Crosslinguistic Influence in Scope Ambiguity: Evidence for Acceleration

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1. Introduction

A large number of studies have shown that crosslinguistic influence in bilingual acquisition of interface-conditioned properties can occur in the form of delay or acceleration (e.g., Döpke, 1998; Hulk and Müller, 2001; Kupish, 2007, Haznedar, 2010). In this paper we investigate whether knowledge of both Italian and Dutch can lead to crosslinguistic influence at the syntax-semantics interface, by examining the acquisition of specific indefinite objects in children who are exposed to the two languages simultaneously. We will show that Dutch-Italian bilingual children assign the adult-like interpretation to scrambled indefinite objects in Dutch earlier than their monolingual peers. Comparing our data to the acquisition pattern found for English-Dutch bilingual children (Unsworth, 2012), we conclude that the direction of influence can also depend on language-internal properties.

2. Crosslinguistic influence in the area of syntax-semantics

Previous research focusing on a wide range of linguistic phenomena in the bilingual acquisition has provided evidence for the existence of crosslinguistic influence. Many of these studies have been carried out in the context of the two conditions on crosslinguistic influence put forward by Hulk and Müller (2000; Müller and Hulk, 2001).

First, the two languages in question need to overlap at the surface level. More specifically, if language A offers evidence for more than one grammatical analysis of a particular structure, and language B reinforces one of these analyses, crosslinguistic influence is predicted from language B to language A. By and large, the available evidence is consistent with this condition (e.g., Foroodi-Nejad and Paradis, 2009). Second, according to Hulk and Müller, crosslinguistic influence should occur at the interface between pragmatics and syntax, i.e., in the C-domain. The available evidence is not always in line with this condition, however. Crosslinguistic influence in bilingual acquisition has been shown to occur at the interface of syntax-morphology and syntax-pragmatics as well as in narrow syntax (e.g., Paradis and Navarro, 2003; Serratrice et al., 2004; Sorace, 2007; Haznedar, 2010).

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As yet, bilingual acquisition at the syntax-semantics interface remains under-researched. The relatively few investigations that have been conducted in this area report conflicting findings. A study by O’Grady, Kwak, Lee and Lee (2011), for example, on bilingual-children’s scope resolution in sentences containing negation and a universal quantifier observes crosslinguistic influence from English to Korean in the form of delay. In contrast, Mykhalyk and Ko (2013) show that in the acquisition of direct object scrambling in Ukrainian, monolingual and bilingual English-Ukrainian children follow a similar developmental pattern.

It has been claimed that crosslinguistic influence may manifest itself in the form of delay or acceleration (Paradis and Genesee, 1996). The majority of studies have however found evidence for the former, with evidence for latter rather limited (cf. Meisel, 2007). One example of a research finding acceleration is Kupisch (2007): in the acquisition of the German determiner system, Kupisch reports that Italian-German bilingual children acquire German determiners faster than monolingual German-speaking children.

To summarise, while there is considerable evidence for crosslinguistic influence in bilingual language acquisition, the number of investigations examining this question for phenomena at the syntax-semantics interface is rather limited. Furthermore, most studies deal with crosslinguistic influence in the form of delay, rather than acceleration. The current study will address both these gaps in the literature by presenting evidence for acceleration in the bilingual acquisition of syntax-semantics. More in particular, extending previous research on children's interpretation of specific indefinite objects in simultaneous Dutch-English bilingual children (Unsworth, 2012), the present paper aims at finding out whether and how language-specific properties can influence children's interpretations of specific indefinite objects. This will be achieved by investigating two languages, Italian and Dutch, which differ from each other in a different way than English and Dutch do.

We start by reviewing the properties of specific indefinite objects in English and in Dutch and their acquisition by monolingual (L1) and simultaneous bilingual (2L1) children in section 3. In section 4, we consider specific indefinites in Italian, and after establishing the preferred interpretation of L1 children and adults in section 5, we investigate crosslinguistic influence in this domain in the acquisition of bilingual Italian-Dutch children.

3. Specific indefinite objects in English and Dutch and their (monolingual and bilingual) acquisition

In English, sentences like (1), which contain negation and an indefinite, are ambiguous and can be interpreted either non-specifically, as in (1) or specifically, as in (1), depending on whether the indefinite falls within or outside the scope of the negation.

Previous research has shown that although sentences like (1) are ambiguous, adults and children can more easily access one reading or the other depending on the context in which the sentence is presented. L1 English children, as well as adults, can access both readings of a scopally ambiguous
sentence depending on context and experimental conditions (Su, 2001; Lidz and Musolino, 2002; Gualmini, 2003; Hulsey et al., 2004; Miller & Schmitt, 2004).²

(1) Elena didn’t paint an egg

   a. It is not the case that Elena painted an egg  
   b. There is a specific egg Elena didn't paint

In contrast to English, in Dutch the two interpretations introduced above, specific and non-specific, are associated with two different word orders: in the non-scrambled order, as in (2), the indefinite object can only be interpreted non-specifically, while in a sentence like (3), in which the direct object has scrambled over the negator, the indefinite object can only be interpreted specifically (de Hoop 1992; Van Geenhoven, 1998; Ruys, 2001).

(2) Elena heeft geen (niet + een) ei geverfd  
   Elena has not an egg painted  
   *Elena didn't paint any egg  
   Non-specific interpretation

(3) Elena heeft een ei, niet t, geverfd  
   Elena has an egg not painted  
   *There is a specific egg Elena didn't paint  
   Specific interpretation

Studies investigating the interpretation of such sentences by L1 Dutch children have found a different acquisition pattern than it is found in English monolingual children. In the earlier stages of development, L1 Dutch children, unlike adults, interpret scrambled indefinites as in (3) non-specifically (Krämer, 2000; Schaeffer, 2000). Subsequently, they pass through a stage (around age four to six) in which scrambled sentences are ambiguous and thus interpreted both specifically and non-specifically (Unsworth et al., 2008). Finally, around the age of six, L1 Dutch children have restricted the specific reading to the scrambled order and the non-specific reading to the non-scrambled order, which is the adult-like interpretation. To summarize; English monolingual children acquire the adult-like pattern earlier than Dutch monolingual children do. In particular, while 4- to 6-year-old L1 Dutch children still interpret the scrambled sentence in a non-adult-like fashion, English speaking children have by that age acquired the target interpretation.

In a recent paper Unsworth (2012) has extended this line of research to English-Dutch bilingual children to investigate whether there is evidence for crosslinguistic influence at the syntax-semantics interface and whether this is modulated by amount of exposure. First, for the acquisition of the specific interpretation of indefinite objects in negative sentences, i.e., (1) and (3) above,

² We are referring here to English speaking children aged 4-to-6. Whether children at an earlier stage of development consistently interpret sentences like (1) non-specifically is still a matter of debate and it goes beyond the scope of the present paper.
she predicted that there may be influence from Dutch to English, and in particular in the later stages of development. To be precise, she suggested that once children have restricted the non-specific interpretation to the non-scrambled order, the surface order similarity between this order and the English order may reinforce the non-specific interpretation for English. This prediction was confirmed, but only for a limited number of individual children. Second, Unsworth (2012) predicted that there may be influence in the other direction in the early stages of development, i.e., from English to Dutch. In particular, the availability of the non-specific interpretation for English may reinforce this interpretation for Dutch, resulting in a delay in convergence on the target specific interpretation for scrambled indefinites. This prediction was not confirmed, however (see also Unsworth, submitted).

The results for Dutch-English bilingual children thus show that, despite the fact that English allows both the specific and non-specific interpretation for one and the same form, this does not appear to have a negative effect on the rate of acquisition for the restriction of the scrambled form to a specific reading in the Dutch of the same children. This could be because the children in question were growing up in the Netherlands and thus likely to be dominant in Dutch, and/or because in the experimental context in question, the specific reading is also the easily accessed reading for English. In this paper, we aim to extend this particular line of research, and more generally to broaden our knowledge of whether knowledge of another language exerts crosslinguistic influence at the syntax-semantics interface, by examining the acquisition of specific indefinites in another language combination, namely Italian-Dutch bilingual children.

4. Specific indefinites in Italian

In Italian, like in English, a sentence like (4) containing negation and an indefinite object can be associated with the two interpretations given in (4) and (4):

(4)   Elena non ha colorato un uovo
Elena not has colored an egg
Elena didn’t paint an egg

   a. It is not the case that Elena painted any egg  not > a
   b. There is a specific egg Elena didn’t paint  a > not

Although sentences like (4) in Italian and (1) in English give rise to the same interpretations, there are crucial lexical differences between the properties of the Italian indefinite determiner un (or una/uno depending on gender/number of the following noun) and the English indefinite a. In particular, in Italian the indefinite un is homophonous with the numeral un (= one). Following Fodor and Sag (1982), we assume that numerals are normally associated with a wide scope reading which corresponds to the specific reading. Such homophony between the indefinite and the numeral has also been observed and studied in languages such as Chinese Mandarin and Spanish, where the words corresponding to the indefinites yi-ge (Chinese) and un (Spanish) are also identical to the numeral
Interestingly, this does not hold for Dutch or English, and this difference turns out to be influential for children's interpretation of sentences containing indefinites under negation, as illustrated by Su (2001) for Chinese and by Miller and Schmitt (2005) for Spanish. To illustrate, the results (see Table 1) of a series of experiments show that Chinese- and Spanish-speaking children (aged 3-6) accept the specific interpretation of the indefinite consistently more often than English- or Dutch-speaking children of the same age, and that they furthermore do not differ from adult speakers of the same language.

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<td>Children</td>
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<td>Adults</td>
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Table 1: Percentages of specific readings for different L1 groups

Su (2001) accounted for these results by proposing The Number Reading Hypothesis. Given the homophony of the indefinite and the numeral one in Chinese, Chinese-speaking children aged 3-6 exclusively interpret the indefinite as a quantity-denoting number expression and thus resort to a reading that in adults is restricted to numerals. We will refer to this reading as the quantity-denoting reading. To illustrate, the quantity-denoting reading of the sentence in (4) can be paraphrased as *It is not the case that the number of eggs that Elena colored is exactly one.*

We follow the proposal put forth by Su (2001) in accepting that the availability of two distinct lexical items plays a role when it comes to children's interpretation of sentences like (4). However, for reasons that will become clear after we present the experimental data, we do not accept Su's claim that the results are due to children accessing exclusively the quantity-denoting reading of (4). By contrast, we contend that the specific interpretation associated with numerals carries over to the indefinite article, thereby making more prominent the specific reading of sentences like (4). Thus, we predict that Italian-speaking children and adults will access the specific reading of the indefinite given in (4) more readily than the non-specific reading. As far as we know, there have been no studies exploring the interpretation of specific indefinites with Italian monolingual children. The data presented in the following section fill this gap.

5. Experiment 1: Italian monolingual children
5.1 Subjects and Methodology

The subjects of the present experiment were eleven Italian monolingual children (age: 4;6-5;11, mean: 5;1) and ten Italian adults (mean: 40). They were

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2 Adapted from Miller and Schmitt, 2005.
3 It is important to notice that the specific reading and the quantity-denoting reading have the same truth values. To be more precise, the specific interpretation in (4) is true because there is indeed a specific egg that Elena did not color. The quantity-denoting reading is also true since Elena painted two eggs and not only one. What Su (2001) therefore assumes is that, in interpreting the sentence in (4), children reason as follows "yes, it is true because Elena did not paint one egg, she painted two of them".
presented with a picture Truth Value Judgment task (Crain & Thornton, 1998). All participants were recruited in Italy. The subjects were told short stories using pictures on a computer screen. Following similar experiments in English (Miller and Schmitt, 2004) and Dutch (Unsworth et al. 2008), in each target trial a main character was asked to act upon all the objects in the scene (e.g., to colour all the eggs) but in the end he or she managed to manipulate only two of the objects (e.g., two out of three eggs). The subjects were then asked to evaluate a sentence which has been previously recorded and played on the computer. To illustrate, in a typical trial, which corresponds to the sentence in (4), Elena has to color all the eggs in the basket as Easter is approaching. She is really good and colours two of them but then she hears her friends playing on the street and she leaves (see Fig. 1). At the end of this story the subjects hear (4) and have to answer 'right' or 'wrong'. This scenario allows us to determine how subjects interpret the test sentences as the two possible interpretations have different truth values. In the context depicted in Figure 1, sentence (4) is true when the indefinite is interpreted specifically (i.e., there is an egg that Elena did not paint), but it is false when interpreted with a non-specific reading (i.e., it is not the case that she painted an egg = she did not paint any).

![Figure 1: Sample story for (4)](image)

Each subject was presented with five target trials, four practice trials, five unrelated filler trials and three control trials. The control trials followed the same structure as the target trials but were presented with the scenario in Figure 2 along with the sentence in (5).

(5) Maria non ha colorato un clown
Maria not has colored a clown
Maria didn't paint a clown

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The experimental pictures used in our study are based on the material used in the study by Miller and Schmitt (2004).
The control trials were used to test Su's claim that children aged 3-6 predominantly access a quantity-denoting reading (see below).

5.2 Results

In analysing the results, the percentage of yes-responses was used as the dependent measure. As shown in Figure 3, Italian adults and Italian monolingual children accepted the target sentences respectively 96% (48/50) and 89% (48/54) of the time. There were no significant differences between these groups (Mann-Whitney U=33.000, p = 0.197).

Before drawing any conclusion as to which interpretation children access, we have to rule out the possibility that children access a quantity-denoting reading rather than a specific reading. Although in our target sentences the two readings are indistinguishable, as they are both true in the situation depicted in Figure 1, the same does not hold for the control sentences. In fact, as suggested by Su (2001), if children in this case interpret the sentence according to the quantity-denoting reading, paraphrased as It is not the case that the number of clowns that Maria colored is one, they should accept the sentence as Maria did
not colour only one but all the clowns. On the other hand, if children do not have this reading, but rather access the specific reading of the indefinite/numeral, they should reject this sentence since there are no clowns that remained unpainted.

The results for both children and adults are given in Figure 4.

![Figure 4: Percentage of no-answers in control trials in Italian](image)

Italian monolingual children rejected the control sentences at a rate of 90% (30/33). The monolingual Italian adults always rejected them. There are no significant differences between monolingual children and adults. (Mann-Whitney U=52.000, p=0.082) Children's behaviour on the control sentences clearly shows that, contra Su (2001), Italian monolingual children access the specific reading of the indefinite/numeral.

The results of the first experiment reveal that, 4- to 6-year-old Italian monolingual children and adults consistently access the specific reading of an indefinite under negation. We therefore conclude that when it comes to the interpretation of sentences containing an indefinite object like (4), Italian does indeed behave like Spanish and Chinese. Furthermore, as already suggested by Su (2001), this is likely the result of the homophony between the numeral and the indefinite determiner in Italian.

6. Experiment 2: Italian-Dutch bilingual children

6.1 Research Questions and Predictions

In experiment 1 we have shown that the specific/numerical reading of the indefinite is indeed the easily accessed interpretation by Italian children, as we predicted. We are now in a position to extend this line of research to bilingual Italian-Dutch children. Following Unsworth’s (2012) study on English-Dutch bilingual children, we investigate whether there is evidence for crosslinguistic influence. Recall that Dutch monolingual children go through a stage (between ages 4 and 6) in which the scrambled form in (3), here repeated as (6), is associated with both the specific and the non-specific reading, before subsequently restricting such sentences to the target, specific interpretation. In Italian, on the other hand, the predominant accessed interpretation of (4),
repeated here as (7), is the specific reading, as we just saw for monolingual 4- to 6-year-olds in Experiment 1.

(6) Elena heeft een ei niet geiverfd
Elena has an egg not painted
There is a specific egg Elena didn't paint

(7) Elena non ha colorato un uovo
Elena not has colored an egg
Elena didn't paint an egg

We predict that for bilingual Italian-Dutch children, the specific interpretation, the mostly accessed interpretation for children and adults, will reinforce the specific interpretation in Dutch, thus leading the bilingual children to reach the target grammar earlier than their monolingual peers. In other words, following e.g. Kupisch (2007), we expect to find evidence of crosslinguistic influence in the form of acceleration.

6.2 Subjects and Methodology

We presented the same picture Truth Value Judgment task as used in Experiment 1 for Italian and as used in Unsworth et al. (2008) for Dutch to thirteen Italian-Dutch simultaneous bilingual children (age: 4;1 to 6;1, mean age = 5;5) and fifteen Dutch monolingual children (age: 4;1- 6;5, mean age = 5;4). All bilingual children were raised according to the ‘one parent, one language’ approach and were resident in The Netherlands at time of testing. The bilingual children were tested in both languages (first Dutch, then Italian) with a two-week interval in order to avoid any possible carry-over effects.

6.3 Results

For all groups, and for both languages, the dependent measure used was the percentage of correct yes-responses, which is the adult response in the experimental context provided (see Fig. 1 for Italian). For Italian, the bilingual and monolingual children accepted the target sentences, as in (7), relative to the scenario in Fig. 1, at a rate of respectively 95% (62/65 trials) and 88% (48/54 trials). We found no significant differences between these two groups (Mann-Whitney U=57,500, p =0.628). For Dutch, a comparison between the bilingual and monolingual children showed that while only 54% (41/75) of the scrambled indefinites were interpreted specifically by the monolinguals, the bilinguals accepted the target sentence 97% (62/65 trials) of the time. This difference was significant (Mann-Whitney U= 45,00, p = 0.005). There was no significant effect of age (t = 0.282, p =0.80). Moreover, for the bilinguals, no significant difference was detected between the two languages (Wilcoxon Z =-1.406, p =0.16): bilingual children accepted the test sentences 95% of the time in Italian and 97% of the time in Dutch. The reasons children provided for accepting or rejecting the test sentences (when available) were all of the type: "Yes, because she forgot to paint one" or "No, she painted these eggs" (pointing at the two colored eggs). A summary of the results is given below in Figure 5.
Following Unsworth (2012) and Krämer (2000), children’s individual response patterns in Dutch were categorised as specific (if 4/5 or 5/5 items accepted), non-specific (4/5 or 5/5 items rejected) or mixed (2/5 or 3/5 accepted). This analysis, given in Figure 6, revealed that while all the bilingual children showed a specific/adult response pattern, the monolinguals exhibited this same pattern in only 40% of the trials. In the remaining trials, Dutch monolingual children were either at chance (25%), or performed non-adult like (35%). The pattern observed for the monolingual Dutch children is in line with previous findings (Krämer 2000; Unsworth, 2005).

Figure 5: Percentage of indefinites interpreted specifically in Dutch

Figure 6: Proportion of children with given response pattern in Dutch

7. Discussion and conclusion

In this study we extended the study carried out by Unsworth (2012) with English-Dutch simultaneous bilingual children to the case of specific indefinite
objects under negation in Italian-Dutch simultaneous bilingual children. We have first shown that in Italian, given that the indefinite determiner and the numeral are expressed by the same word *un*, sentences with negation and indefinite objects are predominantly interpreted with a specific reading by both children and adults. Our second experiment concerned the possibility of crosslinguistic influence from Italian to Dutch. We hypothesised that the early availability of the specific reading in Italian, as demonstrated in experiment 1, would facilitate its acquisition in Dutch in the same children. The results reveal that while only 40% of the monolingual children in Dutch interpret the scrambled sentence specifically, all bilingual children show an adult-like preference for the specific interpretation. In other words, the results show crosslinguistic influence in the form of acceleration in the bilingual acquisition for Dutch, which is in line with e.g., Kupisch (2007) and more recent work by Liceras, Fernández Fuertes and Alba de la Fuente (2011).

We decided to extend the work of Unsworth (2012) to Italian-Dutch simultaneous bilingual children to shed light on the potential role played by language-internal properties on crosslinguistic influence. We took care to keep all the experimental details comparable to the study conducted with English-Dutch bilinguals children: the materials, methodology and procedures were all the same. Moreover, the children who participated in the two studies are comparable in various ways. First, both the English-Dutch bilingual children and the Italian-Dutch bilingual children were all resident in the Netherlands from birth and raised following the 'one parent, one language' approach. They attended schools and regularly participated in other activities where Dutch is the main language. We can thus be confident in affirming that, insofar as we have been able to control for, the only relevant difference between the two studies lays in the other language, and more in particular, in the idiosyncrasy between Italian *un* and English *a*. Crucially, as discussed above, while in Italian *un* is homophonous with the number *one*, thus almost always receiving a specific interpretation, the English *a* is not homophonic with the cardinal and is interpreted as an indefinite. In our view, this property of Italian explains why Italian monolinguals and bilinguals tested in Italian predominantly access the specific interpretation. It also explains why Italian-Dutch bilinguals are facilitated in restricting the interpretation of scrambled indefinites to the specific one.

It is important to note that the quicker rate of acquisition of the specific interpretation of scrambled indefinite objects by the Italian-Dutch bilingual children when compared with their monolingual peers is not due to some methodological artefact. First, the performance of the monolingual Dutch children, tested using the same methodology used for Italian, is consistent with previous findings (Krämer 2000, Unsworth 2008, 2012), namely that specific indefinites are interpreted as ambiguous by Dutch monolingual children between the age of four and six. Second, the bilingual children were tested in Dutch before they were tested in Italian, so it is not the case that their superior performance on the Dutch task is due to a carry-over or learning effect from having completed the task for Italian first.

These findings raise interesting questions concerning the conditions modulating crosslinguistic influence in bilingual acquisition. First, they provide further evidence for crosslinguistic influence in domains other than syntax-
pragmatics, and are thus in line with e.g., more recent findings by Serratrice et al. (2009), who find crosslinguistic influence in a study on plural DPs in specific and generic contexts. In contrast to this latter study, however, which finds that the existence of crosslinguistic influence is modulated by the language of the community, i.e., English-Italian bilinguals living in Italy were less likely to show influence in their English than English-Italian bilinguals living in the UK, we have found crosslinguistic influence from the minority to the majority language. The prediction here would be that Italian-Dutch bilinguals living in Italy should show the same pattern as the Italian-Dutch bilinguals living in the Netherlands examined here.

References


Unsworth, Sharon (submitted). Comparing the role of input in bilingual acquisition across domains’.