

Cross-Linguistic Influence in Word Order: Effects of Age, Dominance and Surface Overlap

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Abstract

The present study investigated cross-linguistic influence (CLI) in the word order of Dutch-English bilingual children, using elicited production and acceptability judgment tasks. The goal was to examine whether monolingual and bilingual children produced and/or accepted V2 word orders in English, as in **Yesterday painted she an apple*. We investigated whether the likelihood of CLI was related to language dominance, age at testing, and the degree of surface overlap (i.e., V2 word orders with auxiliaries versus main verbs).

Even though none of the participants produced V2 word orders in English, in the acceptability judgment task bilingual children were more likely to accept V2 word orders than monolingual peers. Whilst monolinguals sometimes accepted V2 word orders with auxiliaries, bilinguals did so significantly more often (constituting a quantitative difference) and with main verbs, too (implying a qualitative difference). Therefore, we conclude that CLI can occur independently of surface overlap and that it can lead to both quantitative and qualitative differences between bilinguals and monolinguals. The likelihood of CLI was predicted by language dominance, but not by age. Some bilinguals still accepted V2 word orders at age ten, suggesting that in some cases CLI may be more persistent than previously thought.

1. Introduction

Over the past two decades considerable attention has been devoted to the question of whether bilingual children's two languages influence each other, and if so, under what circumstances this cross-linguistic influence (CLI) takes place. The standard assumption in the field of bilingual first language acquisition is that whilst bilingual children are able to separate their languages from very early on, there may still be some degree of interaction (Paradis & Genesee, 1996). A number of language-level and child-level factors have been invoked to explain CLI, including, amongst others, surface overlap and language dominance (e.g., Döpke, 1998; Hulk & Müller, 2000; Yip & Matthews, 2000; see Serratrice, 2013 and Unsworth, 2013a). Whilst a number of studies have investigated CLI in comprehension (e.g., Argyri & Sorace, 2007; Kidd, Chan & Chiu, 2015), the vast majority have focussed on children's productive skills, and in general on children in the preschool and kindergarten years. In this paper, we examine the role of surface overlap, language dominance and age in predicting CLI in production and comprehension in the English word order of bilingual Dutch-English children aged five to ten.

1.1 The role of surface overlap

A particularly influential contribution to the question of when CLI in bilingual acquisition should take place was made by Hulk and Müller (2000) and Müller & Hulk (2001). According to this proposal, there are two conditions which must be met for CLI to be possible (and probable, although not inevitable). First, an interface level between two modules of grammar must be involved. Second, the two languages must overlap at the surface level. If there are two grammatical options for a specific phenomenon in language A and only one of these is available in language B, this may reinforce the use of the option that is shared by both languages

in language A. This implies that CLI is unidirectional, and that it only results in quantitative differences between bilinguals and monolinguals (Hulk & Müller, 2000; Müller & Hulk, 2001; Serratrice, 2013).

The first condition of Hulk & Müller's original hypothesis has turned out to be too strict, since CLI has also been found in non-interface phenomena, including narrow syntax. For example, Pérez-Leroux, Cuza and Thomas (2011) found CLI in Spanish-English bilinguals' clitic placement in Spanish, and Argyri and Sorace (2007) found CLI in Greek-English bilinguals with respect to subject placement in interrogatives in Greek. In contrast, a number of studies have shown that the second condition of Hulk and Müller's hypothesis may be more robust (Müller & Hulk, 2001; Foroodi-Nejad & Paradis, 2009; Serratrice, Sorace & Paoli, 2004). To illustrate, the Italian-English bilingual child studied by Serratrice, Sorace and Paoli (2004) overgeneralized the use of overt subjects in Italian, while he did not use more null subjects in English than monolingual peers. This can be explained in terms of surface overlap, because the use of overt subjects is obligatory in English but optional in Italian.

Other studies have however shown that CLI can occur regardless of surface overlap, leading to qualitatively different language outcomes in bilingual children in both production and comprehension (Gavarró, 2003; Nicoladis, 2006; 2012; Strik & Pérez-Leroux, 2011). Such findings go against the widely held assumption that CLI will only lead to temporary, quantitative differences between bilinguals and monolinguals, in the form of developmental delay or acceleration (Hulk & Müller, 2000; Meisel, 2001; 2008; see Serratrice, 2013 for discussion). For example, in their study of CLI in the domain of *wh*-movement, Strik and Pérez-Leroux (2011) found that (certain) Dutch-French bilingual children produced two types of *wh*-questions in Dutch which were qualitatively different from those produced by monolinguals, namely French-like *wh*-fronting without subject-verb inversion, as in **Wat jij doe giraffe?* (lit. what you do giraffe?), and *wh*-in-situ questions such as **Jij doe wat giraffe?* (lit. you do what

giraffe?). Strik and Pérez-Leroux interpret these findings in terms of a complexity-based theory of transfer, hypothesizing that structures which require less complex structural derivations (such as in-situ questions) may influence structures which require more complex derivations (such as *wh*-fronting with subject-verb inversion) (see also Gavarró, 2003). In other words, overlap may play a role in predicting CLI, but this does not necessarily have to be at the surface level (i.e., the surface form in French overlaps with a form in an earlier derivational step in Dutch).

Another study showing that surface overlap is not a prerequisite for CLI to occur is Nicoladis (2012). She reports bidirectional CLI in three- and four-year-old French-English bilingual children in the elicited production of possessive constructions. Not only did bilingual children in this study produce French-like periphrastic constructions as in ‘the hat of the dog’ in English significantly more often than monolinguals (32% versus 7%), they also produced ungrammatical English-like reversed possessive constructions in French, as in **chien chapeau* ‘dog hat’ to refer to the dog’s hat at a significantly higher rate (18%) than their monolingual peers, who never produced such structures. On Hulk and Müller’s approach, the increased use of French-like periphrastic constructions in English is expected, since this is a grammatical option in both languages; the production of ungrammatical English-like reversed possessives in French is however unexpected.

On the basis of these (and other) results, Nicoladis argues that CLI can occur regardless of surface overlap (‘syntactic ambiguity’ in Hulk and Müller’s terms) or derivational complexity, because the two languages a bilingual speaks are in competition with each other during speech production. This competition is hypothesised to take place at the lemma level, that is when a speaker selects the words and grammatical structures to convey a message that has already been established at a conceptual level, and before it is realized at a phonetic level (Nicoladis, 2006; 2012). Nicoladis emphasizes that “cross-linguistic transfer is a phenomenon of language production, rather than comprehension” (2003, p. 29), while at the same time she

acknowledges that, if cross-linguistic transfer is an epiphenomenon of speech production, it might nevertheless “be manifested in comprehension as well, but perhaps in different ways than in production” (2006, p. 29).

In summary, the available empirical evidence shows that CLI can occur regardless of surface overlap. As a result, the interaction between two languages may cause bilinguals to produce qualitatively different structures which monolinguals would never produce. At least two different alternative hypotheses have been proposed to account for instances of CLI that cannot be explained in terms of surface overlap between two languages: firstly, the direction of CLI may be determined by the complexity of grammatical derivations (Strik & Pérez-Leroux, 2011; Gavarró, 2003), and secondly, CLI may be an epiphenomenon of bilingual speech production, as two languages compete at the lemma level (Nicoladis, 2003; 2006; 2012).

1.2 The role of language dominance

Not all bilingual children show CLI (Gathercole, 2007), and the presence and strength of CLI may be influenced by several child-level factors. One such factor is language dominance. The term ‘dominance’ can be used to refer to differences in frequency of use, or to differences in proficiency (Yip & Matthews, 2006; see Silva-Corvalán & Treffers-Daller, 2016 and papers therein for recent discussion).

There is considerable variation among bilingual children with regard to how much input they receive in their two languages (Unsworth, 2013a), and previous research suggests that there is a relation between current amount of language exposure and CLI (Unsworth, Argyri, Cornips, Hulk, Sorace & Tsimpli, 2014; Hervé, Serratrice & Corley, 2016; Unsworth, 2016). This means that bilinguals who receive relatively more input in one of their languages are more likely to transfer elements from this language than bilinguals who receive less input. Furthermore, bilingual children tend to be more proficient in one of their languages, and such

differences in relative proficiency have also been related to the likelihood of CLI (Yip & Matthews, 2007; Unsworth, 2013a). It should be noted, however, that other studies found that CLI can occur independently of language dominance (Hulk & Müller, 2000; Blom, 2010), and that the effect of language dominance may be modulated by linguistic complexity (Fabiano-Smith & Barlow, 2010; Kupisch, 2007).

In the present study, differences in language dominance are taken into account using both relative amount of exposure and relative proficiency in English and Dutch.

1.3 The role of age

It remains unclear whether CLI is a temporary phenomenon limited to a certain developmental stage, or whether it is more permanent in nature, perhaps even persisting into adulthood. The literature on adult simultaneous bilinguals (or heritage speakers, as they are most commonly referred to in the literature) shows mixed results. Whilst some studies have found adult bilinguals to over-use a structure present in both languages, others have found them to over-use structures which distinguish the two languages (what Kupisch (2014) has dubbed “cross-linguistic overcorrection”; see also e.g. Anderssen, Lundquist & Westergaard, 2018).

There are only a few studies which have investigated CLI in children older than eight years old, and the results are mixed (Argyri & Sorace, 2007; Kidd, Chian & Chiu, 2015; Sorace, Serratrice, Filiaci & Baldo, 2009; Unsworth, 2012; 2013b). For example, Argyri and Sorace (2007) investigated the use of null subject pronouns, post-verbal subjects and object clitics in English-Greek bilingual seven to nine-year-olds, using both elicited production tasks and acceptability judgment tasks. Their results showed monodirectional CLI from English to Greek in production and judgments of post-verbal subjects. In addition, they found CLI in the children’s production of null subject pronouns but not in their judgments, whereas in the use of object clitics there was no CLI in either task. Another example is provided by Kidd, Chan and

Chiu (2015), who report CLI in the domain of relative clause comprehension in English-Cantonese bilingual children up to the age of eleven, suggesting that CLI may persist over time. In contrast, in her study of CLI in the comprehension of specific indefinite objects by English-Dutch bilingual children between the ages of three and seventeen, Unsworth (2012) reports adult-like performance after the age of seven in Dutch (i.e., no CLI), and some differences at the individual level amongst the older bilingual children in English, arguably resulting from CLI. In short, then, the longevity of CLI, that is, whether it is a temporary phenomenon or whether it persists over time remains unclear, as the number of previous studies is limited and they have shown mixed results. The present study therefore aims to investigate whether age, as well as language dominance and surface overlap, are related to the likelihood of CLI.

1.4 Word order in Dutch and English

Word order in Dutch and English provides an interesting test case for the role of surface overlap in predicting CLI in bilingual acquisition. Although there is considerable overlap between Dutch and English word order, there are also some crucial differences.

Dutch is generally assumed to have an underlying SOV structure, which surfaces in embedded clauses, but not in main clauses (Koster, 1975). This is illustrated by examples (1) and (2). However, example (3) shows that in declarative main clauses the finite verb moves to the second position, and the non-finite verb appears in clause-final position (Koster, 1975). Like German and Swedish, Dutch is a ‘verb-second’ (V2) language. This means that the finite verb must appear in second position in main clauses (i.e., in C, on a traditional generative analysis, Broekhuis & Corver, 2015), so if an element other than the subject appears in clause-initial position, subject-verb inversion takes place. Dutch has a multifunctional first position (i.e., Spec, CP), which can be used for subjects, as in (3), for topicalized objects, as in (4), or for adverbials, as in (5) (Broekhuis & Corver, 2015).

(1)

Hij eet een appel

He eats an apple

‘He eats an apple’

(2)

Ik denk dat hij een appel eet

I think that he an apple eats

‘I think that he eats an apple’

(3)

Ik heb gisteren een appel gegeten

I have yesterday an apple eaten

‘I ate an apple yesterday’

(4)

Een appel heb ik gisteren gegeten

An apple have I yesterday eaten

‘An apple, I ate yesterday’

(5)

Gisteren heb ik een appel gegeten

Yesterday have I an apple eaten

‘Yesterday I ate an apple’

English, on the other hand, is a language with a relatively rigid SVO word order, which has no word order contrast between main clauses and embedded clauses (Lehman, 1978). In the English translations of the examples above, the verb consistently appears after the subject, regardless of its position within the sentence. Questions typically form an exception to this rule: in *wh*-questions like ‘Who are you?’ or ‘Where is he going?’, the auxiliary verb appears in second position (i.e., C) in English (Radford, 2004), and yes/no-questions such as ‘Are you happy?’ or ‘Did he go?’ also show subject-verb inversion in what is often referred to as ‘residual V2’ (Rizzi, 1996). However, in declarative clauses SVO word order is normally retained, so when a sentence-initial adverbial is used, the verb appears in its usual third position (i.e., T; cf. (5) where the English translation reads ‘Yesterday I ate an apple’ rather than ‘*Yesterday ate I an apple’).

1.5 Previous studies on word order and CLI

The word order differences between Dutch and English raise the question as to whether Dutch-English bilingual children show CLI in this domain. Indeed, several studies have already investigated CLI with respect to the V2 phenomenon, focusing on Dutch, German or Norwegian, but the results are mixed. For example, Müller (1998) analysed ten different case studies of bilingual children acquiring German (V2) alongside French, Italian or English (not V2). On the basis of these spontaneous speech data she argues that CLI in the domain of word order can occur, but that the difficulties are asymmetric; subordinate clauses in German presented a problem for six of these children, but word order in the other language tended to be unaffected. Similarly, Döpke (1998) studied the spontaneous speech of three simultaneous German-English bilingual children in a longitudinal study, and she found that although English-like V3 word orders in German were very common at a certain stage of development, German-like V2 orders in English were rare.

These findings contrast with those of Anderssen and Bentzen (2018) who, in two of the three simultaneous Norwegian-English bilingual children, observed CLI from Norwegian (V2) to English. This CLI manifested itself in different ways, however: in one child there was CLI across the board, with both auxiliaries and main verbs, whereas in the second child, CLI was only attested in non-subject-initial sentences with auxiliaries. The third child showed no CLI. In a study on the acquisition of English by approximately 100 primary school children in Norway, Westergaard (2003) also observed CLI with respect to V2. More specifically, she found that L1 Norwegian beginning learners of L2 English aged nine to twelve often produced V2 word order in English in a written task; the use of V2 word order gradually decreased from 71% in grade 5 to 33% in grade 7.

Similar results but in the opposite direction (that is, from the V3 language to the V2 language) were found by Unsworth (2016). She tested 87 native English early L2 learners of

Dutch, with an age of onset of in between one and eight years old, using an elicited production task in Dutch. The results showed that children who started learning Dutch before the age of four on average used English-like V3 word orders 31% of the time with clause-initial adverbials, while children who started acquiring Dutch after the age of four did so 52% of the time. It should be noted, however, that the latter two studies focussed on child L2 learners rather than simultaneous bilinguals, which is the focus of the present study.

The available research suggests that there is at least some degree of cross-linguistic interaction in the domain of V2 word order in the grammar of Dutch-English early bilingual children. It remains unclear however whether such CLI can also result in the acceptance and production of Dutch-like word orders in English. The results of previous research are mixed, and mostly based on small case studies. Therefore, the present study fills a gap in the existing literature, by investigating CLI from a V2 language to a non-V2 language in a quantitative, experimental manner. Unlike most previous studies, this study also focuses on older bilingual children, in order to investigate whether CLI in this domain is temporary or persistent over time. Finally, whereas previous research focussed on the production of V2 word orders only, in this study non-production data (acceptability judgments), are also taken into account.

1.6 Research questions and hypotheses

The present study investigated CLI in the language development of simultaneous Dutch-English bilingual children, by examining the production and acceptability judgments of V2 word order in English, and investigating the extent to which age and language dominance impacts on this development.

The research questions were as follows:

- 1) Do simultaneous Dutch-English bilinguals show CLI from Dutch to English with respect to word order and specifically V2 in their production and judgments?

- 2) Does surface overlap between Dutch and English increase the likelihood of CLI?
- 3) If there is CLI, is it related to language dominance?
- 4) If there is CLI, is it related to age? More specifically, do only younger children show CLI, or do older children do so, too?

Hypothesising that CLI can lead to qualitative as well as quantitative differences between bilingual children and their monolingual peers, we predict with respect to the first research question that five- and six-year-old Dutch-English bilingual are more likely to produce V2 word orders in a picture description task and accept V2 word orders in an acceptability judgment task than English monolingual controls. Approaches which emphasize surface overlap as a necessary condition for CLI would in principle not predict any CLI in this direction. However, if surface overlap increases the likelihood of CLI, rather than it being a requirement for CLI to occur, V2 orders are more likely to be transferred in sentences with auxiliaries than in sentences with main verbs. The reason for this is that subject-verb inversion in English occurs with auxiliaries in *wh*-questions (*What is the girl eating?*), but not with main verbs (**What eats the girl?*).

Note that these predictions are only partly in line with the bilingual speech-production model proposed by Nicoladis (2006; 2012). Her approach predicts that Dutch-English bilinguals sometimes produce V2 word orders in English, because CLI is hypothesised to be due to competition between two languages at the lemma level of speech production, in which the words and grammatical structures used to convey a conceptual message are selected. As such competition in the bilingual mind is assumed to occur regardless of structural overlap, this may lead to bidirectional influence and qualitatively different language output compared to monolingual speakers. However, since Nicoladis interprets CLI as a production phenomenon (2003; 2006; 2012), her account does not make any specific predictions about differences between bilinguals and monolinguals in their acceptability judgments.

With respect to our third research question on the role of language dominance, we hypothesise (following Yip & Matthews, 2006, 2007; Unsworth, 2013c) that language dominance will be related to CLI; more specifically, the likelihood of accepting and producing V2 word orders in English is expected to be greater for Dutch-dominant children than for English-dominant children. Language dominance will be operationalised both as relative proficiency, as measured by Dutch and English vocabulary scores, and as relative amount of exposure (following Hervé et al., 2016; Unsworth et al., 2018).

Finally, with respect to the relationship between CLI and age, we hypothesise that the effects of CLI decrease with age, but at the same time, they may still be present to some degree in older bilingual children. Therefore, we predict that on average, younger bilinguals will accept and produce more V2 word orders than older bilinguals. Individual older children may also exhibit CLI, and as outlined in our hypothesis relating to the third research question, we expect these children to be Dutch-dominant.

2. Methods

2.1 Participants

Participants were 117 three- to ten-year-old Dutch-English bilingual children resident in the Netherlands ($M = 7;3$; $SD = 1;11$), and 59 three- to six-year-old monolingual English controls resident in the UK ($M = 4;6$; $SD = 1;1$). Of the bilingual children, 106 were exposed to both English and Dutch from birth, while 11 were exposed to Dutch within three to eleven months. On average, bilingual participants were exposed to slightly more Dutch than English ($M_{Dutch} = 58\%$; $SD = 19\%$).

All bilingual children participated in an acceptability judgment task (AJT), and 102 of these children ($M = 6;11$; $SD = 1;11$) also participated in a picture description task (PDT). Of

the monolingual controls, 40 three- and four-year-olds participated in the PDT ($M = 3;10$; $SD = 0;7$), and 19 five- and six-year-olds participated in the AJT ($M = 5;11$; $SD = 0;6$).

2.2 Materials

The two experimental tasks, the PDT and the AJT, are described separately below. These tasks were part of a larger test battery, as the bilingual children were also tested in Dutch (see Unsworth, 2016). In addition to this, their language proficiency was assessed using the Peabody Picture Vocabulary Task (PPVT, Dunn & Dunn, 2007; Dunn et al., 1997; Dunn, Dunn & Schlichting, 2005).

2.2.1 Elicited production. A picture description task (PDT) was used to elicit finite verbs following a topicalized temporal adverbial, an obligatory context for V2 word order in Dutch (cf. example (5)). The following temporal adverbials were used: *In the morning*, *In the afternoon*, *In the evening*, *Today* and *Yesterday*. The vocabulary items used in the task were all on the MacArthur-Bates Communicative Developmental Inventory (CDI, Fenson et al., 2007), so the necessary vocabulary was expected to be known even by the youngest participants.

In total, 18 items were used to elicit V2 word orders in English in non-subject-initial main clauses. Six of these items were designed to elicit a present progressive containing an auxiliary, while the other 12 items were designed to elicit a main verb in simple present or simple past.³ The present progressive items and the simple past items were presented in pairs, with one picture referring to the present ('Today...') and one picture referring to the past ('Yesterday...'). The present simple items started with 'In the morning', 'In the afternoon' or 'In the evening', as they described daily habits. Figures 1 through 3 provide examples of the

³ The number of items was equally distributed over the three verb tenses because the study was also designed to assess children's acquisition of verbal morphology.

linguistic and visual stimulus for each tense (i.e. present progressive, simple past and simple present).

In addition, 12 fillers were included as distractors. Four of those fillers asked simple questions for which children had to look at the pictures carefully and were therefore used to check whether children were still paying attention. The other eight fillers were not considered here, as they tested other linguistic properties not relevant for the present study.

Figure 1. Example of an item in the PDT targeting the present progressive

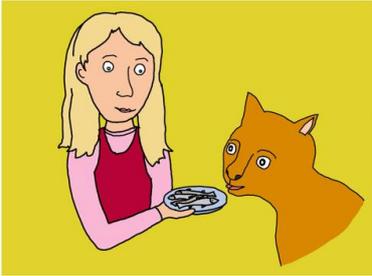
Present progressive	
Instructions	These pictures are about a girl. She likes to paint the same thing every day. Look!
Question	What is she doing today?
Probe	Today ...
Target	... she is painting an apple ... *is she painting an apple



Figure 2. Example of an item in the PDT targeting the simple past

Simple past		
Instructions	These pictures are about a girl. She likes to paint the same thing every day. Look!	
Question	Now tell me what she did yesterday.	
Probe	Yesterday ...	
Target	... she painted an apple ... *painted she an apple	

Figure 3. Example of an item in the PDT targeting the simple present

Simple present		
Instructions	This is Millie. We're going to look at some pictures of what she does every day.	
Probe	In the morning...	
Target	... she feeds her cat ... *feeds she her cat	

2.2.2 *Acceptability judgments.* Children’s ability to detect word order violations was established using an acceptability judgment task (AJT). Children were introduced to a puppet and told that he was learning English; their task was to help the puppet by telling him whether he “said it right”. Again, all of the vocabulary items used in the test sentences were on the CDI (Fenson et al., 2007) and hence were expected to have been familiar to even the youngest participants.

There were 18 items used to test children’s knowledge of V2. Half of these sentences used a grammatical Adverb-SVO word order and the other half used an ungrammatical Adverb-VSO word order. In six items the verb was in present progressive tense and hence included an auxiliary (e.g., **Today is the girl painting an apple*), while in the other 12 items, consisting of six sentences in simple past tense and six sentences in simple present tense, a main verb was used (e.g., **Yesterday painted the girl an apple*). The pictures that were used were the same as in the elicited production task (cf. Figures 1 through 3). Table 1 provides examples of the different types of test items used in the AJT.

Table 1: Examples of test items in the AJT.⁴

	Present progressive	Simple past	Simple present
Grammatical	Today the girl is painting an apple.	Yesterday the boy painted a flower.	In the afternoon she eats a banana.
Ungrammatical	*Today is the girl painting an apple.	*Yesterday painted the boy a flower.	*In the afternoon eats she a banana.

⁴ An anonymous reviewer pointed out that in some items the subject consisted of a full DP, while in other items a subject pronoun was used. Using subject pronouns could potentially have led to lower acceptability of V2 word order, since mixed V2 systems (such as Middle English) typically distinguish word order on the basis of subject type (see e.g., Van Kemenade & Westergaard, 2012). However, a post-hoc analysis revealed that adding Subject Type as a factor did not improve the explanatory power of the models; there were no significant effects in any of the analyses, nor were there significant interactions with other predictors.

The AJT also included 14 fillers, used to distract children from the target. Three of those fillers were used to establish whether participants could detect word order errors which could not have been due to CLI from Dutch, and if they were thus able to reject sentences appropriately in an AJT. An example of this type of filler is provided in Table 2.

Table 2: Example of a filler in the AJT, testing word order errors unrelated to CLI.

	Filler
Grammatical	The girls are running to the house.
Ungrammatical	*The girls are running the house to.

2.2.3 Vocabulary task. A standardized vocabulary task in each language was used as a measure of language proficiency: the PPVT-III-NL (Dunn, Dunn, & Schlichting, 2005) for Dutch, and depending on the variety spoken in the child's environment, the BPVS-2 (Dunn, Dunn, Whetton, Burley, 1997) or PPVT-4 (Dunn & Dunn, 2007) for English.

2.2.4 Parental questionnaire. Information about the bilingual children's language background, including their current patterns of language exposure and use, were collected using a detailed parental questionnaire (*Bilingual Language Exposure Calculator*; Unsworth, 2013b). This was used to calculate the relative amount of exposure to Dutch at the time of testing and incorporated the following sources: family, friends, school or daycare, television, computer and/or internet use, reading or being read to, sports and clubs, and holidays.

2.3 Procedure

For both the PDT and AJT, participants were presented with pictures on a computer screen. As indicated in Figures 1 through 3, in the PDT the experimenter started the sentence by saying the temporal adverbial, using a rising intonation to indicate that the child should complete the sentence. If the child did not understand the intended verb, the experimenter provided a prompt (e.g., *This story is about painting*).

The puppet in the AJT was digital and would appear in the corner of the screen to say something about each picture. His voice was pre-recorded by a male highly proficient near-native speaker. Before starting the test phase of each task, the children were presented with three practice items, which were similar to the fillers.

The vocabulary task was administered following the instructions given in the manual, that is, children started in an age-appropriate set and continued naming pictures until a basal and ceiling item was established; the raw scores were subsequently converted to standardized scores (for monolinguals). The tasks were always administered in the same order (PDT, vocabulary task, AJT) by a trained (near-)native research assistant as part of a larger test battery.

2.4 Statistical analysis

The AJT data were analysed in two steps. The first analysis focussed on the comparison between bilinguals and monolinguals (five- and six-year-olds) to establish whether there was CLI (RQ1) and whether this was affected by surface overlap (RQ2). The second analysis was restricted to the bilingual children (six- to ten-year-olds) in order to investigate to what extent age (RQ3) and language dominance (RQ4) predicted the likelihood of CLI. For both analyses, we used generalized linear mixed effects regression models, using the *glmer* function of the *lme4* package in *R* (Bates et al., 2016; R Core Team, 2016). Symmetric contrasts were specified for all categorical predictors, and all numeric predictors were centered around the mean.

In the first analysis, the dependent variable was a binary outcome (accepted or rejected), and the predictors were *Grammaticality* (yes, coded as 0.5, or no, coded as -0.5), *Group* (monolingual, coded as 0.5, or bilingual, coded as -0.5), *Verb type* (auxiliary, coded as 0.5, or main verb, coded as -0.5) and *Age* (in months), and interactions between *Grammaticality*, *Group* and *Verb Type*. Random intercepts were included for *Item* and *Subject*, as well as random slopes for the interaction and main effects of *Grammaticality and Verb Type*.

The second analysis also had a binary outcome variable (accepted or rejected). *Grammaticality* (yes or no), *Age* (in months), *Dominance* and *Verb type* (main verb or auxiliary), as well as interactions between *Grammaticality*, *Age* and *Dominance*, were included as predictors. This model also contained random intercepts for *Item* and *Subject* with random slopes for the interaction and main effects of *Grammaticality and Verb Type*. *Dominance* was operationalised in two ways: i) relative amount of input at the moment of testing, and ii) relative proficiency. Relative proficiency scores were calculated using a differential (following Yip & Matthews, 2006), that is, the standardised scores on the English PPVT were divided by those on the Dutch PPVT, meaning that a differential greater than zero indicates better vocabulary skills in English whereas a differential less than zero would indicate better vocabulary skills in Dutch. Model comparison based on the Akaike Information Criterion (AIC; Akaike, 1974) was used to select which was a better predictor.⁵

⁵ Stepwise model comparison was used to determine whether adding *Item number* improved the models, in order to control for the possibility that children were primed to accept V2 word orders during the experiment. Similarly, we checked whether non-native parental input in English (based on self report) influenced children's judgments, by adding *Non-native English input* (yes or no) to the model. However, neither turned out to be the case, so we did not include them in the analysis reported on here.

3. Results

The picture description task failed to elicit any V2 word orders in English, that is, none of the participants, bilingual or monolingual, produced a sentence with Dutch-like subject-verb inversion. Our analysis will therefore focus on the AJT data only. As outlined in §2.4, we will first present the results of the comparison between monolinguals and bilinguals, before zooming in on the bilingual children's judgments and their relation to various child-level predictors.

Three- and four-year-olds were excluded from the analysis of the AJT, as their poor performance on the fillers showed that the task was too difficult for them. More specifically, three fillers aimed to establish whether participants were able to reject ungrammatical word orders that could not have resulted from CLI. All participants who gave an incorrect response to one or more of those fillers were excluded, since it is likely that they failed to understand the task. This left us without any three-year-olds, and with a greatly reduced number of four-year-olds. As previous research suggests that acceptability judgment tasks are cognitively too complex for very young children (De Villiers & De Villiers, 1972), we decided to exclude the youngest participants from the analysis of the AJT altogether (following Unsworth, 2013b, which is based on the same sample of children).

The resulting sample consisted of 96 Dutch-English bilingual children between the ages of five and ten ($M = 7;11$, $SD = 1;6$). Bilingual participants were, on average, exposed to Dutch 58% of the time, and to English 42% of the time ($SD = 20.5\%$). The mean standard score on the English PPVT was 94 ($SD = 12.4$), and the mean standard score on the Dutch PPVT was 106 ($SD = 15.8$). The mean differential (or 'balance score') was .91 ($SD = 20.6$), indicating that the children who participated in the AJT were on average slightly more Dutch-dominant in terms of proficiency. As the SDs indicate, however, there was considerable individual variation in terms of relative exposure and language dominance.

A subgroup consisting of all bilingual five- and six-year-olds in the sample ($N = 26$; 12 five-year-olds and 14 six-year-olds) was compared directly to an age-matched monolingual control group ($N = 19$; 9 five-year-olds and 10 six-year-olds). The mean age of the bilinguals was 6;1 ($SD = 0;6$) and the mean age of the monolinguals was 5;11 ($SD = 0;6$). This difference was not significant; $t = .719$, $p = .476$. On average, the bilinguals in this group were exposed to Dutch 54.3% of the time ($SD = 18.3\%$), their mean standard score for the Dutch PPVT was 106 ($SD = 17$) and their mean standard score for the English PPVT was 96 ($SD = 10.6$).

3.1 Bilinguals versus monolinguals

The results for the five- and six-year-olds are presented in Figure 4 (grammatical sentences) and Figure 5 (ungrammatical sentences). The average acceptance rate for monolingual participants was 90% for grammatical items and 14% for ungrammatical items. Bilinguals accepted grammatical items at a comparable rate (86%) but incorrectly accepted V2 word orders at an average rate of 38%. Whilst neither group is at ceiling on grammatical items, bilinguals and monolinguals performed similarly, regardless of whether a main verb or an auxiliary was used (cf. Figure 4). For ungrammatical items (cf. Figure 5), the overall pattern is comparable, with both bilingual and monolingual groups accepting V2 more frequently with auxiliaries than with main verbs. However, the bilingual children do so to a greater degree: compare for main verbs an average acceptance rate of 28% versus 4% for the bilinguals and monolinguals, respectively, and for auxiliaries an average acceptance rate of 58% versus 33%.

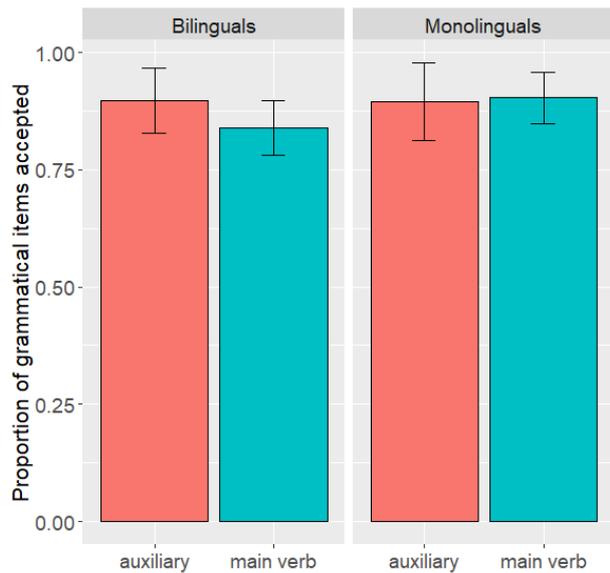


Figure 4. Mean proportions of grammatical items accepted by five- and six-year-old children in acceptability judgment task, with error bars representing 95% confidence intervals

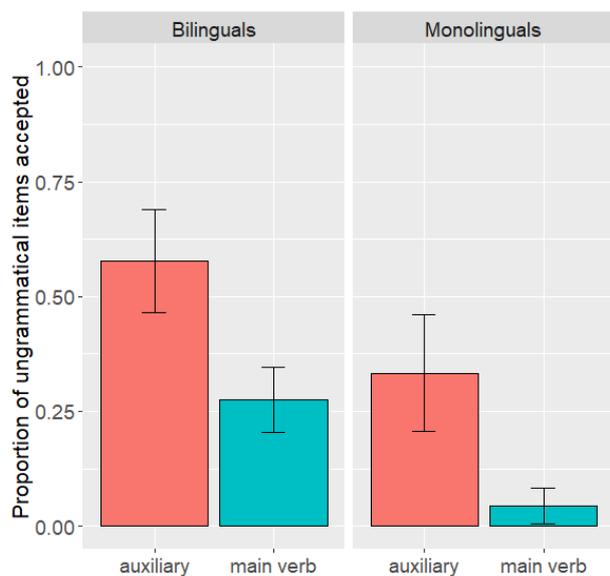


Figure 5. Mean proportions of ungrammatical items accepted by five- and six-year-old children in acceptability judgment task, with error bars representing 95% confidence intervals

The results of the generalized mixed effects model are summarized in Table 3.

Table 3: Estimated odds ratio, 95% confidence intervals and associated *p*-values of main and interaction effects for the bilingual versus monolingual comparison.

Generalized linear mixed model accept ~ grammatical * group * verb type + age + (1 item) + (grammatical * verb type subject)			
<u>Fixed factor</u>	<u>Est. odds ratio</u>	<u>95% CI</u>	<u><i>p</i>-value</u>
Grammaticality	57.7	19.1 .. 175	< .0001 ***
Group	.368	.158 .. .860	.02 *
Verb Type	4.01	1.74 .. 9.23	< .001 **
Age in months	1.05	1.00 .. 1.10	.033 *
Grammatical : Group	18.3	17.5 .. 19.1	.003 **
Grammatical : Verb Type	.098	.020 .. .477	.004 **
Group : Verb Type	1.17	.306 .. 4.50	.816
Grammatical : Group : Verb Type	.207	.017 .. 2.50	.216

The significant interaction between *Grammaticality* and *Group* shows that the difference between grammatical and ungrammatical items was estimated to be 18.3 times greater for monolinguals than for bilinguals, indicating that bilinguals were significantly more likely to accept V2 word orders in English than monolinguals. Furthermore, a significant interaction between *Verb Type* and *Grammaticality* indicates that the difference between the overall odds of accepting a grammatical item and an ungrammatical item was estimated to be .098 times smaller for sentences containing auxiliaries than for sentences with finite main verbs.

There was a significant main effect of *Grammaticality*, indicating that overall the odds of accepting a grammatical sentence were 57.7 times greater than the odds of accepting a V2 sentence. There was also a significant main effect of *Group*, showing that the odds that monolinguals accepted a sentence as grammatical are estimated to be .368 times smaller than the odds that bilinguals did so. Furthermore, the significant main effect of *Verb Type* indicates that overall items with auxiliaries were 4.01 times more likely to be accepted than items with

main verbs. Finally, a significant main effect of *Age* suggests that children were more likely to reject items if they were older (regardless of grammaticality).

In summary, both monolingual and bilingual children sometimes accepted ungrammatical V2 sentences, and they did so more readily when the finite verb in second position was an auxiliary rather than a main verb. Whilst children in both groups sometimes accepted V2 sentences in English, the bilingual children were significantly more likely to do so than their monolingual peers. Furthermore, in both groups V2 sentences were more likely to be accepted when the present progressive tense was used (i.e., with auxiliaries), compared to items in simple past or present tense (i.e., with main verbs).

3.2 *The effect of dominance and age*

Our third and fourth research questions concern the effect of language dominance on bilingual children's patterns of CLI. To address these questions we now examine the data from the larger set of children, aged 5 through 10 years, focussing on the bilinguals only.

Before doing so, we first consider the extent to which our various predictor variables – age, and relative amount of exposure and proficiency differentials, both as indicators of language dominance – correlate with each other. There were no significant correlations between age and amount of exposure ($r(92) = -.127, p = .229$), or between age and differentials ($r(95) = -.15, p = .146$). There was, however, a moderate correlation between relative amount of exposure and differentials ($r(91) = -.502, p < .001$), indicating that children who received more input in Dutch (and thus less input in English), tended to be more Dutch-dominant with respect to proficiency (in line with Unsworth, Chondrogianni and Skarabela, 2018).

Model comparison based on the Akaike Information Criterion showed that *Dominance (amount of exposure)* was a better predictor than *Dominance (relative proficiency)*, and adding *Dominance (relative proficiency)* did not improve the model if *Dominance (amount of exposure)* had already been taken into account. The final model therefore included amount of

exposure as the only measure of dominance. A summary of the generalized mixed effects model is provided in Table 4.

Table 4: Estimated odds ratio, 95% confidence intervals and associated p-values of main and interaction effects for five- to ten-year-old bilinguals.

Generalized linear mixed model accept ~ grammatical * age * dominance + verb type + (1 item) + (grammatical * verb type subject)			
<u>Fixed factor</u>	<u>Est. odds ratio</u>	<u>95% CI</u>	<u>p-value</u>
Grammaticality	111	51.6 .. 239	< .0001 ***
Age in months	.998	.982 .. 1.01	.779
Dominance	9.65	2.49 .. 37.45	.001 **
Verb type	2.82	1.38 .. 5.77	.005 **
Grammatical : Age	1.05	1.02 .. 1.08	.002 **
Grammatical : Dominance	.006	.0004 .. .082	.0001 ***
Age : Dominance	1.01	.941 .. 1.09	.708
Grammatical : Age : Dominance	.976	.845 .. 1.13	.746

The significant main effect of *Dominance* indicates that children who were more Dutch-dominant were overall less likely to reject items in this task, and the significant interaction between *Grammaticality* and *Dominance* shows that sensitivity to grammaticality was modulated by relative amount of language exposure. As in the comparison of bilinguals and monolinguals (cf. Table 3), there was also a significant main effect of *Verb Type*, showing that the odds that a sentence was accepted were 2.82 times higher for sentences where the finite verb was an auxiliary rather than a main verb. There was no significant main effect of *Age* but there was a significant interaction between *Grammaticality* and *Age*, indicating that the effect of grammaticality increased with age.

The results of a post-hoc analysis, aiming to disentangle the effects of *Age* and *Dominance* on grammatical and ungrammatical items, are presented in Tables 5 and 6. This analysis revealed a significant effect of *Age* in both the grammatical and the ungrammatical

condition. In other words, older children tended to perform better on the task than younger children, regardless of grammaticality. Furthermore, *Dominance* was a significant predictor in a model in which only ungrammatical V2 items were considered, but not when only grammatical V3 items were included. In other words, Dutch-dominant children showed less sensitivity to word order violations in English than English-dominant children. It should be noted, however, that the effect was small and that there was great individual variation, especially among Dutch-dominant children, whose acceptance rates of V2 word order ranged from 0% to 100%.

Table 5: Estimated odds ratio, 95% confidence intervals and associated p-values of main and interaction effects for ungrammatical items only for five- to ten-year-old bilinguals.

Generalized linear mixed model
accept.ungrammatical ~ age * dominance + verb type + (1 | item) + (verb type | subject)

<u>Fixed factor</u>	<u>Est. odds ratio</u>	<u>95% CI</u>	<u>p-value</u>
Age in months	.969	.942 .. .996	.026*
Dominance	139	13.6 .. 1427	<.0001***
Verb Type	3.73	1.53 .. 9.09	.004
Age : Dominance	1.02	.898 .. 1.15	.793

Table 6: Estimated odds ratio, 95% confidence intervals and associated p-values of main and interaction effects for grammatical items only for five- to ten-year-old bilinguals.

Generalized linear mixed model
accept.grammatical ~ age * dominance + verb type + (1 | item) + (verb type | subject)

<u>Fixed factor</u>	<u>Est. odds ratio</u>	<u>95% CI</u>	<u>p-value</u>
Age in months	1.02	1.003 .. 1.04	.021*
Dominance	.716	.169 .. 3.04	.651
Verb Type	1.48	.395 .. 5.564	.560
Age : Dominance	1.001	.923 .. 1.09	.976

Figures 6 and 7 illustrate the effect of age on acceptance rates. Figure 6 shows that the average proportion of ungrammatical V2 word orders that were accepted decreased slightly with age

($R^2 = .029$). However, as can be seen from Figure 7, the average proportion of accepted grammatical V3 word orders also slightly increases ($R^2 = .059$).

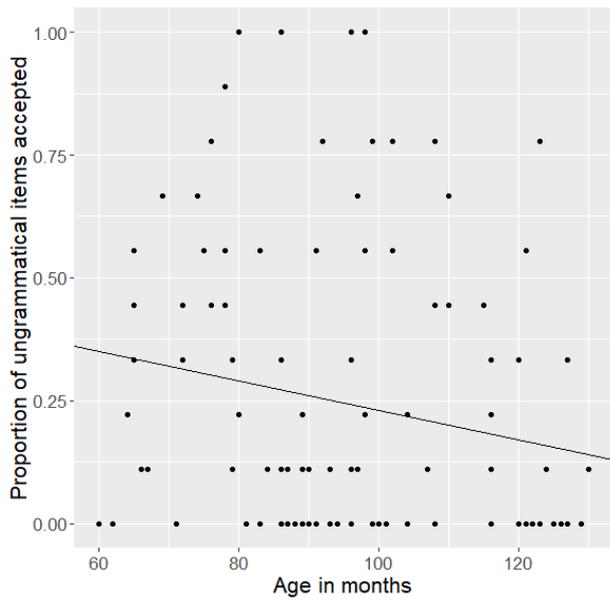


Figure 6. Proportion of ungrammatical V2 word order accepted by age in months

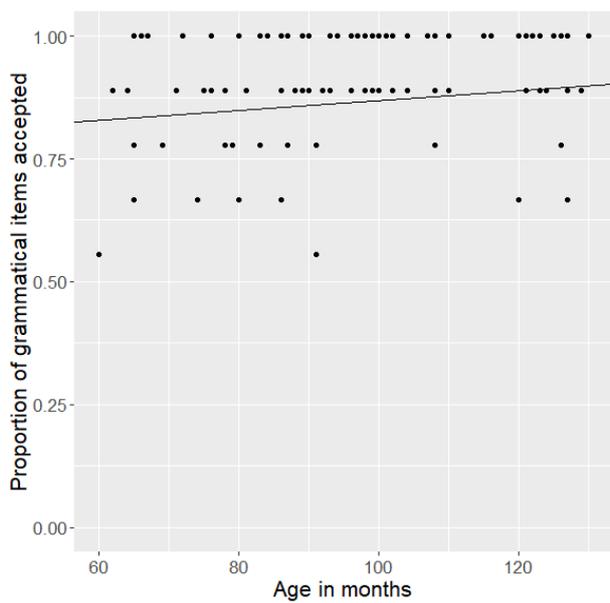


Figure 7. Proportion of grammatical V3 word order accepted by age in months

The relation between acceptance rate and dominance is illustrated by Figures 8 and 9. The data in Figure 8 reveal that children who received relatively more input in Dutch tended to accept more ungrammatical V2 word orders in English in this task ($R^2 = .111$) As can be seen in Figure 9, there was however no relation between dominance and the acceptance rate of grammatical word orders.

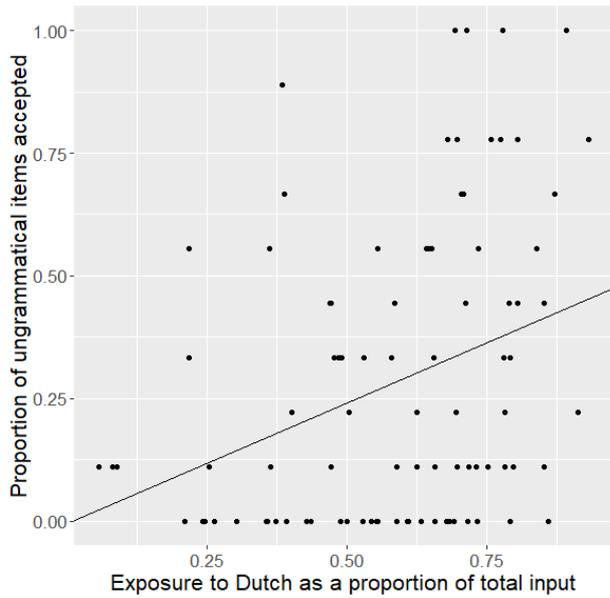


Figure 8. Proportion of ungrammatical V2 word order accepted by language dominance

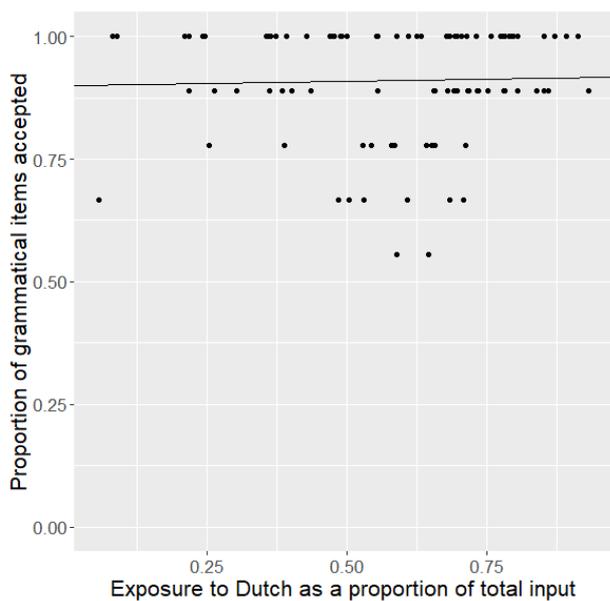


Figure 9. Proportion of grammatical V3 word order accepted by language dominance

To summarise, within the group of five- to ten-year-old Dutch-English bilingual children, sensitivity to the ungrammaticality of V2 word order in English was related to language dominance operationalised as relative exposure. Although acceptance rates were also related to age at the time of testing, this held across ungrammatical and grammatical word orders.

4. Discussion

The aim of the present study was to investigate cross-linguistic influence in the domain of word order in Dutch-English bilingual children, in production as well as in judgments. We investigated whether surface overlap increases the likelihood of CLI, by comparing a structure in which English and Dutch overlap at the surface level to some degree (i.e., V2 order with auxiliaries) to a structure in which there is no surface overlap (i.e., V2 order with main verbs). Furthermore, we investigated whether the likelihood of CLI was related to children's age and to language dominance.

Whereas there was no evidence for CLI in production, the judgment data indicated that five- and six-year-old Dutch-English bilingual children were more likely to accept ungrammatical V2 word orders in English than their monolingual English peers. At the same time, both bilinguals and monolinguals were more likely to accept V2 word orders with auxiliaries than with main verbs. However, monolinguals only accepted V2 word orders in English with auxiliaries, whereas bilinguals accepted such ungrammatical word orders significantly more often and with all types of verbs. In addition, bilingual children were more likely to accept ungrammatical V2 word orders in English if they were exposed to relatively more Dutch than English. Finally, in this study we found no effect of age on the likelihood of CLI; there were still older bilingual children, up to the age of ten, who accepted V2 word order in English.

Our first hypothesis was that CLI can lead to qualitative differences between bilingual and monolingual children, and thus we predicted that bilingual Dutch-English children would be more likely to produce and accept V2 word orders than their monolingual peers. With respect to the production data, this prediction is not borne out. In combination with previous work showing that native English (very) early L2 learners of Dutch sometimes use V3 word orders in Dutch (Unsworth, 2016), this finding suggests that CLI in the domain of word order may be asymmetric. That is, even though Dutch-English bilingual children tend not to produce ungrammatical V2 word orders in declarative sentences in English, they may sometimes fail to invert the subject and the verb after a sentence-initial adverbial in Dutch, because surface SV word orders are common in Dutch. Earlier findings by Döpke (1998) support this explanation: in a study of the spontaneous speech of three German-English bilingual children, Döpke (1998) observed that English-like V3 orders in German were much more likely to occur than German-like V2 orders in English. In contrast, Anderssen and Bentzen (2018) observed V2 transfer in production from Norwegian to English in two of the three simultaneous bilingual children in their study.

With respect to the acceptability judgment data, the results were more complex. The bilinguals differed from the monolinguals and these differences appeared to be both quantitative *and* qualitative in nature. On the one hand, children in both groups accepted the ungrammatical V2 word order in English but the bilingual children did so more readily than their monolingual peers (a quantitative difference). On the other hand, for monolinguals the acceptance of V2 was restricted to sentences in which the finite verb was an auxiliary, whereas bilinguals regularly accepted V2 with main verbs (a qualitative difference).

The finding that monolingual children should consider an ungrammatical word order acceptable is at first blush somewhat surprising. There are at least two possible explanations. First, the relatively complex nature of making an acceptability judgment may have led children

to more readily accept ungrammatical sentences. This explanation does not hold water, however, given that monolingual children only accepted the V2 order with auxiliaries. It seems more likely that children accepted V2 word orders with auxiliaries because this structure is similar to an existing grammatical option in English. To illustrate, the ungrammatical sentence *Today is she painting an apple* may be accepted as grammatical because it is similar to grammatical sentences like *Is she painting an apple?*. In other words, ignoring the first word would allow children to make the sentence grammatical and allow them to produce what for many would be the preferred answer (i.e., ‘yes’). The expectation would therefore be that any group of English-speaking children completing this task, including monolinguals, should accept V2 orders with auxiliaries to some degree. Moreover, there is evidence from the adult psycholinguistic literature that (monolingual) adults are able to understand ungrammatical sentences and that they construct syntactic representations for them which are similar in nature to the ones constructed for grammatical sentences (Ivanova, Pickering, Branigan, McLean & Costa, 2012). It seems plausible that children process ungrammatical sentences in a similar way. Crucially, this explanation would hold for both monolingual and bilingual children.

The Dutch-English bilingual children in this study were significantly more likely to accept V2 word orders than their monolingual peers and most importantly, did so across the board, that is, with both auxiliaries and main verbs. Thus, in addition to whatever is driving monolingual children’s acceptance of V2 in English, the bilingual children’s responses in English also appear to be influenced by their Dutch (in line with Anderssen & Bentzen, 2018). This qualitative difference between bilinguals and monolinguals contradicts claims that CLI in simultaneous bilingualism can lead to quantitative differences only (Meisel, 2001; 2008) but is in line with other work (e.g., Nicoladis, 2006; 2012; Strik & Pérez-Leroux, 2011). The mechanisms underlying this CLI remain unclear, but one possibility is that they result from some kind of cross-language priming (see Serratrice, 2016). We return to this possibility below.

Our second hypothesis was that surface overlap would increase the likelihood of CLI. In line with our prediction, bilinguals were indeed more likely to accept V2 word orders with auxiliaries than with main verbs, but crucially, so were monolinguals. Therefore, it seems unlikely that the effect of verb type can be attributed to CLI, meaning that on the basis of our results we cannot conclude that the likelihood of CLI is related to the degree of surface overlap. Thus, the present study provides additional evidence that CLI can occur when the two conditions proposed by Hulk and Müller are not satisfied. Firstly, the two languages a bilingual speaks may influence each other also for purely syntactic phenomena, not just for interface phenomena (Pérez-Leroux, Cuza & Thomas, 2011; Argyri & Sorace, 2007). Secondly, this study confirms that CLI may occur regardless of surface overlap (Gavarró, 2003; Nicoladis, 2006; 2012; Strik & Pérez-Leroux, 2011), and it extends this finding beyond the area of language production.

Approaches offering alternatives to Hulk and Müller's (2000) hypothesis about surface overlap tend to focus on language production rather than comprehension, but these do not readily provide an explanation for the findings of the present study. For example, on Nicoladis' (2006; 2012) approach, CLI is claimed to result from a competition between two languages during speech production as a result of co-activation, and as such, Dutch-English bilingual children would be expected to sometimes *produce* V2 word orders in English but not necessarily to allow them in their acceptability judgments. Our findings show the exact opposite, however, suggesting that competing structures at the lemma level of speech production cannot be the only source of CLI in bilingual children. Whilst her focus is on CLI as an "epiphenomenon of speech production", Nicoladis (2006, p. 29) does not completely rule out that CLI may manifest itself in comprehension, too, albeit in different ways. The AJT used in this study revealed CLI in linguistic judgments, even though there was no CLI in production.

An alternative account for the CLI observed here, which also draws on the notion of co-activation, comes from the structural priming literature with adult (sequential) bilinguals. Structural (or syntactic) priming refers to the tendency people have to use structures which they have recently heard (Bock, 1986). This tendency has also been observed across a bilingual's two languages. That is, just as a monolingual speaker is more likely to use a prepositional dative after recently hearing a prepositional dative, a bilingual speaker is more likely to use a prepositional dative in one language after having been recently exposed to a prepositional dative in the other language (e.g., Schoonbaert, Hartsuiker & Pickering, 2007). The observation that such cross-language priming is possible is considered evidence for the cross-language sharing of syntactic representations (Hartsuiker, Pickering & Veltkamp, 2004). Moreover, a recent study by Hwang, Shin and Hartsuiker (2018) suggests that, in addition to production, such cross-language sharing of syntactic structures may also lead to CLI in comprehension, even when there is no structural overlap between the two languages regarding the target structure in question. In Hwang et al.'s study, Korean-English adult bilinguals were primed with Korean causative constructions before processing English causative constructions in a picture-sentence verification task. Interestingly, language proficiency correlated positively with the extent of cross-linguistic influence (or 'syntactic transfer' in the authors' terms), suggesting that developing shared syntactic representations is part of becoming a proficient bilingual.

There is a growing body of evidence that, similar to adult (sequential) bilinguals, bilingual children may also share syntactic representations across languages (Vasilyeva et al., 2010; Hervé et al., 2016; Hsin, Legendre & Omaki, 2013). For example, in a cross-language priming study with 5-year-old bilingual Spanish-English children, Hsin and colleagues showed that it was possible to prime the ungrammatical Adj-N structure in Spanish with the grammatical Adj-N structure in English, suggesting that bilingual children's mental representations of their two languages may also be shared, even when there is no surface overlap

between the two. In fact, it has been suggested that “processing mechanisms connected with priming” may be the driving force behind cross-linguistic influence in bilingual children (Serratrice, 2013, p. 18; see also Serratrice, 2016). The results from the present study are compatible with such an account. As a result of syntactic sharing across their two languages, bilingual English-Dutch children will have increased activation of the structure used to parse V2 word orders in Dutch and hence, this same structure will arguably be more readily available for selection when parsing the (ungrammatical) V2 orders in English (Pickering & Branigan, 1998), both with auxiliaries and main verbs. On such a model, both English and Dutch would have a combinatorial node for V2 and this would be activated upon hearing the verb lemma (i.e., auxiliaries in English questions, and all verbs in Dutch main clauses).

Assuming that production and comprehension processes make use of the same representations (e.g., Pickering & Garrod, 2007), the question remains why, if syntactic representations are shared across languages, CLI occurred in children’s acceptability judgments but not in their production. Both tasks were in English, in a monolingual test session, which means that English was likely more activated than Dutch. Consequently, when asked to produce utterances in English starting with an adverbial, the target combinatorial node (i.e., V3) was more readily available for selection. To select the non-target combinatorial node (i.e., V2) would require its activation level to be much higher. In other words, CLI in production is not ruled out by definition but would require higher levels of co-activation (Elson-Güttler et al. 2005). We would therefore predict that in a context where Dutch was more highly co-activated, for example in a bilingual test session, bilingual English-Dutch children may produce V2 utterances in their English.

In the AJT, children are presented with a sentence which they need to parse before they can evaluate it. If they are more readily able to parse the sentence, then they will presumably be more likely to accept it. As noted above, adults are capable of constructing representations

for ungrammatical sentences; assuming that children are able to do the same, and that when – in the case of bilingual children – a representation available from their other language facilitates this process, acceptance rates for ungrammatical sentences are expected to increase. What this means is that even though activation levels for Dutch will have been comparably low for both tasks, the impact of Dutch may have been stronger in the AJT than in the PDT because of the nature of the tasks themselves.

Our third hypothesis was that CLI and language dominance are related, and thus we predicted that the extent of any CLI would be predicted by differences in language dominance. This prediction was borne out. Children with relatively more Dutch (and thus less English) exposure were significantly less sensitive to the ungrammaticality of V2 word order in English. Adding dominance operationalised as relative proficiency to the model did not add any explanatory power once the effect of relative amount of exposure had been taken into account. There was however considerable individual variation, especially amongst children who were Dutch-dominant (measured by exposure). In other words, whereas accepting a V2 word order was rare for English-dominant children, there were both Dutch-dominant children who consistently accepted them and Dutch-dominant children who consistently rejected them. This finding contributes to a growing body of evidence showing that the likelihood of CLI is related to the relative amount of input that bilingual children receive (e.g., Hervé et al., 2016; Unsworth et al., 2014). When amount of input is viewed as a proxy for co-activation, it is also in line with the account outlined above, namely that CLI results from the parallel co-activation of two languages which share (certain) syntactic representations. It furthermore underscores the importance of systematically investigating individual variation in the presence and extent of CLI, an approach which requires a reasonably large sample, and which (likely as a result) has not received enough attention in the field thus far, despite widespread agreement that CLI does

not manifest itself consistently across children, even when they share the same language combination.

Our fourth and final hypothesis was that the effects of CLI would decrease with age, although they may persist to some degree in older bilingual children. This hypothesis is partly corroborated by our data. The results show no evidence that CLI was related to age; the decrease in the likelihood to reject ungrammatical V2 word orders as children got older was no greater than the concomitant increase in the likelihood to accept grammatical V3 word orders. In fact, some of the oldest bilingual children in this study clearly deviated from the monolingual pattern, as they still performed worse than the monolingual five- and six-year-olds at the age of ten. This indicates that in some cases CLI may persist as bilingual children get older, suggesting that the assertion by Meisel (2001) that simultaneous bilinguals ultimately reach the same end state as monolinguals is too strong (e.g., Kupisch et al., 2014). Assuming that simultaneous bilingual children, like sequential bilingual adults, share syntactic representations between their two languages (e.g., Vasilyeva et al., 2010; Hervé et al., 2016; Hsin et al., 2013), it is in fact expected that some types of CLI should persist into adulthood.

One limitation to the present study is that, because the task proved too challenging for many of the youngest children, the number of children in each group included in the bilingual-monolingual comparison was quite small. Future research could address this issue by replicating the study with a larger group of (older) bilingual and monolingual children.

5. Conclusion

Although the present study found no cross-linguistic influence from Dutch to English with regard to word order in production, the results indicated that five- and six-year-old Dutch-English simultaneous bilingual children were significantly less sensitive to the

ungrammaticality of V2 word order in English than monolingual controls. This asymmetry shows that even if bilingual children do not produce deviant structures, their linguistic intuitions with respect to a certain phenomenon may still differ from those of their monolingual peers. This is assumed to reflect a qualitative difference, which we argue results from the coactivation of two languages sharing syntactic representations. A number of studies have shown that CLI can lead to qualitative differences in production (Gavarró, 2003; Nicoladis, 2006; 2012; Strik & Pérez-Leroux, 2011), and the present study extends this finding to acceptability judgments. Future research should explore such differences in more detail, with a view to determining the mechanisms underpinning such CLI. Cross-language priming offers a promising avenue to pursue in this regard (e.g., Serratrice, 2016); if CLI indeed stems from shared syntactic representations, one should be able to elicit CLI in production as well as comprehension and judgments by using a cross-language priming paradigm (Hervé et al., 2016; Vasilyeva et al., 2010).

This study adds to a growing body of literature showing that whilst surface overlap may be a condition on CLI in some cases, it does not always increase the likelihood of CLI. Although V2 word orders were more likely to be accepted when the surface overlap was greater (i.e., with auxiliaries), this was also true for monolingual children, indicating that the effect of verb type cannot have been due to CLI. Rather, because subject-auxiliary inversion resembles a grammatical possibility in English, this made items with auxiliaries more difficult to reject for both monolingual and bilingual children. Thus, whilst the language development of bilingual children need not always be measured against a monolingual yardstick (see De Houwer, 2013 for relevant discussion), the inclusion of a monolingual control group in this study was crucial to understanding the bilingual children's behaviour.

The likelihood of CLI was significantly related to the language dominance of the bilingual participants. The results show that children who were exposed to relatively more

Dutch (and thus less English) were more likely to accept an ungrammatical V2 word order in English. However, the present study found no relation between the likelihood of CLI and age at the time of testing. The finding that not all bilingual children in this study had reached the same end state by the time they were ten years old, suggests that CLI should in some cases be interpreted as a long-term bilingual phenomenon rather than a temporary “symptom” of a specific developmental stage.

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