Object Scrambling and Specificity in Bilingual Ukrainian-English Acquisition*

Roksolana Mykhaylyk, Stony Brook University,
Heejeong Ko, Seoul National University

1. Introduction
A variety of types of word order permutations have been unified under the descriptive term of scrambling. The acquisition of scrambling in first language acquisition (L1A) and second language acquisition (L2A) has been investigated widely in recent studies (see Otsu 1994 for Japanese; Clahsen & Muysken 1986, Hoop 2005 for German; Schaeffer 2000, Krämer 2000, Unsworth 2005 for Dutch, inter alia).

Notably, previous research has provided evidence for an interaction between the notion of specificity and scrambling. The specificity effect in scrambling has been extensively studied for Scandinavian and Germanic languages (see Thrainsson 2001 for an overview) and also for Slavic languages such as Russian (Avrutin and Brun 2001, Dyakonova 2004) and Serbo-Croatian (Ilić and Deen 2004). In acquisition studies, too, it was shown that scrambled object in L1 and L2 learners’ speech is usually interpreted as specific (Schaeffer 2000, Unsworth 2005).

One of the most disputable questions on scrambling has been whether this specificity effect is available in child grammar. Noticing that young children fail to scramble in obligatory contexts, Schaeffer (2000) argued for underspecification of specificity in child Dutch. On the other hand, studies conducted on Russian (Avrutin & Brun 2001) and Serbo-Croatian (Ilić & Deen 2004) have showed that even the youngest children are aware of the correlation between specificity and word order, which suggests that underspecification of specificity is not universal.

In this paper, we attempt to contribute to this debate concerning availability of specificity effects in child grammar. In particular, we investigate how specificity interacts with scrambling in the acquisition of Ukrainian by bilingual children. We evaluate which theoretical account

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of scrambling can be best supported by the acquisition data we gathered. By choosing Ukrainian-English bilingual children as main participants of our experiment, we further examine how bilingual children acquire L2-scrambling when their L1 (English) lacks corresponding phenomenon.

Assuming Full Access to Universal Grammar (UG) in L2-acquisition (Schwartz 2003), we hypothesize that bilingual children acquiring Ukrainian have full access to the specificity feature in UG (regardless of their L1). We thus predict that children will be able to scramble specific objects, in principle. We further hypothesize that if child L2-learners of Ukrainian have problems with scrambling, it is due to possible mis-mapping between syntactic and semantic components of the grammar. More specifically, we argue that they may have difficulty in correlating the specificity feature in semantics with the scrambled position in syntax.

In this paper, we present experimental results that support our proposal addressed above. In particular, we show that specificity plays a significant role in the acquisition of scrambling in Ukrainian by children – which supports syntactic/semantic approaches to scrambling in child grammar (e.g. Unsworth 2005; cf. Schaeffer 2000 for a pragmatic approach). Our data also provide further support for the Full Access to UG in bilingual acquisition (Schwartz 2003).

2. Direct object scrambling in adult Ukrainian grammar
2.1 Theoretical background

Three main concepts are to be defined here in order to set the theoretical framework for our research: definiteness, specificity\(^1\), and scrambling.

We assume that definiteness and specificity are different semantic notions related to the state of discourse participants in the following way:

\[ (1) \quad \text{If a Determiner Phrase (DP) of the form [D NP] is...} \]
\[ \begin{align*}
\text{a.} & \quad [+\text{definite}], \text{then the speaker assumes that the hearer shares the} \\
& \text{speaker’s presupposition of the existence of a unique individual} \\
\end{align*} \]

\(^1\) A cautionary note on the term “specific” is required here. Enç (1991) suggests that there are two sub-types of specificity: specificity encoded by partitive DPs, which are related to a previously mentioned set, and specificity encoded by elements such as a certain in English, which involve speaker intent to refer (Fodor and Sag 1982, and Ionin et al 2004, among others). In our experimental study, we are mainly interested in the former notion of ‘specificity’ which is often termed as ‘partitive’ (Ko, Ionin, and Wexler 2006) and ‘presuppositional’ (Diesing 1992).
in the set denoted by the NP (based on Heim 1991)

b. [+specific], then the speaker presupposes the existence of an individual in the set denoted by the NP (based on Enç 1991).

Ukrainian lacks articles and there is no lexical item that obligatorily marks definiteness or specificity. Word order can encode definiteness and definiteness and specificity in Ukrainian, however. The base structure of Ukrainian is Subject-Verb-Object (SVO). Object scrambling over the verb is allowed only when the object is specific, as in (2). In-situ objects, on the other hand, can be specific or non-specific, as in (3).

(2) Elmo jabluko, jist’ ti.
Elmo apple [+specific] eats
‘Elmo is eating a specific apple.’

(3) Elmo jist’ jabluko.
Elmo eats apple [-specific]/[+specific]
‘Elmo is eating any/a specific apple.’

As for the definition of object scrambling, we simply assume its pre-theoretical meaning – movement of a direct object from its base VP argument position to the higher pre-verbal position. In the current paper, we are concerned mostly with an SOV structure that exhibits direct object scrambling over the verb, as in (2).

2.2 Syntactic/semantic mechanism of object scrambling

2.2.1 The syntax of the scrambled object

To locate the landing site of a scrambled object, it is necessary to find elements that can index the moved position of the object. Adverbs and

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2 Demonstratives such as cej, cja, ce, ci ‘this’ and toj, ta, te, ti ‘that’ can be used to refer to a referential definite, but they are only optionally used (unlike English the). They cannot mark uniqueness presupposition, either. The cardinal numeral ‘one’ in various gender and number forms of odyn, odna, odne, odni often serves as a specificity marker with the meaning ‘a certain’, but they are not obligatory used.

3 We adopt Shevelov’s (1993) view that unmarked word order in Ukrainian is SVO.

4 Given that this paper deals with the reordering of objects within clause boundaries, we could employ the term object shift. However, since this term is usually reserved to a process restricted by the main verb position (Holmberg 1999 for Scandinavian languages), and Ukrainian does not exhibit such restriction, we will use a neutral term - object scrambling.
negation figure prominently as such a landmark (Thrainsson 2001). We thus employ them to detect the landing site of the scrambled object.

As has been shown in Cinque (1999), different types of adverbs can occur in different positions in the clause. In Ukrainian, too, both high (sentential) and low (manner) adverbs precede the main verb in the typical transitive structure S-Adv-V-O, but there are important structural differences between them. In particular, vP-ellipsis tests show that the high adverb *napěvno* ‘certainly’ cannot be elided, which suggests that *napěvno* ‘certainly’ is situated outside of vP:

(4) #Taras *napěvno ne bude čytaty knyžku, a Ivan bude.
    ‘Taras certainly not will read book but Ivan will’

In contrast, deletion of the low adverb *švydko* ‘quickly’ does not make the sentence unacceptable, which suggests that it is a vP-internal element:

(5) Taras bude *švydko čytaty knyžku, a Ivan ne bude.
    ‘Taras will quickly read book but Ivan not will
    ‘Taras will read a book quickly, but Ivan will not.’

Assuming that the low adverb is situated in a vP domain (see also Adger 2003), its addition to the scrambled structure such as (6) shows that the landing site of scrambled object is (at least) at the edge of vP.

(6) Taras *knýžku, švydko čytaje ti_1.
    ‘Taras is reading the book quickly.’

In the case of negation, the scrambled specific object must precede the negation, as in (7). The post-verbal object takes scope under negation, as in (8).

(7) Taras *knýžku, ne čytaje ti_1.
    ‘Taras is not reading the/a certain book’
(8) Taras  ne  čytaje  žodnoji  knyžku,  ti
    Taras not  reads  any  book

    ‘Taras is reading not any book.’

Following Pollock (1989), we assume that negation is a head of NegP. We assume that negation is left-adjoined to vP, and thus can be treated a par with the low adverb as the structural border of vP in Ukrainian (see also Schaeffer 2000, Thrainsson 2001, and Zeijlstra 2004).

2.2.2 Semantic interpretation of the scrambled object

Object scrambling in Ukrainian may alter semantic interpretation of the sentence. In particular, cja ‘this’ and jakas’ ‘some/any’ can be used to test these changes. In the basic structure (9), either of these determiners is acceptable and the sentence can mean: (a) there is a certain book that
will be read by Taras or (b) there will be some event of book-reading.

(9) Taras  bude  švydko  čytaty  cju/jakus’  knyžku.
    Taras  be-FUT  quickly  readINF  this/any  book

    ‘Taras is going to read the/a book quickly.’

After object scrambling, however, the sentences become unacceptable with jakas’ ‘some/any’, as illustrated in (10). This indicates that only specific interpretation is possible with the scrambled object.

(10) Taras  bude  (*jakus’)  knyžku,  švydko  čytaty  ti.
    Taras  be-FUT  any  book-ACC  quickly  readINF

    ‘Taras is going to read a book quickly.’

2.2.3 Syntactic-semantic account

With the theoretical background introduced above, we now present the mechanism of direct object scrambling in Ukrainian. In this paper, we adopt the Phase Theory proposed by Chomsky (2001) to implement scrambling. Specifically, we argue that scrambling is triggered by a probe-goal Search (Chomsky 2001, Ko 2005). The direct object, as a goal, is selected by the probe v, and the object may undergo overt movement to vP-edge position after Agree.
To be more concrete, we argue that the probe and goal has a [SPEC] feature, which marks the specificity value. The goal has an interpretable [SPEC] feature: [iSPEC], and the head v contains an uninterpretable [SPEC] feature: [uSPEC], which must undergo agreement with [iSPEC].\(^5\) When the [SPEC] features of the object and v match with each other, they undergo syntactic Agree.

After Agree between v and D, the object undergoes movement due to the presence of EPP on v. Following Pesetsky and Torrego (2001), we propose that EPP is a sub-feature of [iSPEC]. The goal moves to the specifier position of the head v when the EPP with [uSPEC] on v triggers movement. On this view, movement of the object is a consequence of Agree between v and D, and optionality of movement comes from optional insertion of EPP with [iSPEC].\(^6\)

The pictorial description in (11) illustrates this process: Agree between the probe-goal is established between v and D for [SPEC] feature; the association between [SPEC] and EPP triggers movement of the DP book to the vP edge that is marked by the adverbial quickly. Note that this proposal is in harmony with Chomsky’s view that movement to edge positions (e.g., vP-edges, CP-edges) yields discourse-related effects such as focus and specificity. (In (11), the subject undergoes additional movement from SpecvP to SpecTP due to EPP-requirement of T.)

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\(^5\) Placement of the specificity feature in v is justified by the fact that specificity can be realized in verbal morphology in some languages. For instance, in Swahili, specificity is marked by an object agreement affix (OA) on the verb (Deen 2006):

(i) Juma a- na-li- mw- on- a m-tu.
   Juma SA.3sg- see-IND 1-person
   ‘Juma saw the person/*a person.’

\(^6\) As for languages like Dutch, we assume that the association between EPP and [iSPEC] is obligatory so that post-verbal object must be non-specific.
We close this section with an important premise of our proposal concerning the non-specific object. If the object contain [-specific] value (e.g. [iSPEC: -specific]), the sub-feature EPP cannot be added to the v even after Agree between v and D. Based on this assumption, we derive the fact that there is no scrambling of non-specific object in Ukrainian.7

To sum up, our account of object scrambling links availability of the syntactic movement to the semantic feature of specificity. Adults are able

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7 We note that our proposal for non-specific objects raises a more fundamental question of why the EPP feature is incompatible with [-specific] value. This question has been a long standing puzzle in the scrambling literature for other languages as well (e.g., Scandinavian Object Shift and scrambling in German and Dutch). As Thrainsson (2001:193) points out, the generalization seems to be that a weak/existential reading is incompatible with Object Shift, but the objects with a strong/quantificational/specific reading do not necessarily have to shift or scramble. The exact nature of this optionality in object movement deserves further research. We leave this important question open.
to establish the connection between the EPP sub-feature and the specific semantic feature, and utter scrambled structures. In the next section, we turn to the predictions for child scrambling under the current proposal.

3. Hypothesis and Predictions for child object scrambling

Given our proposals of scrambling in adult Ukrainian, several questions arise regarding the status of scrambling in child grammar. First, do children understand the concept of specificity at all? If so, then do they scramble specific objects? Is child grammar constrained by the same rule as adult grammar? In particular, do children know that non-specific objects cannot undergo scrambling?

In this paper, we address these questions with bilingual children whose primary language (L1) is English and secondary language (L2) is Ukrainian. We adopt the premise that children acquire language with the aid of UG and that they are able to overcome poverty of the stimulus in the input. We also adopt the claim that bilingual children have full access to principles, parameters, and features available in UG in acquiring both languages (Schwartz 2003).

Since English lacks scrambling, knowledge of specificity effects on object movement cannot be transferred from L1-English to L2-Ukrainian. The specificity effects are not the subject of classroom instruction, either. Therefore, if L1-English children show understanding of scrambling constraints in L2-Ukrainian, it cannot be contributed to a high frequency of explicit input. By choosing these children as our main participants, we can test the effect of specificity in scrambling in child grammar and the availability of UG access in child L2 simultaneously.

Based on our analysis of scrambling and the premise that (bilingual) children have full access to UG, we hypothesize the followings:

(12) a. Scrambling is a consequence of syntax-semantics mapping (i.e. association between EPP on v and [+specificity] on D).
    b. (Bilingual) children have the knowledge of specificity from an early stage due to full access to UG, regardless of their L1.
    c. Children may have difficulty in understanding the mapping between syntax (the EPP feature) and semantics (specificity).
Our hypotheses make various predictions concerning possible and impossible patterns of word order in child grammar. First, if children have the knowledge of specificity, they will be able to utter sentences with the scrambled object, in principle. On this view, we crucially diverge from the view that children lack the knowledge of specificity and consequently would not utter scrambled sentences (cf. Schaeffer 2000).

Second, if children may have difficulty in associating the EPP-feature (a pure syntactic feature) with [+specific] feature (a semantic feature), we expect that children may apply less scrambling to specific objects than adults. Thirdly, we expect that children will not scramble objects randomly. If children can make a distinction between specific objects and non-specific objects (reflecting knowledge of specificity), they would not wrongly scramble non-specific objects.

What we predict is that children may undergenerate scrambling with specific objects, but that they would not overgenerate scrambling with non-specific objects. Given full access to UG in L2A, our predictions will hold for bilingual Ukrainian-English children despite lack of scrambling in their primary language, English.

Our predictions are summarized in (13).

(13)  
  a. Children may utter scrambled sentences with specific objects.  
  b. Children may apply less scrambling than adults  
  c. Children will not randomly scramble non-specific objects.  
  d. The predictions concerning scrambling hold for bilingual children despite the lack of scrambling in their L1.

4. Experimental Study

4.1 Subjects
The experimental study was conducted with 41 bilingual Ukrainian-English children and a control group of 4 adult Ukrainian speakers. The age range of children was from 2;10 to 7;11 (mean 6;2) (6 children from 2;10 to 3;8 (mean 3;3), 16 children from 4;6 to 5;11 (mean 5), and 19 children from 6 to 7;11 (mean 6;7)).

4.2. Method
The main goal of the experimental study is to determine whether children are aware of correlation between specificity and scrambling and can in fact produce relevant structures as well as perceive such differences. To
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this end, we designed our experimental tasks based on Schaeffer (2000) - which were a combination of a truth value judgment task and an elicited production task.

The procedure of the experiment was as follows: each subject was presented with short puppet shows with two characters and a number of props (pictures or toys). First, one puppet presented his story, and then, another puppet that does not know Ukrainian well (Tigger) either made a comment or asked for clarification. The subject, then, was asked to help Tigger by saying whether his comment was true or false, and if it was false, by correcting it. In responding to the puppets, children would produce a sentence with a scrambled or non-scrambled sentence.

In order to ensure presence of the direct object in child responses, only telic verbs were selected: zlovyty ‘to catch up’, namaljuvaty ‘to draw’, vyrizaty ‘to cut out’, vykydaty ‘to throw out’. Following Schaeffer (2000), adverbs or negation were used in order to mark the landing site of a scrambled object: a half of the stimuli contained antonymous pairs of low adverbs, and in the other half, negation was contrasted with affirmation. Four types of conditions were tested (8 tokens each, 32 testing tokens in total, and 8 fillers): definite specific (14), indefinite specific (15), indefinite non-specific (16) and definite pronominal (17). The pronominal condition was similar to definite specific, but additional questions were included to trigger production of a personal pronoun as direct object. The stimuli used in the study are exemplified below.

(14)  Definite specific DP with an adverb (well/wrongly)
Piglet: Look, a horse. What a beautiful horse. I am going to draw it. And I am going to do it WELL!
Tigger: Piglet is going to draw the horse WRONGLY!
Exp: No? What is really happening?
Child: Porosjatko konyka pravyl’no namaljuje (konyka)
Piglet  horse    well  will. draw  horse
‘Piglet is going to draw the horse WELL.’

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8 Since only future events were discussed in the dialogs, subjects could use any of two forms of future tense, e.g., for 3sg these forms are: zlovyt’ / bude lovyty ‘will catch’; namaljuje / bude maljuvayt’ ‘will draw’ and etc. Although distribution of telic verbs can interact with specificity (Slabakova 1999), the current study did not focus on this issue.

9 In the actual experiment, the whole stimuli were given in Ukrainian, but we present English translation of our stimuli here for the ease of presentation.
(15) Indefinite specific DP with an adverb (neatly/messily)

Piglet: Look, what nice fishies! I am going to cut one of them out. 
And I am going to do that NEATLY.

Tigger: Piglet is going to cut one fishie MESSILY!

Exp: No? What’s really happening?

Child: Porosjatko odnu rybkú oxajno vyriže (odnu rybkú) 
Piglet one fish neatly will.cut out one fish
‘Piglet is going to cut out one fishie NEATLY.’

(16) Indefinite non-specific DP with negation ‘ne’

Roo: I feel like drawing something. What should I draw? […]child response]. Okay, but I do not feel like drawing a dog.

Tigger: Oh, I do not understand. What is Roo not going to do?

Child: Kenhuru (*sobaku) ne namaluje sobaku 
Roo dog not will.draw dog
‘Roo is NOT going to draw a dog.’

(17) Definite pronominal direct object with an adverb (quickly/slowly)

Winnie: Look, what a nice butterfly. I will catch it QUICKLY.

Tigger: Winnie is going to catch the butterfly SLOWLY.

Exp: No? What is Winnie really going to do with the butterfly?

Child: Winnie joho ŠVYDKO zlovyt’ (*joho) 
Winnie him quickly will.catch him
‘Winnie is going to catch it QUICKLY.’

In (14)-(15), scrambled and non-scrambled orderings are all grammatical in adult speech. In (16), however, the use of scrambled structure is not acceptable due to non-specific interpretation of the object. In (17), a scrambled structure is strongly preferred in adult speech since pronominals are prototypical definite (and specific) elements.

5. Results

The experimental results for children and adults are summarized in Table 1, and plotted in Figure 1.
Table 1. Group results for scrambling across condition

<table>
<thead>
<tr>
<th>Group</th>
<th>definite specific</th>
<th>indefinite specific</th>
<th>indefinite non-specific</th>
<th>definite pronominal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Children</td>
<td>45</td>
<td>36/80</td>
<td>65</td>
<td>52/80</td>
</tr>
<tr>
<td>Adults</td>
<td>53</td>
<td>17/32</td>
<td>69</td>
<td>22/32</td>
</tr>
</tbody>
</table>

Figure 1 Scrambling rates

Overall, children show less scrambling than adults. Scrambling rate of children were 41.16% (135/328), and the scrambling rate of adults were 50.78% (65/128). However, scrambling rates per condition indicate important similarities between children and adult group.

As shown in the Table 1, in both children and adult data, scrambling occurs optionally, but not randomly. Both adult speakers and bilingual children employ object scrambling in specific contexts: (14)(15)(17). Adults show scrambling in definite specific (53%) and indefinite specific (69%) conditions. Children utter scrambled sentence in 45% of the time in definite-specific contexts and 65% in indefinite-specific contexts.

Crucially, however, both adults and children rarely apply scrambling in non-specific contexts. Adults never uttered scrambled objects in non-specific indefinite contexts. Children allow object scrambling in non-
specific contexts only in 9% of the time. This result shows that they have knowledge of the correlation between scrambling and specificity. As for the pronominal scrambling, children show greater optionality than the adults. Adults consistently scrambled pronominal direct objects (81.25%) while children used significantly less scrambling (45.45%).

A detailed statistical analysis supports our prediction about the non-random nature of scrambling in children’s grammar. One-way ANOVAs on children’s data show that there was a significant main effect of specificity on the word order choice in child production \[F (3,41)= 9.99, \ p<.0001\]. The planned comparison tests confirm that the indefinite specific condition triggered significantly more use of scrambled structure than the indefinite non-specific condition \(p<.0001\). The definite specific condition also triggered significantly more use of scrambled structure than the indefinite non-specific condition \(p=.001\). The difference between the definite pronominal and the indefinite non-specific condition was highly significant as well \(p=.001\). Furthermore, there was no significant difference between the definite specific and the indefinite specific conditions \(p=.065\), or between the definite specific and the definite pronominal \(p=.965\). This suggests that specificity, instead of definiteness, significantly contributes to scrambling in child grammar.

6. Discussion

Our experimental results confirm the predictions presented in (13). First, our data clearly show that specificity interacts with object scrambling in child L2-Ukrainian, as predicted in (13a). Specific objects occurred in a pre-verbal position via scrambling in children’s utterances. This result provides further arguments for the view that children do have the knowledge of specificity in their grammar (Avrutin & Brun 2001, Ilić & Deen 2004). This, in turn, poses a challenge to the proposal that specificity is underspecified in child grammar (cf. Schaeffer 2000).

Second, our results show that children apply less amount of scrambling than adults, as predicted in (13b). This result supports our hypothesis that children do have the knowledge of specificity, but they may lack association between syntactic knowledge (EPP on v) and semantic knowledge (specificity on D). This result provides further support for the proposal that L2-learners have problems with mapping
issues at the interface (e.g. Prevost & White 2000 for mis-mapping between syntax and morphology).

Third, our data demonstrate that children rarely scramble the object in non-specific contexts, as predicted in (13c). This indicates that children can distinguish between specific and non-specific objects, reflecting their semantic knowledge of specificity. When they utter scrambled structures, they know that it applies only to specific objects.

Finally, the hypothesis (13d) that bilingual children have full access to UG is confirmed by our results. In particular, our data show that L1-English child learners of L2-Ukrainian can understand constraints on scrambling despite the absence of scrambling in their primary language. Bilingual Ukrainian-English children utter scrambled structure in specific contexts although they have never been instructed to do so. This further supports the premise that children are able to overcome poverty-of-the-stimulus, and they have access to the specificity feature in UG.

7. Conclusion

In this paper, we have seen that specificity effects are obtained in early child grammar. In particular, we have shown that English-speaking children acquiring Ukrainian as their L2 have full access to the specificity feature, and that they apply scrambling to specific objects, but not to non-specific objects. Our study provides empirical evidence that bilingual children have full access to principles and features in UG. It also supports the view that word order variation in Ukrainian syntax is tied to the semantic notion of specificity both in adult and child grammar.

References


