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Abstract

This study examined Spanish-Welsh (in Patagonia) and Welsh-English (in North Wales) bilingual children's and adults' processing of sentences in which two noun phrases acted as arguments of a verb. The goal was to determine the relative importance of distinct cues to the identification of the subject in the bilinguals' processing of their two languages, and to explore possible crosslinguistic influence between their two languages.

We provided speakers with a receptive task in which the participant heard a sentence in the given language and had to identify which of three cartoon depictions on a screen corresponded with the sentence heard. The sentences were constructed to systematically manipulate cues such as word order, prosodic stress, animacy, gender, and case marking.

The results suggest some differences in performance between groups, but primarily in Welsh, not in English or Spanish. The results are discussed for their relevance to theories concerning the importance of proficiency, language balance, and acquisitional processes in bilinguals' performance in their two languages.

Keywords: bilinguals, Welsh, Spanish, Argentina, Patagonia, interaction, sentential subjects

Introduction

One important aspect of competence in a language is the ability to process sentences in which two or more noun phrases act as arguments of a verb and to identify which of those acts as the subject of the sentence (Comrie 1981). Crosslinguistic research has suggested that speakers of distinct languages pay attention to different cues for the identification of the subject, depending on the 'validity' ('availability' + 'reliability') of the various cues in the language (e.g., MacWhinney 1987; McDonald 1989). For example, English speakers rely heavily on word order for the identification of the subject, because word order provides a reliable, valid cue; in contrast, speakers of a language like Italian are more likely to rely on agreement markers on the verb for the identification of the subject (MacWhinney, Bates, and Kliegl 1984). Potential cues to subject-hood across languages include word order, case marking of nominal forms, subject-verb agreement, stress, relative animacy of the nominal referents, and definiteness of the noun phrases. The acquisition of the appropriate balancing of the relevant cues within a given language is highly dependent on the cue characteristics and may last well into adolescence (McDonald 1989).

There are indications that second language learners and bilinguals may not rely on the same cues to the identification of subjects as monolingual speakers (Kilborn and Ito 1989, MacWhinney 1987, Wulfeck, Juarez, Bates, and Kilborn 1986). Among other things, they may transfer cue weights from their L1 to the L2 or may rely heavily on semantic cues such as animacy, a possibly universal interpretation strategy for both L1 and L2 learners (Gass 1987, MacWhinney 1987; Comrie 1981, Sierwierska 1988, Tomlin 1986). The route taken may depend on exposure and attitude (McDonald 1987).

The present study examines the performance of bilingual Spanish-Welsh speakers in

Patagonia and Welsh-English speakers in North Wales to determine potential crosslinguistic influences in their attention to relevant cues in their two languages, in comparison with monolingual speakers (of English and Spanish; Welsh monolingual speakers are virtually non-existent). It also explores the importance of language proficiency and language dominance in bilinguals' processing of their two languages.

The three languages of concern here, Welsh, Spanish, and English, use distinct cues to subjecthood, in particular relating to word order, case marking, and prosodic stress. In English, word order is highly predictive of subjecthood, with SVO order dominant. Thus, English speakers generally treat the first noun in NVN sequences as the subject, but tend to treat the second noun in NNV and VNN sequences as the subject (MacWhinney, Bates, & Kliegl, 1984), treating these as orders resulting from left dislocation and right dislocation through processes of topicalization. Prosodic stress may indicate newness or contrastivity, especially in non-canonical orders, e.g., NNV -- "MARY John saw" vs. "Mary JOHN saw" (MacWhinney, Bates, & Kliegl 1984); contrastive stress tends across languages to fall on the focus of the sentence, which in turn tends to be expressed as the object (Gundel 1988). MacWhinney et al. (1984) suggest that stress may play a more important role in languages that allow more variable word order than in those with stricter order, like English. Case marking is relevant for pronouns in English but irrelevant to nouns.

In Spanish, word order is variable, allowing both SV and VS order in various contexts, and is thus a less reliable cue to subjecthood (Contreras 1978; Lozano 2003; Parafita Couto, Gathercole and Stadthagen-González 2015; Suñer 1982; Zubizarreta 1998). Subject-verb agreement plays a role, as does case marking: For full animate noun phrases, the direct object marker *a* identifies the object, as in *Pedro quiere a María* 'Pedro loves Maria'. Leonetti (2004)

identifies animacy as the dominant trigger for use of this marker, although it is also associated with specificity. Research has shown that both L2 learners of Spanish (Guijarro-Fuentes and Marinis 2007) and heritage speakers of Spanish in the USA (Montrul and Bowles 2009; Montrul and Sánchez-Walker 2013; Pérez-Tattam, Gathercole, Yavas and Stadthagen-González 2013) are more likely than monolingual speakers to omit *a* in oral production and perform more at chance in judgment and comprehension tasks contingent on the processing of *a*. Guijarro-Fuentes and Marinis (2007) interpret their findings as supporting the claim that L2 learners have difficulties acquiring structures involving the syntax/semantics interface; Montrul and colleagues interpret their findings with heritage speakers as related to reduced input in Spanish, leading to either attrition or incomplete acquisition, alongside potential transfer from English.

For Welsh, the main word orders are VSO and Aux SVO. For the latter, Aux is often deleted in spoken Welsh, leaving SVO--e.g., *Ti isio panad?* '(Do) you want a cup (of tea)?' Welsh does not generally show case marking. However, there is some participation of Soft Mutation (SM) in possible marking of participant roles. SM is a morphophonological process whereby a closed set of word-initial consonants (/p, t, k, b, d, g, ɬ, r̥, m/) undergo a process of lenition when placed in various syntactic or lexical contexts (see Ball & Müller, 1992). In certain constructions (when a noun occurs without a determiner, as in non-specific reference), direct objects are more likely to undergo mutation than subjects are (e.g., in '(a) cat saw (a) dog', direct object *ci* 'dog' undergoes SM (/k/-> /g/): *Mi welodd cath gi* part-saw-cat-dog '(a) cat saw (a) dog')[1]. Gathercole, Laporte, and Thomas (2005) found that SM on objects played only a marginal role in children's understanding of sentences, and only in children who spoke only Welsh at home ("OWH"). Gathercole, Thomas, and Laporte (2001) hypothesized that the multi-functionality of SM in Welsh makes it a very opaque structure and therefore impedes the rapid

acquisition of the structures in which it participates. Besides marking non-specific direct objects, among other functions, SM also marks gender: feminine nouns undergo SM when singular feminine nouns occur with the definite article (Gathercole et al. 2001) – e.g., *y gath* /ə gaθ/ 'the cat' < *cath* /kaθ/ 'cat$_{fem}$' (cf. *y ci* /ə ki/ 'the dog', *ci* 'dog'$_{masc}$). Because of the opacity of SM, when SM occurs on definite nouns, it may play a role in the identification of subjects: since SM occurs on definite feminine nouns, and not on masculine definite nouns, it may influence sentences with feminine nouns more than those with masculine nouns. This may be especially true for Welsh learners.

In addition to these different cues across the three languages, it is possible that speakers of all three languages use animacy as a cue, as has been shown for speakers of other languages (see e.g., Stoops, Luke and Christianson, 2013, for Russian, and Wang and Xu, 2015, for Chinese). The 'more animate' a noun's referent, the more likely it is to be interpreted as the agent of an action, relative to 'less animate' or inanimate referents.

The type of bilingual available in the two geographical contexts varies. In Wales, Welsh-speaking children come from a variety of language backgrounds (e.g., some hear mostly Welsh at home, some hear Welsh and English about equally at home, and some hear mostly English at home but learn Welsh in school). In Patagonia, some adults are native Welsh speakers, but currently children who learn Welsh are largely exposed to Welsh in school. Past studies in Wales have shown that, while all home language groups show considerable command of both languages, speakers from distinct home languages gain parity in the dominant language, English, but not in Welsh (Gathercole and Thomas 2009). Relative performance on Welsh falls generally in line with relative exposure to Welsh. Similar findings are found elsewhere in the literature in relation to other types of bilinguals (see Unsworth, 2016, for a lucid discussion).

Some might predict that influence from one language to another is more likely to occur from the dominant language in each context to the less dominant language. In the cases examined here, that would mean more influence from English and Spanish to Welsh than vice-versa. This would be in accordance with many previous studies (e.g., Bernardini 2003; Döpke 1998; Yip and Matthews 2000). However, the notion and definition of dominance is of considerable debate (see Silva-Corvalán and Treffers-Daller 2016), and not all research supports such a prediction: First, some studies have failed to find such an effect (Gathercole, Pérez-Tattam, Stadthagen-González and Thomas 2014), or, if they have found "transfer-like" phenomena in bilingual children's speech, it may be only under certain conditions (Kupisch 2007) or attributable to other factors, such as timing of development relative to maturational or linguistic stage (Schlyter and Häkansson 1994). Nicoladis (2016) provides a lucid review and points out the importance of a measure of dominance that is independent of the measure of potential transfer. She argues that when such a control is present, the data at best reveal that dominance predicts transfer globally at a group level, and other factors, such as linguistic similarity, quantity and quality of input, age at which children gain enough input evidence to learn a given structure, and processing itself, are equally or more important. Paradis (2000) adds that the phenomena may also reflect a level of ambiguity in the input (following, e.g., Döpke, 1997, and Hulk & Müller, 2000), or might constitute a typical, language-specific stage in development.

Relatedly, we might predict differences in performance across particular groups according to their exposure to the languages (which may be related to dominance but would provide a distinct explanation for performance). For example, even in Wales, it is possible that a child who has had greater input in Welsh may pay attention to one type of cue, and a child with

more exposure to English may pay attention to another. Similarly, we might expect any occurrence of transfer from Spanish to Welsh in children in Patagonia (with L1 Spanish, L2 Welsh) to be more comparable to the occurrence of transfer from English to Welsh in children from only-English homes in North Wales (with L1 English, L2 Welsh) than to other bilingual children in Wales. Both groups experience the majority language at home and learn the minority language through school. Thus, for example, in relation to word order, we might expect influence in these two groups to go from Spanish to Welsh and from English to Welsh, respectively. On the other hand, for those children with the greatest exposure to Welsh (OWH) in North Wales, we might predict influence from Welsh to English. Such influence in the three groups might be observable, for example, in the strength of SVO for English transferred to Welsh among OEH children, in more flexibility in word order interpretations transferred from Spanish to Welsh in the children in Patagonia, and in the interpretation of N1 as subject in VNN sentences for Welsh transferred to English among the OWH children.

The major questions addressed here are the following:

(1) What cues are used in each language for the identification of sentential subjects, and are these cues used similarly by distinct groups of speakers of that language?

(2) Are differences across groups more apparent with respect to word order, animacy, or other cues to subjecthood in the language?

(3) Are differences across groups best explained in terms of language proficiency, language dominance, or some other factor such as acquisitional processes?

Method

Participants were asked to complete an experimental task, as well as standardized and non-standardized measures of receptive vocabulary (Welsh - child and adult versions of the

Prawf Geirfa Cymraeg (Gathercole and Thomas 2007); English - BPVS (Dunn, Dunn, and Whetton 1982); and Spanish - TVIP-III Spanish (Dunn, Dunn, and Arribas 2006)). They were also administered a test of receptive grammar in their two languages (Gathercole, Pérez-Tattam, Stadthagen-González, and Thomas 2014; Pérez-Tattam, Gathercole, Yavas, and Stadthagen-González 2013). Participants were also asked to complete a background questionnaire to provide information on language background, age, and education.

For the experimental task, a forced-choice task was used, aimed at determining the extent to which Welsh-, English- and Spanish- speaking children and adults pay attention to various elements in the identification of subjects of sentences, and whether the profile found for one sub-group differed in any appreciable way from the profiles found in the other sub-groups. In this task, participants chose one of three cartoon pictures in response to aurally presented sentences, constructed to control for several variables in each language.

Stimuli

Linguistic stimuli

Sentences were constructed around several potential cues for subjecthood in the three languages: animacy and word order were controlled in all three languages. Additionally, one other variable was manipulated in each language as well: for English, stress, for Welsh, noun gender, and for Spanish, nominal/object case marking with *a*. Semantically reversible sentences containing an action verb and two nouns (N1 and N2) were constructed as target stimuli for each of the three languages. Comparable verbs and nouns were used across the three languages, but distinct sentences were developed for each language. All nouns in the target sentences occurred in the singular with definite articles. The nouns are presented in Table 1, and the verbs in Table 2.

PLACE TABLES 1 AND 2 ABOUT HERE

Four levels of animacy were controlled -- both nouns animate (AA), the first noun animate and second noun inanimate (AI), the first noun inanimate and the second noun animate (IA), and both nouns inanimate (II). Three word orders were used: NNV, NVN, and VNN. In English, three levels of stress were used: neither N stressed (S0), first N stressed (S1), and second N stressed (S2). For Spanish, three patterns for the object marker *a* were used: no occurrence (a0), occurrence with the first N (a1), and occurrence with the second N (a2). For Welsh, sentences contained either two feminine nouns or two masculine nouns.

The combinations of these variables yielded 36 target sentences each for English and Spanish and 24 for Welsh. Filler sentences involving other variables were also used, to give a total of 72 trials per language. No N-N combination occurred more than twice per animacy level.

Here are examples of the target sentences (caps indicate stress):

English:

The SEAGULL is pulling the rabbit. (AA, NVN, S1)

The crane THE WOLF is pinching (IA, NNV, S2)

Welsh:

Pinsiodd y craen y blaidd (IA, VNN, Masc)

'Pinched the crane the wolf'

Y wiwer [=gwiwer] ddaliodd y fasged [=basged] (AI, NVN, Fem)

'the squirrel carried the basket'

Spanish:

A la gaviota tira el conejo (AA, NVN, a1)

'to the seagull pulls the rabbit'

Tira el búho la carreta (AI, VNN, a0)

'Pull the owl the cart'

Nonlinguistic Stimuli

To go with each of the 72 sentences, two sets of cartoons were constructed for each language. The two sets of stimuli for each language presented the screens in opposite orders. For every sentence, there was a screen showing three different pictures: the referent of N1 performing the action denoted by the verb on the referent of N2; the referent of N2 performing the action denoted by the verb on the referent of N1; and a distractor depicting both N1 and N2 performing the same action on some third object or animal. The three pictures appeared at the same time one above the other, divided by a line. The location of the N1-N2, N2-N1, and distractors on the screen were balanced across trials. For the verbs of pushing, pulling, scratching, and hitting, the cartoons were animated. For the other verbs, the cartoons were static. Sample pictorial stimuli are shown in Figure 1. (Words are shown in Figure 1 simply to indicate which lexical items were associated with the pictorial stimulus above them. No words were shown with the actual stimuli.)

PLACE FIGURE 1 ABOUT HERE.

Procedure

Test sentences were pre-recorded in English, Welsh, and Argentinean Spanish and presented through headphones.

Participants were told that they were going to see some pictures on the screen and hear sentences like "the deer is seeing the bull". Each sentence was heard twice –once when the screen was blank (see Gerken and Shady 1996), once with the onset of picture display. In the case of the children, we asked them to point to the picture they thought went best with the

sentence they had just heard. In the case of the adults, we asked them to press a key on a response box (top key if they picked the picture at the top, middle key for the cartoon in the middle, bottom key for the bottom cartoon). The display of the pictures was not timed. Adults were encouraged to press a key as soon as possible after making their decision. Participants were tested individually. Monolinguals were tested in their single language. Bilinguals were tested in both of their languages, with the testing separated by other unrelated tests. Half of the bilinguals in each group received language A before language B, and half in the reverse order.

Participants

Participants were Welsh-English bilingual children and adults, Spanish-Welsh bilingual children and adults, monolingual English-speaking adults, and monolingual Spanish-speaking adults.

In Wales, the Welsh-English bilingual children were recruited at schools in Gwynedd and Anglesey, North Wales, and the adults were recruited through personal contacts. Children were tested in the schools, and adults were tested on the premises of Bangor University or at home. All were living in North Wales at the time of testing. There were three age groups: age 8 (N=57, 28 female, 29 male, mean age 8;1, range 6;5-9;5), age 10 (N=60, 34 female, 26 male, mean age 10;8 range 9;6 to 12;2) and adults (N=16, 9 female, 7 male, mean age 33;5, range 18;5 to 51;2). The adults all grew up in homes in which only Welsh was spoken. For the children there were three home language groups: Only Welsh at Home (OWH, N=41), Welsh and English at Home (WEH, N=34) and Only English at Home (OEH, N=42). OWH children came from households where both parents were Welsh speakers, WEH children came from households where one parent was a Welsh speaker or both parents spoke both Welsh and English, and OEH children

came from households where neither parent was Welsh speaking, OEH children thus had their first exposure to Welsh when entering preschool or when reaching school age (age 4).

In Patagonia, the Spanish-Welsh bilingual children were recruited at a bilingual school in Trelew (Chubut province), and the Welsh-speaking adults were recruited through personal contacts in the wider Trelew area. Children were tested at the school, and adults were tested at home. There were two age groups: age 8 (N=26, 11 female, 15 male, mean age 8;1, range 7;11 to 10;6) and adults (N=16, 12 female, 4 male, mean age 51;0, range 22;2 to 84;4). The children were L2 speakers of Welsh; as in the case of the OEH children in North Wales, they had limited exposure to Welsh before entering school. The adults were a mixture of highly proficient L2 speakers of Welsh (N=7, AoA 17;8, range 7-42 years) (many were teaching at the bilingual school, some had studied Welsh in Wales) and early speakers of Welsh (N=9, AoA 1;3, range 0-3 years) who had grown up with Welsh at home, but Spanish in the wider community. Because of the small numbers, we merged the Welsh-speaking adults in Patagonia into one group.

For control purposes, we tested a monolingual English group (N=23, 12 female, 11 male, mean age 19;6, range 18;0 to 25;0) and a monolingual Spanish group (N=16, 13 female, 3 male, mean age 49;2, range 19;9 to 79;8). The English group were Psychology students at Bangor University who had little or no knowledge of Welsh. The Spanish group were people from the Welsh community of Trelew who had little or no knowledge of Welsh.

Results

Results will be presented for English, Spanish, and Welsh separately.

English

For English, the adults were analyzed first, to determine whether the Welsh-English bilinguals and the monolingual English-speaking adults performed differently, and to determine

which cues were most influential on performance. Then the children's data were analyzed to determine whether the children's performance differed by home language and age.

Adults

Preliminary analyses were conducted to compare the monolingual and bilingual adults' performance on the BPVS and the English grammar task. For the BPVS, a univariate ANOVA revealed that the two groups did not differ significantly, MonE Ads (136.8, out of 150), OWHBil Ads (138.0, out of 150). On the English grammar task, the two groups differed significantly, F (1, 37) = 4.18, p = .048, with monolinguals receiving slightly higher scores than the bilinguals: MonE Ads 36.6 (out of 39), OWHBil Ads 34.9 (out of 39).

For the participant roles task, responses were scored according to whether a participant chose the cartoon that corresponded to the first noun (N1) acting as the subject of the sentence (referred to below as "N1 as subject choices"). Because the data were categorical, a binary logistic regression analysis was conducted. The dependent variable was a response of treating N1 as the subject, and the independent variables were word order (VNN, NNV, NVN), animacy (A-I, I-A, I-I, AA), stress (S1, S2, S0), and language group (MonE Ads and OWHBil Ads). (In the case of the variables with more than two levels, the third listed (i.e., NVN for word order, AA for animacy, and S0 for stress) was treated as the baseline in the analyses.)

The omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (8) = 1059.3, p < .001. The model revealed a significant contribution of word order, p < .001, with NNV yielding significantly fewer N1 as subject choices than NVN (B = - 4.995, p < .001 [Exp(B) = .007]), and VNN yielding significantly fewer choices of N1 as subject than NVN (B = - 5.228, p < .001 [Exp(B) = .005]). Stress also contributed significantly, p < .001, with S1 eliciting fewer choices of N1 as subject than S0 (B =

- .925, $p < .001$ [Exp(B) = .396]), and S2 eliciting fewer choices of N1 as subject than S0 (B = -.529, $p = .020$ [Exp(B) = .589]). There was no significant effect of language group, nor of animacy. Performance by word order and stress is shown in Figure(s) 2.

PLACE FIGURE 2 ABOUT HERE.

To summarize, the adult speakers of English chose N1 as subject more often with NVN than with NNV and VNN structures, for which speakers gave N2 as subject choices. Stress on either noun led away from interpretations of N1 as the subject -- i.e., stress was treated as putting a noun in focus. The results revealed no difference between the monolinguals and the bilinguals.

Children

Preliminary analyses were again conducted to compare the children's performance on the BPVS and the English grammar task by home language and age groups. For the BPVS, ANOVA revealed significant effects by home language, F (2, 107) = 4.48, $p = .014$, and by age, F (1, 107) = 51.23, $p < .001$. OWH children had lower scores (72.4, out of 150) than the OEH children (81.9, out of 150), $p = .004$, pairwise comparisons (WEH children were between the two, mean score 76.4, out of 150). Younger children had lower scores (24.5, out of 150) than the older children (86.6, out of 150). On the English grammar task, performance did not differ significantly by home language, but it did by age group, F (1, 111) = 17.08, $p < .001$. Younger children had lower scores (24.5, out of 39) than the older children (32.5, out of 39). These differences are as expected, and conform with other work in the Welsh context (Gathercole and Thomas 2009).

For the participant roles task, responses were again scored according to whether a participant chose the cartoon that corresponded to the first noun (N1) acting as the subject of the sentence. Once again, a binary logistic regression analysis was conducted in which the dependent

variable was a response of treating N1 as the subject, and the independent variables were word order (VNN, NNV, NVN), animacy (A-I, I-A, I-I, AA), stress (S1, S2, S0), language group (OWH, WEH, OEH), and age (8, 10). (Again, in the case of the variables with more than two levels, the third listed (i.e., NVN for word order, AA for animacy, S0 for stress, and OEH for language group) was treated as the baseline in the analyses.)

The omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (10) = 1490.8, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 3.159, $p < .001$ [Exp(B) = .042]), and VNN yielding significantly fewer choices of N1 as subject than NVN (B = - 3.172, $p < .001$ [Exp(B) = .042])). Stress also contributed significantly, $p < .001$, with S1 eliciting fewer choices of N1 as subject than S0 (B = - .600, $p < .001$ [Exp(B) = .549]) and S2 eliciting near-significantly fewer choices of N1 as subject than S0 (B = - .169, p = .059 [Exp(B) = .844]). There was no significant effect of language group and only a marginal difference by age (B = - .142, p = .057 [Exp(B) = .867]), but there was a significant effect for animacy, p = .004. IA structures elicited fewer N1 as subject responses than AA (B = - .321, p = .002 [Exp(B) = .725]), and II elicited fewer N1 as subject responses than AA (B = - .237, p = .024 [Exp(B) = .789]. Performance by word order, stress, and animacy is shown in Figure 3.

PLACE FIGURE 3 ABOUT HERE.

To summarize, the bilingual child speakers of English, like their adult counterparts, chose N1 as subject more often with NVN than with NNV and VNN structures, and treated stress on either noun as leading away from interpretations of N1 as the subject. Unlike their adult counterparts, the children were also swayed by animacy, with IA and II structures eliciting fewer

N1 as subject responses than AA structures. There was no difference across the home language groups, and only a marginal difference by age.

Spanish

For Spanish, the two adult groups (MonS and SWBil Ads) were examined first, followed by the children.

Adults

As above for English, preliminary analyses examined performance on the TVIP-III-Spanish vocabulary test and the Spanish grammar task. Univariate analyses of variance revealed no difference in performance between the MonS Ads and the SWBil Ads: TVIP: MonS Ads 169.8, SWBil Ads 170.8 (out of 192); Spanish grammar: MonS Ads: 33.4, SWBil Ads: 34.7 (out of 39).

For the participant roles data, a binary logistic regression analysis was again conducted as above, with the independent variables of word order (VNN, NNV, NVN), animacy (A-I, I-A, I-I, AA), "a" (a1, a2, a0), and language group (MonS Ad, SWBil Ad). (As above, in the case of the variables with more than two levels, the third listed (i.e., NVN for word order, AA for animacy, a0 for "a") was treated as the baseline in the analyses.)

The omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (8) = 405.527, $p < .001$. The model revealed a significant contribution of word order, $p = .002$, with VNN yielding significantly fewer choices of N1 as subject than NVN ($B = -.483$, $p = .006$ [Exp(B) = .617]). NNV did not differ significantly from NVN. The occurrence of "a" also contributed significantly, $p < .001$, with a1 eliciting fewer N1 as subject choices than a0 ($B = -2.427$, $p < .001$ [Exp(B) = .088]) and a2 eliciting more of N1 as subject choices than a0 ($B = .800$, $p < .001$ [Exp(B) = 2.225]). That is, participants interpreted *a*

as signaling the object of the verb. There was no significant effect of language group, nor of animacy. Performance by word order and *a* is shown in Figure 4.

PLACE FIGURE 4 ABOUT HERE.

These results for the adults indicate some attention to word order, in that VNN structures elicited fewer N1 as subject choices than NVN and NNV. Attention to object 'a' was high, with a1 leading away from N1 as subject and a2 leading to more N1 as subject choices.

Children

Similar analyses were conducted for the Spanish-Welsh children in Patagonia. First, their Spanish vocabulary scores (TVIP) were examined: As expected, their mean score (97.7, out of 192) was significantly lower than those of the MonS Ads (169.8) and the SWBil Ads (170.8), *t*s (40) $\geq$ 13.0, *p*s < .001. But their standard scores (mean 102.0) were very close to the standardized mean of 100, indicating age-appropriate proficiency in Spanish. The children's grammar scores for Spanish (mean 30.8, out of 39) were significantly lower than those of the SWBil Ads (34.7), $p = .008$, but not than those of the MonS Ads (33.4), $p = .065$.

For the participant roles data, responses were again scored according to whether a participant chose the cartoon that corresponded to the first noun (N1) acting as the subject of the sentence. A binary logistic regression analysis was again conducted, with the independent variables of word order (VNN, NNV, NVN), animacy (A-I, I-A, I-I, AA), "a" (a1, a2, a0), and language group (MonS Ad, SWBil children). (In the case of the variables with more than two levels, the third listed (i.e., NVN for word order, AA for animacy, a0 for "a") was treated as the baseline in the analyses.)

The omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (8) = 160.818, $p < .001$. The model revealed a significant

contribution of word order, $p = .001$, with VNN yielding significantly fewer choices of N1 as subject than NVN ($B = -.498$, $p < .001$ [Exp(B) = .608]). There was no difference between NNV and NVN. The occurrence of "a" also contributed significantly, $p < .001$, with a1 eliciting fewer choices of N1 as subject than a0 ($B = -1.263$, $p < .001$ [Exp(B) = .283]). There was no significant effect of animacy. Performance by word order and "a" is shown in Figure 5.

PLACE FIGURE 5 ABOUT HERE.

These results for the children in Spanish indicate close conformity with the adult patterns for Spanish: fewer N1 as subject choices in VNN order than in NVN order, but little difference between NNV and NVN. The children also, like the adults, paid close attention to object 'a', with fewer N1 as subject choices when the noun was accompanied by *a*. Unlike the English-speaking children for English, the Spanish-speaking children were not swayed by animacy.

Welsh

Adults

Preliminary analyses examined the OWHBil Ads and SWBil Ads for Welsh vocabulary and grammar. On the adult PGC, their performance was significantly different, $F(1, 30) = 11.3$, $p = .002$, with OWHBil Ads at 83.9 (out of 100) and the SWBil Ads at 67.4. (When the SWBil Ads are split between Early and Late AoA, their vocabulary scores do not differ significantly (66.4, 68.7, respectively).) On the Welsh grammar task, there was also a significant difference, $F(1, 30) = 22.2$, $p < .001$, with the OWHBil Ads at 36.2 (out of 39) and the SWBil Ads at 30.6. (When the SWBil Ads are split between Early and Late AoA, their grammar scores are near-significantly different, $t(14) = 2.10$, $p = .055$, with the late learners showing slightly higher scores (28.8, 33.0, respectively).

For the participant roles data, a binary logistic regression analysis was again conducted, with the independent variables of word order (VNN, NNV, NVN), animacy (A-I, I-A, I-I, AA), gender (feminine, masculine), and language group (OWHBil Ads, Wales, BilSW adults, Patagonia). (As above, for the variables with more than two levels, the third listed (i.e., NVN for word order, AA for animacy) was treated as the baseline in the analyses.)

The omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (7) = 87.327, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 1.424, $p < .001$ [Exp(B) = .241]). VNN and NVN did not differ significantly. Animacy also contributed significantly, $p = .048$, with IA structures eliciting near-significantly fewer choices of N1 as subject than AA (B = - .408, $p = .064$ [Exp(B) = .665]). There was no significant effect of language group, nor of gender. Performance by word order and animacy is shown in Figure 6.

PLACE FIGURE 6 ABOUT HERE.

Because Figure 6 reveals an apparent tendency in the SWBil Ad group to treat NNV structures differently from the OWHBil Ads, the two groups were analyzed separately as a further exploratory measure. For the OWHBil Ads, the omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (6) = 119.3, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 2.484, $p < .001$ [Exp(B) = .083]). VNN and NVN did not differ significantly. Animacy was not significant, nor was gender. For the SWBil Ad group, the omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (6) = 14.79, $p = .022$. The

model did not reveal a significant contribution of word order. Animacy was not significant, but gender was, (B = .523, p = .015 [Exp(B) = 1.686]), with masculine structures eliciting more N1 as subject choices than feminine structures.

These results with the Welsh-speaking adults, then, when taken together, reveal discrimination of NNV from NVN structures in the prevalence of N1 as subject responses, but not of VNN from NVN. However, this result was unique to the OWHBil Ads. Taken together, the results also showed that IA structures elicited fewer N1 as subject responses than AA structures, but this result was not reflected in the results of the individual groups when analyzed separately. Noun gender was not significant for the two groups taken together, but it was significant for the SWBil Ads when analyzed separately. Thus, the SWBil Ads appear to have responded differently from the OWHBil Ads, in that, unlike their OWHBil Ad counterparts, they did not differentiate N1 as subject choices by word order, and they were influenced by gender.

Children, Wales

Preliminary analyses examined performance on Welsh vocabulary and grammar. On the PGC, performance was significantly different by home language, F (2, 100) = 10.1, p < .001, with OWH Children receiving higher scores (102.2, out of the original 240 words compiled, see Gathercole and Thomas 2007; Gathercole, Thomas and Hughes 2008) than both OEH (72.0) and WEH (71.2) children, and by age, F (1, 100) = 15.0, p < .001, with younger children showing lower scores (74.0) than the older children (96.3). A Home Language X Age Group interaction, F (2, 100) = 11.8, p < .001, revealed increased performance with age in the WEH and OWH groups (75.8 to 86.7 in WEH, 72.1 to 132.3 in OWH), but not in the OEH group (74.0 to 70.1). On the Welsh grammar task, there was also a significant difference by home language, F (2, 111) = 18.9, p < .001, with the OEH children's scores (25.4) lower than WEH (29.6) and OWH (31.0)

children's, *p*s < .001, and by age group, F (1, 111) = 5.9, p = .017, with younger scores (27.6) lower than older scores (29.6). These effects are entirely in line with previous results reported for Welsh in the Welsh context (e.g., Gathercole and Thomas 2009).

For the participant roles data, a binary logistic regression analysis was again conducted, with the independent variables of word order (VNN, NNV, NVN), animacy (A-I, I-A, I-I, AA), gender (feminine, masculine), language group (OWH, WEH, OEH), and age (8, 10).

The omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (9) = 513.801, p < .001. The model revealed a significant contribution of word order, p < .001, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 2.049, p < .001 [Exp(B) = .129]), and VNN yielding significantly fewer choices of N1 as subject than NVN (B = - .411, p < .001 [Exp(B) = .663].) Animacy also contributed significantly, p = .003, with AI structures eliciting more N1 as subject responses than AA (B = .346, p = .005 [Exp(B) = 1.413].) There was also a significant contribution of gender (B = .269, p = .002 [Exp(B) = 1.308]), with masculine nouns eliciting higher N1 as subject than feminine nouns. Finally, there was a significant effect of language group, p < .001. OWH children gave more N1 as subject responses than OEH children (B = .392, p < .001 [Exp(B) = 1.480]), as did WEH children (B = .286, p = .008 [Exp(B) = 1.331]. There was no effect of age. Performance by word order, animacy, and gender is shown in Figure 7.

PLACE FIGURE 7 ABOUT HERE.

In order to explore the home language differences in more detail, separate binary logistic regressions were conducted for each home language group. As above, the variables word order, animacy, and gender were entered for each group.

For the OWH children, the omnibus test of model coefficients revealed that the model

significantly predicted more variance than the null model, X^2 (6) = 201.79, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 2.038, $p < .001$ [Exp(B) = .130]), but no similar effect for VNN. That is, there was no difference in performance between NVN and VNN. Animacy also contributed significantly, p = .013, with AI structures eliciting more N1 as subject responses than AA (B = .603, p = .006 [Exp(B) = 1.828]). There was no significant contribution of gender.

For WEH children, the omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (6) = 210.12, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 2.477, $p < .001$ [Exp(B) = .084]), and VNN yielding significantly fewer choices of N1 as subject than NVN (B = - .464, p = .033 [Exp(B) = .629]). Animacy also contributed significantly, p = .002, with AI structures eliciting more N1 as subject responses than AA (B = .674, p = .006 [Exp(B) = 1.962]). There was a significant contribution of gender (B = .421, p = .013 [Exp(B) = 1.524]), with structures with masculine nouns eliciting more N1 as subject responses than those with feminine nouns.

For OEH children, the omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (6) = 122.63, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 1.755, $p < .001$ [Exp(B) = .173]), and VNN yielding significantly fewer choices of N1 as subject than NVN (B = - .664, $p < .001$ [Exp(B) = .515]). Animacy was not significant. There was a near-significant contribution of gender (B = .258, p = .058 [Exp(B) = 1.294]), with structures with masculine nouns eliciting more N1 as

subject responses than those with feminine nouns.

The patterns of responding for each group are shown in Figure 8.

PLACE FIGURE 8 ABOUT HERE.

To summarize, these results on the individual home language groups show that OWH children treated NVN and VNN structures equally in interpreting N1 as subject (and more than NNV), while both WEH and OEH children interpreted NVN structures as N1 as subject structures more than either NNV or VNN structures. In addition, both OWH and WEH children were affected by animacy, treating AI forms as N1 first structures more than AA forms. And both WEH and OEH children were influenced by the gender of the nouns, giving more N1 as subject responses with masculine nouns than with feminine nouns.

These results for the children in North Wales reveal the following: first, like Welsh-speaking adults, the children showed significant attention to word order. Both adults and children gave fewer N1 as subject responses to NNV structures than NVN structures. However, whereas the adults did not differentiate NVN and VNN forms, treating them as favoring N1 as subject equally, the children treated NVN as eliciting more N1 as subject than VNN -- but this was true of only the WEH and OEH children, not the OWH children. The results also showed significant differences across groups, with OWH and WEH children giving more N1 as subject responses than OEH children. And the WEH and OEH children, but not the OWH children, were influenced by the gender of the nouns, giving more N1 responses with masculine nouns than feminine nouns.

Children, Patagonia

The final set of analyses examined the Patagonia children's performance on Welsh.

Preliminary analyses on their Welsh vocabulary and grammar performance showed a

PGC mean of 48.4, lower than any other Welsh-speaking group, *p*s $\leq$ .019. This includes their performance relative to the group most similar to them in Welsh language experience, the younger OEH children. The latter had a mean score of 71.8 on the PGC; the two groups differed significantly, $F(1, 60) = 19.2$, $p < .001$. Similarly, their mean on the Welsh grammar task was 18.5, lower than every other Welsh-speaking group, *p*s < .001. Again, this includes the younger OEH children (mean 25.5), $F(1, 66) = 32.8$, $p < .001$. These results suggest that these children's level of knowledge of Welsh was at immature stages relative to the speakers of every other group.

For the participant roles data, these children's performance was compared to that of the younger OEH children in Wales. This is the group whose language experience of Welsh was most comparable to that of the children in Patagonia -- Welsh is a second language in both cases. The younger OEH children were in the same age range as the children in Patagonia. A binary logistic regression analysis was again conducted, with the independent variables of word order (VNN, NNV, NVN), animacy (A-I, I-A, I-I, AA), gender (feminine, masculine), and language group (younger OEH children, SWBil children, Patagonia).

The omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (7) = 72.214, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN ($B = -.795$, $p < .001$ [Exp(B) = .452]). VNN was near-significantly different from NVN ($B = -.251$, $p = .097$ [Exp(B) = .778]). Animacy was not significant. There was no significant contribution of gender. Finally, there was a significant effect of language group ($B = -.812$, $p < .001$ [Exp(B) = .444], with SWBil children from Patagonia giving fewer N1 as subject responses than the OEH children.

Performance by word order is shown in Figure 9 for both groups together, as well as each group separately.

PLACE FIGURE 9 ABOUT HERE.

In order to explore the differences between the two language groups in more detail, separate binary logistic regressions were conducted for each group. As above, the variables word order, animacy, and gender were entered for each group.

For the younger OEH children, the omnibus test of model coefficients revealed that the model significantly predicted more variance than the null model, X^2 (6) = 49.676, $p < .001$. The model revealed a significant contribution of word order, $p < .001$, with NNV yielding significantly fewer choices of N1 as subject than NVN (B = - 1.519, $p < .001$ [Exp(B) = .219]), but no similar effect for VNN. There were no other significant contributory effects.

For the younger SWBil children in Patagonia, the omnibus test of model coefficients revealed that the model did not significantly predict more than the null model, X^2 (6) = 6.084, p = .414. The model revealed no significant effects. Thus, N1 as subject choices could not reliably predicted on the basis of any of the variables -- word order, animacy, or gender.

Discussion

These data provide clear results for the majority languages, English and Spanish. In both cases, the different language groups show parallel patterns. In English, for NVN structures, SVO interpretations predominate, and treatment of NNV and VNN as OSV and VOS is strong in all groups. Stress on either noun leads away from treatment of N1 as subject, particularly in relation to non-canonical orders, NNV and VNN. Animacy plays a minor role, in lowering choices of N1 as subject in IA and II structures in the interpretations of the children. There are no appreciable differences by home language in either the adult or child groups. This can be

attributed to the high level of proficiency across groups in English (see discussion below).

In Spanish, word order also acted as a predictor, with NNV and NVN both eliciting N1 as subject choices more than VNN. Object 'a' was also a significant predictor for both the adults and the children, with *a* clearly signaling an object role for the noun. Animacy was not influential.

For Welsh, in both contexts, the findings show more variability. OWHBil Adults showed clear attention to word order, consistently aligning VNN with NVN in interpreting N1 as the subject -- i.e., treating them as expressing VSO and SVO, and differentiating them from NNV, for which N2 was taken as subject -- i.e., as expressing OSV. The SWBil Adults, however, did not discriminate by word order. That is, N1 as subject choices were similar for NNV, NVN, and VNN structures in their responses. The OWHBil Ads were not affected by noun gender, but the SWBil Ads were.

The children also showed variation. In North Wales, the three home language groups showed attention to word order slightly differently. The OWH children treated NVN and VNN as equally strong predictors of N1 as subject, while OEH and WEH chose N1 as subject more with NVN than VNN structures. The OWH and WEH children, like the adult Welsh speakers, were influenced by animacy, giving more N1 responses with AI than with AA. And the WEH and OEH children were influenced by gender, giving more N1 responses with masculine nouns than with feminine nouns.

The Welsh-speaking children in Patagonia, in contrast, showed no consistent patterns of differentiating structures by any of the variables, whether word order, animacy, or gender.

What conclusions can we draw from these data? There are clear differences across groups in their performance on Welsh, but what is the best explanation for the differences? Of

the theoretical positions espoused in the literature -- supporting roles for language dominance, for language proficiency, for acquisitional processes, and the like, is one supported more than others by these data? We will focus in particular on proficiency, language dominance, and acquisitional processes and try to discern which of these is most parsimonious with the data.

For proficiency alone as the most influential factor, the results are mixed. As measures of proficiency, we have information on the vocabulary performance in each language and a receptive grammar task in each language for all the bilinguals. Table 3 presents the relative performance on these by the relevant groups, alongside their performance on the participant roles task. Looking first at the adult groups, we see that for Spanish, the MonS Ads and the SWBil Ads performed equivalently on all three tasks, the vocabulary, grammar, and participant roles tasks. For English, the MonE Ads and the OWHBil Ads performed equivalently on English vocabulary, but the OWHBil Ads performed at a slightly lower level on the English grammar task. Yet the two groups did not differ on the participant roles task in English. For Welsh, the SWBil Ads clearly performed at lower levels than the OWHBil Ads on both the vocabulary and grammar tasks, and they performed differently from them on the participant roles task, showing a lack of discrimination of word order in their N1 as subject choices. Based on these adult data, proficiency appears to be related to performance, but it alone cannot predict performance on the participant roles task, judging by the results from the OWHBil Ads for English.

Turning to the children, for both English and Welsh we can see differences in relative proficiency. (For Spanish, we have no comparison data for the SWBil children.) For English, the OWH children have lower vocabularies than OEH children; however, there are no differences in performance on the English participant roles task. Thus, for example, the OWH children are not more likely than the OEH children to treat VNN structures as encoding VSO structures, on

analogy with Welsh. For Welsh, the SWBil children clearly have lower proficiency in Welsh vocabulary and grammar than the younger OEH children, and we see a dramatic difference in performance between these two groups on the participant roles task.

These differences in relative proficiency among the children, like those for the adults, provide mixed evidence on a direct link between proficiency and performance on the participant roles task: while the OWH children had lower vocabularies in English than the OEH children, their performance on the participant roles task in English did not differ from them; in contrast, the SWBil children's lower performance than the OEH children's on Welsh vocabulary and Welsh grammar corresponded with differential performance on the participant roles task.

PLACE TABLE 3 ABOUT HERE.

Can language dominance provide a better explanation for the results? Relative proficiency does not necessarily correspond with relative balance in a bilingual. For example, the OWH children may perform at slightly lower levels than OEH children on English vocabulary, but this does not necessarily mean that their Welsh is dominant over their English. To get some sense of language dominance in these groups, we can examine performance on the grammar tasks, which were designed to be relatively equivalent across the languages tested (see Gathercole, Pérez-Tattam, Stadthagen-González, and Thomas 2014; Pérez-Tattam, Gathercole, Yavas, and Stadthagen-González 2013). (The performance on the vocabulary measures, on the other hand, cannot be compared across languages because of differences in scales and design.) Table 4 presents a comparison of each group's performance on the grammars of their two languages (all tests have a maximum score of 39), along with *t*-test measures comparing performance on the two languages. By these measures, we can infer, in general, that the WEH and OEH children were dominant in English over Welsh, and the OWHBil Ads were marginally

dominant in Welsh. Similarly, by this measure, the SWBil Ads and the SWBil children were both dominant in Spanish over Welsh.

When these dominance relations are compared with performance on the participant roles task, can we conclude that dominance in a language leads to transfer or influence from the dominant language to the less dominant language? On the one hand, it is true that it is the WEH and OEH children who are less likely to treat VNN structures as VSO than their OWH peers, and this might be attributable in part to influence from English. On the other hand, the OEH and WEH children's performance on VNN in Welsh does not mirror their performance on VNN in English, so it is definitely not a case of direct transfer. Another case in point is the SWBil Ads in Patagonia. Their grammar scores indicate that they are dominant in Spanish over Welsh, and their performance on the Welsh participant role task did not differentiate structures by word order, distinct from their OWHBil Ads peers in Wales. Yet a direct transfer from Spanish would entail equivalence of NVN and NNV structures and differentiation of these from VNN structures, and this is not what was observed. A similar conclusion can be drawn regarding the patterns of responses of the SWBil children in Welsh. Their responses on Spanish showed clear discrimination of NVN and NNV structures on the one hand from VNN structures on the other. But their responses on Welsh are more random. They do not suggest a direct transfer from Spanish to Welsh (for example, treating NNV and NVN structures as encoding N1 subjects more than VNN, in line with the patterns for Spanish), but, instead, a lack of any solid basis for determining the subject of a sentence in Welsh. Their low level of vocabulary and grammar performance in Welsh suggest that they are at a much earlier stage in acquisition of Welsh than their OEH counterparts. They appear to be at an early stage of acquisition at which they are still trying to discern the appropriate cues to subjecthood in Welsh.

Let us consider, then, alternative explanations. The above findings suggest that, while those participants who show differential abilities in their two languages are those who are more likely to perform on the participant roles task differently from their peers, this is not due to direct transfer from one language to the other. Those who show performance in Welsh that might on the surface "look like" interactional effects seem to fall into two groups: children whose Welsh is behind that of their peers (in both vocabulary and grammar) -- OEH and SWBil children -- and children and adults who appear very fluent in Welsh but who are also highly competent in their other language -- WEH children and SWBil adults. The patterns of performance are suggestive of, not transfer per se, but an outgrowth of acquisitional processes faced by children and adults whose proficiency in the language of concern may be (still) somewhat fragile, in the process of acquisition, or "bumping up against" their knowledge of the other language.

Some support for this account may come from the performance relating to gender in Welsh. Recall that there were no significant effects regarding gender in Welsh for the OWHBil Ads or the OWH children in Welsh. However, the SWBil Ads and the WEH and OEH children showed more N1 as subject choices with masculine nouns than with feminine nouns. This appears to be an outgrowth of a level of immaturity in Welsh: One possibility is that the fact that feminine nouns undergo soft mutation with the definite article may mean that their meanings are obscured, so less proficient speakers may be uncertain of the meanings of the mutated nouns. Alternatively, speakers who may still be in the process of sorting out the relevant functions of soft mutation in Welsh, including both its use in relation to participant roles and in relation to noun gender, may be uncertain about the SM in these structures. The fact that the gender effect was not unique to the least proficient speakers (in fact, this effect is absent in the SWBil children

in Patagonia) suggests that this corresponds to some transitional stage in Welsh. Future research is needed, however, for a conclusive answer.

The inferences to be drawn from these data are the following: First, these data do not provide strong support for a strictly proficiency-based or a dominance model of language transfer in the use of these structures by bilinguals. Those who are less proficient in general in the language do not necessarily perform differently on the task, and those who are dominant in one language do not necessarily carry over structures from one language to the other. The results here argue, instead, for an acquisitional account for the interpretation of these structures, whereby a bilingual child or adult does not directly carry over structures from one language to the other, but, instead, may take longer to work out the relevant language-specific patterns governing each language or to work through a complex network of structures to determine those that are language-specific.

These data together provide some new information on language interaction in a relatively understudied bilingual pair, Spanish and Welsh, and the comparison with data from North Wales helps to elucidate the exact factors influencing such interaction. The apparently profound differences in the young Spanish-Welsh bilingual children's processing of Welsh relative to their North Wales peers', as well as the differences in the SWBil Ads' processing of Welsh relative to the OWHBil Ads, help illuminate the importance of the level of input and of the larger linguistic community in which the bilinguals are situated. In North Wales, over 50% of the population (65.4% in Gwynedd, 57.2% in Anglesey) speak Welsh (Office of National Statistics Census 2011), and children largely attend Welsh-medium schools in the early school years. In Patagonia, in contrast, approximately 10% of the Welsh-heritage community (about 50,000, BBC 2015) are Welsh speakers (BBC 2014), and 1% of the overall population (of about 500,000,

Dirección General de Estadística y Censos Chubut 2014), and Welsh-medium schools are a recent development. Such dramatic differences in the larger context in which a second language is learned are worthy of much more extensive research.

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[1] The optimal linguistic analysis of the trigger for such mutation may relate to simple syntactic sequencing, in that it is not only syntactic objects that undergo such mutation, but any form that follows a phrasal category (Borsley and Tallerman 1996, Harlow 1989).

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Table 1. Nouns used in the experimental task

Animate			*Inanimate*		
English	Spanish	Welsh	English	Spanish	Welsh
bull	toro	tarw M	bag	bolsa	bag M
butterfly	mariposa	glöyn byw M	ball	pelota	pêl F
camel	camello	camel M	basket	canasta	basged F
cat	gato	cath F	bike	moto	beic M
cow	vaca	buwch F	brick	ladrillo	bricsen F
crow	cuervo	bran F	car	auto	car M
lamb	oveja	dafad F	cart	carro	trol F
donkey	burro	mul M	crane	grúa	craen M
goat	cabra	gafr F	dish	plato	dysgl F
hedgehog	puercoespín	draenog M	drum	tambor	drwm M
horse	caballo	ceffyl M	mirror	espejo	drych M
monkey	mono	mwnci M	glove	guante	maneg F
owl	buho	tylluan F	mountain	montaña	mynydd M
parrot	loro	parot M	peg	gancho de ropa	peg M
penguin	pingüino	pengwin M	plant	planta	planhygin M
pig	cerdo	mochyn M	pram	cochecito	coets F
rabbit	conejo	cwningen F	stick	palo	gwialen F
seagull	gaviota	gwylan F	stone	piedra	carreg F
snail	caracol	malwen F	sword	espada	cleddyf M
squirrel	ardilla	gwiwer F	tent	carpa	pabell F
deer	ciervo	teigres F 'tigress'	tree	arbol	coeden F
turkey	pavo	twrci M	truck	camión	tryc M
wasp	avispa	cacynen F	tyre	rueda	teiar M
wolf	lobo	blaidd M	wheelbarrow	carretilla	berfa F

Table 2. VERBS used

English (in present continuous form)	Spanish (in present tense)	Welsh (in past tense)
block	tapar	blocio
carry	cargar	gafael 'hold'
hide	esconder	cuddio
hit	golpear	taro
hold	sostener	dal
pinch	apretar	pinsio
pull	tirar	tynnu
push	empujar	gwthio
scratch	arañar	crafu

Table 3. Comparison of vocabulary, grammar, and participant roles tasks across groups.

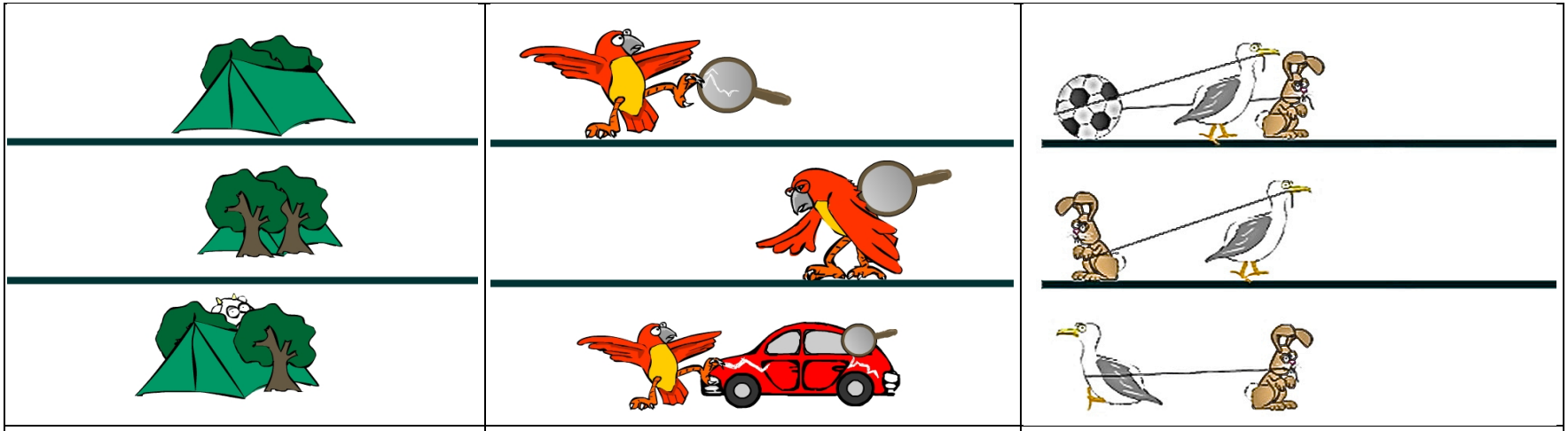
Language	Participant Groups	Vocabulary	Grammar	Participant Roles Task	
ENGLISH	MonE Ads, OWHBil Ads	MonE Ads = OWHBil Ads	MonE Ads > OWHBil Ads	MonE Ads = OWHBil Ads	NVN > NNV, VNN S0 > S1, S2
	Children, Wales (OEH, WEH, OWH)	OEH > OWH Older > Younger	OEH = WEH = OWH Older > Younger	OEH = WEH = OWH	NVN > NNV, VNN S0 > S1, S2 AA > IA, II
SPANISH	MonS Ads, SWBil Ads	MonS Ads= SWBil Ads	MonS Ads = SWBil Ads	MonS Ads= SWBil Ads	NVN > VNN NVN = NNV a0 > a1, a2
	SWBil Children	At standard level, 102.0	SWBil children = MonS Ads		NVN > VNN NVN = NNV a0 > a1
WELSH	OWHBil Ads, SWBil Ads	OWH Ads > SWBil Ads	OWHBil Ads > SW Bil Ads	OWHBil Ads =? SWBil Ads	NVN > NNV NVN = VNN AA > IA
				BUT: OWHBil Ads:	NVN > NNV NVN = VNN
				SWBil Ads:	w.o. n.s. M > F
	Children, Wales (OEH, WEH, OWH)	OWH > WEH, OEH Older > Younger	OWH, WEH > OEH Older > Younger	OWH, WEH > OEH	NVN > NNV NVN > VNN AI > AA M > F But:
				BUT: OWH:	NVN > NNV NVN = VNN AI > AA
				WEH:	NVN > NNV NVN > VNN

			OEH:	AI > AA M > F NVN > NNV NVN > VNN M > F
Younger OEH, SWBil Children	Y OEH > SWBil	Y OEH > SWBil	Y OEH > SWBil children	NVN > NNV
Younger OEH SWBil Children				But: NVN > NNV n.s.

Table 4. Comparison of performance across languages on grammar tasks.

	LANGUAGE			
Group	English	Welsh	Spanish	*t*-test
OWHBil Ads	34.9	36.2		$t(15) = 2.00, p = .064$
OWH children	30.4	31.0		*n.s.*
WEH children	31.7	29.6		$t(33) = 3.71, p = .001$
OEH children	31.0	25.4		$t(41) = 6.64, p < .001$
SWBil Ads		30.6	34.7	$t(15) = 3.67, p = .002$
SWBil children		18.5	30.8	$t(25) = 11.19, p < .001$

Figure 1. Sample pictorial stimuli with nouns and verb used



tree - tent - hide	parrot - mirror - scratch	seagull - rabbit - pull

Figure 2. ENGLISH Adults, Word Order X Stress

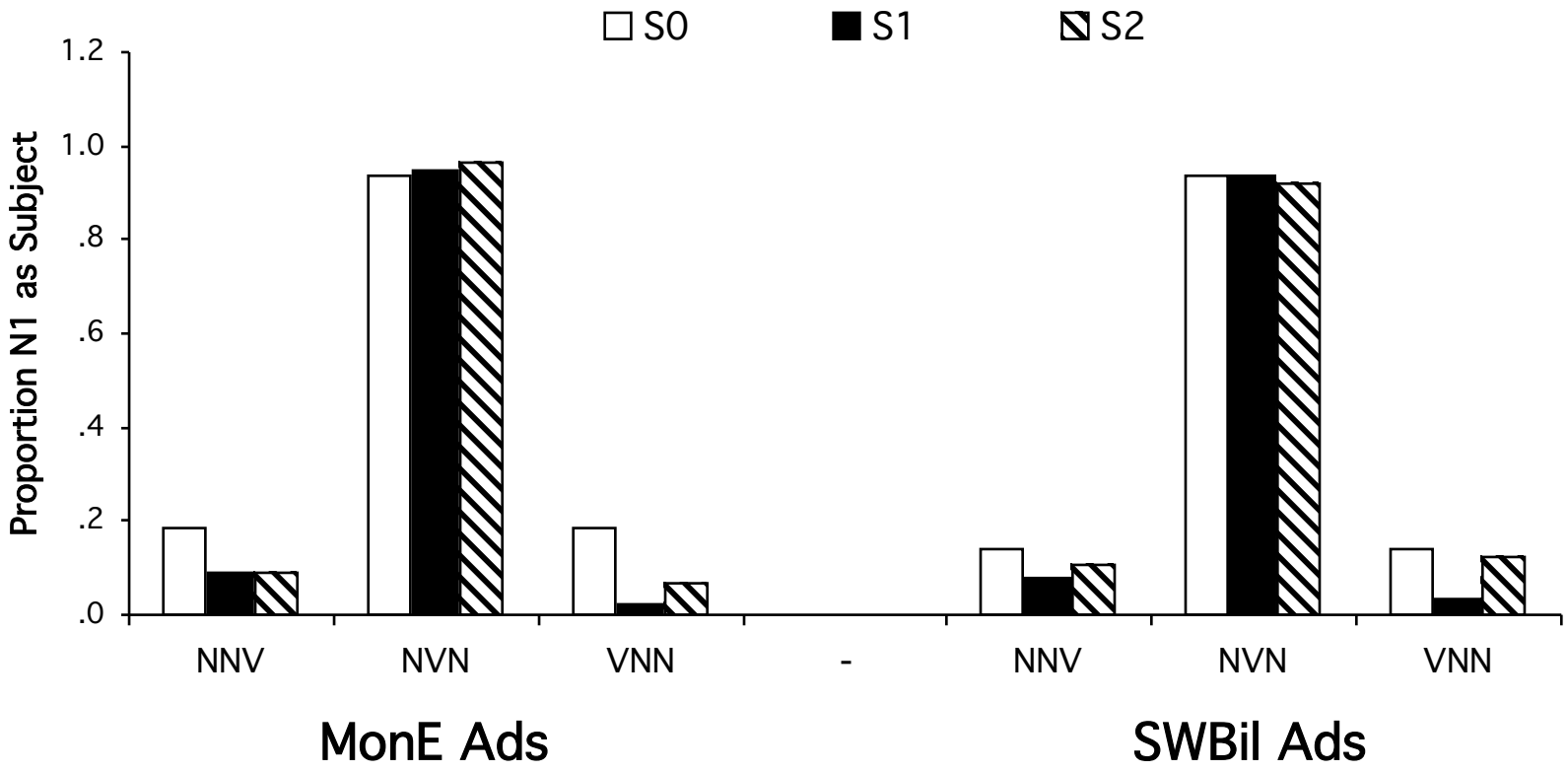


Figure 3. ENGLISH Children, Animacy X Word Order X Stress

Figure 3. (a)

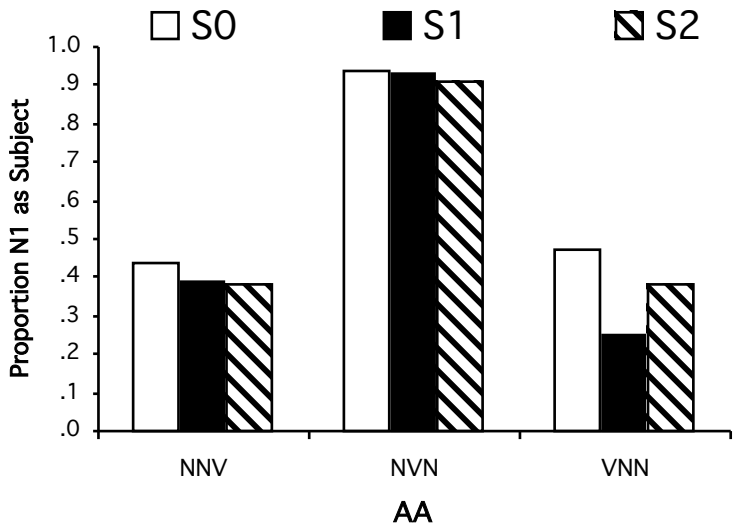


Figure 3. (b)

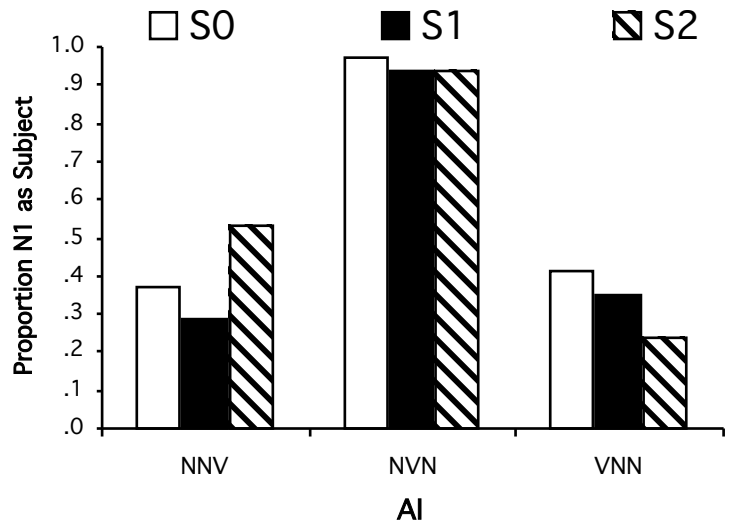


Figure 3. (c)

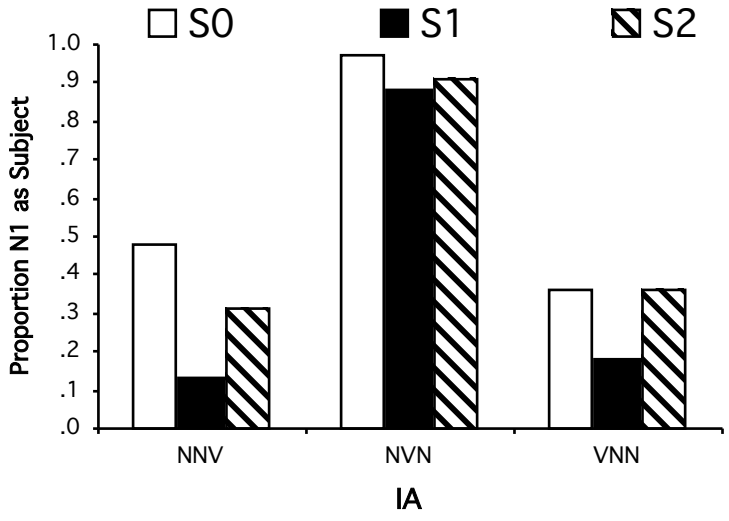


Figure 3. (d)

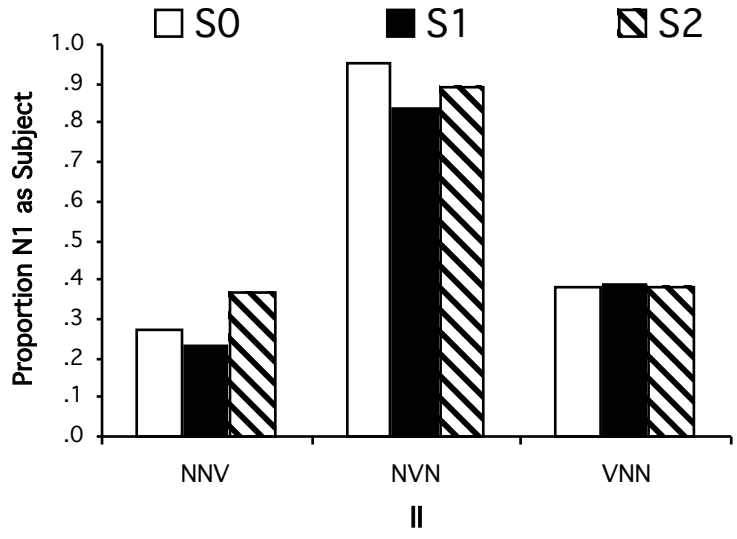


Figure 4. SPANISH Adults, Word Order X Object'a'

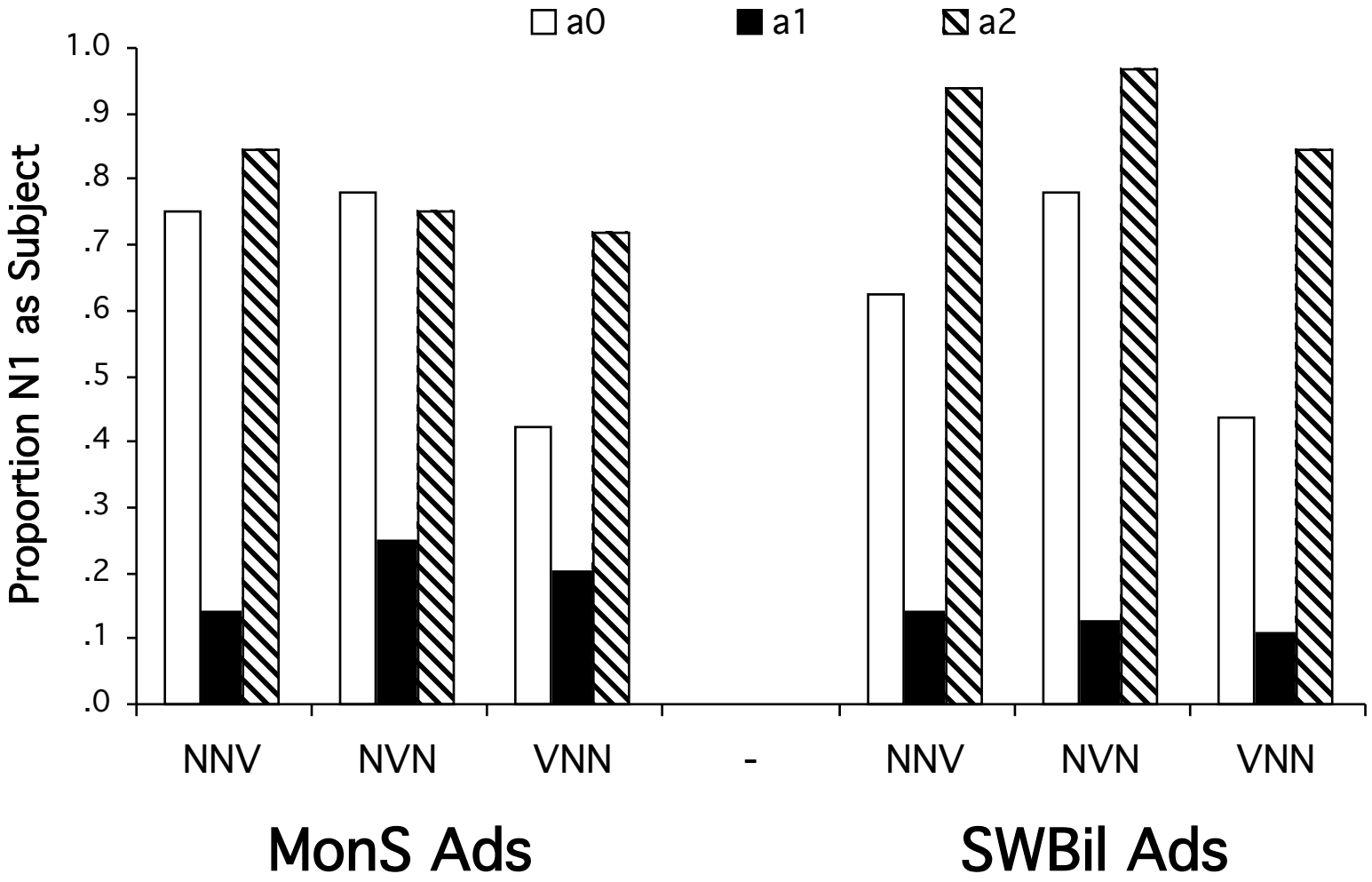


Figure 5. SPANISH Children, Word Order X Object'a'

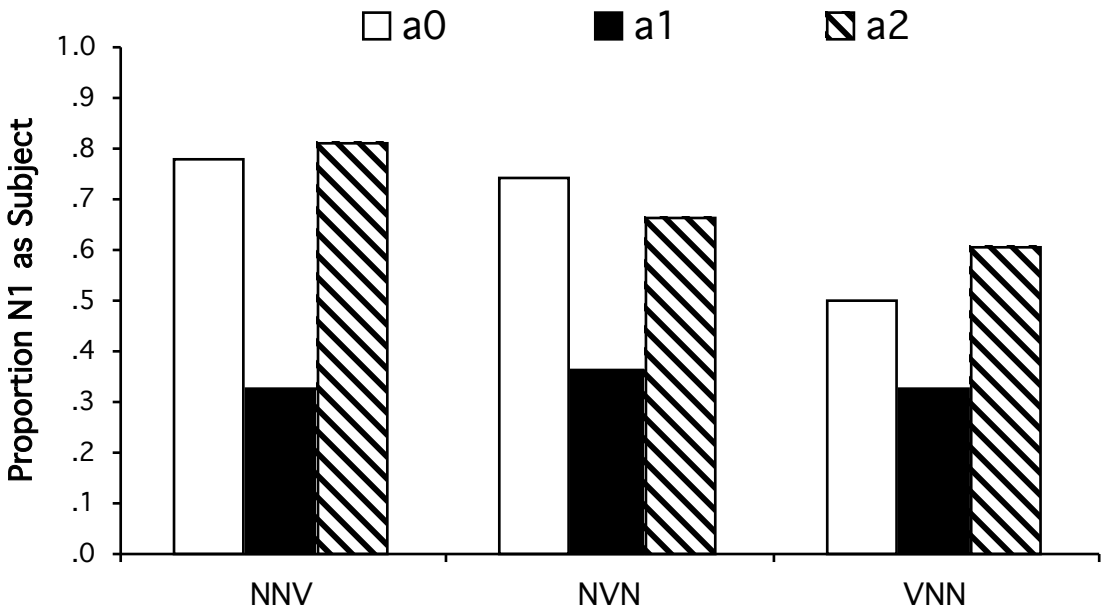


Figure 6. WELSH Adults, Animacy X Word Order

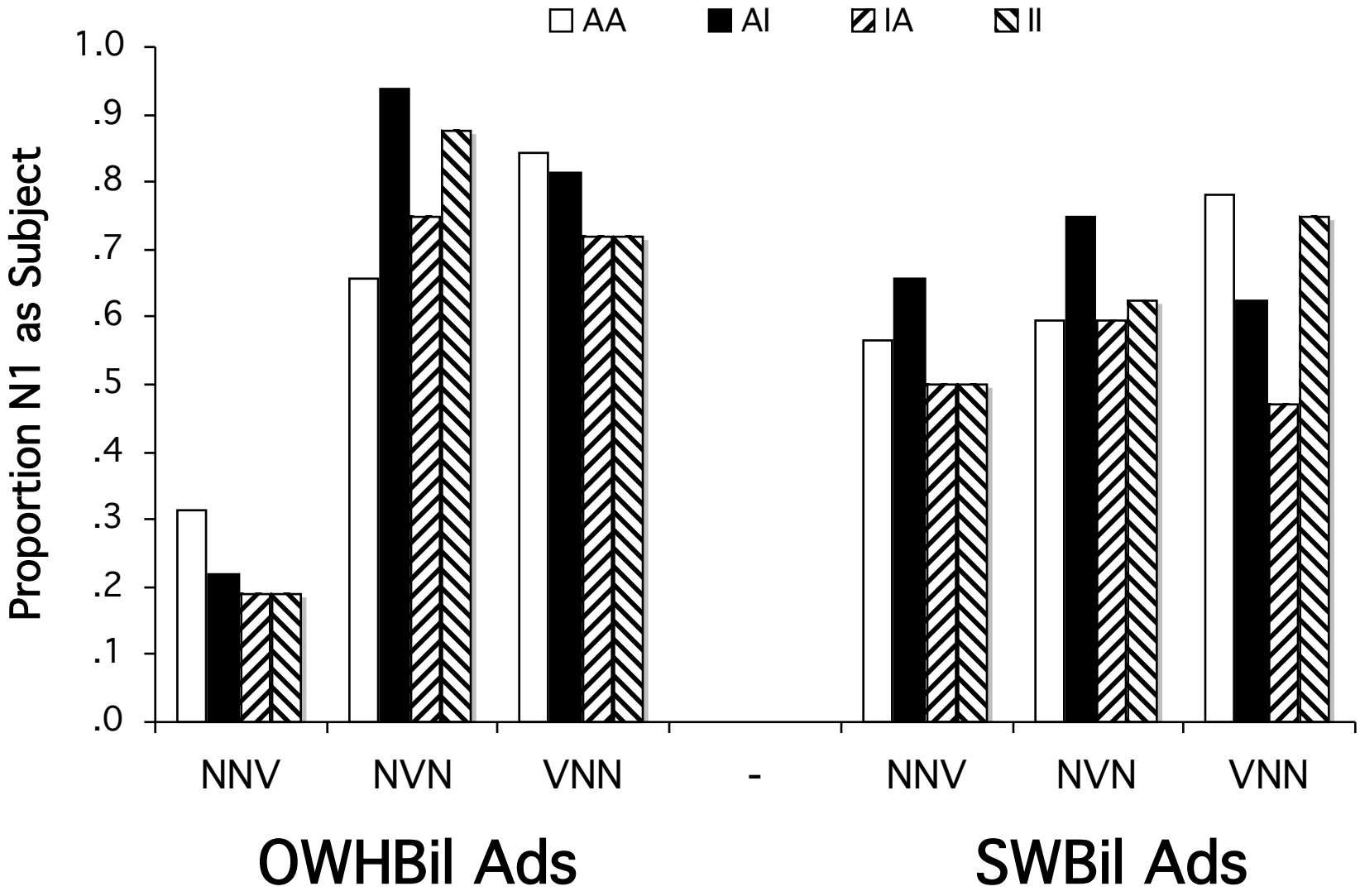


Figure 7. WELSH Children Wales, Animacy X Word Order X Gender

Figure 7. (a)

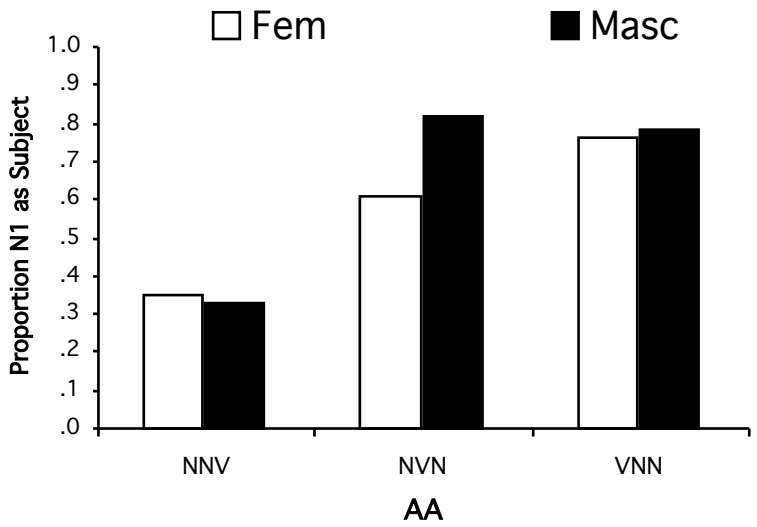


Figure 7. (b)

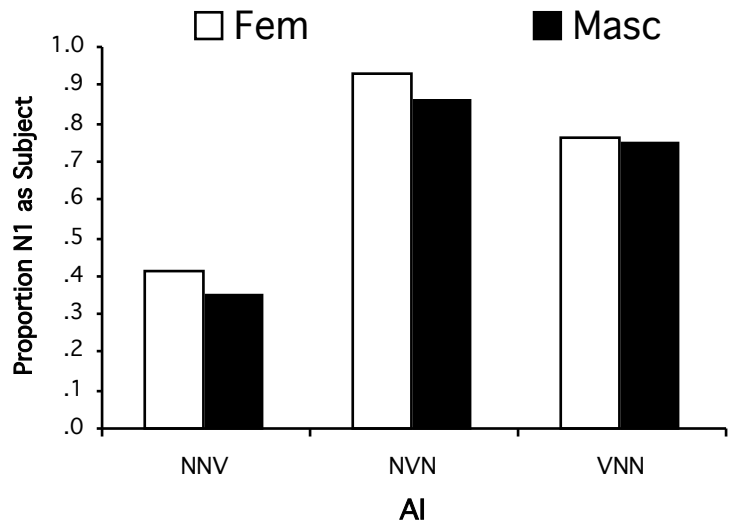


Figure 7. (c)

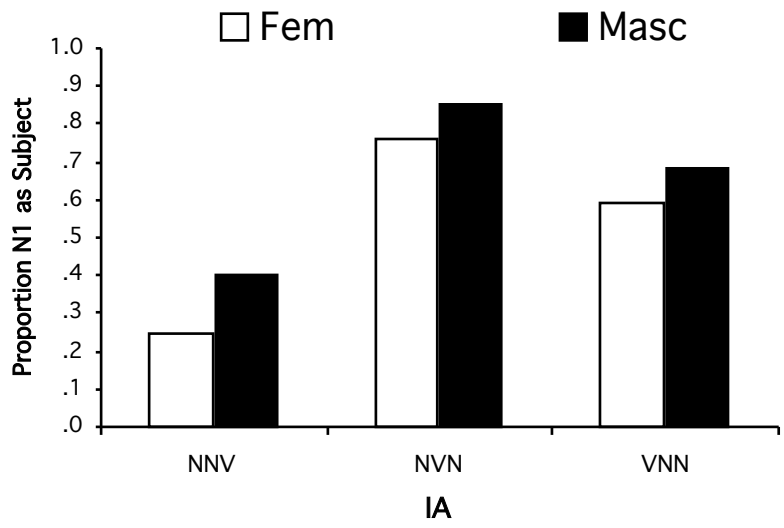


Figure 7. (d)

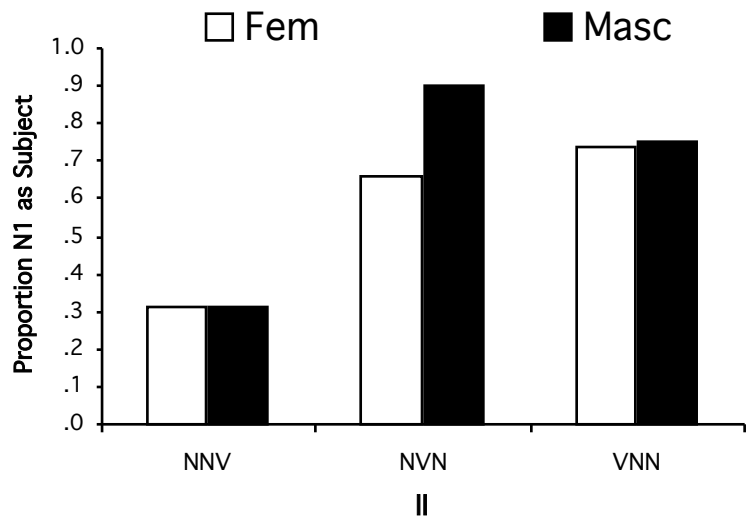


Figure 8. WELSH Children Wales, by Home Language

Figure 8. (a) OWH [WO, Animacy]

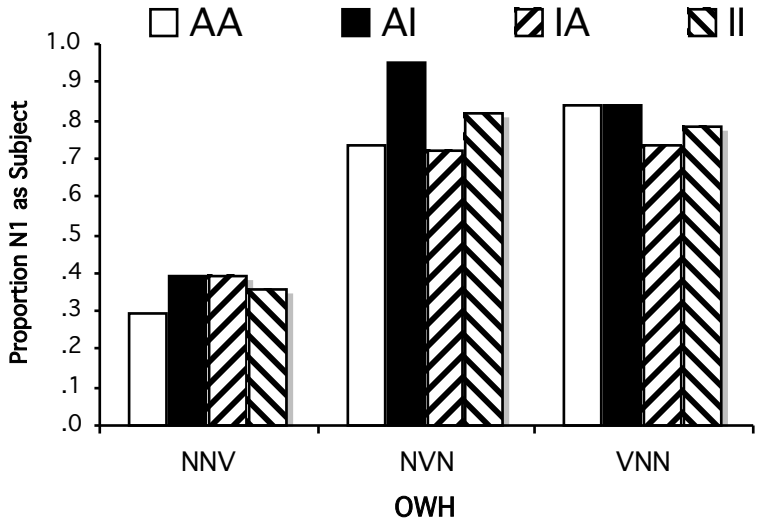


Figure 8. (b) WEH [WO, Animacy, Gender]

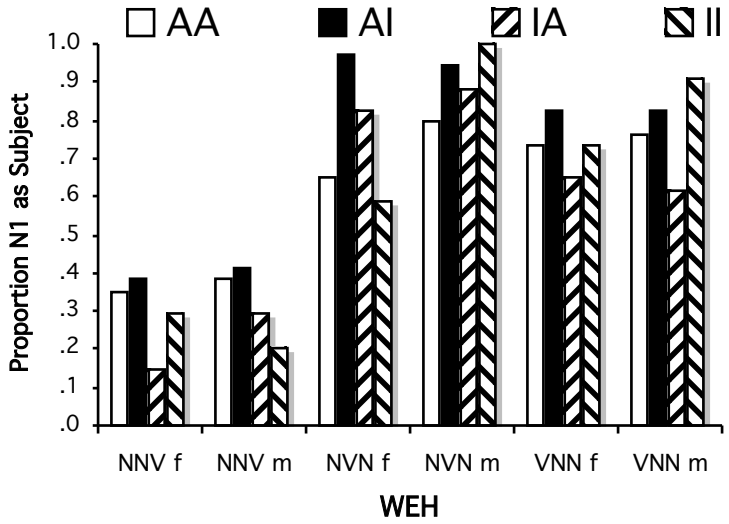


Figure 8. (c) OEH [WO, Gender]

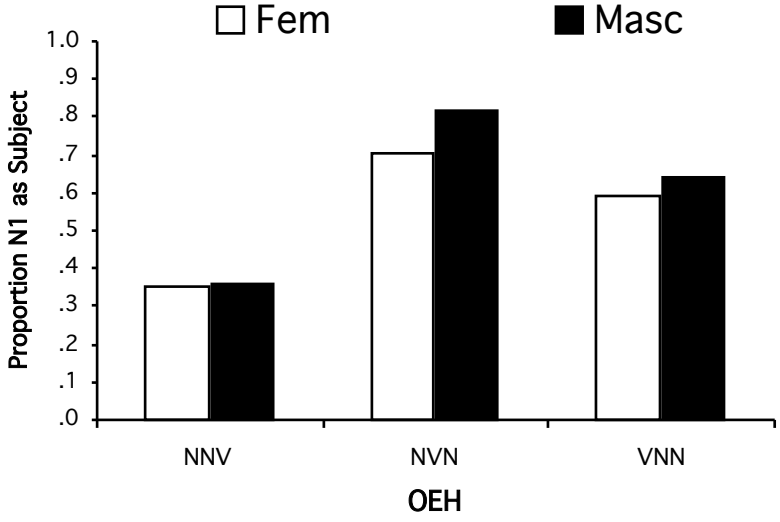


Figure 9. WELSH Younger OEH children and SWBil Children Patagonia, Word Order

Figure 9. (a) Together

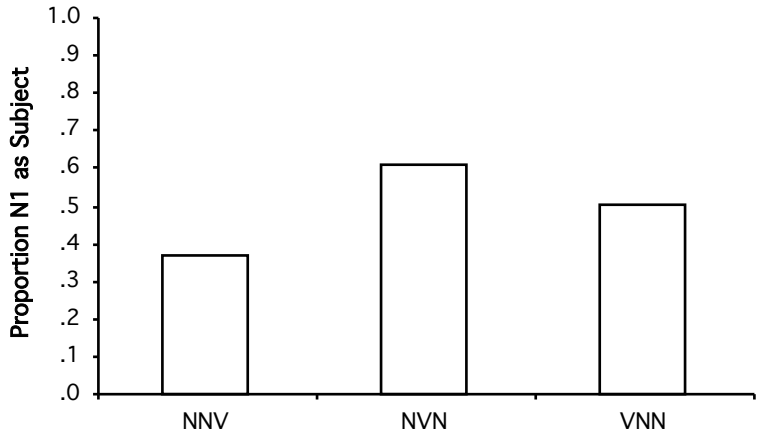


Figure 9. (b) Younger OEH vs SWBil Children