

## Prosodic Effects in Word Order: Evidence from Ukrainian

The interaction between prosody and word order has been of significant crosslinguistic interest in recent years (Vallduvi 1992, Cinque 1993, Zubizarretta 1998, Reinhart 2006, *i.a.*). In Slavic languages, which exhibit significant freedom of word order (Bailyn 1995 and many others) the effects of prosody on word order permutations, known as scrambling, have nevertheless been largely ignored (though see Slioussar 2007).

In this paper we present novel evidence for the role of prosody in Ukrainian - a language that exhibits a scrambling-definiteness correlation (Mykhaylyk & Ko 2008). The major questions addressed in the study are whether prosody operates as an alternative to scrambling and whether the absence of scrambling in definite-partitive contexts is represented prosodically in terms of a distinct prosodic contour associated with such syntactic structures.

DPs in Ukrainian typically show a definite interpretation in a scrambled position (as in (1)). But these same elements, with the same interpretation, will prefer to stay *in situ* under the influence of prosodic recontouring (as in (2)).

- |  |   |
|--|---|
| <p>(1) Ivan <u>tu knyžku</u> uže čytav.<br/> <i>Ivan that book already read</i><br/>         ‘Ivan has read that book already.’</p> <p>(3) Ivan <u>jiji</u> čytav<br/> <i>Ivan 3SgFEM read</i><br/>         ‘Ivan has read it (the book).’</p> | <p>(2) Ivan uže ČYTAV <u>tu knyžku</u>.<br/> <i>Ivan already read that book</i><br/>         ‘Ivan has READ that book already.’</p> <p>(4) Ivan ČYTAV <u>jiji</u>.<br/> <i>Ivan read 3SgFEM</i><br/>         ‘Ivan has READ it (the book).’</p> |
|--|---|

While such effects of prosody on syntactic position of elements are well documented for pronouns (which ordinarily must scramble to the vP edge (3) unless a distinct prosodic contour is applied (4) - see Richards 2006, for e.g.), such changes in sentence prosody for full DPs are not as easily detectable, with some other examples showing an even more subtle effect. In view of such considerations we conducted an experimental production study in which 8 female native speakers of Ukrainian (age range 20-52) participated, with a detailed acoustic analysis of produced structures carried out in order to provide valid evidence for the effects of prosody on word order.

Based on the assumptions introduced above, the following core predictions were made: Ukrainian speakers will assign a distinctive prosodic contour to the basic SVO sentences if they contain a definite/partitive direct object. Specifically, such structures will have a falling pitch accent on the verb and a destressed object (following Neeleman & Reinhart 1998).

The experimental task involved reading sentences which represented 8 conditions with different types of contexts, direct objects and syntactic structures: Pronoun, SOV (5a); Pronoun, SVO (5b); Definite Noun, SOV(6a); Definite Noun, SVO(6b); Partitive Noun, SOV(7a); Partitive Noun, SVO(7b); Indefinite Noun, SOV(8a); Indefinite Noun, SVO(8b).

- (5) Yesterday, Ivan caught a big fish and gave it to his neighbor, and today he saw, that
- |  |  |
|--|--|
| <p>a. vona <u>jiji</u> varyt’.<br/> <i>she it cooks.</i></p> | <p>b. vona varyt’ <u>jiji</u>.<br/> <i>she cooks it.</i></p> |
|--|--|
- (6) Yesterday, boys caught a big fish. Roman went home, but Ivan decided, that
- |   |   |
|---|---|
| <p>a. vin <u>tu rybynu</u> zvaryt’.<br/> <i>he that fish will cook.</i></p> | <p>b. vin zvaryt’ <u>tu rybynu</u>.<br/> <i>he will cook that fish.</i></p> |
|---|---|
- (7) In the morning Ivan caught a lot of fish. Five fishes he gave to his neighbor, and at night
- |   |   |
|---|---|
| <p>a. vona <u>odnu rybynu</u> zvaryla.<br/> <i>she one fish cooked.</i></p> | <p>b. vona zvaryla <u>odnu rybynu</u>.<br/> <i>she cooked one fish.</i></p> |
|---|---|
- (8) Mama is thinking what to cook today for dinner. If children want,
- |   |   |
|---|---|
| <p>a. vona <u>yakus’ rybynu</u> zvaryt’.<br/> <i>she some fish will cook.</i></p> | <p>b. vona zvaryt’ <u>yakus’ rybynu</u>.<br/> <i>she will cook some fish.</i></p> |
|---|---|

Each subject received 8 counterbalanced testing items and 8 fillers in a randomized order. All speech samples were recorded to a personal computer, labeled manually using ToBI labeling conventions (Pierrehumbert 1980, see also Yokoyama 2001 and Igarashi 2008 for Slavic).

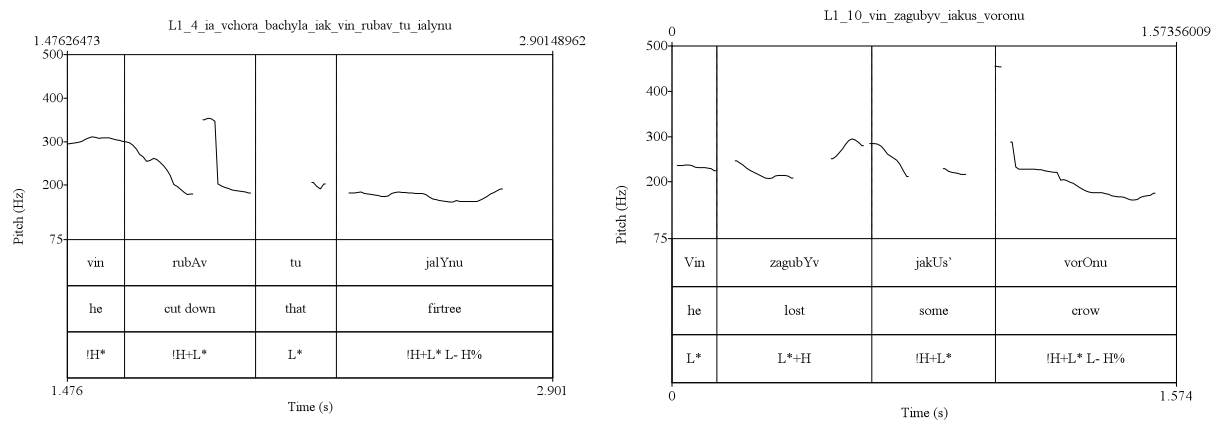
The results show a clear contrast between different types of structures. Target SVO sentences with an indefinite object DP are produced with neutral prosody on which the verb is realized with a rising pitch accent (L\*+H), and the strongest falling pitch accent falls on the noun. In contrast, the same SVO structures with definite or partitive object DPs have the strongest falling pitch accent realized on the verb (!H+L\*), while the object is prosodically destressed. The two pitch accents on the verb are attested for all conditions, as predicted:

*Table 1. Percentage of expected pitch contours on the verb per condition*

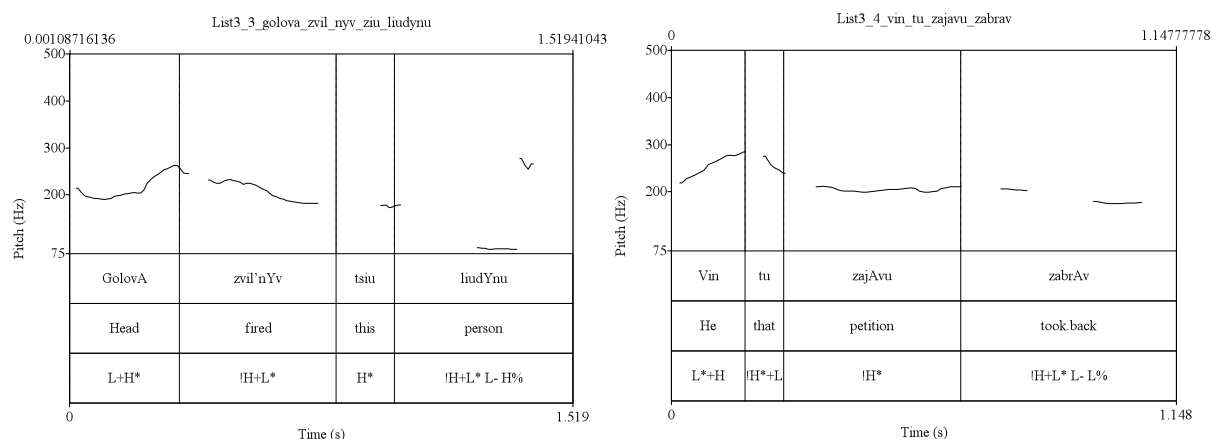
	Pronoun	Definite Noun	Partitive Noun	Indefinite Noun
SVO	100%	87%	87%	87%
SOV	100%	100%	100%	100%

Two contrastive SVO structures are presented in Fig.1. Likewise, sentences with definite objects in SVO and SOV structures also differ prosodically (Fig.2).

*Figure 1. Pitch contours for the basic SVO structures in Indefinite and Definite Conditions*



*Figure 2. Pitch contours for definite objects in SVO and SOV structures.*



Our data support the main predictions and present evidence for the prosodic recontouring in Ukrainian, suggesting that prosodic recontouring may indeed function as an alternative to scrambling, thus addressing the optionality problem. The above findings therefore suggest that a full understanding of scrambling can only emerge via simultaneous study of its semantic and prosodic effects.