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# Optional Scrambling is not Random: Evidence from English-Ukrainian Acquisition

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## Abstract

In this paper we investigate the role of specificity and definiteness in a ‘free-word-order’, article-less language – Ukrainian. Particularly, we are interested in the acquisition of direct object scrambling as a means to encode the feature [+specific] on the scrambled direct object DP. An elicited production study is used to show that bilingual English-Ukrainian children have specificity in their grammar, and they are able to match it with appropriate syntactic movement in Ukrainian. However, object scrambling is optional in adult grammar, and even more so in the child grammar. We argue that the high rate of optionality in child scrambling can be better accounted for with syntax-semantics notions, contrary to a discourse-pragmatic approach to the phenomenon. Since children do not overuse scrambled constructions with non-specific objects, the optionality of the process is unlikely to be due to the pragmatic deficit.

## 1. Introduction

A variety of types of word order permutations have been unified under the descriptive term of scrambling. Previous research has provided evidence for an interaction between scrambling and the semantic feature “specificity”.<sup>1</sup> 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).

The acquisition of scrambling in first language acquisition (L1A) and second language acquisition (L2A) has been widely investigated in recent studies (see Otsu 1994 for Japanese; Clahsen & Muysken 1986, Penner, Tracy & Weissenborn 2000, Hoop 2005 for German; Josefsson 1996 for Swedish; Westergaard 2007 for Norwegian; Powers 2000 for English *inter alia*). In a number of acquisition studies, too, it was shown that a scrambled object in L1 and L2 learners’ speech is usually interpreted as specific (Schaeffer 2000, Unsworth 2005).

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<sup>1</sup> A precise definition of specificity will be provided in section 3. Roughly, we use the term “specific” to mean that the speaker presupposes the existence of an individual.

We focus on three main approaches to the acquisition of interaction between scrambling and specificity.

Schaeffer's (2000a) approach can be best defined as discourse-pragmatic. Schaeffer argues that scrambling in Dutch is triggered by a discourse-related feature – specificity.<sup>2</sup> She further proposed that young children lack the pragmatic concept of non-shared knowledge, so they are not able to correctly mark specificity on the direct object DP, and thus specificity feature is underspecified in their grammar. Therefore, scrambling does not occur consistently in child speech due to lack of pragmatic knowledge.

Avrutin and Brun (2001) proposed a syntax-discourse approach to the acquisition of scrambling. They based their research on the assumption that word order interacts with specificity and definiteness, especially in Russian. It was shown that Russian children (age 1;7-2;3) place most arguments in correct positions, which suggests that they have the knowledge of specificity/definiteness from a very early age. Errors, if they exist, are due to children's egocentric assumption that the elements they refer to are known to the speaker and the hearer.

Unsworth (2004, 2005) showed some inadequacies of the pragmatic analysis and put forward a syntactic-semantic approach to the acquisition of object scrambling. She suggested that errors in the acquisition of scrambling are not likely to be due to the lack of pragmatic knowledge since even adult learners show the same problems with scrambling as child learners (e.g., in L2 Dutch). In her view, errors in scrambling (especially in production) are linked to an unstable mapping between a semantic feature and syntax movement.

There are many issues left open, however: how specificity interacts with scrambling in child grammar of other languages, which theoretical account concerning acquisition of scrambling can be supported by cross-linguistic data, and how bilingual children acquire scrambling especially if their L1 lacks scrambling, to list a few. In the current paper, we provide experimental evidence for interaction between specificity and scrambling in Ukrainian and propose a syntactic-semantic analysis of optionality in scrambling.

The base structure of Ukrainian is SVO, and it has object scrambling over the verb.<sup>3</sup> Similarly to Dutch, Ukrainian allows object scrambling only when the object is specific (see (1) and (2)).

- |     |             |   |              |                |                       |  |  |  |  |
|-----|-------------|---|--------------|----------------|-----------------------|--|--|--|--|
|     |             | √   |              |                |                       |  |  |  |  |
| (1) | Elmo        | <b>jabluko<sub>i</sub></b>  | <u>jist'</u> | t <sub>i</sub> | (- vono take smačne). |  |  |  |  |
|     | <i>Elmo</i> | <i>apple</i> [ <sub>+</sub> specific]                               | <i>eats</i>  |                | ( it such delicious)  |  |  |  |  |
|     |             | ‘Elmo is eating a specific apple (- it is such a delicious apple).’ |              |                |                       |  |  |  |  |
|     |             |   |              |                |                       |  |  |  |  |
| (2) | [*]Elmo     | <b>jabluko<sub>i</sub></b>  | <u>jist'</u> | t <sub>i</sub> | (bo vin holodnyj).    |  |  |  |  |
|     | <i>Elmo</i> | <i>apple</i> [ <sub>+</sub> specific]                               | <i>eats</i>  |                | (because he hungry)   |  |  |  |  |
|     |             | ‘Elmo is eating a specific apple (because he is hungry).’           |              |                |                       |  |  |  |  |

<sup>2</sup> See examples of Dutch sentences in section 2.

<sup>3</sup> We adopt Shevelov's (1993) view that unmarked word order in Ukrainian is Subject-Verb-Object. We abbreviate the unmarked order as SVO hereafter.

Unlike in other languages, e.g., in Dutch, in Ukrainian, in-situ objects can be specific or non-specific, as in (3) and (4). Adults, however, strongly prefer a non-specific reading for in-situ objects.

- (3) Elmo jist' **jabluko** (bo vin holodnyj).  
*Elmo eats apple [-specific] (because he hungry)*  
 'Elmo is eating some apple (because he is hungry).'
- (4) Elmo jist' **jabluko** (jake jomu dav Bert).  
*Elmo eats apple [+specific] (which him gave Bert)*  
 'Elmo is eating a specific apple (which Bert gave to him).'

The pragmatic approach to the acquisition of scrambling in Ukrainian predicts that young children will produce sentences with a scrambled object even in non-specific contexts, as in (2). On this analysis, children might misinterpret hearer knowledge, and thus mark a [-specific] object as specific/definite according to their own beliefs, which in turn will trigger more scrambling of non-specific objects. However, we show that such an approach fails to account for the optional child scrambling in Ukrainian.

We argue that bilingual children acquiring Ukrainian have access to the specificity feature in UG and to the UG-defined 'scrambling rule' (regardless of their L1), assuming Full Access to UG in child L2 (Schwartz 2003). We, however, propose that children and adults may show different scrambling patterns in certain contexts because children, unlike adults, might have difficulty in correlating syntactic and semantic components of the grammar (see also White (2003) for adult L2). Specifically, we hypothesize that Ukrainian adult speakers resolve the semantic ambiguity of the SVO structure by syntactic movement, but that children may scramble at a lower rate than adults due to an unstable mapping between syntactic feature (EPP) and semantic feature (specificity).

The current approach to optional direct object scrambling will be shown to be supported by our experimental study (an elicited production task based on Schaeffer (2000a) and conducted with 41 Ukrainian/English bilingual children). The results of the study reveal that there is no significant overuse of object scrambling in non-specific contexts, contrary to what is predicted under the pragmatic approach. They further indicate that children have the specificity value in their grammar, but employ syntactic movement only optionally.

The paper is organized as follows. First, previous experimental research on scrambling acquisition is surveyed in section 2. Next, the theoretical background of the syntactic mechanism of scrambling in adult Ukrainian is presented in section 3. The hypothesis and predictions for child acquisition of object scrambling in Ukrainian are defined in section 4. Section 5 provides a detailed description of the experimental study, and in section 6 the results are summarized. The paper concludes with a discussion of the findings and their implications for language acquisition theory.

## 2. Reviews of previous studies

A number of studies on the acquisition of object scrambling were conducted on languages with scrambling, such as Dutch and Russian. They reported optionality of scrambling in different age groups of L1 and L2 learners, attributing this phenomenon either to a pragmatic deficit (e.g., Schaeffer 2000a, Avrutin and Brun 2001) or to a syntactic-semantic mismapping (Unsworth 2004, 2005). Although the authors account for the optionality of the process in different terms, their findings document several convergent patterns in the acquisition of scrambling that can be tested cross-linguistically.

### 2.1. Discourse-pragmatic approach

Schaeffer (2000a, 2000b) assumes that object scrambling is driven by the feature [+specific] – [+specific] objects undergo scrambling, but [-specific] objects do not. The specificity (or ‘referentiality’ in Schaeffer’s (2000a) terms) was defined as follows:

- (5) A nominal expression is understood to be referential if it has a “fixed referent” in the (model of the) world, meaning that it can be identified by the speaker and/or by one of the people whose propositional attitudes are being reported (Schaeffer 2000a:24).

Importantly, Schaeffer argues that the specificity feature is *underspecified* in early child grammar. She predicts that at an early stage of acquisition, children may lack the concept of specificity and thus cannot associate it with scrambling. Consequently, children at this stage may scramble only optionally.

This hypothesis was tested with an experimental study which consisted of an elicited production task and a truth value judgment task. The subjects (49 Dutch children (2;4-6;10) and 23 adults) were shown short puppet shows with direct objects incorporated into a definite/specific, indefinite/specific, or indefinite/non-specific context. These contexts were designed to elicit a certain type of production from language learners. The target sentence may be accompanied with or without scrambling (over adverbs or negation), as exemplified in (6).<sup>4</sup>

- (6) a.        Dat Marieke **een (bepaald/zeker)boek gisteren** gekocht heft.  
                   *that Marieke a        certain                    book yesterday bought has*  
                   ‘That Marieke bought a certain book yesterday.’

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<sup>4</sup> A similar experiment was also conducted with 35 Italian children (2;1-5;11) in order to show that the object scrambling across negation and adverbs in Dutch and object cliticization in Italian are similar syntactic processes (Schaeffer 2000a).

- b. Dat Marieke gisteren **een (of ander) boek** gekocht heeft.  
*that Marieke yesterday a/one or other book bought has*  
 ‘That Marieke bought some book or other yesterday.’

Schaeffer observes two developmental stages in scrambling acquisition: At Stage 1, 2-year-old children scrambled highly optionally, and at Stage 2, 3-year-old and older children behave more adult-like: they scrambled specific objects at a high rate (over negation). This is illustrated by Table 1.

Table 1. Placement of definite and indefinite direct objects with respect to negation

age	Definite		Indefinite	
	Pre-neg.	Post-neg.	Pre-neg.	Post-neg.
2	30%	70%	33%	67%
3	72%	28%	56%	44%
4	82%	18%	57%	43%
5	76%	24%	59%	41%
6	83%	17%	57%	43%
adults	96%	4%	66%	34%

Schaeffer claimed that the optionality of object scrambling at the early stage of acquisition results from the optional marking of specificity, which in turn depends on the acquisition of ‘Concept of Non-Shared Knowledge’ – speaker and hearer knowledge are always independent. Under this view, young children lack a specific pragmatic principle which leads to the lack of distinction between discourse-related (mentioned in the discourse, e.g., *the tree*) and non-discourse-related (part of the long-term shared knowledge, e.g., *the sun*) object DPs. The object, then, is not constantly marked with a relevant feature, and the syntactic process of scrambling does not always take place in child Dutch.

However, this analysis was developed mostly for definite DPs (including proper names and pronouns) and specific indefinite DPs that must precede the adverb and negation. Since the results from indefinite/specific and indefinite/non-specific were collapsed together (see Table 1), it is unclear whether children optionally scramble only in specific (or referential on Schaeffer’s term) contexts or in any contexts across-the-board. We will return to this issue in section 3.

## 2.2. *Syntax-discourse approach*

Avrutin and Brun (2001) (and later Brun 2005) challenged Schaeffer’s (2000a, 2000b) claim about underspecification of specificity in child grammar. In their study, the terms ‘specificity’ and ‘non-specificity’ are used in “an intuitive pre-

theoretical sense” and are defined along the lines of Yokoyama’s (1986) description of different states of interlocutors’ knowledge in discourse.<sup>5</sup>

- (7) Specific expression denotes an individual already mentioned in the conversation and, therefore, familiar (“old”) with respect to a given discourse (Avrutin and Brun 2001:70).

The observation of Russian facts, which constitute the base of the study, may be summarized as follows: independently of the grammatical function (subject or object), preverbal elements are interpreted as specific and postverbal as non-specific.

- (8) a.        **Mal’čik**        činit                igrušku.  
                  (the) boy.NOM   is-fixing                (a/some)toy.ACC  
                  ‘The boy is fixing a toy.’
- b.        **Igrušku**        činit                mal’čik.  
                  (the)toy.ACC   is-fixing                (a/some)boy.NOM  
                  ‘A boy is fixing the toy.’

The authors pose a specific research question: to what extent young children know this dependency between word order and specificity and use it in their speech. If it is true that children lack knowledge of specificity, Russian children should misinterpret preverbal and post-verbal arguments. Nonetheless, naturalistic data from four Russian children (1;7-2;3) showed that most of the arguments were placed correctly (90% of specific subjects and 89.4% of specific objects occurred preverbally).

Table 2. Distribution of subjects and objects in child speech (Avrutin and Brun 2001; 73)

Interpretation	Preverbal subject	Postverbal subject	Preverbal object	Postverbal object
specific	90.0%	<b>10.0%</b>	89.4%	10.6%
non-specific	32.2%	67.8%	<b>9.7%</b>	90.3%

Interestingly, only 9.7% of non-specific objects were scrambled over the verb. Therefore, Avrutin and Brun concluded that Russian children (unlike Dutch children from Schaeffer’s study) show knowledge of specificity from a very early age. However, the high rate of preverbal non-specific subjects (32.2%) weakened the argument, so the authors suggested that this is due to pragmatic factors: “that is, to the child’s erroneous presupposition that the referred individual is known to the listener and hence specific” (Avrutin and Brun 2001:79). It has remained

<sup>5</sup> In fact, Avrutin and Brun’s definition of specificity corresponds to definiteness, and in the follow up study, Brun (2005), only term ‘definiteness’ was used.

unclear, however, why the object behaves in a different way from the subject in scrambling.

To sum up, it was shown that children know and use at an early age the mapping between position for the scrambled object and specificity. This mapping, thus, can be considered a part of an innate (or very early acquired) knowledge of the *syntax-discourse interface* rules. Furthermore, Avrutin and Brun suggested that the optionality of scrambling is related not to the featural underspecification (cf. Schaeffer 2000a), but to the optionality of the syntactic representation of the discourse referent. “While in adult language the discourse referents are introduced by syntactic means, children may (optionally at some stage) rely on discourse presupposition as the source of introducing discourse entities” (Avrutin and Brun 2001: 79).

### 2.3. Syntactic-semantic approach

Unsworth (2005) compared child L1, child L2 and adult L2 acquisition of scrambling in Dutch. The main goal of her research was to examine whether English-speaking adult and child L2 learners go through the same developmental sequences in their acquisition of object scrambling in Dutch as L1 Dutch children. Unsworth employed both production and comprehension tasks in the experiment. The production task focuses on object scrambling over negation (based on Schaeffer’s (2000) experiment). In the comprehension task, scrambling across the frequency adverbial *twee keer* ‘twice’ and negation was examined (based on Krämer’s (2000) experiment).

Unsworth assumes that scrambling is movement to some VP-external position that has interpretive semantic effects. She notes that scrambled indefinite objects have been variously labeled as ‘specific’ (in the sense of Enç 1991), ‘referential’ (Fodor and Sag 1982), or ‘presuppositional’ (Diesing 1992). To avoid any confusion, she uses the cover-term ‘specific’, although, strictly-speaking, the reading which was tested in the relevant experimental conditions is partitive or ‘strong’, in de Hoop’s (1992) terms.

The goal of Unsworth’s experimental production study was to determine whether learners know the interpretive constraints on scrambling. For instance, scrambling over negation is obligatory for specific direct objects, as in (9b), but it is not allowed for non-specific direct objects, as in (9a).

- (9) a. Brigit heeft geen (niet+een) roos geplukt.  
*Brigit has no (not+a) rose picked*  
 ‘Brigit didn’t pick a(ny) rose.’
- b. Brigit heeft een roos niet geplukt.  
*Brigit has a rose not picked*  
 ‘Brigit didn’t pick a (certain) rose.’

Based on the elicited production task conducted with three different learner groups (13 L1 children, 25 L2 children, and 23 L2 adults), Unsworth analyzed the developmental stages of scrambling acquisition.

The results showed that adult Dutch L2 learners' initial stage corresponds to their L1 (English SVO) word order, but the next stages are similar for L1 and child and adult L2 learners. It was concluded, then, that since both adults and children pass through the same optional scrambling stage (see a shaded row in Table 4, for example), they make use of the same mechanisms in language acquisition.

Table 3. L1 child and L1 adult object scrambling (Unsworth 2005: 226)

age	Condition		
	definite	specific indefinite	non-specific indefinite
5	71.7%	61.3%	<b>15.2%</b>
adults	98.5%	92.9%	<b>0%</b>

Table 4. L2 child and L2 adult object scrambling per condition (Unsworth 2005: 243, 244)

Proficiency in Dutch	definite		specific indefinite		non-specific indefinite	
	children	adults	children	adults	children	adults
Low	22.1%	19.3%	23.3%	14.3%	23.3%	20.0%
Mid	80.0%	88.9%	71.7%	58.3%	30.0%	13.3%
High	88.1%	87.5%	91.7%	85.7%	16.7%	0%

Overall, results of Unsworth's study demonstrate that L2 children and adults are able to overcome the poverty-of-the-stimulus in the infrequent input for scrambling and make a connection between semantic notion of specificity and syntactic movement. The existence of an optional scrambling stage in the L2 data was claimed to be inconsistent with Schaeffer's (2000a) approach discussed above. The adult L2 subjects tested were old enough to know pragmatic principles, and yet, they scrambled optionally.

These findings imply that syntactic-semantic factors might play a more important role in Dutch scrambling acquisition than knowledge of a certain pragmatic concept. However, more research on languages other than Dutch is needed in order to evaluate the validity of the syntax-semantic approach to scrambling and specificity in general. The current study aims to contribute to this by presenting evidence from acquisition of object scrambling in Ukrainian.

## ***2.4. Summary of the literature overview***

To summarize, previous research on free-word-order languages provided evidence for the existing interaction between the notion of specificity and scrambling. In particular, it was shown that the direct object that was moved out of the VP is usually interpreted as specific in L1 and L2 learners' production. One of the most disputable questions has been whether the specificity feature is available in child grammar. Noticing that young children fail to scramble in obligatory contexts, Schaeffer argued for optionality of specificity in child Dutch. On the other hand, studies conducted on Russian and Serbo-Croatian showed that even the youngest children are aware of the correlation between specificity (definiteness, more precisely speaking) and word order which suggests that underspecification of specificity is not universal. Interestingly, all studies mentioned above reported optionality of scrambling in different age groups, attributing this phenomenon either to a pragmatic deficit (Schaeffer 2000a and 2000b, Avrutin and Brun 2001, Ilić and Deen 2004) or to a syntactic-semantic mismapping (Unsworth 2004 and 2005). The current study aims to resolve these conflicting accounts by presenting evidence from acquisition of direct object scrambling in Ukrainian.

## **3. Direct object scrambling in adult Ukrainian grammar**

### ***3.1. Theoretical background***

Three main concepts are to be defined in order to set the theoretical framework for the research: specificity, definiteness and object scrambling.

We assume that definiteness and specificity are different semantic notions related to the speaker's and hearer's knowledge in the following way:

- (10) If a Determiner Phrase (DP) of the form [D NP] is...
- a. [+definite], then the speaker assumes that the hearer shares the speaker's presupposition of the existence of a unique individual 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 regardless of hearer's

knowledge (based on Enç 1991; cf. Diesing 1992 for presuppositionality; Ko, Ionin, and Wexler 2006 for partitivity).<sup>6</sup>

Ukrainian lacks articles and there is no lexical item that directly marks “definiteness” of a DP. Demonstratives can be used to refer to a referential definite in some contexts. As shown in (11), demonstratives such as *cej, cja, ce, ci* ‘this’ and *toj, ta, te, ti* ‘that’ strongly imply shared knowledge between the speaker and hearer about a particular individual.

- (11) Čy ty bačyla tu igrašku, yaka meni spodobalasja?  
*Q-Part you saw that toy.ACC that I.DAT liked*  
 ‘Have you seen that/the toy that I liked?’

Note, however, that Ukrainian demonstratives are only optional (unlike English articles), and they do not have the same semantics as the English definite article *the*. Hence, in Ukrainian, no demonstrative is used to mark definiteness even when the uniqueness presupposition is satisfied for the object ‘author’.

- (12) Ya xoču зустріти avtora cijeji kartyny, ale ya ne znaju xto vin.  
*I want to meet author.ACC of this painting but I not know who he*  
 ‘I want to meet the author of this painting, but I do not know who it is.’

Indefiniteness can be used, based on the speaker’s knowledge only, as in (13) (specific reading), or it can be related neither to the speaker, nor to the hearer, as in (14) (non-specific reading). In Ukrainian, the cardinal numeral ‘one’ in its various gender and number forms *odyn, odna, odne, odni* can have a specific meaning of ‘a certain’, and thus it often serves as a specificity marker (cf. (11) for the use of demonstratives which are reserved for [+definite, +specific] contexts):

- (13) Cej recept meni dala odna žinka, jaku ty ne znaješ.  
*this recipe.ACC I.DAT gave one woman that you not know*  
 ‘I got this recipe from a woman who you do not know.’

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<sup>6</sup> 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* (see also Fodor and Sag 1982, Ionin 2003, and Ionin et al 2004, among others). In this paper, we are mainly interested in the former notion of ‘specificity’ – which is often termed as ‘partitive’ (Ko, Ionin, and Wexler 2004, 2007) and ‘presuppositional’ (Diesing 1992). Although we also present examples relevant to the latter notion of *specificity as speaker intent to refer* here for concreteness (e.g., (13),(14)), our experiment is mainly designed to test the effects of ‘specificity’ in the sense of ‘presuppositionality’, as given in (10)b. We acknowledge, however, that we call these two sub-types of DPs as *specific* only for convenience. These two notions are known to be independent semantic features at work in L2 acquisition (Ko, Ionin, and Wexler 2004, 2007). We wish to investigate how this fine-grained distinction of specificity interacts with L2- Ukrainian scrambling in our future research.

Non-specific interpretation is usually associated with the commonly used indefinite determiner *jakyjs'*, *jakas'*, *jakes'*, and *jakis'* ('some/any') or other indefinite pronouns *byd'-jakyj*, *dejakyj*, *jakyj-nebud'* with the reinforced indefinite meaning 'whichever'.<sup>7</sup> Cummins (1998) describes different nuances of similar pronouns in Czech and classifies them as such that mark different degree of indefiniteness.

- (14) Cej      recept              napysala jakas'      žinka,      jaku      ja ne znaju.  
*this    recipe.ACC    wrote    some    woman    that    I not know*  
 'This recipe was written by a woman who I do not know.'

In some contexts, word order can also encode definiteness and specificity in Ukrainian. As discussed briefly in the introduction, object scrambling into preverbal position is allowed only when the object is specific (see (1) and (2)). In-situ objects can be specific (e.g., definite DP, specific indefinite DP) or non-specific (i.e. non-specific indefinite DP) (see (3) and (4)).<sup>8</sup>

Another concept to be defined is *object scrambling*.<sup>9</sup> Without delving into different definitions of scrambling offered in the literature, we simply assume its pre-theoretical meaning – scrambling as a change in word order from the base order. Since the main constituent that is in focus of the current research is the direct object, its movement leftward will be described in terms of scrambling. Therefore, object scrambling is defined as a direct object movement from the base VP argument position to the higher situated pre-verbal landing site. The choice of the landing site, mechanism of the movement, and change in object interpretation associated with scrambling in Ukrainian will be discussed in detail in the following section.

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<sup>7</sup> Cummins (1998) provides description and classification of similar pronouns in Czech. In Ukrainian, too, they differ slightly in the degree of indefiniteness.

<sup>8</sup> It was also argued for Russian that all preverbal elements are interpreted as specific and postverbal as non-specific (Avrutin and Brun 2001:71) (Note that 'specific' in Avrutin and Brun (2001) actually refers to 'definite': see note 5). Crucially, however, Ukrainian direct object can be either specific or non-specific in postverbal position.

<sup>9</sup> Given that this paper deals with the reordering of sentential constituents, namely direct objects, within clause boundaries, the term *object shift* could be used to refer to the process under the analysis. However, *object shift* is usually reserved for Scandinavian languages and has not been applied to Ukrainian. This term *object shift* has been used to refer to a process restricted by the position of the main verb (Holmberg 1999), whereas in Ukrainian, there is no such restriction concerning verb raising and object scrambling. Since it is not our intention to find out a consensus in the terminological disputes, in this paper we use a neutral term for Ukrainian object movement - *direct object scrambling*.

### 3.2. Syntactic-semantic mechanism of object scrambling

In Ukrainian, the direct object can take different positions in the sentence, but since the base structure of the language is SVO, all other orders of constituents are considered derived. In the current paper we are concerned mostly with an SOV structure that exhibits direct object scrambling over the verb, but below the subject, as in (16):

- (15) Taras            čytaje            **knyžku.**  
*Taras.NOM        reads                book.ACC*
- (16) Taras            **knyžku** <sub>i</sub>            čytaje            t<sub>i</sub>  
*Taras.NOM        book.ACC        reads*  
 ‘Taras is reading a/the book.’

#### 3.2.1. Landing sites

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 negation figure prominently as such landmarks (Thrainsson 2001). In this paper, we also 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 *napevno* ‘certainly’ cannot be elided and, thus, it is situated outside of vP:

- (17) Taras napevno ne bude čytaty knyžku, a Ivan napevno bude.  
*Taras certainly not will read book.ACC but Ivan certainly will*  
 ‘Taras is certainly not going to read a book, but Ivan certainly will [read a book].’
- (18) #Taras napevno ne bude čytaty knyžku, a Ivan bude.  
*Taras certainly not will read book.ACC but Ivan will*  
 ‘Taras is certainly not going to read a book, but Ivan certainly will [read a book].’

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

- (19) Taras bude švydko čytaty knyžku, a Ivan ne bude.  
*Taras will quickly read book.ACC but Ivan not will*  
 ‘Taras will read a book quickly, but Ivan will not [read a book quickly].’

Assuming that the low adverb is situated in a vP domain (see also Adger 2003), its position to the scrambled structure such as (20) indicates that the landing site of scrambled object is (at least) as high as the edge of vP.

- (20) Taras knyžku<sub>i</sub> švydko čytaje t<sub>i</sub>  
*Taras book.ACC quickly reads*  
 ‘Taras is reading the book quickly.’

The scrambled specific object must precede the negation in Ukrainian. When the object precedes the negation, the sentence gets a sentential negation reading over the object, as shown in (21). If the object follows the negation, a constituent negation reading is obtained instead, as described in (22).

- (21) Taras knyžku<sub>i</sub> ne čytaje t<sub>i</sub>  
*Taras book.ACC not reads*  
 ‘Taras is not reading the/a certain book.’
- (22) Taras ne knyžku<sub>i</sub> čytaje t<sub>i</sub> (a žurnal).  
*Taras not book.ACC reads*  
 ‘Taras is reading not a book, (but a journal).’

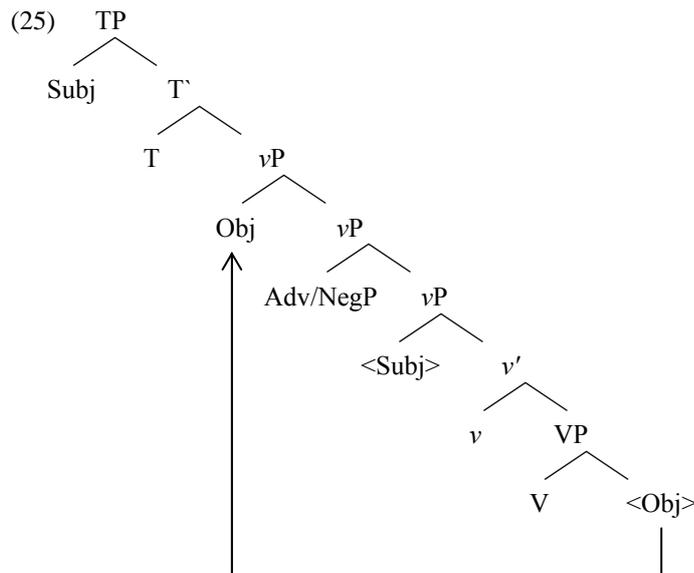
Following Pollock (1989:397), we assume that negation is the head of NegP, and that NegP can be left-adjoined to vP in some languages (see Schaeffer 2000 and Thrainsson 2001 for Germanic and Scandinavian). This assumption is in line with the previous proposals for Slavic languages that the sentential negation marker is pronounced on the finite verb, but checks its [NEG] feature in the head of NegP (Brown 1999). Similar proposals have also been suggested for Czech in which quantifiers are able to precede the negative marker, but remain under the scope of the negation (Zeijlstra 2004). Ukrainian exhibits similar phenomenon with the negative pronoun ‘nothing’:

- (23) Taras ničoho<sub>i</sub> ne čytaje t<sub>i</sub>  
*Taras nothing.GEN not read*  
 ‘Taras reads nothing / Taras does not read anything.’

Post-verbal objects take scope under negation, as in (22):

- (24) Taras ne čytaje žodnoji knyžky<sub>i</sub> t<sub>i</sub>  
*Taras not reads any book.GEN*  
 ‘Taras is not reading any book.’

We argue that in Ukrainian, as in other Slavic languages (Zeijlstra 2004), the negative marker is base-generated within  $vP$  and the negative feature moves out of  $vP$  to create a sentential scope of negation. Consequently, if a direct object moves to a pre-verbal position via scrambling (i.e.,  $vP$  adjunction), the linear order of the sentence becomes Subject > Direct Object > Neg+Verb, as shown in the tree (25). We thus assume that the negation can be treated a par with the low adverb as a marker of the structural border of  $vP$  in Ukrainian.



Thus, the change from the basic SVO structure to SO(Adv/Neg)V involves the direct object movement to the left edge of the  $vP$ , which is clearly detectable if the sentence contains NegP or low adverbs. The details of the movement will be discussed in the section 3.2.2, but it is clear that in both cases the shifted direct object precedes these elements.

### 3.2.2. Semantic interpretation of the direct object

We argue that scrambling under analysis is used to mark a change in the semantic interpretation of the direct object. This approach is based on Dutch/Ukrainian parallels. In Dutch, a direct object scrambled over a high adverb (and/or negation) always receives a specific interpretation for the speaker as shown in the example (26) from (Schaeffer 2000a).<sup>10</sup> Corresponding Ukrainian

<sup>10</sup> Schaeffer mentions that indefinite objects with the indefinite article *een* 'a' are slightly awkward in pre-high adverb position, and the sentence sounds better if the determiner *één* 'one'

examples with a high adverb are given in (27), where (27) is parallel to Dutch in that it is understood as ‘Maria bought a certain specific book yesterday’, although there is no determiner in (27), compared to (26).<sup>11</sup>

- (26) a. Dat Marieke gisteren een (of ander) boek gekocht heeft.  
*that Marieke yesterday a/one or other book bought has*  
 ‘That Marieke bought some book or other yesterday’
- b. Dat Marieke een (bepaald/zeker) boek gisteren gekocht heeft.  
*that Marieke a certain book yesterday bought has*  
 ‘That Marieke bought a certain book yesterday’
- (27) a. Marija včora kupyla knyžky.  
*Maria yesterday bought book.ACC*  
 ‘Maria bought a book yesterday.’
- b. Marija knyžku včora kupyla.  
*Maria book.ACC yesterday bought*  
 ‘Maria bought a certain book yesterday.’

Furthermore, personal pronouns that are considered to be inherently specific (see also Koopman 1998) must raise both in Dutch (28) and in Ukrainian (29):<sup>12</sup>

- (28) dat Marieke haar niet gezien heft.  
*that Marieke her not seen has*  
 ‘that Marieke didn’t see her’
- (29) Marija iji ne bačyla.  
*Maria her not seen*  
 ‘Maria didn’t see her.’

Object scrambling in Ukrainian may alter the semantic interpretation of the sentence. In particular, *cja* ‘this’ and *jakas* ‘some/any’ can be used to test the possible changes in the meaning of scrambled sentences. In the basic structure (30), either of these determiners is acceptable and the sentence can have the

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is used. Unsworth (2005), however, notes that there is a clear interpretational difference between scrambled and non-scrambled word orders in both cases.

<sup>11</sup> High adverbs can appear in different positions in Ukrainian, but only post-subject and pre-verbal position as in (27b) is indicative of object scrambling. Therefore, in the following discussion and in the experimental design we use mostly low adverbs because they appear more consistently in a pre-verbal position.

<sup>12</sup> Analysis of pronominal movement in Ukrainian is a separate topic that will not be discussed in this paper. These examples (as well as the pronominal condition in the experiment) are used as an additional evidence of object scrambling, but the nature of pronominal movement is more complex than the movement of DP and needs a more careful investigation.

following readings: (a) there is *a certain book* that will be read by Taras *or* (b) there will be some event of reading *of any book*.

- (30) a. Taras bude švydko čytaty [cju] knyžku.  
*Taras be.FUT quickly read.INF this book*  
 ‘Taras is going to read the/*this* book quickly.’
- b. Taras bude švydko čytaty [jakus’] knyžku.  
*Taras be.FUT quickly read.INF any book*  
 ‘Taras is going to read a book quickly.’

After object scrambling, however, the sentences become unacceptable with *jakas* ‘some/any’, as shown in (31a) and (31b). This indicates that only a specific interpretation is possible with the scrambled object.

- (31) a. Taras bude [\*jakus’] knyžku<sub>i</sub> švydko čytaty *t<sub>i</sub>*.  
*Taras be-FUT any book.ACC quickly read<sub>INF</sub>*  
 ‘Taras is going to read a book quickly.’
- b. Taras [\*jakus’] knyžku<sub>i</sub> bude švydko čytaty *t<sub>i</sub>*.  
*Taras any book be.FUT quickly read<sub>INF</sub>*  
 ‘Taras is going to read a book quickly.’

Therefore, the above examples show that direct object scrambling is related to different semantic interpretations of the direct object DP. They suggest that the movement is employed in order to disambiguate semantic readings of direct object and induce its [+specific] interpretation. This proposal will be considered in detail in the next section.

### 3.2.3. The syntactic-semantic account

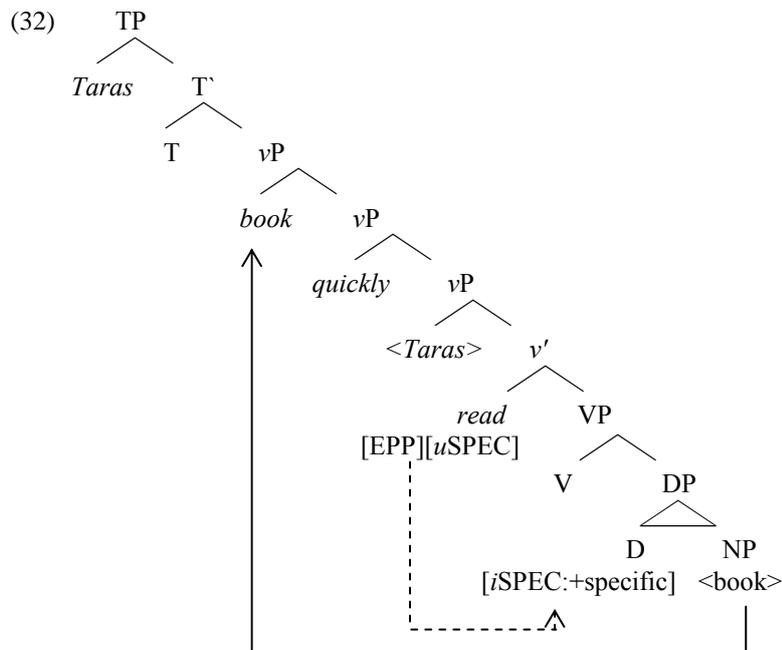
With the theoretical background presented above, we now turn to the mechanism of direct object scrambling in Ukrainian. In this paper, we adopt the *Phase Theory* proposed by Chomsky (2001) to implement scrambling. Specifically, we argue that scrambling is triggered by a probe-goal Search (Chomsky 2001, Ko 2005). The direct object, as a *goal*, is selected by the *probe* *v*, and the object may undergo overt movement to *v*P-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 [*i*SPEC], and the head *v* contains an uninterpretable [SPEC] feature [*u*SPEC],

which must undergo agreement with [*i*SPEC].<sup>13</sup> 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 [*u*SPEC]. The goal moves to the specifier position of the head *v* when the EPP with [*u*SPEC] 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 [*u*SPEC].

The tree diagram in (32) illustrates this process: Agree between the probe-goal is established between *v* and D for [SPEC] feature; the association between [*u*SPEC] and EPP triggers movement of the DP *book* to the *v*P 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., *v*P-edges, CP-edges) yields discourse-related effects such as focus and specificity. (In (32), the subject undergoes additional movement from Spec*v*P to SpecTP due to EPP-requirement of T).



<sup>13</sup> 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- li- mw-on-a m-tu.  
 Juma SA.3sg- past- OA.3sg- see-IND I-person  
 'Juma saw the person/ \*a person.'

For completeness of the overall structure, we also note that the direct object marked as [+specific] can undergo further movement to a position higher than the vP-edge. As shown in (33), when the vP is elided, the scrambled object *journal* remains intact. This indicates that the scrambled object can be situated outside of vP.

- (33) Taras knyžku<sub>i</sub> švydko čytaje *t<sub>i</sub>* a Ivan žurnal ni.  
*Taras book.ACC quickly reads but Ivan journal not*  
 ‘Taras is reading the book quickly, but Ivan is not [reading quickly] the journal.’

In Ukrainian, the auxiliary verb (e.g., *bude* ‘will’) may occur with a non-finite main verb, as in (34). In such cases, the object may scramble to the left of the low adverb, as in (35), or it may scramble further to the left of the auxiliary and negation, as in (36).<sup>14</sup>

- (34) *Basic Structure with auxiliary*  
 Subject>Negation>Auxiliary>Low Adverb>Main Verb>Direct Object.  
 (Taras) ne bude švydko čytaty knyžku.  
 (Taras) not will quickly read book.ACC  
 ‘Taras will not read a book quickly.’
- (35) Subject>Negation>Auxiliary>Direct Object>Low Adverb>Main Verb  
 (Taras) ne bude knyžku švydko čytaty.  
 (Taras) not will book.ACC quickly read  
 ‘Taras will not read a book quickly.’
- (36) Subject>Direct Object>Negation>Auxiliary>Low Adverb>Main Verb  
 (Taras) knyžku ne bude švydko čytaty.  
 (Taras) book.ACC not will quickly read  
 ‘Taras will not read a book quickly.’

We close this section with an important premise of our proposal concerning the non-specific object. If the object contains a [-specific] value (e.g., [*iSPEC: -specific*]), then the sub-feature EPP cannot be added to the *v* even after Agree between *v* and D. We argue that this is because [-specific] value is incompatible with the EPP feature. Based on this assumption, we derive the fact that there is no scrambling of non-specific object in Ukrainian.

<sup>14</sup> The auxiliary *bude* is a part of verbal form which indicates the future tense. At this point, it is not clear to us where exactly the auxiliary is generated. For the current paper, we stipulate that it is base-generated within the vP domain, probably where aspect phrases are normally generated. It should also be noted that we do not propose a new theory of the relative ordering between negation and various types of low adverbs on the vP edge. Given that negation can precede or follow the low adverb, we expect that the vP-edge should be an extended domain (just like the IP-domain) that can host a low-adverb, auxiliary, and negation.

### 3.2.4. On the optionality of scrambling

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). We will briefly sketch the issues that are related to this puzzle.

First, if object scrambling [related to interpretational differences] is optional, it is puzzling what distinguishes languages that allow this operation obligatorily (e.g., Dutch) or optionally (e.g., Ukrainian) from languages that do not allow it at all (e.g., English). As for object movement (i.e., object shift for Scandinavian languages), Chomsky (2001:35) proposed the following principles:

- (37) a.  $v^*$  is assigned an EPP-feature only if that has an effect on outcome.  
 b. The EPP position of  $v^*$  is assigned Int[erpretation].  
 c. At the phonological border of  $v^*P$ , XP is assigned Int[erpretation].

Descriptively speaking, we may assume that the association between EPP and specificity is obligatory in languages like Dutch so that post-verbal object must be interpreted as non-specific (see also footnote 8 for Russian). For languages like Ukrainian, we assume that the EPP feature is available, but not obligatorily so that specific object may undergo movement or stay in-situ. Crucially, however, the object must receive Int' at the  $vP$  edge once it undergoes object scrambling (37c).

According to this view, however, the problem still remains on why the EPP feature is optional in Ukrainian. This problem has been recognized in a number of studies (see Diesing (1992) and Thrainsson (2001) among others), but there has not been a satisfactory solution offered so far. In this paper, we claim that optional movement can be best understood by optional insertion of the EPP feature in the Minimalist Program, and that is the view we adapt to Ukrainian optional scrambling (see more on the optionality of the feature in Grewendorf and Sabel (1999) and Ko (2005) *inter alia*).

Despite the puzzling nature of scrambling in general, the most important fact for the current research is clear:

- (38) Non-specific objects do not undergo scrambling [in Ukrainian].

This is also true for other languages exhibiting similar movement (e.g., Scandinavian OS 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 (or scrambling), 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 sum up, our account of object scrambling links availability of the syntactic movement to the semantic feature of specificity. Adults are able to establish the connection between the EPP-feature and the specific semantic feature, and prefer scrambled structures. In the next section, we turn to the predictions for child scrambling under the current proposal.

#### 4. Predictions for acquisition of Ukrainian 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 Universal Grammar (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, and the specificity effects are not a topic of classroom instruction, either. Therefore, if L1-English children demonstrate understanding of scrambling constraints in L2-Ukrainian, it cannot be attributed to a high frequency of an explicit input. By choosing children as our main participants whose L1 is English and L2 is Ukrainian, we can test the effect of specificity in scrambling in child grammar and the availability of UG access in child L2 *simultaneously*.

Based on language acquisition theories put forward by Schwartz (2003) and White (2003) (and others) and our syntactic analysis of Ukrainian scrambling we hypothesize the following:

- (39) a. Scrambling is a consequence of syntax-semantics mapping (i.e., association between EPP on  $v$  and [+specific] feature 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 (39) make various predictions concerning possible and impossible patterns of word order in bilingual children's grammar. First, if children have knowledge of specificity, they should be able to utter sentences with the scrambled object, in principle. On this view, we crucially diverge from the view that children lack knowledge of specificity and consequently would scramble

highly optionally in all contexts (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 (based on their knowledge of specificity), they would not wrongly scramble non-specific objects, just like 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. When children utter scrambled sentences, they know that it is due to the presence of [+specific]. Given full access to UG in L2A, our predictions will hold for bilingual Ukrainian-English children despite the lack of scrambling in their primary language, English.

Our predictions are summarized in (40):

- (40) a. Children will 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.

## 5. Experimental study

### 5.1. Subjects

The experimental study was conducted with 41 bilingual children and a control group of 4 adult Ukrainian speakers. The age range of children was from 2;10 to 7;11 (mean age 6;2) (6 children from age 2;10 to 3;8 (mean 3;3), 16 children from age 4;6 to 5;11 (mean 5), and 19 children from age 6 to 7;11 (mean 6;7). Bilingual English-Ukrainian children were selected because their speech is a valuable testing ground for our proposals. Since English does not exhibit scrambling, and all children live in a predominantly English-speaking environment, they should be able to overcome the poverty-of-the-stimulus in the input in order to acquire scrambling in Ukrainian. Children's proficiency in Ukrainian was first evaluated indirectly through a questionnaire designed for parents and then directly through a conversation session between the child and the investigator. Children younger than 3 years old had significant difficulty with understanding Ukrainian, and so

were not selected as participants.<sup>15</sup> All children were recruited and tested in two Saturday Ukrainian schools - in Uniondale, NY and in the city of New York. Most of the children were born in the USA and have parents who are Ukrainian speakers. A few children were born in Ukraine and arrived in the USA before the age of 2. According to parents, some children can also understand other languages: Polish (4 children), Russian (3 children), Lithuanian (1 child), and German (1 child).<sup>16</sup> There were 14 males, and 27 females in the study.

The adult control group consisted of 2 females (49 and 18 year-old) and 2 males (40 and 42 year-old). They were recruited and tested at Stony Brook University, NY. All of the adult participants are native speakers of Ukrainian, fluent in Russian, and second language learners of English.

## ***5.2. Procedure***

The experiments started with a short training session conducted with a group of children to familiarize them with the task, and then each subject was invited to a separate room for an individual experiment. Two scenarios were specifically used as a Ukrainian proficiency test (for children only). If a child was able to name all the puppets in Ukrainian, and answer questions that followed two puppet shows, the experimenter proceeded with the main task.<sup>17</sup> The full session took no longer than 15-20 minutes and consisted of 10 scenarios: 4 with different adverbs, 4 with negation, and 2 fillers. All 10 tokens were randomized together so that each of four lists had a different order of material presentation. Children were tested in their school and rewarded for the participation with a small gift (a pen or a drawing board). Adult subjects were tested with the same scenarios as children, but without breaking them into 4 groups. That is, each adult received all 32 testing items and 8 fillers presented in a randomized order. Adult subjects were rewarded monetarily for their participation.

## ***5.3. Method***

The main goal of the experimental study was to determine whether children are aware of correlation between specificity and scrambling in Ukrainian. The task is a modified version of Schaeffer's (2000a) experiment that was a combination of a

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<sup>15</sup> Four children of different age (from 3 to 5) were predominantly English speakers and did not pass the proficiency test in Ukrainian, so they were not chosen for the participation in the study.

<sup>16</sup> Their experimental data did not differ from other subjects' data, and therefore are included in the results (see section 6.2)

<sup>17</sup> Only listening skills, knowledge of necessary vocabulary, and ability to build a full sentence in Ukrainian were taken into account in defining the proficiency level.

truth value judgment task and an elicited production task.<sup>18</sup> Each subject was presented with a short puppet show with two characters and a number of props (pictures or toys).

First, one puppet (either Winnie the Pooh, Piglet, or Roo) presented his story, and then, another puppet who is silly and does not know Ukrainian well (Tigger) either made a comment or asked for clarification. The subject, then, was asked to help by saying whether Tigger's comment was true or false, and if it was false to correct it. The puppet comments and questions were designed in such a way that in responding to them children would produce a sentence with a scrambled or non-scrambled word order and either with an adverb or negation. The choice of word order must be dependent on the context.

Four conditions were tested in the experiment: definite specific (as in (41)), indefinite specific (as in (42)), indefinite non-specific (as in (43)) and definite pronominal (as in (44)). The pronominal condition had the same context as the definite specific, but additional questions were included to trigger production of a personal pronoun as the direct object. The stimuli used in the study are exemplified below:

(41) Definite specific DP with an adverb

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?

Child:	Kenhuru	<u>metelyka</u>	ŠVYDKO	zlovyt'.
	Roo	butterfly	quickly	will.catch

	Kenhuru	švydko	zlovyt'	<u>metelyka</u> .
	Roo	quickly	will.catch	butterfly
	'Roo is going to catch the butterfly QUICKLY.'			

(42) Indefinite specific DP with an adverb

Piglet: Look, two cats: 1, 2. I am going to draw one of them. And I'm going to do it NICELY!

Tigger: Piglet is going to draw one cat IN AN UGLY WAY!

Exp: What is really happening?

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<sup>18</sup> High adverbs were not used in the stimuli because they take various positions in Ukrainian and thus do not serve the same role as in Dutch (see the footnote 11). Proper names as direct objects were also excluded from the experiment simply to keep it time-limit appropriate, even for youngest children. The characters were changed to those that Ukrainian children are more familiar with. Indefinite contexts were modified based on Unsworth (2005). It is interesting to note that although Schaeffer and Unsworth define specificity in different terms (referentiality and partitivity, respectively), they both use the same stimuli. This means that they tested partitivity effects instead of specificity 'as speaker intends to refer'.

Child: Porosjatko odnoho kotyka HARNO namaljuje.  
*Piglet one cat nicely will.draw*

Porosjatko harno namaljuje odnoho kotyka.  
*Piglet nicely will.draw one cat*  
 ‘Piglet is going to draw one cat NICELY.’

(43) Indefinite non-specific DP with an adverb

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 not going to do that CAREFULLY!

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

Child: Winnie oberežno bude lovyty (akulu).  
*Winnie carefully will catch shark*

[\*] Winnie (akulu) oberežno bude lovyty.  
*Winnie shark carefully will catch*  
 ‘Winnie will catch a shark carefully.’

(44) Definite pronominal DP with negation

Winnie: Look, a boot is in the pond. I have a good fishing rod, but you cannot catch boots. So, I am not going to catch it.

Tigger: Winnie is going to catch it.

Exp: What is Winnie really going to do with the boot?

Child: Winnie joho NE BUDE lovyty.  
*Winnie him not will catch*

[\*] Winnie ne bude lovyty joho.  
*Winnie not will catch him*  
 ‘Winnie will not catch it.’

In (41) and (42), scrambled and non-scrambled word orders are both grammatical for adult speakers (although scrambled order is preferred). In (43), however, use of scrambled order (i.e., SO (Neg/Adv)V structure) is not acceptable. In (44), a scrambled structure is strongly preferred in adult speech, and all things being equal, it is expected to prevail in child production as well.

In order to ensure the 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’.<sup>19</sup> Following Schaeffer (2000a), adverbs or negation

<sup>19</sup> Since only future events were discussed in the dialogs, subjects could use any of two forms of future tense. For example, for 3sg these forms are: *zlovyt’ / bude lovyty* ‘will catch’; *namaljuje /*

were used in order to mark a landing site of a scrambled object and to control for the object focusing by stressing an adverb or negation instead. Focus movement of direct objects could intervene with the object movement for interpretational reasons. Thus, to avoid these complications, we emphasized adverbs and negation in producing testing structures. In half of the stimuli, negation was contrasted with affirmation. In the other half, antonymous pairs of low adverbs were used: *svydko/povil'no* ‘quickly/slowly’, *harno/pohano* ‘nicely/wrongly’, *pravyl'no/nepravyl'no* ‘well/wrongly’, *oxajno/neoxajno* ‘neatly/messily’. There were 32 tokens altogether, which were interspersed with 8 fillers designed similarly, but always triggering a ‘yes’ response from a subject. Fillers were necessary to test if children are still paying attention, and to prevent them from forming strategies in answering questions.

## 6. Results

### 6.1. Group results

The data is analyzed in terms of the percentage rate of scrambling in four tested conditions (number of responses with scrambled objects relative to a total number of tokens per condition). The overall experimental results for two groups (children subjects and adult controls) are summarized in Table 5.

First, the results show that both adult Ukrainian speakers and bilingual English-Ukrainian children employ object scrambling in three specific contexts, and exhibit knowledge of the correlation between scrambling and semantic interpretation.

Table 5. Group results for scrambling across condition

Group	n	Condition							
		Definite specific		Indefinite specific		Indefinite non-specific		Definite pronominal	
		%	n	%	n	%	n	%	n
Children	41	45	36/80	65	52/80	9	7/80	45.45	40/88
Adults	4	53	17/32	69	22/32	0	0/32	81.25	26/32

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*bude maljuvaty* ‘will draw’, *vyriže / bude vyrizaty* ‘will cut out’, *vykyne / bude vykydaty* ‘will throw out’. Although distribution of telic verbs can interact with specificity of the direct object (Slabakova 1999), the current study did not focus on this issue.

Next, overall, children show less scrambling than adults: 41.16% (135/328) vs. 50.78% (65/128). However, scrambling rates per condition indicate important similarities between child and adult group data, as presented in Figure 1. Adults consistently scramble pronominal direct objects (81.25%), but never scramble in a non-specific indefinite condition. Their group data also show optional scrambling in definite specific (53%) and indefinite specific (69%) conditions. Although the rate is not very high, there is no difference among subjects if some extreme outliers are excluded (this will be discussed in individual results in 6.2). Child data from the same conditions show the same tendency: they scramble 45% in definite/specific contexts and 65% in indefinite/specific contexts, but they rarely allow object scrambling in non-specific contexts (9%).

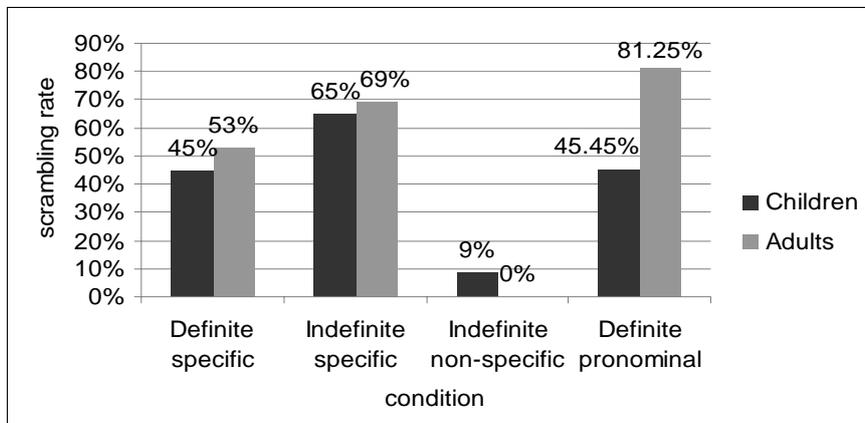


Figure 1 Scrambling rate: Children vs adults

As for the pronominal direct object scrambling, children show greater optionality than the adults: 28.41% (children) vs 68.75% (adults) scrambled pronouns in the definite pronominal condition. However, children used full DP instead of a pronoun, and if we count scrambling rates including pronouns and DPs that were used for pronouns, the total rate of scrambling of children amounts to 45%. This rate is very similar to the scrambling rate obtained in the definite specific context (45%), which suggests that children follow the same rules in both cases, but might have difficulty with pronominal production (to be discussed in 6.2).

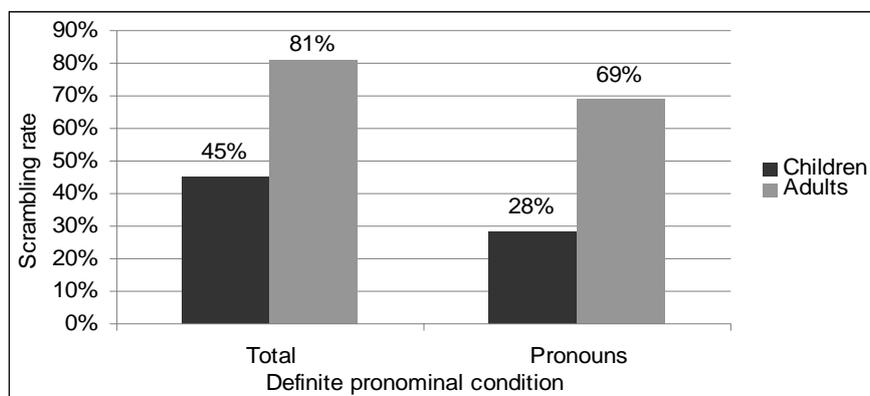


Figure 2 Pronominal scrambling in the definite pronominal condition.

Finally, a statistical analysis of the child data also supports the prediction about the non-random nature of scrambling in language learners' grammar. The direction of the means (presented in Figure 3) indicates that the indefinite specific condition and two definite conditions trigger scrambling much more than the indefinite non-specific condition in child data.

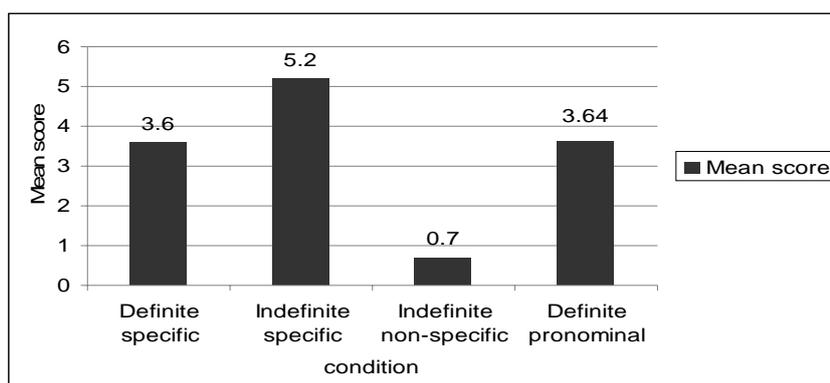


Figure 3. Mean rate of scrambling: child data

The univariate analyses of variance (ANOVAs) show that there is a significant main effect of specificity on the word order choice in child production [ $F(3;41)=9.992$ ,  $p<.0001$ ]. Contrastive results confirm that the difference between the indefinite specific and the indefinite non-specific condition is highly significant ( $p<.0001$ ). The difference between the definite specific and the indefinite non-specific condition is also significant ( $p=.001$ ) as well as the difference between the definite pronominal and the indefinite non-specific condition ( $p=.001$ ). Furthermore, the results also show that there is no significant difference between the definite specific and the indefinite specific conditions ( $p=.065$ ) and the definite specific and the definite pronominal ( $p=.965$ ). This

suggests that specificity, instead of definiteness, significantly contributes to object scrambling by the learners.

## 6.2. Individual results

Children's individual responses confirm group results. None of the subjects scrambled obligatorily in definite specific contexts. Only one subject scrambled 100% in the indefinite specific condition. Crucially, however, none of the child subjects used scrambled order more than twice in indefinite non-specific condition. This again suggests a really sporadic nature of scrambling in non-specific contexts. Moreover, four children never scrambled in this condition, showing adult-like performance. Most of the children scrambled at a high rate in the indefinite specific condition (i.e., three subjects produced 7 (out of 8) tokens with object scrambling in this context). Children who were claimed by their parents to be trilingual showed similar results, as indicated below.

Table 6. Scrambling rate: bilingual (English-Ukrainian) vs trilingual children

Children	Languages	<i>n</i> of children	Total
Bilingual	English-Ukrainian	32	40.63%
Trilingual	+ Russian	3	41.7%
	+ Polish	4	46.88%
	+ Lithuanian	1	62.5%
	+ German	1	12.5%

A majority of the subjects were English-Ukrainian bilinguals, but some children grew up in families where other languages were spoken. It seems, though, that the general pattern of scrambling by bilingual and trilingual children does not differ: they scramble at a similar rate in all contexts. It should be noted that a child speaking German showed only 12.5% scrambling because she was tested only in indefinite/non-specific contexts, and, thus, such a result was expected.

On the other hand, child performance with pronominal direct objects was poorer than expected for all subjects mainly because very few pronominals were used. However, when they were used, they were always placed correctly above the adverb or negation.

Surprisingly, the child's age was not the main factor in pronoun usage: the youngest subject (2;10 year-old) had two responses with a scrambled pronoun, while the oldest child in this group (7;3 years old) had none.<sup>20</sup> Although it was not the goal of this study to establish developmental stages in scrambling acquisition,

<sup>20</sup> This subject's performance on the test was rather out of the ordinary. That was the only case when no scrambled structures were used. However, this child has a high level proficiency in Ukrainian, and her spontaneous speech contained both pronominals and scrambled direct objects.

it seems that, in general, there was no strong correlation between the child's age and the ability to scramble in the right condition.

Table 7. Children: Age groups

age	Condition							
	definite specific		indefinite specific		indefinite non-specific		definite pronominal	
	%	n	%	n	%	n	%	n
3	56	9/16	62.5	10/16	12.5	1/8	50	4/8
4-5	50	16/32	75	12/16	7.5	3/40	42.5	17/40
6-7	34.4	11/32	62.5	30/48	9.4	3/32	47.5	19/40

These results contradict Schaeffer's (2000a) claim that there is a correlation between syntactic development of child grammar and children's pragmatic maturity. If it were the case, we would expect to see a gradual increase in the scrambling rate from younger to older children. And yet, our data from Ukrainian acquisition does not show such a pattern.

The individual results for the adult controls are summarized below:

Table 8. Adults: Individual results for scrambling across condition

Subject	Total %	Condition							
		Definite specific		Indefinite specific		Indefinite non-specific		Definite pronominal	
		%	n	%	n	%	n	%	n (n of pronouns)
AS-1 (F)	56.25	62.5	5/8	87.5	7/8	0	0/8	75	6/8 (6/8)
AS-2 (M)	62.5	75	6/8	100	8/8	0	0/8	75	6/8 (5/8)
AS-3 (F)	34.38	25	2/8	37.5	3/8	0	0/8	75	6/8 (4/8)
AS-4 (M)	50	50	4/8	50	4/8	0	0/8	100	8/8 (7/8)

As can be seen from Table 8, no adult subjects scrambled in the indefinite non-specific condition. The rate of scrambling for the other conditions varies from 25% in a definite specific context (AS-3) to 100% in an indefinite specific context (AS-2). As expected, all of the subjects scramble pronominal direct objects at a very high rate: from 75% to 100%. Overall, as shown in Figure 3, none of the subjects scrambled obligatorily, which confirms that object scrambling in Ukrainian is optional even in adult grammar. That is, for AS-2 it is a preferred

response in specific conditions, while AS-3 produces mostly unscrambled structures in all conditions except for the pronominal condition.

The individual grammar of AS-4 requires special attention. This subject consistently scrambled direct objects over negation, but, in definite specific and indefinite specific contexts that required use of adverbials, he produced unscrambled structures – SVOAdv (also occurring in AS-3 data). Although this structure differs from the base structure (SAdvVO), it is not considered an instance of object scrambling, but rather an adverbial focusing. Since other responses given by AS-4 show consistent scrambling, this result could be triggered by other factors to which I return below.

### 6.3. Produced sentence structures

More should be said about the obtained data in terms of the types of scrambled sentences. Word order with pre-adverbial or pre-negation objects such as S-O-Adv-V and S-O-Neg-V were considered as a clear case of scrambling. There were, however, more variations in scrambling types. We consider all preverbal objects indicated in Table 9 as a case of scrambling.

Table 9. Types of structures

	Adults		Children	
	%	<i>n</i>	%	<i>n</i>
SOAdvV	35.4	23/65	40.74	55/135
SONegV	<b>55.4</b>	36/65	<b>45.19</b>	61/135
SNegAuxOV	6.15	4/65	8.9	12/135
SAdvOV	3.10	2/65	3.7	5/135
OSV	-	-	1.48	2/135

Scrambling over negation (SONegV) was used at the highest rate, especially by adults. However, since all scenarios triggered responses about a future event and the future tense can be expressed in Ukrainian either as one or two words, subjects could use either of the structures: with or without a future auxiliary. When the auxiliary was used, some subjects preferred ‘shorter’ scrambling - SNegAuxOV over ‘longer’ scrambling– SONegAuxV. These responses were still coded as scrambling because they showed object movement to a higher situated pre-verbal position which can be associated with specificity in Ukrainian. Scrambling over adverbs (SOAdvV) was less productive due to different reasons. Some subjects (mostly adults) focused on adverbs and changed the word order to emphasize the adverb and not the object, while others (mostly young children) had difficulty using adverbs at all (as was noticed in Schaeffer 2000a, too) and produced them

with a delay at the end of the utterance. Thus, the structure SVOAdv was used by adults and children, but was considered as unscrambled.<sup>21</sup>

To summarize, our results demonstrate that the effect of specificity on scrambling established for adult speakers remains significant for children as well. Children acquiring Ukrainian do not perform at random and appear to be aware of interpretative constraints on scrambling.

## 7. Discussion

Our experimental results confirm the predictions presented in (40). First, our data clearly show that specificity interacts with object scrambling in child Ukrainian, as predicted in (40). Specific objects occurred in a pre-verbal position via scrambling in children's utterances. Moreover, children uttered scrambled sentences significantly more often in specific contexts than in non-specific contexts. This result provides further arguments for the view that children do have the knowledge of specificity in their grammar from a very early stage (Avrutin and Brun 2001, Ilić and Deen 2004). This, in turn, poses a considerable challenge to the proposal that the specificity feature is underspecified in child grammar (cf. Schaeffer 2000).

Second, our data demonstrate that children apply less scrambling than adults, as predicted in (40). Adults are able to establish association between syntactic knowledge (EPP on *v*) and semantic knowledge (SPEC on D) and freely use scrambling in order to convey specific interpretation of the direct object. Children, on the other hand, may have difficulty in correlation between [SPEC] and EPP features. We argue that a low rate of scrambling in child Ukrainian stems from an instable mapping between syntax and semantics. Our data can be taken as further support for a syntactic-semantic approach to acquisition of scrambling proposed by Unsworth (2004, 2005). These results also provide support for the proposals that L2-learners may have problems with mapping issues at the interface (e.g., Prevost & White (2000) for mismapping between syntax and morphology and White (2003:205) for lack of mapping from the lexicon to the syntax).

Third, it has been shown that children scramble optionally, but not randomly. When children scrambled an object, they scrambled the [+specific] object, as predicted in (40). This indicates that children can distinguish between specific and non-specific objects, reflecting their semantic knowledge of specificity. When they scramble direct objects, they know that it applies only to specific objects. There were infrequent instances of scrambling in non-specific contexts, but since the group scrambling rate in non-specific contexts was only 9%, we take those data as performance errors.

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<sup>21</sup> SVOAdv structure could also be analyzed as such that was derived by a *vP* movement. However, since adverbs in such sentences were always focused, we assume a different, non-scrambling, analysis for these structures.

These results suggest that a pragmatic approach is unlikely to account for optionality in scrambling observed in the study. The pragmatic approach to the acquisition of specificity was originally proposed by Maratsos (1976) to explain errors in article usage by children, and later widely adapted to explain errors in scrambling (e.g., Avrutin and Brun 2001, Schaeffer 2000). Our data, however, suggest that the pragmatic approach to scrambling fails to account for acquisition of scrambling in Ukrainian. On the pragmatic analyses, children might mark a [-specific] object as specific/definite according to their own beliefs, which in turn can trigger more scrambling of non-specific objects. Under Avrutin and Brun's view, for instance, egocentricity of children can lead to obligatory scrambling everywhere. For Schaeffer, on the other hand, specificity is underspecified, so random scrambling is expected across all contexts. Consistent with any of these pragmatic approaches, it would be predicted that Ukrainian children would produce sentences with a scrambled object even in non-specific contexts. However, the obtained experimental data show that this was not the case: optional child scrambling in Ukrainian did not exhibit significant overuse of object movement in the non-specific condition at any age group (Table 8), and, thus, the pragmatic approach is not supported.

Finally, the Full Access to UG in child L2 hypothesis was confirmed by our results. In particular, our data show that Ukrainian-English bilingual children can understand constraints on scrambling despite the absence of scrambling in their primary language. Child learners of L2-Ukrainian produce scrambled structures in specific contexts although they have never been instructed to do so. This further supports the premise that child L2 learners are able to overcome poverty-of-the-stimulus, and they have access to the specificity feature in UG.

## 8. Conclusion

In this paper, we have seen that specificity effects are obtained in early child grammar. In particular, we have shown that bilingual 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 some 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.

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