Developmental Patterns in Flexible Word Order Acquisition

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1. Introduction

This paper presents an experimental study investigating the development of a flexible word order in early bilingual (2L) acquisition as opposed to monolingual (L1) acquisition[1]. In particular, it concerns the acquisition of *direct object scrambling* as a means of encoding specificity/definiteness by monolingual Ukrainian and bilingual English-Ukrainian children.

Research within the last twenty years has shown that bilingual children are able to distinguish two language structures from the earliest stages and follow similar developmental patterns in each language as monolinguals (Meisel 1989; Genesee 1989; De Houwer 1994; Genesee et al 1995, Paradis & Genesee 1995 among others). These findings provide supportive evidence for the *'early differentiation of languages'* hypothesis.

Nonetheless, a number of studies have noticed that the two grammars of young bilinguals are not fully independent of each other (Gawlitzek-Maiwald & Tracy 1996, Döpke 1998, Müller 1998, Müller et al 1999, Muysken 2000, Bullock & Toribio 2004). They have argued that the language(s)' influence/transfer/convergence occurs not only in the lexicon, but also on the syntactic level. The nature of this process has been explained in diverging terms. Supporters of the '*weaker language'* hypothesis have claimed that the acquisition of a weaker (non-dominant or less preferred) language differs fundamentally from L1 and/or balanced bilingual L1 and resembles second language (L2) acquisition (see e.g. Schlyter 1993 and Schlyter & Hakansson 1994 on French-Swedish bilinguals, or Modyanova 2006 on English-Russian bilinguals). Hulk & Müller (2000) and Müller & Hulk (2001), however, do not attribute the main role in grammar development to the dominant language, but argue for the '*cross-linguistic influence'* hypothesis claiming that the influence is to be expected only under certain specific conditions:

(1) a. the phenomenon has to belong to the interface between two modules of grammar;
b. there has to be a certain overlap of the two systems at the surface level.

Acquisition of flexible word order involves interaction of different types of knowledge: syntactic, semantic and pragmatic, and, thus, is a good candidate for a possible cross-linguistic influence. Furthermore, English and Ukrainian syntactic structures present an overlap, since both languages have the same basic word order (see (2) and (3)). Ukrainian, however, also employs other word orders, as one shown in (4)).

(2) John reads a/the **book**. (English)

(3) Ivan čytaje **knyžku**. (Ukrainian)
Ivan reads book
'Ivan reads a/any/the book.'

* I would like to thank Dan Finer, Heejeong Ko, Natalie Batmanian, and audiences at LSA 2008 Annual Meeting and GALANA 3 for discussions and help with different parts of this research. All shortcomings are my own.

[1] The bilinguals are abbreviated as 2L learners, as they acquire two languages either simultaneously from birth (2L1) or successively before the age of 6 (child L2). This notation allows us to treat all children as a group.

(4) Ivan **knyžku** čytaje. (Ukrainian)
Ivan book reads
'Ivan reads a specific/the book.'

Bilingual English-Ukrainian acquisition, then, presents a particularly interesting area for this investigation. Since two specific conditions for the cross-linguistic influence are met, it can be predicted that bilinguals will differ from monolinguals with regard to word order patterns. In line with previous studies, I argue that this difference will be only quantitative, but not qualitative (Hulk & Müller 2000, Sorace 2005).

Ukrainian is also likely to be a less-preferred language for English-Ukrainian bilinguals and, thus, might show different signs of transfer from the stronger language – English – according to the *weaker language* hypothesis. This research examines factors contributing to the word order variability in Ukrainian development, and shows that both the 'overlapping' input and the language dominance play significant role in the cross-language influence.

The paper is organized as follows. Section 2 briefly discusses relevant language facts and presents predictions for acquisition of word order in Ukrainian. Section 3 provides a detailed description of the experimental study. Results of the experiment and their analysis are presented in section 4. The paper concludes with a discussion of main findings and their implications for language acquisition theory.

2. Word order facts: Ukrainian scrambling

The word order change SVO > SOV is variously defined as a short object scrambling or object shift and is known to have distinct syntactic and semantic characteristics. According to previous studies, this change seems to be associated with a coherent set of semantic functions – such as specificity/definiteness/partitivity (Schaeffer 2000, Krämer 2000, Avrutin and Brun 2001, Dyakonova 2004, Ilić and Deen 2004, Unsworth 2005, *inter alia*).

Ukrainian, too, employs short object scrambling. The direct object can occur either in a post-verbal or pre-verbal position. In its base, post-verbal, position it can be interpreted as specific/definite or non-specific/indefinite, as in the following examples:

(5) Elmo jist' **jabluko** (bo vin holodnyj)
Elmo eats apple
'Elmo is eating some apple (because he is hungry)

(6) Elmo jist' **jabluko** (jake jomu dav Bert)
Elmo eats apple
'Elmo is eating a specific apple (which him gave Bert)

When the direct object is scrambled over the verb or higher, its interpretation is always specific/definite (as in (7)). Non-specific direct objects (as in (8)) cannot occur in a scrambled position.

(7) Elmo **jabluko** jist' (-vono take smačne)
Elmo apple eats
'Elmo is eating a specific apple (it is such a delicious apple)

(8) [*] Elmo **jabluko** jist' (bo vin holodnyj)
Elmo apple eats
'Elmo is eating some apple (because he is hungry)

The main task of Ukrainian learners is to acquire this subtle structure-meaning mapping and to not scramble indefinite/non-specific direct objects. On the other hand, bilinguals acquiring Ukrainian along with English (which lacks scrambling) still should scramble in appropriate contexts (e.g., place personal pronouns in a pre-verbal position).

In this paper I provide results of an experimental study with monolingual Ukrainian and bilingual English/Ukrainian children which answers specific questions concerning the object scrambling acquisition:

(9) a. Do monolingual and bilingual children acquiring Ukrainian show the same patterns of the syntactic structure-meaning interaction?
b. Are there any differences in the rate of scrambling in their speech?
c. How can we explain variability in children's use of syntactic structures?

Assuming that both (simultaneous and/or successive) bilingual acquisition and monolingual acquisition are constrained by the principles of UG, I hypothesize the following:

(10) a. Children acquiring two languages with different syntactic systems should be able to distinguish them from the beginning (Meisel 1998), and yet
b. One language could greatly influence the other if their syntactic systems overlap, and if two modules of grammar (syntax and semantics/pragmatics) are involved (Hulk and Müller 2000).

It is predicted, then, that

(11) a. L1 and 2L scrambling will be qualitatively alike: children will not produce scrambled SOV structures in indefinite non-specific contexts.
b. There might be quantitative differences between two language groups: e.g., older 2L children will show lower rates of scrambling due to English influence.

3. Experiment

3.1. Subjects

38 monolingual Ukrainian and 31 bilingual English-Ukrainian children of the same age (3-6) participated in the study. In particular, there were 8 3-year-old, 13 4-year-old, 8 5-year-old, and 9 6-year-old monolingual children and 6 3-year-old, 6 4-year-old, 7 5-year-old, and 8 6-year-old bilinguals. 24 adult Ukrainian native speakers were used as a control group. Monolingual children and adults were tested in Ukraine, while bilingual children were tested in two Saturday Ukrainian schools in the USA[2].

3.2. Method

The method used in the experiment is based on Schaeffer's (2000) design, which is a combination of two tasks: Truth Value Judgment and Elicited Production. The subjects received 4 testing conditions (32 testing items in total), but this paper focuses only on the results from two the most contrastive conditions: Definite Specific and Indefinite Non-specific[3]. The examples of stimuli are given below: subjects were shown short puppet shows, where they heard an infelicitous statement from Tigger and by correcting him they produced either a scrambled or unscrambled sentence[4]:

(12) Definite Specific Context

Roo:	Look, what a nice butterfly. I have a new net, and I am going to catch it QUICKLY.
Tigger:	Roo is going to catch the butterfly SLOWLY.
Exp.:	What is really happening?

[2] See more on bilingual subjects in Mykhaylyk & Ko (2008).
[3] Other conditions are Indefinite Specific/Partitive and Definite Pronominal, but they are not discussed in details in this paper.
[4] In the actual experiment, the whole scenario was in Ukrainian. English translation is provided here for the ease of presentation.

Possible responses:

Child:	Kenhuru	**metelyka**	ŠVYDKO	zlovyt'.
	Roo	*butterfly*	*quickly*	*will.catch*
	Kenhuru	ŠVYDKO	zlovyt'	**metelyka.**
	Roo	*quickly*	*will.catch*	*butterfly*

'Roo is going to catch the butterfly QUICKLY.'

(13) Indefinite Non-specific Context

Winnie: I feel like catching something big. What can I catch? I can catch a whale, a shark, or a crocodile. [Child response…]. OK! And I am going to do that CAREFULLY!

Tigger: Oh, I haven't understood it very well. What is Winnie going to do carefully?

Possible responses:

Child:	Winnie	OBEREŽNO	zlovyt'	(**akulu)**.
	Winnie	*carefully*	*will.catch*	*shark*
[*]	Winnie	**(akulu)**	OBEREŽNO	zlovyt'.
	Winnie	*shark*	*carefully*	*will.catch*

'Winnie will catch a shark CAREFULLY.'

In (12), both word orders are possible in the response, although the scrambled structure is more transparent with regard to the direct object interpretation. In (13), however, the only acceptable response is the basic syntactic structure, while the scrambled sentence would be pragmatically odd.

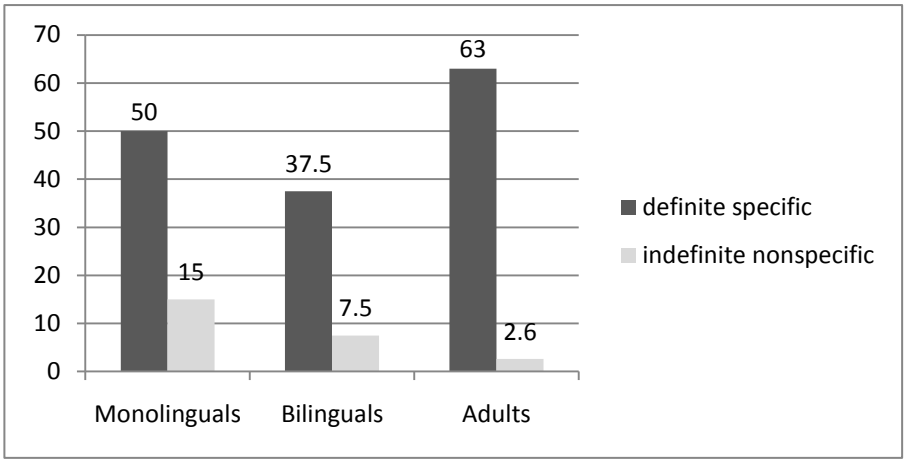
Following Schaeffer (2000), adverbs or negation were used in order to control for the object focusing by stressing an adverb or negation instead. In half of the testing stimuli, negation was contrasted with affirmation. In the other half, antonymous pairs of low adverbs were used. The stimuli were interspersed with 8 fillers that were designed similarly, but they always triggered a 'yes' response from a subject. Fillers were necessary to prevent children from forming strategies in answering questions.

4. Results

4.1. Child and adult group data

The results indicate that both children and adults use the non-basic word order in appropriate contexts. They scramble optionally, but not randomly: definite specific contexts trigger considerably more scrambling than indefinite nonspecific contexts.

Figure 1: Total scrambling rates



The statistical analyses of all available data show a significant main effect of condition on the word order choice:

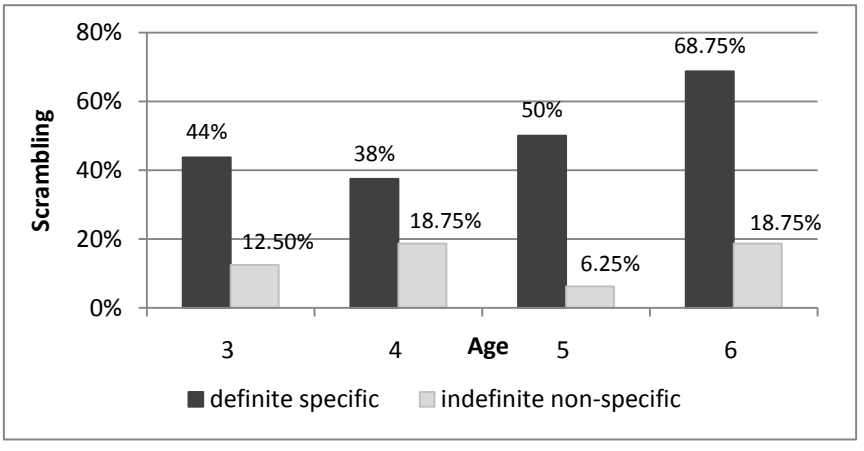
Table 1: ANOVAs (Four conditions)

Group of subjects	**F value**	**p value**
Monolingual children	*F(3, 12)* = 23.31	*p=0.0001*
Bilingual children	*F(3, 9)* = 13.76	*p= 0.001*
Adults	*F(3, 69)* = 97.17	*p= 0.0001*

The results of two most contrastive conditions (exemplified in (12) and (13)) have been submitted to a more fine-grained analysis by splitting them according to child age. These cross-sectional data show us stages that the children at each language group pass through[5].

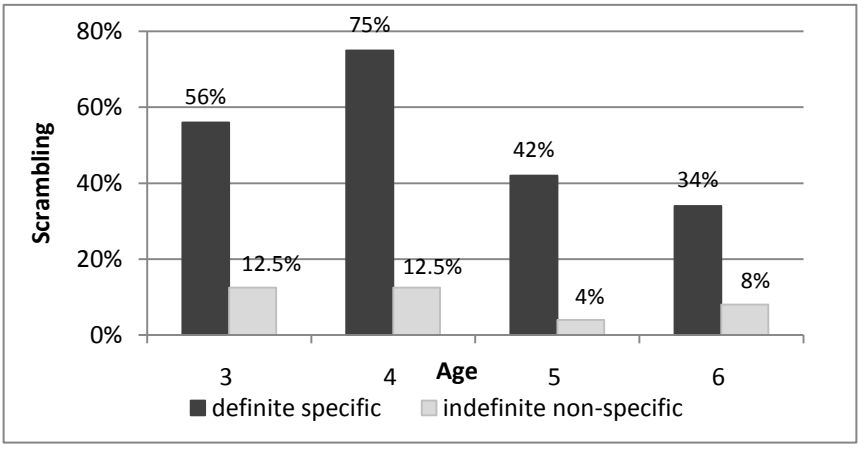
In particular, L1 children's use of scrambling shows an increase in rate with age, reaching the adult level at 6 (68.75% and 63%, respectively):

Figure 2: Monolingual scrambling as a function of age



Bilingual scrambling, on the other hand, decreases with age, but continues exhibiting the same prominent asymmetry between the two conditions.

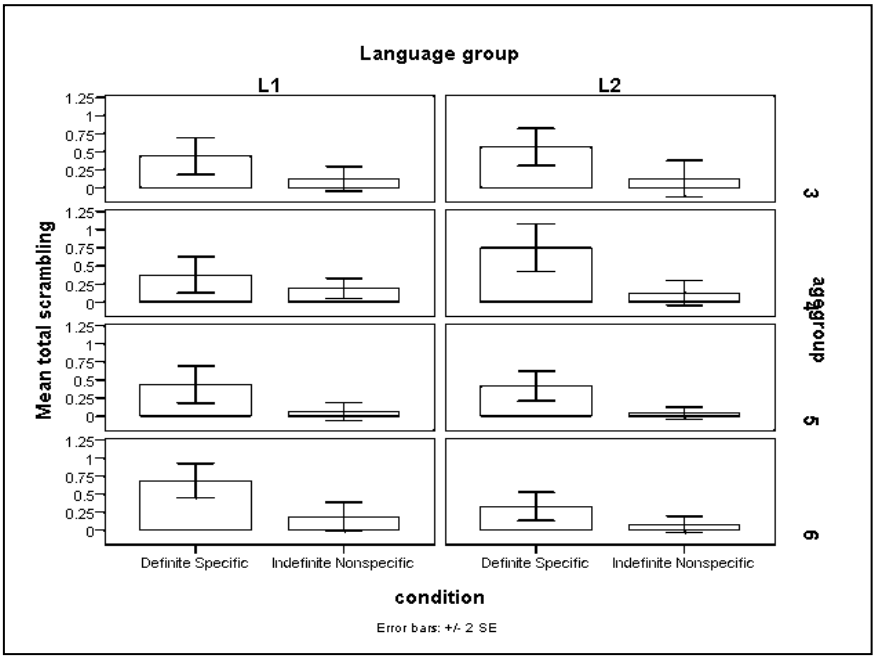
Figure 3: Bilingual scrambling as a function of age



[5] While a developmental study could be more appropriate for the same bilingual child across time, comparing the group results by monolinguals and bilinguals allows us to make important generalizations leaving aside their individual differences.

Comparing two language groups indicates interesting similarities and differences in the word order production. Bilingual 3-year-old children use a non-basic word order at a similar rate to L1 children (56% and 44%, respectively), but 6-year-old bilingual children scramble significantly less than their monolingual peers (34% vs 68.75%), as shown in Figure 4.

Figure 4: Scrambling by language group, age, and condition



To summarize thus far, monolingual and bilingual children acquiring Ukrainian show the same patterns of the syntactic structure-meaning interaction: the majority of scrambled objects are definite-specific. The distribution of scrambling across age groups, however, is not the same. Young 3-year-old children show similar scrambling rates regardless of their language environment, which implies that they are able to differentiate Ukrainian free-word-order grammar from the fixed English word order system[6]. The frequency of scrambling is different for older children, which leads to the diverging end-state grammar of 6-year-olds.

4.2. Further analysis

In order to explain the apparent variability in the children's use of scrambled structures, two factors are to be explored:

(14) a. The nature of the 'overlapping' input for word order (Müller & Hulk 2001)
b. The language dominance (or the role of the stronger language) (Schlyter 1993 and others)

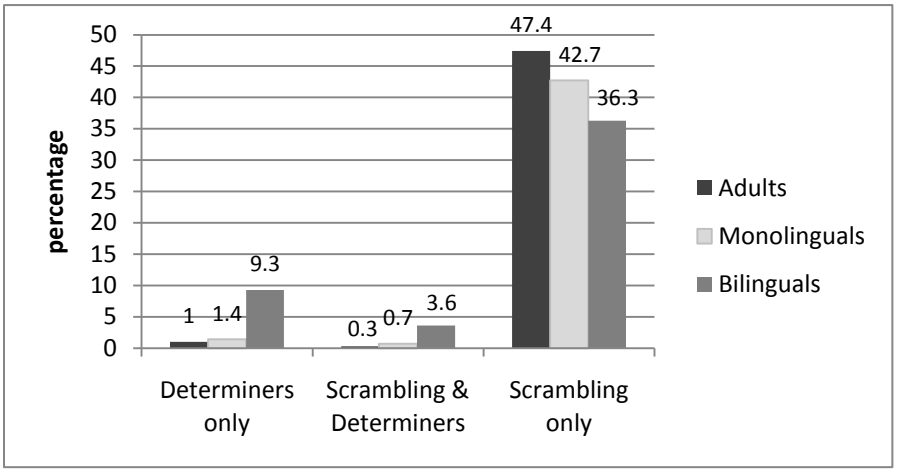
With regard to the nature of the input, the following observation is crucial: cross-linguistic influence occurs in the area which is also problematic, although to a lesser extent, for monolinguals. Monolingual Ukrainian speakers use scrambling optionally. Therefore, bilingual children are not qualitatively different; they simply exhibit a higher level of optionality. The relatively low rates of

[6] Bilingual children have not been tested for their knowledge of English so far. However, observation of their spontaneous speech suggests that it is very unlikely that they would use a word order other than the basic one in English. If follow-up studies confirm this prediction, the 'early-differentiation' hypothesis will receive additional supportive evidence.

scrambling by bilingual children might be due to an indirect influence of the great amount of evidence available in the input for a non-scrambled structure.

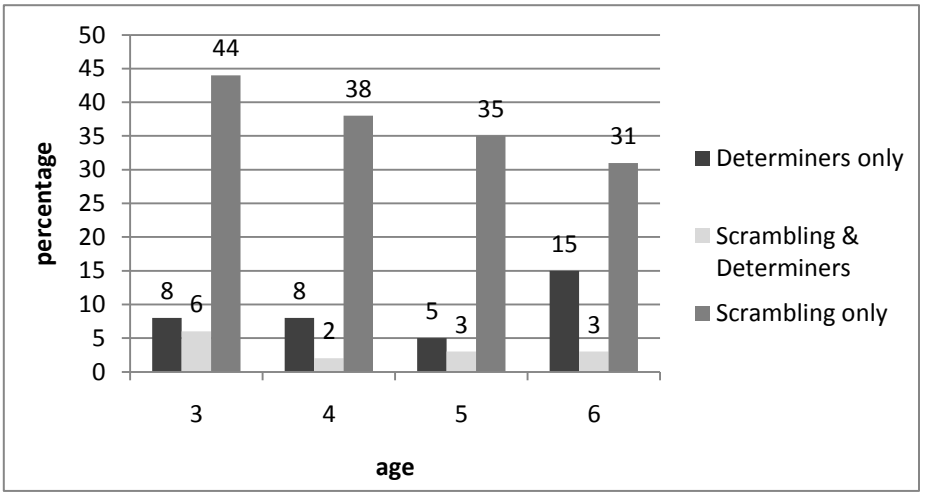
Furthermore, 2L children receive input that is not only reduced in quantity, but also mixed. In particular, English grammar does not allow object scrambling, but expresses definiteness-specificity with articles, while Ukrainian grammar uses scrambling to mark an object as definite-specific, and lexical markers (such as definite pronouns *toj* 'that' and *cej* 'this'*)* are not obligatory. A post-hoc analysis of the experimental data shows a clear asymmetry in the use of determiners by bilingual children comparing to monolingual children and adults (9.3% vs 1.4% and 1%).

Figure 5: Definiteness/Specificity Marking



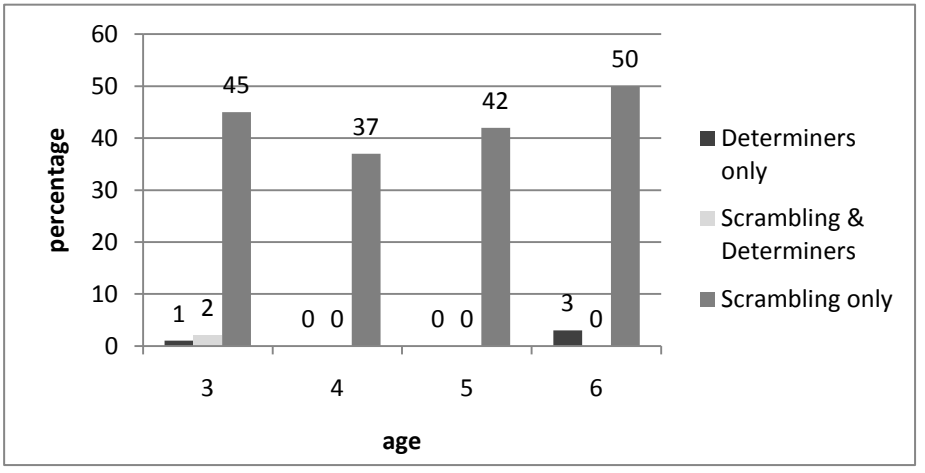
For bilingual children, definiteness-specificity can be marked either by a particular syntactic structure or by a lexical item – an article. It seems that in Ukrainian they apply the same strategy and use definite pronouns with or without scrambling. They go from a mixed marking system (3 year-olds) to the grammar which employs more determiners and less scrambling (6 year-olds) (see also Polinsky 1996 for determiners in American Russian).

Figure 6: Definiteness/specificity in bilingual data



L1 children, on the other hand, use determiners at a very low rate (if at all), but their scrambling rate increases with age, as depicted in Figure 7.

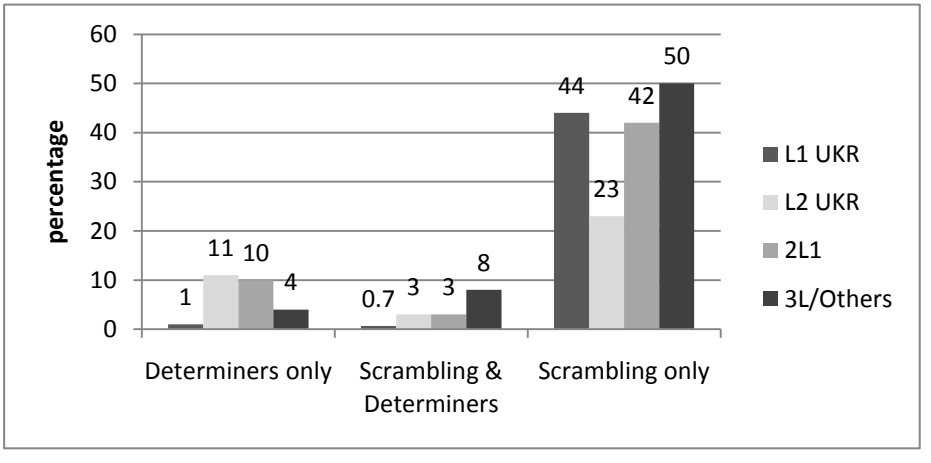
Figure 7: Definiteness/specificity in monolingual data



These data show the cross-linguistic influence at work: the Ukrainian grammar of English-Ukrainian bilingual children undergoes shift to the English means of encoding definiteness-specificity.

Before drawing the final conclusions, the second factor of the diverging bilingual development should be considered. The data, thus, have been analyzed with regard to the role of language dominance in the child Ukrainian[7]. L1 Ukrainian children have been compared to bilinguals with English as their dominant language (child L2 Ukrainian learners), balanced bilinguals (2L1), and trilingual children (3L1). The analysis shows that bilinguals use determiners at a similar high rate, but L2 Ukrainian learners stand low in scrambling because they mostly use the basic word order under the influence of their dominant language – English.

Figure 8: Definiteness/specificity marking by language sub-group



The statistical analyses (ANOVAs) confirm a significant effect of language dominance on the use of definite pronouns and scrambling. In particular, L2 Ukrainian learners and 2L1 children significantly differ from L1 children in the use of determiners (*p>0.001* & *p=0.004,* respectively). In scrambling, L2 Ukrainian learners differ both from L1 and 2L1 children (*p=0.001* & *p=0.023*, respectively).

[7] Empirical justifications for qualifying a language as "dominant" commonly refer to the following observations: (a) the dominant language is strongly preferred over an extended period of time, (b) the other language is rarely actively used, and (c) the development of the allegedly dominant language is more advanced than that of the other language(s) (Schlyter 1993).

5. Discussion

The results of this experiment with Ukrainian monolingual and English-Ukrainian bilingual children show important qualitative similarities in the acquisition of scrambling. Both groups follow the same UG rule, i.e., they are aware that indefiniteness-nonspecificity is incompatible with the scrambled structure (confirming prediction (11a)). Furthermore, the bilingual children scramble despite the lack of scrambling in English. This implies that they are able to successfully internalize Ukrainian grammar from an early age and follow L1 patterns (consistent with Meisel 1998 and others).

However, in the course of further development bilingual syntactic structures exhibit properties quantitatively different from those of monolinguals: 6-year-old 2L children scramble considerably less than L1 children (as was predicted in (11b)). The extensive data analysis suggests two factors contributing to this variation: language-internal – the properties of the available syntactic structures, and language-external – language environment supporting acquisition of one language and inhibiting development of the other. The first factor is a surface overlap at the syntactic level, which means that, in accordance with Hulk & Müller (2000), English reinforces an option available in Ukrainian – an SVO basic structure. Furthermore, English can be perceived as a more restricted grammar compared to Ukrainian, so that children would favor it as a more economic one (see Platzack 2001, Zuckerman 2001, Gavarro 2002, Westergaard 2004 on economy in word order acquisition)

The last suggestion, however, requires further investigation, as it would become applicable only if we consider the merge-operation more economic than the move-operation. It has been shown that bilingual children use lexical means to mark definiteness-specificity, i.e., determiners, while monolinguals prefer movement for the same purpose. Why children scramble at all, then, remains an open question. Recently, Sorace (2005) has broadened the discussion by considering the role of the adult language input, both quantitatively and qualitatively, in a variety of bilingual situations. Typically in generative grammar, frequency in the input is not considered to be important in relation to the acquisition of syntax; it could be the case, however, that this is different with regard to the acquisition of interface phenomena by bilinguals.

A second factor that has emerged from the analysis of these experimental results with regard to the preferred language concerns language use. It appeared that cross-linguistic influence is more evident at the word order choice level by non-balanced learners (defined as L2 Ukrainian). Apparently, for these children, their dominant language – English – presents a strongly reinforced option of the basic word order, which they chose in Ukrainian as well. Non-balanced bilingual children, then, show a decline in their knowledge of the lesser-used language, as it is compromised by extensive use of English. Balanced linguistic input, on the other hand, promotes retention of properties idiosyncratic to languages.

In conclusion, the ultimate finding of this experimental study is that flexible word order acquisition by bilingual children proceeds in stages. Younger children acquire two syntactic systems similarly to their monolingual peers, while 6 year-old bilinguals (specifically, non-balanced ones) might show signs of language attrition, and then the role of dominant language becomes more prominent in the word order choice (consistent with Modyanova 2006). This research, thus, demonstrates that the language external factors such as language dominance might have different weight at different developmental stages (cf. Meisel 2007).

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