

## PREDICATE-ARGUMENT STRUCTURE AND VERB ACCENTUATION IN ESTONIAN

Heete Sahkai<sup>1</sup> and Ann Veismann<sup>2</sup>

<sup>1</sup>*Institute of the Estonian Language and* <sup>2</sup>*University of Tartu*

**Abstract.** This paper reports the results of a production study whose aim was to ascertain whether Estonian exhibits the regularity whereby verbs are unaccented when they are in focus together with an adjacent object. The study also examined whether this regularity holds when the verb is in sentence-final position, or when it is separated from the object by an intervening adjunct. The results suggest that in all these cases the verb is unaccented, unlike when it is complemented only by an adjunct. More generally, these results show that Estonian belongs to the category of languages with plastic sentence accent placement, and that predicate-argument structure is one of the factors that determine sentence accent placement in Estonian. The results also raise questions for future research concerning the theoretical interpretation of the descriptive observations made in the study.

**Keywords:** Estonian, sentence accent placement, deaccentuation, predicate-argument structure

**DOI:** <http://dx.doi.org/10.12697/jeful.2015.6.3.05>

### 1. Introduction

This paper presents the results of a production study whose aim was to establish certain descriptive facts about Estonian concerning the distribution of pitch accents in an utterance. The study contributes to the overall goal of ascertaining whether Estonian belongs typologically to the category of languages that exhibit non-plastic sentence accent placement, like for instance Italian or Catalan, or to the category of languages with plastic accent distribution, like English, German or Dutch. In the former type, the location of the main accent is almost exclusively on the rightmost content word, whereas in the latter, nuclear accent placement is subject to a variety of factors, including sentence type, information structure, and predicate-argument structure (Ladd 2008: 251–253, Vallduví 1991). The study also contributes to the

general aim of identifying the principles that govern sentence accent placement in Estonian. More specifically, the study will test whether and how sentence accent placement correlates with certain aspects of predicate-argument structure.

Previous studies on the plasticity and principles of sentence accent placement in Estonian have concentrated on whether and how accentuation is affected by information structure, in particular, narrow focus and givenness (e.g. Sahkai et al. 2013, Salveste 2013, 2015). Authors who classify languages on the basis of the plasticity of accent placement associate prosodic plasticity with syntactic plasticity, assuming that the two tend to be complementary (e.g. Vallduví and Engdahl 1996). Estonian is a language with plastic syntax in the sense that its constituent order has been described as being partly governed by information-structural principles (Tael 1988), implying that it is a discourse-configurational language like the closely related Finnish (Vilkuna 1989). However, it has also been shown that syntactic and prosodic plasticity can be compatible, as is for instance the case in Russian, an areal contact language of Estonian (Van Valin 1999). Similarly, Vilkuna (1989) points out that in Finnish, the information structure-driven word order principles are operative in written language, whereas in spoken language the same functions are performed by plastic prosody. Estonian could thus be expected to exhibit either plastic or non-plastic accent placement. Studies (Sahkai et al. 2013, Salveste 2013) have shown that non-sentence-final narrow focus can be expressed by the placement of the main accent in combination with post-focal deaccentuation, the narrow-focus accent being the last one in the sentence. This means that the location of the nuclear accent is not fixed but may vary depending on the position of the narrowly focused constituent. Prosodic focus-marking has been found to occur even in cases where it is in principle possible to express narrow focus syntactically, by means of constituent order. For instance, narrow focus on the subject can be expressed syntactically, by placing the subject last in the sentence, but a production study showed that speakers may prefer to express subject focus prosodically, by leaving the word order unchanged and placing the main accent on the subject (Sahkai et al. 2013). A perception study confirmed that accent placement is indeed interpreted as expressing narrow focus (Salveste 2013). Given information in turn may cross-linguistically be marked by deaccentuation (e.g. Ladd 2008: 231–236). In Estonian, this is the case in post-focal position: since the narrow-focus accent is the last one in the sentence, all given constituents that follow the narrow focus are

deaccented. However, givenness does not automatically trigger deaccentuation: given constituents that precede the narrow focus seem to be generally accented (Sahkai et al. 2013, Salveste 2015), although further study is required to verify this in longer utterances. In other words, Estonian seems to allow post-nuclear, but not pre-nuclear deaccentuation. To summarise, previous studies show that despite the fact that Estonian has “plastic syntax”, i.e. permits information structure to be expressed by syntactic means, nuclear accent placement too is to some extent plastic. We can thus hypothesise that accent placement also interacts with predicate-argument structure, another factor known to affect nuclear accent placement cross-linguistically.

The goal of the present study is to examine whether and how accent placement is affected by predicate-argument structure and the linear order of constituents in an all-new verb phrase under broad focus. Cross-linguistically, it is known that the accentuation of a predicate may depend, among other things, on its complement structure: within focus, a predicate may be unaccented when adjacent to a lexical argument that carries new information, and accented otherwise (e.g. Gussenhoven 1992). The first aim of the present study is to verify whether this generalisation holds in Estonian. More specifically, our first research question is whether verb-adjacent arguments and adjuncts have a different effect on the accentuation of the verb. We hypothesise, in accordance with the cross-linguistic facts, that under broad focus, a verb is unaccented when adjacent to an argument (object), and accented when adjacent to an adjunct.

Our second research question is whether the potential deaccentuation of the verb in the presence of an argument obtains also when the verb is sentence-final, which is frequently the case in Estonian. In languages with plastic accent placement, sentence-final verbs can be deaccented. In languages with non-plastic accent placement, the different accentuation of predicates and arguments is achieved syntactically, by post-verbal placement of arguments; if the verb nevertheless occurs sentence-finally, it bears the nuclear accent (Ladd 2008: 248–251). A characteristic of languages with non-plastic accent placement is obligatory subject inversion inthetic (all-new) intransitive sentences (Ladd 2008: 248–249, Vallduvi 1991, Van Valin 1999). Since this characteristic does not seem to be obligatory in Estonian (similarly to Russian, see Van Valin 1999), we hypothesise that if the deaccentuation of the verb is observed in the presence of an argument, it will also occur when the verb is clause-final, confirming that Estonian has plastic nuclear accent placement.

Our final research question is motivated by the fact that in Estonian it is frequently the case that a verb and its argument are not adjacent but separated by an adjunct, much like in German, a language that has probably influenced Estonian word order (e.g. Aavik 1936). While previous cross-linguistic studies and theoretical proposals unanimously predict the effect of an adjacent argument on the accentuation of the verb, the predictions concerning the effect of a non-adjacent argument are less clear. The question thus arises as to what the accentuation pattern is in such cases. Therefore, the present study will also examine two typical word order patterns where an adjunct occurs between the verb and the argument in a broad-focus verb phrase.

The first pattern consists of a finite verb followed by an adjunct and the object, i.e. [verb + adjunct + object], e.g. *Triinu sööb aias kooki* ‘Triinu eat-PRS.3SG garden-INESS.SG cake-PART.SG’<sup>1</sup> ‘Triinu is eating some cake in the garden’. This is the typical neutral location for most adjuncts (an exception is constituted by directional adjuncts, see below). If the adjunct were located after the object, it would be interpreted as being narrowly focused (or possibly dislocated). In previous literature, Féry and Herbst (2004) have examined the accentuation of the pattern [argument + adjunct + verb] in German. They found that despite the presence of an intervening accented adjunct (the adjunct was accented in 91% of cases), the verb was nevertheless mostly unaccented (in 85% of cases). To explain this pattern they propose that the prosodic phrase corresponding to the adjunct is embedded in a larger prosodic phrase constituted by the argument and the verb; the accent on the argument can therefore still project to the verb. Féry (2011) proposes alternatively that in the accentuation pattern [OBJECT + ADJUNCT + verb] (capital letters indicate accented constituents), the verb is integrated into the prosodic unit of the adjunct. On the basis of these findings, we hypothesise that in the Estonian pattern to be examined, the verb will turn out to be mostly unaccented and both the adjunct and the object will be accented.

The second VP pattern to be examined consists of the object, a directional adjunct<sup>2</sup>, and a non-finite verb, i.e. [object + directional adjunct +

1 Abbreviations used in the glosses: all. – allative, com. – comitative, gen. – genitive, ill. – illative, iness. – inessive, inf. – infinitive, nom. – nominative, prs. – present, part. – partitive, pl. – plural, ptcp. – participle sg. – singular.

2 The syntactic status of a directional complement as an argument or an adjunct is somewhat controversial. We assume that with a verb like *panema* ‘put’, it is an argument, but in case of a manner of motion verb like *veeretama* ‘roll tr.’ or a mental verb like *unustama* ‘forget’, it is not part of the semantic argument structure of the verb. The verbs selected in the data were of the latter type.

verb], e.g. *Naabrid on laua hoovi kandnud* ‘neighbour-NOM.PL be-PRS.3SG table-GEN.SG courtyard-ILL.SG carry-PAST.PTCP’ ‘‘The neighbours have carried a table into the courtyard’’.

Again, the same syntactic pattern has been described in German, where the pattern [argument + directional/locational PP + verb] differs from the pattern [argument + adjunct + verb], described above, and from the pattern [argument + argument + verb] (these two patterns display accents on both complements, with the rightmost being the nuclear accent, and usually no accent on the verb). According to the description of Féry (2011), the pattern [argument + locational/directional PP<sup>3</sup> + verb] may display three different accentuation patterns: the adjunct can be either accented or unaccented; when it is accented, the verb can be either accented or unaccented; when the adjunct is unaccented, so is the verb; the object is always accented. In other words, the following patterns occur: [OBJECT + adjunct + verb], [OBJECT + ADJUNCT + verb], [OBJECT + ADJUNCT + VERB]. Féry (2011) explains the variation by proposing that the same syntactic structure can correspond to different prosodic structures, as a result of competing constraints. When neither the verb nor the adjunct is accented, the phrase formed by the adjunct is prosodically embedded into the phrase formed by the object and the verb; it is prosodically weaker than the latter and, because of its post-nuclear status, its accent is deleted. When the adjunct is accented and the verb unaccented, the prosodic phrase of the adjunct is not subordinate but carries the nuclear accent; the verb is unaccented because it is integrated into the prosodic phrase of the adjacent adjunct. When the verb too is accented, it forms its own prosodic phrase and receives the nuclear accent.<sup>4</sup>

Given these descriptions, we hypothesise that the pattern [object + directional adjunct + verb] will display variable accentuation patterns in Estonian as well.

## 2. Procedure

To answer these research questions, we conducted a production study including the following conditions (the number in parentheses indicates the number of test sentences instantiating each condition in the experiment; all the test sentences are given in the appendix):

3 Féry (2011) assumes the directional or locational PP to be an adjunct.

4 See Büring (2012) and Kratzer and Selkirk (2007) for different explanations of the pattern where both the PP and the verb are unaccented.

Research question 1: Does the presence of an adjacent argument, as opposed to that of an adjunct, cause the verb to be deaccented?

Condition 1: Test sentences containing a verb and an adjacent object, i.e. [verb + object], e.g. *Triinu söi kommi* ‘Triinu eat-PAST.3SG candy-PART.SG’ ‘Triinu ate candies’ (2).

Condition 2: Test sentences containing a verb and an adjacent adjunct, i.e. [verb + adjunct], e.g. *Triinu söi aias* ‘Triinu eat-PAST.3SG garden-INESS.SG’ ‘Triinu was eating in the garden’ (2).

Hypothesis 1: In condition 1 the verb is unaccented, in condition 2 it is accented.

Research question 2: Does the potential deaccentuation of the verb also occur in sentence-final position? This question was tested in non-finite VPs complementing finite auxiliaries.

Condition 3: Test sentences containing a non-finite verb preceded by its object, i.e. [object + verb], e.g. *Maaler peab köögis seinu värvima* ‘painter-NOM.SG must-PRS.3SG kitchen-INESS.SG wall-PART.PL paint-INF’, ‘A painter must paint the walls in the kitchen’ (4).

Hypothesis 2: Accentuation of the verb does not depend on the position of the verb.

Research question 3: Does the potential deaccentuation of the verb also occur when an adjunct occurs between the verb and the object? Under the third question, two typical constituent order patterns are examined: [verb + adjunct + object], and [object + directional adjunct + verb]. The second pattern was again examined in non-finite VPs.

Condition 4: Test sentences containing a verb followed by an adjunct and the object, i.e. [verb + adjunct + object], e.g. *Triinu söi aias kooki* ‘Triinu eat-PAST.3SG garden-INESS-SG cake-PART.SG’, ‘Triinu was eating some cake in the garden’ (4).

Condition 5: Test sentences containing a verb preceded by a directional adjunct and an object, i.e. [object + directional adjunct + verb], e.g. *Naabrid on laua hoovi kandnud* ‘Neighbour-NOM.PL be-PRS.3SG table-GEN.SG courtyard-ILL.SG carry-PAST.PTCP’, ‘The neighbours have carried a table into the courtyard’ (3).

Hypothesis 3: In condition 4, the verb will be mostly unaccented and both the adjunct and the object will be accented.

Hypothesis 4: In condition 5, various accentuation patterns will occur: [OBJECT + adjunct + verb], [OBJECT + ADJUNCT + verb], [OBJECT + ADJUNCT + VERB].

The test sentences were embedded in a reading task. They were formulated as direct speech embedded in small joke-like stories. We expected direct speech to elicit an imitation of natural speech with respect to accentuation. The stories were used to provide filler sentences and to create an appropriate context that would elicit broad focus either on the VP or the whole sentence. All the constituents in the VP were new information. The stories also contained test sentences for a different experiment concentrating on the prosody of verb-particle combinations.

The task contained altogether 9 different stories, each containing 1–4 target sentences for two different studies, separated by filler sentences. The target sentences in each story were either of the same or different conditions and occurred in a random order. All participants saw the stories in the same order.

7 informants were asked to read the stories, six women and one man. They were instructed to first familiarise themselves briefly with the content of each story and then read the story with no particular attempt of expressivity. During the reading the subjects were alone in the sound-proof room of the recording studio.

Altogether, the data comprised 105 sentences. The sentences were examined with Praat (Boersma and Weenink 2012) and the constituents of the VP were annotated for pitch accents by the first author, using the inventory of Estonian pitch accents in Asu (2004). As a result of the annotation, three categories emerged: 1. accented, i.e. the word carried an identifiable pitch accent from the inventory of Asu (2004); 2. unaccented, i.e. the contour on the relevant word was flat or interpolated; 3. uncertain: in a few cases, the test word was neither clearly accented nor completely flat. Since the research questions bear on the phonological presence or absence of a pitch accent, the experiment was not designed to permit phonetic analysis of the data and no phonetic analysis was conducted.

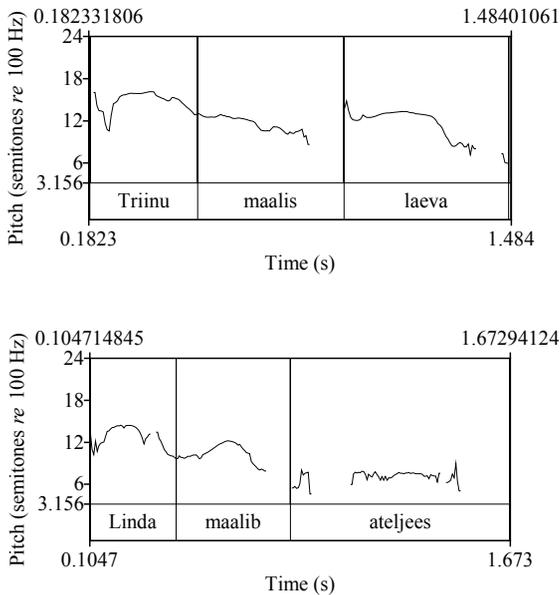
### 3. Results and discussion

The first hypothesis was borne out: a verb is unaccented when adjacent to an argument and accented when adjacent to an adjunct, see Table 1 and Figure 1. In condition 1 (verb + object), in 13 out of the total of 14 instances the verb was unaccented, and one instance was difficult to interpret. In condition 2 (verb + adjunct), in 11 instances the verb was accented and in 3 unaccented, but the latter accentuation pattern seems

to induce an interpretation whereby the adjunct is narrowly focused and the verb is given information (according to the intuition of the authors).

**Table 1.** Accentuation of the verb in the presence of the object vs. an adjunct.

	C1 (verb + object)	C2 (verb + adjunct)
Verb accented	0	11
Verb unaccented	13	3
Uncertain	1	0
Total	14	14



**Figure 1.** Sentences *Triinu maalis laeva* ‘Triinu paint-PAST.3SG ship-GEN.SG’ ‘Triinu painted a ship’ (top, Condition 1) and *Linda maalib ateljees* ‘Linda paint-PRS.3SG studio-INESS.SG’ ‘Linda is painting in the studio’ (bottom, Condition 2), produced by the same speaker.

This result confirms that predicate-argument structure does correlate with the accentuation of the verb. Specifically, arguments and adjuncts affect the accentuation of the verb differently: an adjacent argument, unlike an adjunct, causes the preceding verb to be unaccented.

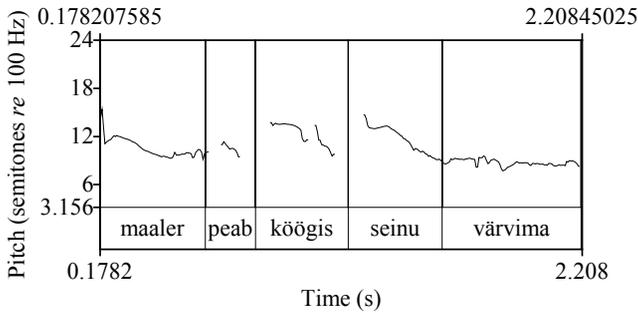
This descriptive generalisation can be assigned different theoretical interpretations. According to a widely accepted approach (e.g. Frota 2000, Hellmuth 2007, Ladd 2008), the distribution of pitch accents is to be defined in terms of prosodic structure and the placement of prosodic phrase stress. This approach predicts that a different effect of arguments and adjuncts on the accentuation of the verb reflects different prosodic groupings in the two cases. In Estonian, prosodic structure above the level of the prosodic word has not been systematically studied. Asu (2004) suggests that Estonian has a single prosodic unit above the prosodic word, the intonation phrase, which encompasses the entire clause. Consequently, the different effect of arguments and adjuncts on the accentuation of the verb could be a sign of the existence of an intermediate level of prosodic structure, or of recursive intonation phrases. In future studies it will thus be relevant to verify whether the patterns [verb + object] and [verb + adjunct] show any other evidence of different prosodic structure. If they do not, as predicted by the previous descriptions of Estonian (Asu 2004), i.e. if accentuation can vary depending on predicate-argument structure without variation in prosodic structure, this would call into question the assumption that accent placement is determined by prosodic structure. And conversely, if other evidence of different prosodic structure can be found, the different accentuation patterns would support the positing of an intermediate prosodic unit in Estonian, or of recursive or smaller intonation phrases.

Prosodic structure in turn is assumed to be determined (partly) by syntactic structure (e.g. Nespor and Vogel 2007, Selkirk 2000, Truckenbrodt 1999). Consequently, the different effect of arguments and adjuncts on prosodic structure (and thereby on accentuation) is assumed to arise from the fact that arguments and adjuncts occur in different syntactic positions. The reason why a verb adjacent to an argument is not accented is that it does not constitute the kind of syntactic unit (e.g. an XP) that would correspond to a prosodic unit receiving stress. Instead, the verb and the argument are part of the same relevant prosodic unit, which is stressed on the argument.

This account seems to predict that in a discourse-configurational language, arguments and adjuncts should not have a different effect on prosodic structure (and accent distribution) since their syntactic relationship with the verb should be the same (Hale 1983). Consequently, the fact that a difference was found in the present study could constitute evidence either against Estonian being a discourse-configurational language or against the assumption that the effect of predicate-argument

structure on prosody is necessarily mediated by syntax<sup>5</sup>. Further study is needed in order to discuss the implications of the present findings for these theoretical questions.

The second hypothesis too was confirmed: in the pattern [object + verb], the verb was unaccented in all 28 instances, see Figure 2. In other words, it is confirmed that the presence of an adjacent argument causes the verb to be deaccented even when the verb is the rightmost content word in the sentence. This constitutes further evidence to the effect that Estonian belongs to the category of languages with plastic accent placement, as already suggested by the studies that examined the effect of narrow focus on accentuation. The present study confirms that predicate-argument structure is one of the factors that may cause the nuclear accent to shift to the left from the rightmost content word in Estonian.



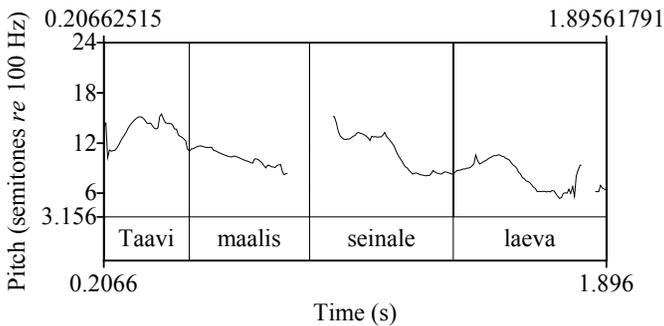
**Figure 2.** A rendering of the sentence *Maaler peab köögis seinu värvima* ‘painter-NOM.SG must-PRS.3SG kitchen-INESS.SG wall-PART. PL paint-INF’ ‘A painter must paint the walls in the kitchen’ (Condition 3), with an unaccented sentence-final verb following the object.

The third hypothesis is also borne out: in the condition [verb + adjunct + object], the verb is almost always unaccented and the adjunct and the object are accented (see Table 2 and Figure 3). It can thus be concluded that the presence of an argument conditions the deaccentuation of the verb also across an intervening adjunct, given that in the presence of an adjacent adjunct alone the verb is accented, as shown by Condition 2.

<sup>5</sup> In fact, there are proposals to the effect that argument structure affects prosody directly, cf. Büring (2012).

**Table 2.** Accentuation of the verb, adjunct and object in the pattern [verb + adjunct + object] (Condition 4).

	Verb	Adjunct	Object
Accented	1	27	28
Unaccented	23	0	0
Uncertain	4	1	0
Total		28	

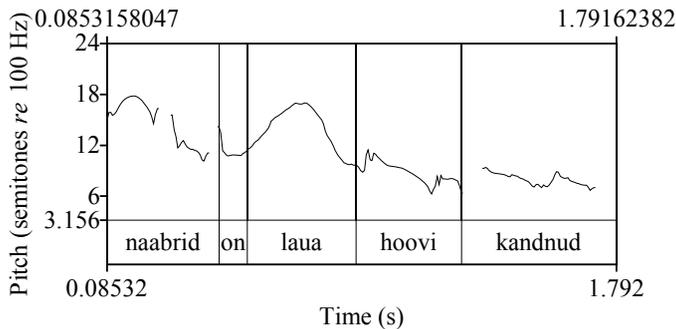
**Figure 3.** The sentence *Taavi maalis seinale laeva* ‘Taavi paint-PAST.3SG wall-ALL.SG ship-GEN.SG’ ‘Taavi painted a ship on the wall’ (Condition 4), produced by the same speaker as in Figure 1.

It remains open whether this accentuation pattern should be interpreted as a sign of the adjunct being embedded in a larger prosodic unit constituted by the verb and the object, or of the verb being integrated into the prosodic phrase of the adjunct, or whether a still different explanation is in order. Again, further studies into the prosodic structure of Estonian are needed to clarify this. It could be hypothesised that if the adjunct constituted an embedded prosodic phrase, it would exhibit signs of prosodic subordination. Féry (2011) proposes that the prosodic subordination of an adjunct in a post-nuclear position entails the deaccentuation of the adjunct (see above). In pre-nuclear position, deaccentuation is less expected, but the possible subordination of the adjunct could be manifested in some other way, for instance as an absence of downtrend between the adjunct and the object. This could be checked in 14 instances that were produced with a H\*+L accent both on the adjunct and the object. From these, downtrend could be observed in 6 cases and was absent in the remaining cases, which is inconclusive.

The fourth hypothesis was that in the pattern [object + directional adjunct + verb], the accentuation will vary. This is indeed to some extent the case, but unlike in German, the different accentuation patterns do not seem to be synonymous. Also, the variation is not between three possibilities but only two: the object is always accented and the verb always unaccented, with only the adjunct displaying variability (see Table 3). The results thus confirm again that a (sentence-final) verb is unaccented also when an adjunct occurs between the verb and its object. The variable accentuation of the adjunct, however, raises further questions.

**Table 3.** Accentuation of the verb, adjunct and object in the pattern [object + directional adjunct + verb] (Condition 5).

	Verb	Adjunct	Object
Accented	0	8	20
Unaccented / flat	20	12	0
Total	20	20	20



**Figure 4.** A rendering of the sentence *Naabrid on laua hoovi kandnud* ‘neighbour-NOM.PL be-PRS.3SG table-GEN.SG courtyard-ILL.SG carry-PAST.PTCP’ ‘‘The neighbours have carried a table into the courtyard’’ (Condition 5), with no pitch accent on the adjunct and the verb.

From the total of 20 analysable instances (one instance had to be discarded for technical reasons), 12 presented a flat (or interpolated) contour on the adjunct (see Figure 4) and 8 an identifiable pitch accent on the adjunct. However, from the latter, 3 exhibited small disfluencies and 2 sounded marked (exaggerated). In the remaining 3 instances, the

adjunct seemed to be interpretable only as being narrowly focused and the object as given information (according to the judgment of the two authors). In other words, the preliminary results suggest the hypothesis (to be further verified) that (in a neutral and fluent rendering) only the pattern where the adjunct is unaccented is compatible with the broad focus reading. This possibility and the pattern in general raise several questions.

The first question is how to interpret the flat contour on the adjunct. Is it an instance of deaccentuation, e.g. of post-nuclear deaccentuation caused by the prosodic subordination of the adjunct, as proposed by Féry (2011) for the similar pattern in German? Or should it be analysed as an instance of downstep or pitch compression? Further studies are needed in order to verify whether the adjunct is perceived as being accented or unaccented, and whether it displays any non-tonal correlates of phrase stress (not yet studied in Estonian).

The second question that arises is why this condition caused more disfluencies and more variation than for instance the condition verb-adjunct-object, despite the fact that only one rendering seems to be compatible with the relevant context. We propose that the order object-adjunct is less frequent and more marked than the order adjunct-object, and that therefore the corresponding prosodic pattern is also more marked and hence less expected, causing more disfluencies.

The final question is how to interpret the fact that only one accentuation pattern seems to be compatible with broad focus and that the mere presence of an accent on the adjunct seems to induce a narrow focus reading. Various explanations can of course be offered. For instance, it could be hypothesised that the constraint inducing adjunct subordination proposed by Féry (2011) and the consequent deaccentuation are obligatory in Estonian. However, that the described accentuation pattern is not related to adjunct subordination and verb-argument non-adjacency is suggested by the fact that the same kind of prosodic reduction of post-object directional arguments and adjuncts under broad focus (and similar narrow-focus interpretation in case of accentuation) seems to occur in non-verb-final sentences, i.e. in a sentence like *Naabrid kannavad lauda hoovi* ‘neighbour-NOM.PL carry-PRS.3PL table-PART.SG courtyard-ILL.SG’, ‘The neighbours are carrying a table into the courtyard’.

Büring (2012) explains the prosodic specificity of locational and directional complements by suggesting that they are semantically predicates and therefore behave prosodically like predicates, too. However, the results of the present study show that locational/

directional complements do not behave in all respects like predicates (verbs). While verbs are deaccented both prenuclearly (in conditions 1 and 4) and postnuclearly (in conditions 3 and 5), the former is not true of locational/directional complements: in conditions 3 and 4 the test sentences contain a prenuclear locational adjunct, which is never unaccented in the data (see table 2 for condition 4). Furthermore, it should be tested if other adjuncts occurring neutrally in post-object position in Estonian behave differently from directional complements (e.g. adjuncts in sentences like *Ta täidab klaasi veega* ‘3SG fill-PRS.3SG glass-PART.SG water-COM.SG’ ‘He/She is filling a glass with water’): if they exhibit the same behaviour as directional complements, this behaviour is less likely to be attributable to the predicate status of the complement.

We therefore propose an additional hypothesis to explain the prosodic reduction of the adjunct: that the post-object position where the adjunct is located is inherently related to narrow focus (either a syntactic focus position or simply a position that is habitually related to narrow focus), given that this is the position where arguments and adjuncts that normally occur before the verb are placed in order to syntactically mark them as narrowly focused, cf. examples (1) and (2). Deaccentuation or pitch compression could therefore be necessary in order to avoid the narrow focus interpretation that is associated with the post-object position.

(1) Broad focus, adjunct precedes the object:

- a. *Triinu sööb aias kooki.*  
 Triinu eat-PRS.3SG garden-INESS.SG cake-PART.SG  
 ‘Triinu is eating some cake in the garden’

- b. *Triinu tahab aias kooki süüa.*  
 Triinu want-PRS.3SG garden-INESS.SG cake-PART.SG eat-INF  
 ‘Triinu wants to eat some cake in the garden’

(2) Narrow focus on the adjunct, adjunct follows the object:

- a. *Triinu sööb kooki aias.*  
 Triinu eat-PRS.3SG cake-PART.SG garden-INESS.SG  
 ‘Triinu is eating the cake IN THE GARDEN’

- b. *Triinu tahab kooki aias süüa.*  
 Triinu want-PRS.3SG cake-PART.SG garden-INESS.SG eat-INF  
 ‘Triinu wants to eat the cake IN THE GARDEN’

To summarise, it is not clear how the accentuation of the two patterns with an adjunct intervening between the object and verb should be interpreted, but in both examined patterns – [verb + adjunct + object] and [object + directional adjunct + verb] – the verb is unaccented, exactly like when it is adjacent to the argument. The results thus show that when a verb is complemented by an argument, it is unaccented independently of whether it is sentence-final or not and whether the argument is adjacent to it or not. The reported study was not designed to permit the phonetic analysis of the data. This will nevertheless be necessary in future studies as it was not always possible to identify the presence or absence of an accent by mere visual inspection (see e.g. Table 1). Furthermore, it has been found for the closely related Finnish language that although the presence of an argument has an effect on the accentuation of the verb, this effect is not necessarily interpretable as deaccentuation (Arnhold et al. 2010).

#### 4. Conclusion

The study reported in this paper aimed to establish whether, in Estonian, the presence of an adjacent argument causes the verb to be deaccented, including when the verb occurs in sentence-final position or is separated from the argument by an intervening adjunct.

The results showed that generally the verb is in all these cases unaccented, unlike when complemented only by an adjacent adjunct, in which case the verb is accented. This result will have to be confirmed by a phonetic analysis of the intonation on the verb.

More generally, the results confirm that Estonian typologically belongs to the category of languages with plastic nuclear accent placement: like narrow focus, predicate-argument structure can cause the nuclear accent to shift to the left from the sentence-final position. The results thus also confirm that predicate-argument structure is one of the factors determining sentence accent placement in Estonian.

The study also raised a number of questions for further research. For one, the questions concern the theoretical interpretation of the different effect of arguments and adjuncts on verb accentuation. Firstly, is the correlation between verb accentuation and predicate-argument structure mediated by prosodic structure and syntax, especially given that Estonian has been proposed to possess a single prosodic unit above the prosodic word, the intonation phrase, which is furthermore assumed to encompass the entire clause, and that Estonian may be considered a

discourse-configurational language where arguments and adjuncts are not syntactically different? Secondly, how to interpret the deaccentuation of the verb in the two patterns with an intervening adjunct: is it to be interpreted as the embedding of the adjunct into a larger prosodic phrase constituted by the verb and the object, or as the integration of the verb into the phrase of the adjunct, or as something else?

Questions are also raised by the flat contour of the adjunct in the pattern [OBJECT + directional adjunct + verb]. First it is necessary to verify the impression that only the rendering where the adjunct is flat is compatible with the broad focus interpretation, whereas a pitch movement on the adjunct automatically produces a narrow focus reading. Secondly, it must be verified whether the adjunct is indeed deaccented or simply compressed. Finally, it is necessary to test the hypothesis that the phenomenon is related to the fact that the post-object position is inherently associated with narrow focus.

### **Acknowledgements**

The study was supported by the institutional research grant IUT35-1 of the Estonian Ministry of Education and Research, and by the University of Tartu research project base funding PFLEE15908.

#### **Addresses:**

Heete Sahkai  
Institute of the Estonian Language  
Roosikrantsi 6, 10119 Tallinn, Estonia  
Tel.: +372 6177 510  
E-mail: Heete.Sahkai@eki.ee

Ann Veismann  
University of Tartu  
Jakobi 2-402, 51014 Tartu, Estonia  
E-mail: ann.veismann@ut.ee

## References

- Aavik, Johannes (1936). *Eesti õigekeelsuse õpik ja grammatika*. [Estonian orthography and grammar.] Tartu: Noor-Eesti.
- Arnhold, Anja, Martti Vainio, Antti Suni and Juhani Järvikivi (2010) “Intonation of Finnish verbs”. In *Speech Prosody 2010* 10054:1–4. Available online at <<http://speechprosody2010.illinois.edu/papers/100054.pdf>>. Accessed on 13.03.2015.
- Asu, Eva Liina (2004) *The phonetics and phonology of Estonian intonation*. PhD dissertation, University of Cambridge.
- Boersma, Paul and David Weenink (2012) Praat: Doing phonetics by computer. Version 5.3.14 [Computer program]. Available online at <<http://www.praat.org/>>. Accessed on 13.04.2012.
- Büring, Daniel (2012). “Predicate integration: phrase structure or argument structure?” In A. Neeleman and I. Kučerová, eds. *Contrasts and positions in information structure*, 27–47, Cambridge: Cambridge University Press.
- Féry, Caroline (2011) “German sentence accents and embedded prosodic phrases”. *Lingua* 121, 1906–1922.
- Féry, Caroline and Laura Herbst (2004) “German sentence accent revisited”. *Interdisciplinary Studies on Information Structure* 1, 43–75.
- Frota, Sónia (2000) *Prosody and focus in European Portuguese: phonological phrasing and intonation*. New York: Garland.
- Gussenhoven, Carlos (1992) “Sentence accents and argument structure”. In I. M. Roca, ed. *Thematic structure: its role in grammar*, 79–106. Berlin, New York: Foris.
- Hale, Ken (1983) “Warlpiri and the grammar of non-configurational languages”. *Natural Language and Linguistic Theory* 1, 5–47.
- Hellmuth, Sam (2007) “The relationship between prosodic structure and pitch accent distribution: evidence from Egyptian Arabic”. *The Linguistic Review* 24, 291–316.
- Kratzer, Angelika and Elisabeth Selkirk (2007) “Phase theory and prosodic spellout: the case of verbs”. *The Linguistic Review* 24, 93–135.
- Ladd, D. Robert (2008) *Intonational phonology*. Cambridge: Cambridge University Press.
- Nespor, Marina and Irene Vogel (2007) *Prosodic phonology: with a new foreword*. Berlin: Mouton de Gruyter.
- Sahkai, Heete, Mari-Liis Kalvik, and Meelis Mihkla (2013) “Prosodic effects of information structure in Estonian”. In E. L. Asu and P. Lippus, eds. *Nordic prosody: proceedings of the XIth conference, Tartu 2012*, 323–332. Frankfurt am Main: Peter Lang Edition.
- Salveste, Nele (2013) “Focus perception in Estonian: is it governed by syntax or prosody?”. In E. L. Asu and P. Lippus, eds. *Nordic prosody: proceedings of the XIth conference, Tartu 2012*, 333–342. Frankfurt am Main: Peter Lang Edition.
- Salveste, Nele (2015) On the pragmatic functions of Estonian sentence intonation. PhD dissertation. Ludwig Maximilians University Munich.

- Selkirk, Elisabeth (2000) "The interaction of constraints on prosodic phrasing". In M. Horne, ed. *Prosody: theory and experiment. Studies presented to Gösta Bruce*, 231–261. Dordrecht, Boston, and London: Kluwer Academic Publishers.
- Tael, Kaja (1988) *Sõnajärjemallid eesti keeles (võrrelduna soome keelega)*. [Word order patterns in Estonian (in comparison with Finnish).] (Preprint KKI-53.) Tallinn: Eesti NSV Teaduste Akadeemia Keele ja Kirjanduse Instituut.
- Truckenbrodt, Hubert (1999) "On the relation between syntactic phrases and phonological phrases". *Linguistic Inquiry* 30, 219–255.
- Vallduví, Enric (1991) "The role of plasticity in the association of focus and prominence". In Y. No and M. Libucha, eds. *Proceedings of the seventh Eastern States conference on linguistics*, 295–306. Ohio: The Ohio State University.
- Vallduví, Enric and Elisabet Engdahl (1996) "The linguistic realization of information packaging". *Linguistics* 34, 459–519.
- Van Valin, Robert D. Jr. (1999) "A typology of the interaction of focus structure and syntax". In E. Raxilina, J. Testelec, eds. *Typology and the theory of language: from description to explanation*, 511–524. Moscow: Languages of Russian Culture.
- Vilkuna, Maria (1989) *Free word order in Finnish: its syntax and discourse functions*. Helsinki: Suomalaisen kirjallisuuden seura.

**Appendix**

Test sentences used in the experiment.

Condition 1, [verb + object]

1. *Triinu sõi kommi.*  
 Triinu eat-PAST.3SG candy-PART.SG  
 “Triinu ate candies.”

2. *Triinu maalis laeva.*  
 Triinu paint-PAST.3SG ship-GEN.SG  
 “Triinu painted a ship.”

Condition 2, [verb + adjunct]

1. *Triinu sõi aias.*  
 Triinu eat-PAST.3SG garden-INESS.SG  
 “Triinu was eating in the garden.”

2. *Linda maalib ateljees.*  
 Linda paint-PRS.3SG studio-INESS.SG  
 “Linda is painting in the studio.”

Condition 3, [object + verb]

1. *Maaler peab köögis seinu värvima.*  
 painter-NOM.SG must-PRS.3SG kitchen-INESS.SG wall-PART.PL paint-INF  
 “A painter must paint the walls in the kitchen.”

2. *Külalised hakkasid toas filme vaatama.*  
 guest-NOM.PL start-PAST.3PL room-INESS.SG movie-PART.PL watch-INF  
 „The guests started to watch movies in the house.”

3. *Taavi proovis seinale laeva maalida.*  
 Taavi try-PAST.3SG wall-ALL.SG ship-PART.SG paint-INF  
 “Taavi tried to paint a ship on the wall.”

4. *Linda tahab kööki diivani soetada.*  
 Linda want-PRS.3SG kitchen-ILL.SG sofa-GEN.SG buy-INF  
 “Linda wants to buy a sofa in the kitchen”

Condition 4, [verb + adjunct + object]

1. *Triinu sõi aias kooki.*  
 Triinu eat-PAST.3SG garden-INESS.SG cake-PART.SG  
 “Triinu was eating some cake in the garden”
  
2. *Taavi maalis seinale laeva.*  
 Taavi paint-PAST.3SG wall-ALL.SG ship-GEN.SG  
 “Taavi painted a ship on the wall”
  
3. *Külalised vaatasid toas filme.*  
 guest-NOM.PL watch-PAST.3PL room-INESS.SG movie-PART.PL  
 “The guests watched movies in the house.”
  
4. *Taavi loopis tunnis palli.*  
 Taavi throw-PAST.3SG class-INESS.SG ball-PART.SG  
 “Taavi was throwing a ball in the class.”

Condition 5, [object + directional adjunct + verb]

1. *Naabrid on laua hoovi kandnud.*  
 neighbour-NOM.PL be-PRS.3SG table-GEN.SG courtyard-ILL.SG carry-PAST.PTCP  
 “The neighbours have carried a table into the courtyard.”
  
2. *Mart pidi viina jaama unustama.*  
 Mart must-PAST.3SG vodka-GEN.SG station-ILL.SG forget-INF  
 “Mart almost left a bottle of vodka in the station.”
  
3. *Taavi tahtis kuule auku veeretada.*  
 Taavi want-PAST.3SG marble-PART.PL hole-ILL.SG roll-INF  
 “Taavi wanted to roll marbles into a hole.”

**Kokkuvõte. Heete Sakkai ja Ann Veismann: Argumentstruktuur ja verbi lauserõhulisus eesti keeles.** Artiklis tutvustatakse uurimust, mille eesmärk oli kindlaks teha, kas eesti keeles kehtib levinud seaduspära, et koos objektiga fookuses olev verb ei kannu lauserõhku. Uurimuses kontrolliti seaduspära kehtimist ka juhtudel, kus verb asub lause lõpus või ei paikne objektiga kõrvuti, vaid on lahutatud sellest vaba laiendiga. Tulemused näitavad, et kõigil neil juhtudel on verb rõhutu, erinevalt juhtumist, kus verbi laiendab üksnes vaba määrus. Uurimuse üldisem tulemus on, et eesti keel kuulub tüpoloogiliselt plastilise lauserõhu asukohaga keelte hulka ning et argumentstruktuur on üks neist teguritest, mis määravad lauserõhu asukohta eesti keeles. Tulemused tõstatavad ka edasist uurimist nõudvaid küsimusi, mis puudutavad eelkõige kirjeldatud seaduspärade teoreetilist tõlgendamist.

**Märksõnad:** eesti keel, lauserõhk, deaktsentueerimine, argumentstruktuur