia, especially outside the Barcelona area, comes from bilinguals who were child L2 Spanish learners themselves. Typically child L2 studies are done in naturalistic contexts (but see Rothman, Long, Iverson, Judy Lingwall & Chakravarty, 2016) where the L2 input they receive is from monolingual native speakers. In our case, however, the input comes from non-native, non-dominant L2 learners although usually with extremely high proficiency. This fact already suggests that the quantity and quality of input will be somewhat different from what other children in Spain receive.

2. Accusative Objects in Catalan and Spanish

Differential Object Marking (DOM) is the overt morphological expression used by some languages to mark Case on (at least some) accusative objects. While Spanish is known to be a language that uses DOM, Catalan does not, at least when the realization of the object is a full DP¹.

Rodríguez-Mondoñedo (2007) suggests that there are two important dimensions which help determine the marking of the object: animacy and specificity. If we use these two dimensions, there are four possible scenarios for objects: [+specific, +animate], [+animate, -specific], [-animate, +specific] and

¹ Escandell-Vidall (2009) points out that there are certain dialects of Catalan which allow DOM in this context.

[-animate, - specific]. In Spanish, the accusative object is obligatorily (Case) marked with *a* when it is [+specific, + animate] as in (1a-b).

- (1) a. *Las chicas vieron Ø Laura ayer por la noche
 b. Las chicas vieron a Laura ayer por la noche
 The girls saw Acc.Marker Laura last night
 ‘The girls saw Laura last night’

To be sure, there is significant dialectal variation as pertains to DOM in Spanish dialects (see López, 2012 for discussion). However, there is no dialectal variation in the case exemplified in (1) above, which is the only context of DOM used in our experiments. And so, the fact that DOM can vary across dialects and even individual speakers in contexts, for example, that are minus [-specific, +animate] is interesting, yet irrelevant for our purposes.

In Central and Standard Catalan, however, DOM is not allowed in the above-mentioned context. When the object is a [+animate, +specific] full DP, the accusative marker *a* is not required (See 2a-b).

- (2) a. Les noies van veure Ø la Laura ahir al vespre
 b. *Les noies van veure a la Laura ahir al vespre
 The girls saw Acc.Marker the Laura last evening
 ‘The girls saw Laura last night’

Escandell-Vidall (2009) does note that DOM is now appearing in spoken Catalan, that is, that DOM is perhaps becoming an oral phenomenon. It is not clear whether this trend is more reflective of Spanish influence as opposed to truly descriptive of any particular dialect of Catalan independently; however, to avoid any possible dialectal effects, the participants in the present study are all from the same Catalan-dominant area where DOM is definitively not part of the native Catalan of that region.

3. Background literature

Differential Object Marking has undergone robust experimental investigation in the domain of bilingual language acquisition. Much of this research has dealt with DOM in Spanish as a Heritage Language (HS) in North America (Montrul, 2004; Montrul and Bowles, 2009; Montrul and Sánchez-Walker, 2013), which has shown variation with respect to convergence towards monolingual baselines. There has also been considerable work in recent years examining the acquisition of DOM in L2 Spanish (e.g. Bowles and Montrul, 2008; Farley and McCollam 2004; Montrul, 2004; Guijarro-Fuentes and Marinis, 2007; Guijarro Fuentes, 2012,), which, again, has shown various degrees of convergence towards a native monolingual baseline. To our knowledge, there is just one study that looks at DOM in the case of Catalan-Spanish bilingualism in comparison to other non-native Spanish groups (Guijarro-Fuentes and Marinis, 2009). A noteworthy finding in this study is that

even though the Catalan-Spanish bilinguals performed in a more target-like fashion than the L1 English L2 Spanish group overall, the former group showed over-use of the accusative marker in contexts where it is not allowed in Catalan. From their results, we know that grammatical sensitivity to Spanish DOM can be affected by the lack of DOM in Catalan, but what we do not know is if the lack of DOM in Catalan can be affected by Spanish in the opposite direction. Additionally, all of the studies mentioned above use off-line measures and recent work in the literature has shown that while bilingual participants may not show target-like performance in off-line measures, they might when tested using on-line measures (Villegas, 2014; Puig-Mayenco, Miller, Bayram, Cunnings, Tubau and Rothman, submitted). In light of this trend, we offer data from additional online measures to see if there is a mismatch between behavioral offline and online measures that in combination suggest the offline measure obscures otherwise (monolingual) native-like sensitivity to DOM.

4. Methodology

The experimental tasks and test group described below were designed and selected in order to examine the primary (and subsequent) research question(s):

1. Do child L2 speakers of Spanish show a monolingual-like knowledge of Differential Object Marking in Spanish?
 - a. Is there cross-linguistic influence from Catalan to Spanish and vice-versa?
 - b. Are there asymmetries depending on the type of knowledge (behavioral vs. procedural)?

4.1. Participants

Twenty-two child L2 learners of Spanish whose first language is Catalan took part in the study. To control for possible dialectal differences, all the participants were recruited in Osona (Catalonia), an area situated in the pre-Pyrenees and known to be a Catalan-dominant area. The participants were tested for proficiency in both languages, Catalan and Spanish. An adapted version of the Diplomas de Español come Lengua Extranjera (DELE), a commonly used measure in bilingual Spanish studies, and an adapted version of the *Nivell D* for Catalan were used to measure proficiency in Spanish and Catalan respectively. As expected, all the participants scored at the highest levels of proficiency (Spanish, $M=46$ out of a maximum of 50; Catalan, $M=34$ out of a maximum of 40).

As mentioned, all participants were first exposed to Catalan from birth with their first exposure to Spanish at age 6 when Spanish is introduced in the schooling system. Each participant attended schools that follow *El programa d'immersió lingüística*, which entails that the language of education is Catalan with the exception of three hours of Spanish language and literature and three

hours of a foreign language per week. All the participants reported being dominant in Catalan and they reported that their use of Spanish was restricted to formal settings.

4.2. Experimental Tasks

We employed a Grammaticality Judgment Task (GJT) and a Self-Paced Reading Task (Just, Wooley & Carpenter, 1982). The GJT was designed using *Qualtrics*, while the SPRT was designed using Ibx Farm software. In this study, the data were collected in a lab-setting and the participants were supervised by one of the researchers. There were two conditions which were employed in both tasks. All the sentences in the two conditions of interest contained a [+animate, +specific] accusative object, realized as a full DP. Condition 1 contained trials in which an overt accusative marker (ungrammatical in Catalan and grammatical in Spanish) was used. Condition 2 presented trials in which there was no overt accusative marker (grammatical in Catalan and ungrammatical in Spanish).

Both the Catalan and Spanish GJTs consisted of 48 items, which were distributed across six conditions. For this study, we report on the two conditions of interest.² See (3a-b) and (4a-b) for examples of the experimental items in condition 1 and 2 respectively.

- | | | | | | |
|--------|----------------------------------|------------|-----------|-------------------|------------|
| (3) a. | *Las chicas vieron | Ø | Laura | ayer por la noche | <i>Sp</i> |
| b. | Las chicas vierón | a | Laura | ayer por la noche | |
| | The girls saw | Acc.Marker | Laura | last night | |
| | 'The girls saw Laura last night' | | | | |
| (4) a. | Les noies van veure | Ø | la Laura | ahir al vespre | <i>Cat</i> |
| b. | *Les noies van veure | a | la Laura | ahir al vespre | |
| | The girls saw | Acc.Marker | the Laura | last evening | |
| | 'The girls saw Laura last night' | | | | |

Each sentence was judged on a 6-point Likert scale where '1' was completely odd and '6' was completely natural. There was also an option of 'I'm not sure'. Participants were instructed to answer as fast as possible and to leave aside any prescriptive judgements by rating the sentences according to their own intuitions.

The SPRTs had a similar design in that there were also 48 experimental items divided across the same six conditions. The experimental items were divided into three regions of interest, which were neither at the beginning nor at the end of the experimental item in order to avoid possible misleading effects

² Two of the other conditions were targeting a completely different syntactic structure and the remaining two conditions were fillers/distractors.

(Just & Carpenter 1980). See example (5a-b) and (6a-b) for examples of the SPRTs in Catalan and Spanish in the two conditions.

- (5) a. *Las chicas conocieron \emptyset Laura después de clase (...) *Sp*
 b. Las chicas conocieron a Laura después de clase (...)
 The girls met Acc.Marker Laura after class (...)
 ‘The girls met Laura after class (...)’
- (6) a. Les noies van conèixer \emptyset la Laura ahir al vespre (...) *Cat*
 b. *Les noies van conèixer a la Laura after class (...)
 The girls met Acc.Marker the Laura after class (...)
 ‘The girls met Laura after class (...)’

Content questions appeared at a ratio 1-to-3 presented randomly. This was done to maximize participants’ attention during the task.

Half of the participants were first tested in Catalan and the others in Spanish. Irrespective of the language they started with, they always completed the SPRT task followed by the GJT. Once they finished the two tasks of the first language, they were given a break and were then asked to proceed to the tasks in the other language.

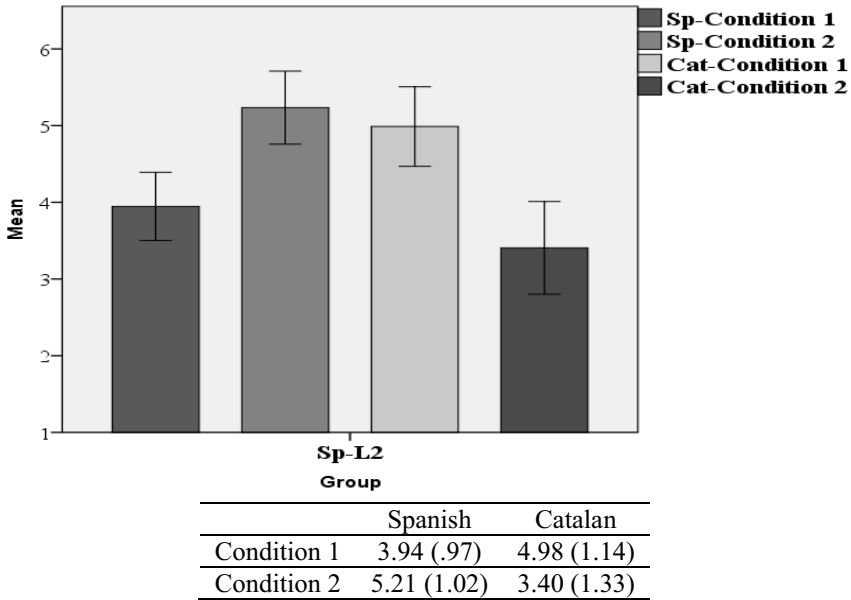
5. Results and discussion

Group results for the syntactic representation of DOM in the grammar of Child L2 learners of Spanish are presented below. First, we will discuss the data of the GJT and then the SPRT data are to be presented.

5.1. Grammaticality Judgement Task data

Recall that all the experimental items presented here consist of sentences with [+animate, +specific] accusative objects and, thus, the items in condition 1 lack the accusative markers (ungrammatical in Spanish, yet grammatical in Catalan) while items in condition 2 have the overt accusative marker *a* (grammatical in Spanish, ungrammatical in Catalan). Figure 1 contains the descriptive statistics and visual representation for the two conditions in each language.

Figure 1: Means and SD of acceptability scores and errors bars (CI 95%) in both conditions for the AJTs in both languages



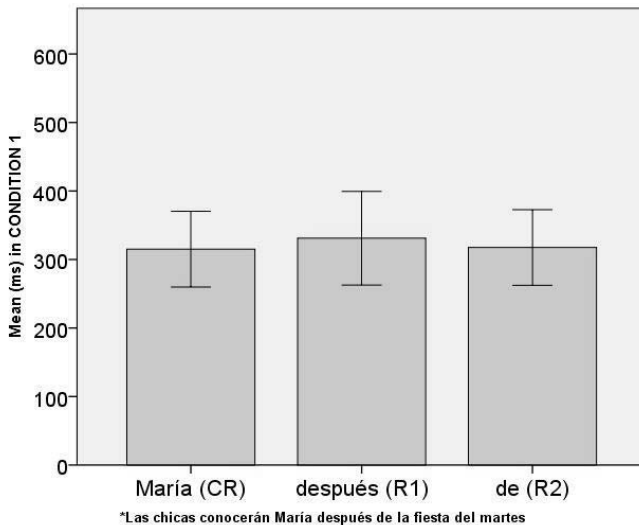
With respect to the grammatical condition in Spanish (green bar), participants show target-like responses by rating these conditions on average 5.21 out of 6. However, their performance on items in condition 2 (ungrammatical in Spanish) indicate a general acceptance for sentences that lack the obligatory accusative marker (blue bar). The results for the ungrammatical condition in Catalan indicate target-like performance in that there is a general acceptance of grammatical sentences (acceptance score = 4.98 – beige bar). However, the ungrammatical condition (i.e. accusative marker where it is not expected) seems to be generally accepted with a score of 3.40, which is higher than expected for an ungrammatical condition.

A Repeated Measures (RM) ANOVA was used to test for statistical differences in the ratings of the two conditions in each language. There was no between-subjects factor as all the participants were child L2 learners of Spanish and there was a within-subjects factor “conditions” with four levels (Cat-Condition 1, Cat-Condition 2, Sp-Condition 1, Sp-Condition 2). The RM ANOVA revealed a significant main effect of condition ($F(4.87, 204.81) = 3.13$, $p < .010$, Partial Eta Squared = .368, Observed power = .999). Notice that though there is a significant difference between both conditions in each language, when they are tested in Spanish, the ratings of the ungrammatical option are 3.95 out of 6. Thus, even though they clearly show a preference for the grammatical option, they do not completely rule out the ungrammatical one.

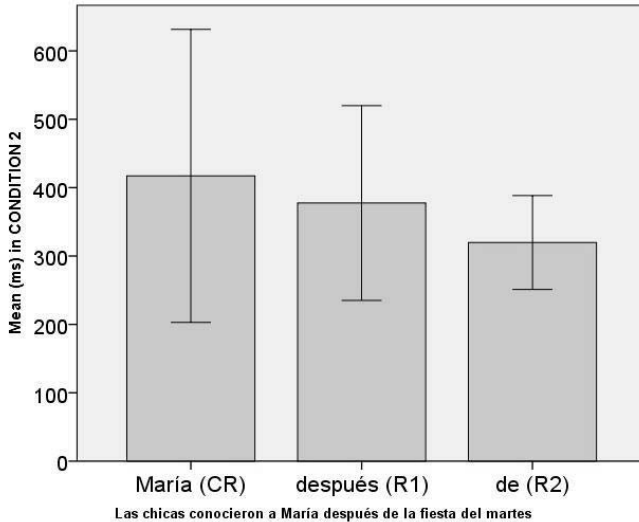
5.2. Self-Paced Reading Task

The comprehension questions were analyzed to measure the rate of accuracy in order to ensure that participants were reading the sentences and paying attention to the task. The mean accuracy is 93.04% in Spanish and 95.61% in Catalan. The analysis of the SPRT focuses on the Critical Region³ and the two following regions; this was done to check for possible slowing down effects (i.e. spill-over effects). The reaction times (RTs) for each condition were analyzed separately and each region was compared to its counterpart in the other condition. Figure 2 (condition 1) and figure 3 (condition 2) show the Mean RT for each of the regions of interest.

Figure 2-3. Bar graphs of Reaction Times (RTs) in milliseconds (ms) in the regions of interest of the two conditions when tested in Spanish



³ Due to the fact that in condition 2 we were probing for the absence of the accusative marker. We compared the three regions after the Accusative marker (or its absence)

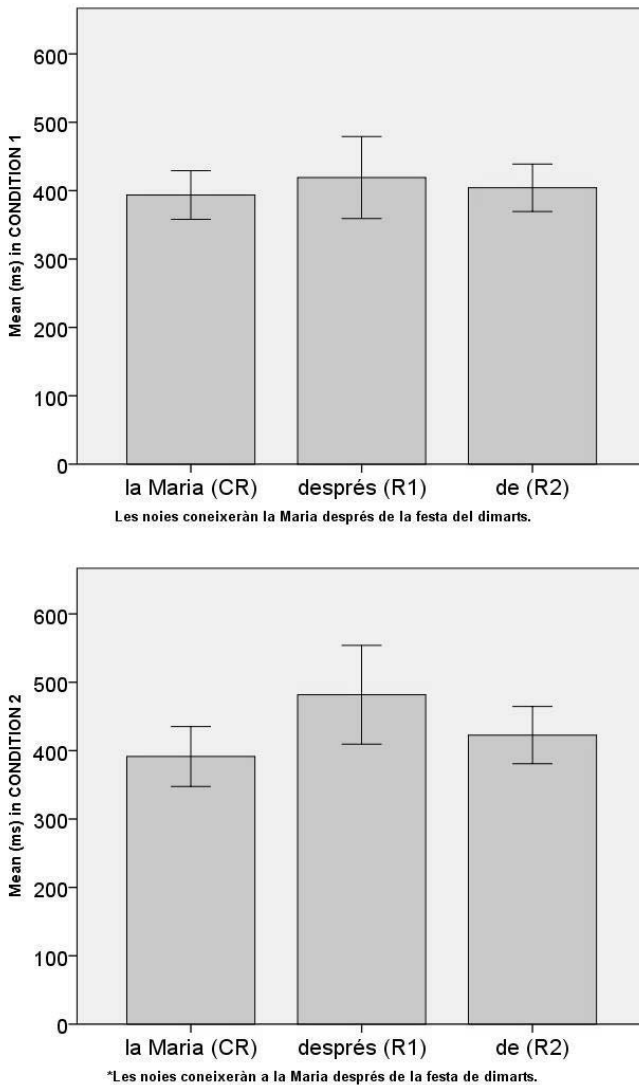


We ran RM ANOVA on the data for each language. The within-subject factor was *condition* with the six levels representing each condition in each of the three (spillover) regions of interest. The assumption of sphericity was violated ($p > .001$) and, therefore, we reported the results using the Green-house Geisser correction ($\epsilon = .351$). The RM ANOVA revealed that the effect was not significant ($F(1.75, 35.12) = .661, p < .504, \text{Partial Eta Squared} = .032, \text{Observed power} = .121$).

The results for Spanish show that the participants treated both conditions equally in that they were not sensitive to the morphosyntactic violation in Condition 1. The data here show that the participants process the sentences in condition 1 with what appears to be a target-like grammar for sentence with an overt accusative marker (grammatical in Spanish). No sensitivity was found for the ungrammatical conditions, suggesting that their grammars allow for optionality of the accusative marker in Spanish.

Turning now to their Catalan data, the same model was used to examine the two conditions within the same language to see whether the Spanish L2ers were sensitive to the morphosyntactic violation in their native Catalan for one of the two conditions, in this case, that of condition 2. Figure 4 (condition 1) and figure 5 (condition 2) show the Mean RT for each region of interest.

Figure 4-5. Bar graphs of Reaction Times (RTs) in milliseconds (ms) in the regions of interest of the two conditions when tested in Catalan



For this ANOVA, the within-subject factors was *condition* with the six levels representing each region in each condition. The assumption of sphericity was again violated ($p > .001$) and, therefore, we reported the results using the Greenhouse Geisser correction ($\epsilon = .462$). The ANOVA revealed that the effect was significant ($F(2.31, 46.24) = 3.06, p < .049, \text{Partial Eta Squared} = .133, \text{Observed power} = .604$). We further explored the main effect using a pairwise

comparison and we found that some of the interactions were significant (see table 1).

Table 1. Post hoc pairwise comparisons of the conditions (CR=Critical Region, R1=Region 1, R2=Region 2, Cn1=Condition 1 and Cn2=Condition 2).

Regions Compared		Mean Diff.	Std Err.	p.	95% CI for difference	
					LB	UP
Cr-Cn1	Cr-Cn2	2.11	19.58	.884	-27.85	32.08
R1-Cn1	R1-Cn2	-62.53	43.72	.076	-153.74	28.67
R2-Cn1	R2-Cn2	-18.52	.475	.475	-71.56	34.51
Cr-Con1	R1-Cn1	-25.62	19.58	.206	-66.47	15.22
R1-Cn1	R2-Cn1	15.03	26.48	.577	-70.28	40.21
Cr-Cn2	R1-Cn2	-90.27	27.77	.004*	-148.21	-32.34
R1-Cn2	R2-Cn2	59.044	32.53	.085	-8.82	126.91

Notice that when comparing each region with its counterpart in the other conditions, no significant interactions occur. It is also worth noting that Region 1 in condition 1 and Region 1 in condition 2 show a marginal slowing down effect, though it is not significant. Nonetheless, it is interesting to see the interaction between the Critical Region and Region 11 in condition 2 (ungrammatical in Catalan), such that there is a significant slowing down effect. Thus, this can be taken as evidence that their Catalan does not allow/require differential object marking when the object is a [+animate, +specific] full DP.

5.3. Overview and conclusion

The aim of the present study was to explore whether child L2 speakers of Spanish with Catalan as their L1 tested in adulthood would show monolingual-like knowledge of Differential Object Marking (DOM) in Spanish and whether there was cross-linguistic influence in a bi-directional way.

As has been shown in both tasks, when the participants were tested in Spanish they did show target-like responses/behavior with respect to the grammatical condition in that they allowed the presence of the accusative marker *a* when the object was [+animate, +specific]. Moreover, an analysis of the sentences that require DOM in Spanish and had it in our design (recall the ungrammatical ones required it but did not have it), shows that the participants were target-like in both sets of data. However, the participants did not show target-like behavior for the ungrammatical condition. In the off-line measure, they did show a preference for grammatical option in that they rated those significantly higher, but it is worth bearing in mind that they still rated the ungrammatical sentences quite high, 3.94 out of 6. Furthermore, results from the online data show that their grammars are not sensitive to such violations.

Their results for the Catalan test also show that they prefer the grammatical option in Catalan over the ungrammatical one, but their rating is higher than expected. However, their online results show a clear slowing down effect in the second region of interest in the ungrammatical condition. Considering the two types of methodologies, the participants show a preference of grammatical sentences in Spanish when asked to judge the grammaticality of the sentences, but when they are processing the sentences their grammars are not sensitive to such violation.

If we now ponder why DOM is specifically difficult even for child L2ers in adulthood who are extremely proficient in the L2, have been exposed to a significant amount of input for a considerable amount of time and have undergone literacy training in the L2, we must keep in mind that the accusative case marker itself is phonologically reduced and not overly salient. Furthermore, DOM reflects a large degree of variation across conditions and even native dialects, which might indicate that it is an inherently vulnerable domain. All of these factors might contribute to why DOM is a property of variation when investigated in many contexts of Spanish bilingualism. However, given the special context of Catalonia where Spanish input is easily accessible in and out of education contexts (increasingly so outside as bilinguals get older), one would not necessarily predict that DOM would be so problematic in our subject group. However, it is worth pointing out that much of the Spanish input available to all learners comes from L2 Spanish speakers as opposed to native monolinguals as would be the case in Madrid, Jaén and Burgos. Therefore, it is likely that issues pertaining to consistency of input cues for this domain contribute to the present findings in both groups, but especially the Catalan dominant bilinguals (see Rothman, 2007; Pascual y Cabo & Rothman, 2012).

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