Interdisciplinary Studies on Information Structure Vol. 17

Information Structure: Empirical Perspectives on Theory

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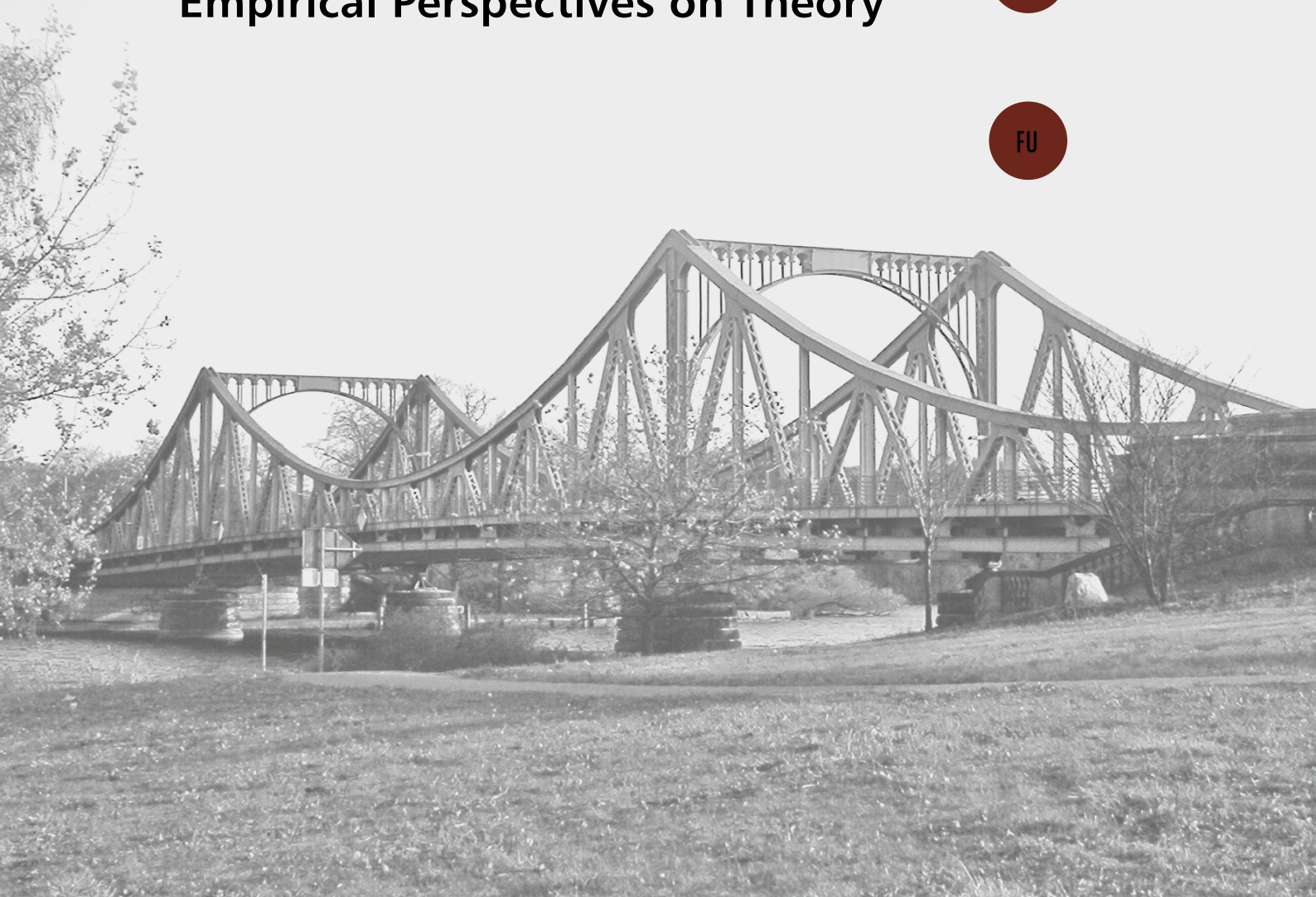

Interdisciplinary Studies on Information Structure

ISIS | Working Papers of the SFB 632 | 17

Maria Balbach | Lena Benz | Susanne Genzel |
Mira Grubic | Agata Renans | Sören Schalowski |
Maja Stegenwallner | Amir Zeldes (Eds.)

Information Structure: Empirical Perspectives on Theory

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Preface

The papers collected in this volume were presented at a Graduate/Postgraduate Student Conference with the title *Information Structure: Empirical Perspectives on Theory* held on December 2 and 3, 2011 at Potsdam-Griebnitzsee. The conference was organized by the SFB 632 graduate students Maria Balbach, Lena Benz, Frauke Berger, Susanne Genzel, Sabrina Gerth, Mira Grubic, Agata Renans, Julia Ritz, Sören Schalowski, Maja Stegenwallner, Marta Wierzba, Seda Yilmaz, and Amir Zeldes.

The main goal of the conference was to connect young researchers working on information structure (IS) related topics and to discuss various IS categories such as givenness, focus, topic, and contrast. The aim of the conference was to find at least partial answers to the following questions: What IS categories are necessary? Are they gradient/continuous? How can one deal with optionality or redundancy? How are IS categories encoded grammatically? How do different empirical methods contribute to distinguishing between the influence of different IS categories on language comprehension and production?

To answer these questions, a range of languages (Avatime, Chinese, German, Ishkashimi, Modern Greek, Old Saxon, Russian, Russian Sign Language and Sign Language of the Netherlands) and a range of phenomena from phonology, semantics, and syntax were investigated. The presented theories and data were based on different kinds of linguistic evidence: syntactic and semantic fieldwork, corpus studies, and phonological experiments. The six paper presented in this volume discuss a variety of IS categories, such as emphasis and contrast (Stavropoulous, Titov), association with focus and topics (van Putten, Karvovskaya), and givenness and backgrounding (Kimmelmann, Röhr).

Pepi Stavropoulou (*On the Status of Contrast. Evidence from the Prosodic Domain*) presents data from a controlled Modern Greek production experiment which investigates the status of contrast as a distinct information structural component. She argues for a special status of correction in grammar and proposes that only correction is truly contrastive.

In her paper *Scrambling and Interfaces*, Elena Titov proposes a novel account for Russian OVS-structures. Her analysis is based on the interaction of thematic and information structural prominence relations. For Russian OVS-constructions, she argues for a base-generation analysis in which the correct information structural mapping wins over a transparent mapping of thematic relations and word order. With her idea, Titov offers an insightful mechanism for cross-linguistic differences in the realization of information structure.

Saskia van Putten (*The Meaning of the Avatime Additive Particle tsyɛ*) discusses the semantics of the Avatime additive particle tsyɛ. Her investigations are based on a corpus of recordings that she gathered during her fieldtrips to Ghana. She shows that tsyɛ cannot be analysed in the same way as English and German particles: tsyɛ does not have to associate with the element in focus and does not impose an identity requirement between the expressed proposition and an alternative. Van Putten argues for a language specific definition of the particle tsyɛ.

In *'Also' in Ishkashimi: Additive Particle and Sentence Connector*, Lena Karvovskaya discusses a syntactic puzzle concerning the additive(-scalar) particle -məs ('also', 'even') in the Pamir language Ishkashimi: In contrast to the generalization that focus-sensitive operators can only associate with foci in their syntactic scope, the operator -məs can associate with focus from within the fo-

cus. Additionally, the paper discusses some semantic properties of the particle, most importantly the fact that it can be used as a coordinating conjunction similar to English 'and', but may not associate with contrastive topics. The data presented in this paper were elicited in syntactic/semantic fieldwork.

In *Doubling in RSL and NGT: a Pragmatic Account*, Vadim Kimmelman discusses the causes of a doubling phenomenon which is common in both Russian Sign Language (RSL) and Sign Language of the Netherlands (NGT). Providing evidence from corpora of narratives, Kimmelman argues against analyses positing that doubling is a strategy to save derivations that would otherwise crash, and against analyses suggesting that the doubled constituent is emphasized or new. Instead, he argues that the doubled constituent is foregrounded, a notion which he takes to be orthogonal to the new/given distinction, and applicable to topical as well as focused constituents.

Christine Röhr's paper (*Information Status and Prosody: Production and Perception in German*) investigates the marking of information status in German by purely prosodic means, using multiple experiments. The study concentrates on the correlation between levels of givenness and prosodic prominence of constituents. By analyzing the results from both a production experiment manipulating the givenness of a target referent and two perception experiments on the acceptability and information status of referents with and without contextual cues, she shows how progressively stronger marking, coded in the GToBI scheme, can serve as a cue predicting referents' levels of givenness. As a result of the investigation, the study also offers empirical evidence for identifiable information status categories on the scale between given and new.

We are very grateful to the authors for their contributions to this volume. We would also like to thank all presenters for their interesting presentations and stimulating discussions.

Many thanks to Sarah Dietzfelbinger and Simone Pfeil who helped in editing and correcting this volume and to Beate Bergmann, Stella Gryllia and Radek Šimík who helped in reviewing the papers. We would also like to thank the SFB 632 for support in organizing the workshop.

Presenters whose contributions are not represented in the present volume are: Franziska Scholz and Yiya Chen (*Contrastive Focus and Tone Sandhi in Wenzhou Chinese*), Line Burholt Kristensen, Elisabeth Engberg-Pedersen, and Mads Poulsen (*Effects of Context on Word Order Processing*), Ramon Ziai (*Towards Focus Detection in Content Assessment*), George Walkden (*Object Position and Heavy NP Shift in Old Saxon and Beyond*), and Ewa Trutkowski (*Topic Drop at the Syntax-Semantics-Pragmatics Interface*).

Maria Balbach
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Contents

On the Status of Contrast. Evidence from the Prosodic Domain

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University of Ioannina

Recent models of Information Structure (IS) identify a low level contrast feature that functions within the topic and focus of the utterance. This study investigates the exact nature of this feature based on empirical evidence from a controlled read speech experiment on the prosodic realization of different levels of contrast in Modern Greek. Results indicate that only correction is truly contrastive, and that it is similarly realized in both topic and focus, suggesting that contrast is an independent IS dimension. Non default focus position is further identified as a parameter that triggers a prosodically marked rendition, similar to correction.

Keywords: Information Structure, Prosody, Contrast, Correction, Markedness

1 Introduction

The work described in this paper builds on evidence from the prosodic domain to explore questions on the status of contrast as a distinct Information Structure (IS) component, as well as its relation to other widely acknowledged IS components such as the focus and the topic of the utterance.

1.1 Contrast as part of an IS representation

Despite the divergence in opinions regarding the exact representation of IS, there are some key intuitions pertaining to all – or at least most – theoretical approaches (cf. Büring, 2007; Kruijff-Korbayová & Steedman, 2003). These intuitions refer to a) a distinction of givenness or contrast, which has been linked to notions such as referential status, denotation of alternatives made available in

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context or even mere previous mentioning, and b) the association of the focused elements with the wh-element of a preceding question. The latter can be linked to proposed utterance partitions into complementary parts such as topic and focus/comment or theme and rheme, as well as notions such as presupposition, Question under Discussion (QUD) and so forth (see Jackendoff, 1972; Gundel, 1989; Steedman, 2000; Büring, 2007 among others).

Accordingly, more complex models of IS have been proposed, which incorporate the above mentioned elements into a two-dimensional view of the organization of information within the utterance (Vallduvi & Vilkuna, 1998; Steedman, 2000; Büring, 2007; Krifka, 2008). More specifically, the first dimension involves a horizontal, syntagmatic partition into a topic and a focus part (or topic-comment, theme-rheme and so forth, depending on the adapted notation and terminology). The topic part anchors the utterance to the previous discourse, while the focus part answers the underlying question, advancing the discourse and updating the common ground. The second dimension involves a vertical, paradigmatic feature of givenness or contrast among alternative discourse entities, which can function both within the topic and the focus part of the utterance. Example (1) illustrates the two dimensions. Prosodically prominent words are capitalized. "C" subscript stands for contrast, and refers to the second IS dimension.

(1) What did the tourists want?
The British tourist wanted to rent the blue car. (The $\text{ITALIAN}_{\text{C}}$ tourist)$_{\text{TOPIC}}$ (wanted to rent the RED_{C} car.)$_{\text{FOCUS}}$

Nevertheless, there is still no consensus on the exact relation between the two dimensions (cf. Halliday, 1967; Lambrecht, 1994; Steedman, 2000; Molnár, 2002; Gryllia, 2008; Hartmann, 2008 among others). Halliday (1967), for example, considers the givenness/contrast dimension as independent of the

theme-rheme distinction. Kruijff-Korbayová and Steedman (2003), on the other hand, view the two dimensions as different, yet interdependent aspects of the same structure. In Steedman's (2000) view, the type of the Nuclear Pitch Accent assigned to the contrastive element is dependent upon the θ or ρ marking property of the element (where θ and ρ stand for theme and rheme respectively). Furthermore, in another line of research, evidence on the grammatical encoding of different *levels* of contrast (or the lack of it) is used in favor or against the postulation of an independent contrast feature (Molnár, 2002; Gryllia, 2008; Hartmann, 2008).

1.2 The different levels of contrast

Several researchers (Gussenhoven, 2007; Molnár, 2002) propose the existence of different types of contrast, based on evidence from various languages that grammatically encode them. Molnár for example identifies the following contrast hierarchy within the linguistic literature (from weaker (1) to stronger (5)):

1. mere *highlighting* through accentuation
2. existence of a *dominant contrast*, dividing the utterance into a focus and background part
3. existence of an *open set of alternatives*
4. existence of a *limited closed set of alternatives*
5. *explicit mentioning of alternatives* in the context (i.e. existence of a salient directly accessible set).

It should be noted that this hierarchy clearly diverges from the two dimensional views of IS, as it intermingles the two dimensions (e.g., "dominant contrast" and "mentioning of alternatives") applying them on the same level of structure. Furthermore, it makes no direct reference to the notion of correction. Recent work has pointed out the importance of correction as a special type of contrast

with distinct prosodic markers (Gussenhoven, 2007; Greif, 2010). It is actually the case that – in some languages at least (e.g., Efik, Basque, Mandarin Chinese) – only correction as opposed to other sub-notions of contrast is expressed differently. Nevertheless, this hierarchical approach provides useful insight on the possibility of a finer grained notion of contrast, which – once elements overlapping with the syntagmatic dimension of IS are factored out – can be incorporated in a two dimensional view of Information Structure. (2) is an example of such an incorporation where highlighting (±h), closed set (±cs) and correction (±cor) are represented as binary distinctive features.

(2) What did the tourists want?
The British tourist wanted to rent the blue car. (The $\text{ITALIAN}_{C[+h,+cs,-cor]}$ tourist)$_{TOPIC}$ (wanted to rent the $\text{RED}_{C[+h,+cs,-cor]}$ car.)$_{FOCUS}$

Furthermore, with regards to the notion of correction, Vallduvi's (1992) "informational" approach can provide an account of the special status of correction. According to this approach, different IS organizations of the utterance correspond to different sets of instructions as to where and how the information (propositional content of the utterance) must be entered to the hearer's knowledge store. In this sense, correction is a more complex process, as it doesn't merely indicate the location to which updated information should be entered (as is the case with simple topics) nor does it involve a mere addition of information (as is the case with information focus). In contrast, it involves both locating *and* replacing (subtracting *and* adding) a piece of knowledge in the hearer's knowledge store. Alternatively, in a different line of research, the special status of correction may be attributed to the associated low degree of discourse expectability, which calls for a more emphatic, marked rendition (Zimmermann, 2008).

1.3 Research assumptions and hypotheses

Accordingly, in the study at hand, we took a pragmatic approach to IS, which contrary to a semantic approach, is "sensitive" to discourse related notions such as saliency, accessibility and expectability (and hence to the different levels of contrast attested, as shown below). We further assumed a two dimensional partition of IS, representing the contrast dimension as a three level contrast hierarchy (cf. example 2), the three levels being: "no contrast", "closed set of alternatives" and "correction". We then used controlled experiments to explore the prosodic realization of these three levels of contrast in Modern Greek (MG), following an autosegmental metrical approach (Ladd, 1996) for the analysis of the utterance prosody. The analysis served both a descriptive and an interpretive goal. With regards to the former, the prosodic realization of these three levels of contrast was examined within the topic and focus phrase of the utterance, to explore a) whether the different levels of contrast are prosodically encoded in Modern Greek, and b) the aspects of the phonological organization (i.e. phrasing, NPA location, NPA type) that each IS dimension affects.

Furthermore, the following hypotheses were tested with regards to the theoretical independence of the contrast feature: Assuming that contrast is primarily associated with specific words or entities bearing the NPA, different levels of contrast would most likely be reflected through differences in the phonetic and phonological properties of these words on a paradigmatic axis of prominence. Thus, if contrast is an independent IS feature, then it is more likely to have a similar prosodic realization with regards to NPA properties in both topic and focus phrases; that is irrespective of the topic-focus partition. Similarly, different types of contrast may be realized differently, but again irrespective of the topic-focus partition. Finally, marking should be stronger for correction, since it constitutes the highest, most prominent contrast level.

In the following sections, we first briefly outline the relation between prosody and IS, focusing on previous experimental evidence from Modern Greek. Next we present the experimental setup for this study and the results of the analysis. Finally we discuss key findings in light of the theoretical issues stated in the introductory section.

2 Information Structure and Prosody

It is widely acknowledged that there is a strong interaction between Information Structure and Prosody (cf. Ladd, 1996; Truckenbrodt, 1995; Selkirk, 1995; Frota, 2000; Büring, 2007, among many others). In (primarily) plastic languages (Vallduvi, 1992) such as Greek for example, focus places a strong constraint on the location of the nuclear pitch accent, forcing the material following the focused constituent to surface de-accented. Furthermore, the division of the utterance into topic and focus has been shown to align with the division of the utterance into prosodic phrases (Steedman, 2000; Baltazani, 2006). Steedman (2000) further claims that different types of nuclear pitch accents (NPAs) reflect the themehood or rhemehood status of the particular phrase. Results from Gussenhoven (2007) on the other hand indicate that different types of accents may be associated with different *types* of focus, and corrective focus in particular.

In the case of Greek more specifically, Baltazani (2006) has shown that topics in declaratives are realized with a single low tone (L*) NPA and a high boundary tone, whilst foci are produced with a single high tone (H*) NPA and a low boundary tone. The reverse pattern applies in the case of yes/no questions, where the focused word carries a L* NPA, enhancing the contrast to the question's high boundary tone, as suggested by the author. Similarly, the topicalized phrase is produced with a H* accent and a low boundary tone in

question contours, indicating that it is the boundary tone that selects the NPA type rather than some IS contrast.

With regards to the realization of contrast in Greek, Gryllia (2008) examines the realization of different types of contrast across topic and focus for direct and indirect objects in preverbal as well as postverbal position. She reports that corrective focus is realized with slightly lower frequency and intensity and shorter duration, with statistical significance varying depending on the type of object (direct-indirect), measurement point and conditions compared (direction of the effect). She further shows that simple topics differ from contrastive topics with regards to F0, intensity and duration, and that contrastive topics significantly differ from corrective foci providing evidence against the independence of a contrast feature. The results in Gryllia (2008) are not directly comparable to the work that will be presented below, first because the terminology used is different and second because of differences in the approach: Gryllia (2008) follows a holistic configurational approach, while we are working within the Autosegmental-Metrical framework of intonational phonology (see e.g., Ladd, 1996). An attempt to compare the two approaches is beyond the scope of the present paper and such a comparison will therefore not be undertaken.

3 Experimental Set Up

To test the hypotheses outlined in section 1.3, a controlled experiment was carried out examining three levels of contrast ("no contrast", "closed set of alternatives", "correction,") within topic and focus phrases in sentence initial position. All new utterances were also included. However, discussion of all new cases is beyond the scope of this paper, and results are reported based on contrast conditions alone. (3) exemplifies each level of contrast. For ease of

presentation throughout this paper reference is made to different types of topics and foci (e.g., corrective, contrastive etc.); however, what is actually meant is that there is a different level of contrast associated with the topic and the focus of the utterance, as explained below.

More specifically, "no contrast" is associated with *simple* topics and *information* focus, "closed set" is associated with *contrastive* topic and focus, and "correction" is associated with *corrective* topic and focus (see e.g., Rump & Collier (1996) and Krifka (2008) for uses of these terms). Simple topics are already established topics referring to old, already evoked entities, and information focus merely highlights the part of the utterance that is informative, giving no rise to contrast from a pragmatic point of view. In the simple topic example in (3), "lieutenant" is the already established topic based on the preceding question, while information focus simply answers the question corresponding to the wh-part.

The closed set condition, on the other hand, indicates the existence of a salient, directly accessible, limited set of alternatives that stands in relational contrast to the element in focus. In the contrastive topic example, "lieutenant" is in a set membership relationship with the already established topic "officers on the bridge". It therefore constitutes a partial topic shift, in the sense that it does not introduce a completely new topic nor does the exact same topic continue. Instead, the new topic is a subset of the previously established topic. In the QUD approach (Büring, 2003; Roberts, 1996), contrastive topics would indicate the existence of a discourse strategy to answer the question via a set of relative sub-questions (i.e. "What did the mechanic order?", "What did the lieutenant order?" etc.).The contrastive focus example also illustrates the contrast between the members of the salient and closed alternative "officers" set: [lieutenant, mechanic].

(3) Contrast Types

Simple Topic	[ti 'ekane o ipo'pliarxos] What did the lieutenant do? [(o ipo'pliarxos)$_{ST}$ 'ðjetakse tin e'cenosi tu 'pliu] (The lieutenant)$_{ST}$ ordered the evacuation of the ship.
Contrastive Topic	[ti 'ekanan i 'ðio aksiomati'ci] What did the two officers do? [o mixani'kos iðo'piise tin aktofila'ci. (o ipo'pliarxos)$_{CT}$ 'ðjetakse tin e'cenosi tu 'pliu] The mechanic notified the coastguard. (The lieutenant)$_{CT}$ ordered the evacuation of the ship.
Corrective Topic	[ti 'ekane o mixani'kos] What did the mechanic do? [(o ipo'pliarxos)$_{CorT}$ 'ðjetakse tin e'cenosi tu 'pliu] (The lieutenant)$_{CorT}$ ordered the evacuation of the ship.
Information Focus	[pços 'ðjetakse tin e'cenosi tu 'pliu] Who ordered the evacuation of the ship? [(o ipo'pliarxos)$_{IF}$ 'ðjetakse tin e'cenosi tu 'pliu] (The lieutenant)$_{IF}$ ordered the evacuation of the ship.
Contrastive Focus	[pços 'ðjetakse tin e'cenosi tu 'pliu. o ipo'pliarxos 'i o mixani'kos] Who ordered the evacuation of the ship? The lieutenant or the chief mechanic? [(o ipo'pliarxos)$_{CF}$ 'ðjetakse tin e'cenosi tu 'pliu] (The lieutenant)$_{CF}$ ordered the evacuation of the ship.
Corrective Focus	[o mixani'kos 'ðjetakse tin e'cenosi tu 'pliu] The mechanic ordered the evacuation of the ship. [(o ipo'pliarxos)$_{CorF}$ 'ðjetakse tin e'cenosi tu 'pliu] (The lieutenant)$_{CorF}$ ordered the evacuation of the ship.

Finally, correction rectifies misconceptions on the part of the hearer replacing information that is already part of his knowledge store. It directly contrasts with the respective element to be replaced. As well as being contrastive, it is also exhaustive (with reference to the set of entities under discussion). Accordingly, in both corrective topic and focus "lieutenant" replaces "mechanic" in the corresponding entry in the hearer's knowledge store. In the case of topic, it also results in a complete topic shift: in (3) "lieutenant"

introduces a completely new topic compared to the "mechanic". More specifically, the speaker corrects the hearer's misconception that the current discussion is about the mechanic rather than the lieutenant. It should be noted that this exchange is rather uncommon, referring to instances in which a serious "breakdown" in communication has occurred, and in which speakers may typically resolve to lengthier and more elaborate responses, in order to set the conversation back on track. In contrast, in the case of corrective topic, intonation is utilized, in order to provide a "swifter" and – in this sense – more economical response. Similarly, in the case of corrective focus, the negation particle [oçi] ("no") in the beginning of the response utterance was intentionally avoided, as it is also used to express/intensify the speech act of correction, and could thus interfere with the realization of corrective focus reducing its effects.

Target topic and focus phrases consisted of a single content word. In order to be able to measure the effect of /s/-voicing (see below for details on the use of /s/ voicing), the materials were constructed in such a way that the target word ended in /s/, and the subsequent word began with a voiced obstruent or nasal. Furthermore, target words had non-initial and non-final stress, in order to avoid any tonal crowding effects, and allow "room" for the accents to be "properly" realized.

There were four lexicalizations per condition, following disambiguating questions and statements aiming to elicit "context" appropriate speaker responses. The complete set of trigger and target materials is presented in the Appendix. All utterances were produced by 8 speakers of Athenian Greek, 2 males and 6 females (ages ranging from 19 to 36), resulting in a total of 224 (7x4x8) tokens; 192 (6x4x8) tokens if all new sentences are excluded. To avoid priming effects, materials were presented in random order and were part of a single larger recording session, in which two different experiments were conducted serving at the same time as distracters to one another. Subjects were

asked to read both the trigger and the target phrase from a Powerpoint slide show at their own pace. Recordings were conducted in a silent room using an Olympus Linear PCM Recorder LS-10 microphone. The acoustic signal was digitized to 16-bit count accuracy at a 44.1 kHz sampling rate.

Materials were then subjected to both phonological and phonetic analysis. In particular, the resulting corpus was annotated for pitch accent type and local F0 minima and maxima. Annotation was based on GRToBI guidelines (Arvaniti & Baltazani, 2005). GRToBI builds on the original ToBI annotation system (Silverman et al., 1992), identifying the following 5 main types of pitch accents for Greek: L*+H, L+H*, H*+L, H* and L*, where H and L represent high and low level tones respectively, and "*" denotes the central tone associated to the syllable bearing the main word stress.

Furthermore, measurements were taken of: duration (stressed vowel/syllable), mean intensity (stressed vowel/syllable), pre-boundary lengthening (duration from the end of the accented syllable to the end of the target phrase) and /s/ voicing. Measurements of pre-boundary lengthening and /s/ voicing were used as a more objective indication of phrasing. With regards to pre-boundary lengthening, longer duration of the segmental material at the end of a phonological phrase has been shown to correspond to a stronger boundary (Kainada, 2009). As for /s/ voicing, even though recent studies (Pelekanou & Arvaniti, 2001; Baltazani, 2006) suggest that /s/ voicing is a gradient, optional phenomenon and cannot serve as a full proof criterion for the detection of prosodic structure, it may still be assumed that a lower degree of assimilation is more probable in the case of high level boundaries, and could thus serve as an indication of prosodic constituency. For the purposes of this study, the degree of /s/ voicing was expressed proportionally as the duration of /s/ voicing divided by the total duration of /s/, in order to control for any durational variation of /s/ caused by preboundary lengthening and inter-speaker differences. Signal

analysis was performed using Praat (Boersma & Weenink, 2005). Statistical tests were run using IBM's SPSS software. Unless otherwise stated, statistical analysis results are reported for two-way repeated measures ANOVAs with IS_Partition (levels: topic, focus) and Contrast_Level (levels: no contrast, closed set, correction) as factors. To assess the direction of the effect, follow up paired samples t-tests with Bonferroni correction were conducted. It should be pointed out that due to the limited amount of data statistical analysis results should be treated with caution.

4 Results

Figure 1 shows the distribution of PAs across different types of foci and topics. L* and L*+H were the typical accents for simple and contrastive topics with the latter being more frequent (22% and 78%, and 34% and 66% for simple and contrastive topics respectively). Furthermore, 68% and 52% of the L*+H accents in simple and contrastive topics respectively were found in pre-nuclear position based on GRToBI break indices distribution.

In contrast, corrective topics were consistently produced with a L+H* accent (94% of total cases) and delimited by an intonational phrase break. In ~66% of the corrective topic renditions the break occurred immediately after the subject (i.e. the target word), whilst in ~19% of the cases the break occurred after the verb and before the focused object. In both renditions the L+H* accent aligned with the subject, but in the second rendition the verb was produced within a compressed pitch range. Figures 3 and 4 illustrate the two renditions respectively. The remaining 15% of the corrective topic renditions corresponds to cases where – contrary to what was expected – speakers dephrased and deaccented the whole subsequent material, assigning utterance prominence to

the topic rather than the focus phrase. This behavior may be due to the fact that corrective topics are uncommon, and speakers resort to more familiar renditions.

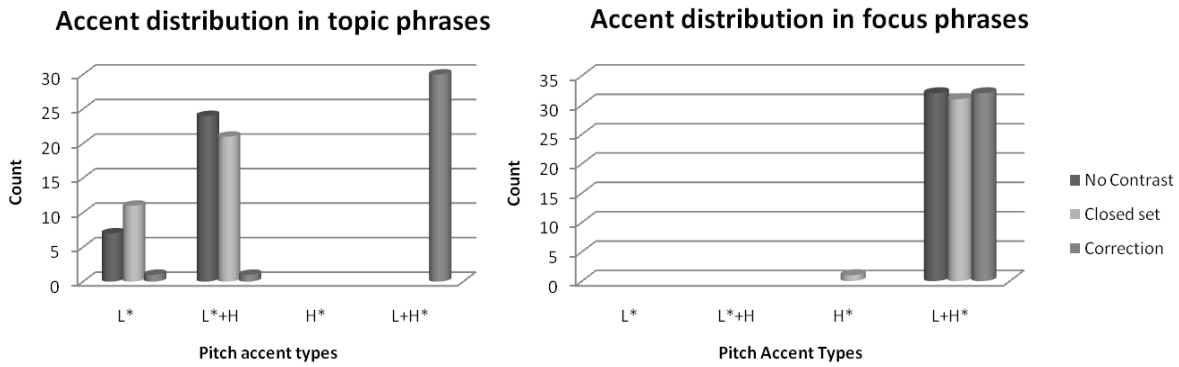

Figure 1 Accent distribution in topic and focus phrases

Similarly to corrective topics, all types of focus were also produced with a L+H* accent; the only difference between corrective topic and focus is that in the case of focus the whole subsequent phrase following the focused subject got deaccented (Fig. 5).

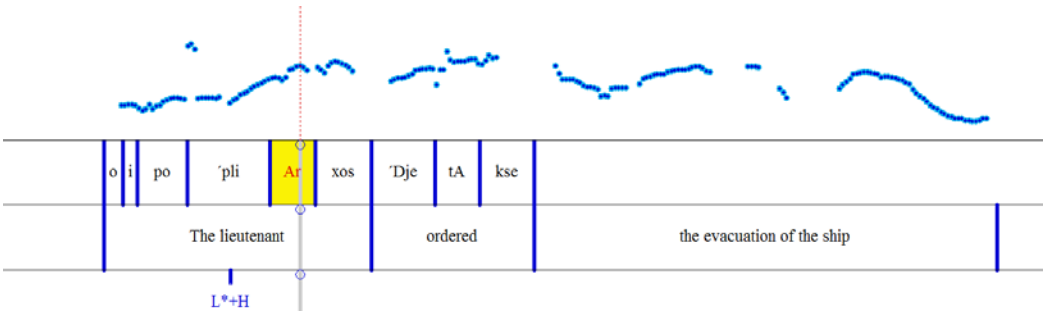

Figure 2 Simple and contrastive topic rendition (L*+H)

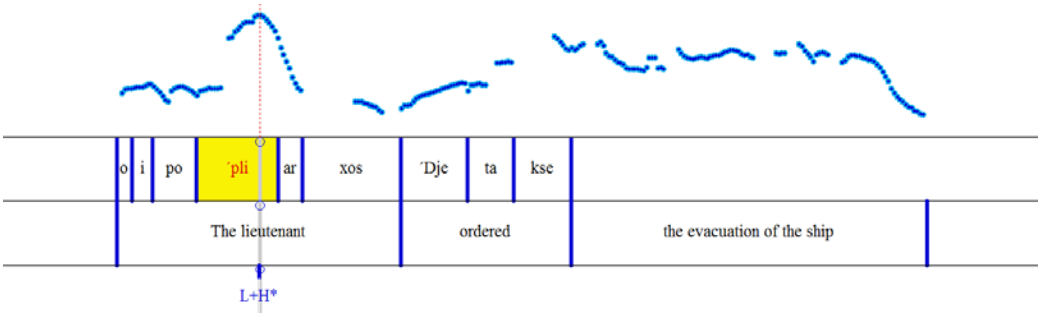

Figure 3 Corrective topic rendition (L+H*) - phrase break after the subject

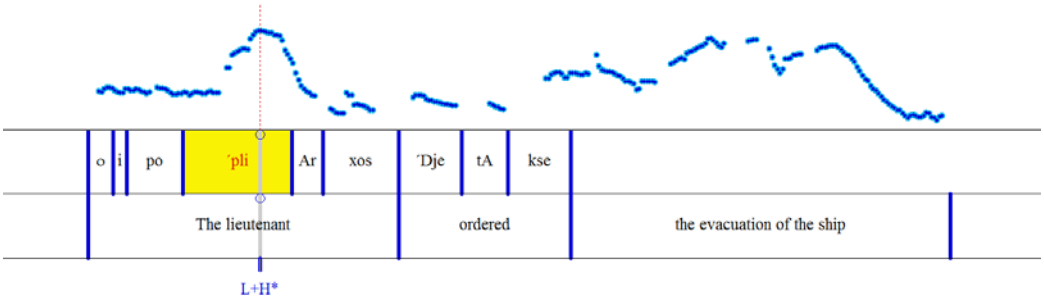

Figure 4 Corrective topic rendition (L+H*) - phrase break after the verb

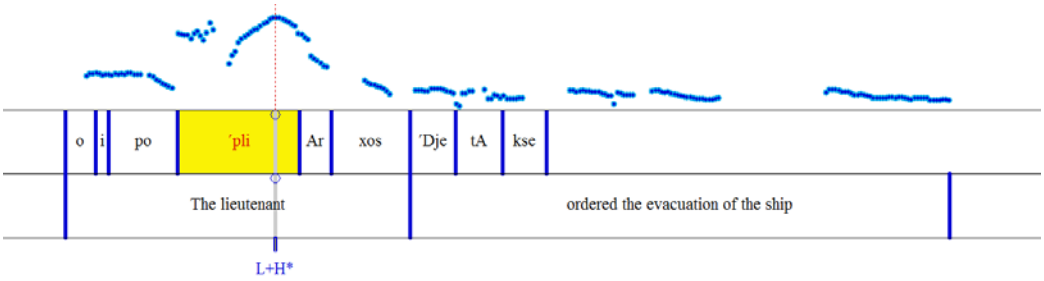

Figure 5 Sentence initial focus rendition (L+H*)

To verify the validity of the annotation, alignment measurements of local F0 maxima were also taken, expressed as a percentage of the accented syllable duration (distance of the H target from the beginning of the syllable divided by the syllable duration). Values over 100% correspond to late alignment of the H target in the post-accentual syllable. Values below 100% correspond to alignment within the accented syllable. The former corresponds to a typical L*+H accent, while the latter to a L+H* accent. Accordingly, simple and contrastive topics, which were rendered with an L*+H accent, display a mean value over 100% (Figure 6). A one way univariate Anova was conducted to further validate the correlation between accent type and H target alignment, showing a statistically significant effect of the former on the latter ($F(1) = 582.031$, $p < 0.0001$). Furthermore, a two way RM Anova was run to assess the effect of IS Partition and Contrast Level (cf. section 3) on H target alignment. The effect was found to be significant for both IS Partition ($F(1,15) = 117.95$, $p<0.0001$, $\eta^2_{partial} = 0.887$) and Contrast Level ($F(2,30) = 31.3$, $p < 0.0001$, $\eta^2_{partial}$

= 0.676). Follow up paired samples t-tests with Bonferroni correction showed that correction significantly differed from other contrast levels in the case of topics alone. In addition, there was no statistically significant difference between corrective focus and corrective topic.

Furthermore, scaling measurements of the H target were taken. As the distribution of F0 minima and maxima pairs was not even across speakers and tokens (20 % of topic phrases were produced with an L* accent lacking a corresponding H target and were thus not included in the analysis), a semitone scale was used for normalizing F0 values, and allowing for a better comparison. The following formula was used for converting F0 values in Hz to semitones:

$$F_{st} = 12 (\log_2 f_{hz} - \log_2 k)$$

where f_{hz} is the original F0 value of the H target in Hz and k is a speaker dependent reference value equal to the F0 value (Hz) of the corresponding L target. Scaling measurements indicate that correction was produced within a greater F0 range for both topic and focus, as shown in figure 6. The difference was shown to be statistically significant for IS Partition ($F(1,15) = 6.85$, $p = 0.019$, $\eta^2_{partial} = 0.313$) and Contrast Level ($F(2,30) = 4.963$, $p = 0.013$, $\eta^2_{partial} = 0.249$). However, follow up tests indicate that there was no statistically significant difference between different contrast levels within topic and focus, nor between corrective topic and focus.

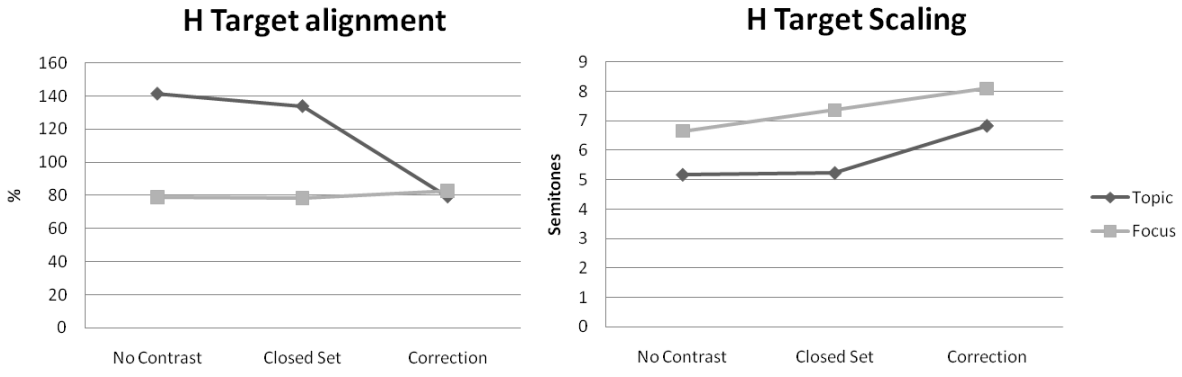

Figure 6 Alignment (expressed as a proportion of syllable duration) and scaling of the H target.

Figure 7 presents the results for the stressed syllable intensity (mean) and duration. Focus is realized with increased intensity compared to simple and contrastive topic. Corrective topics on the other hand are realized with a mean intensity at approximately the same levels as foci. Analysis of variance revealed a significant effect of both IS Partition ($F(1,31) = 29.015$, $p < 0.0001$, $\eta^2_{partial} = 0.483$) and Contrast Level ($F(2,62) = 17.533$, $p < 0.0001$, $\eta^2_{partial} = 0.361$). Follow up t-tests showed that correction significantly differed compared to other contrast levels in the case of topic alone, and that there was no statistically significant difference between corrective topic and corrective focus.

With regards to duration, corrective topics are realized with a higher duration compared to other types of topics as well as corrective focus. The effect of Contrast Level was found to be statistically significant ($F(2,62) = 0.519$, $p < 0.0001$, $\eta^2_{partial} = 0.519$) contrary to the effect of IS Partition ($F(1,31) = 0.495$, $p = 0.487$, $\eta^2_{partial} = 0.015$). Pairwise comparisons showed that correction significantly differed from other contrast levels for both focus and topic. Corrective topic and focus also differed in pairwise comparisons.

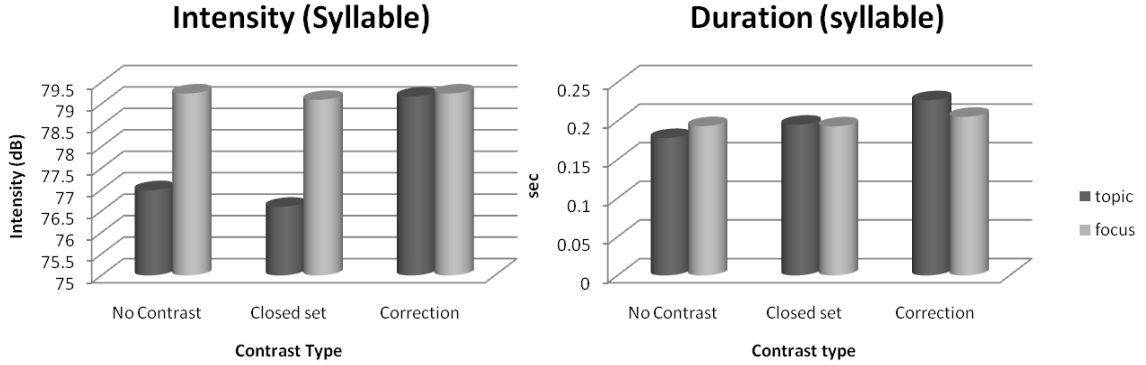

Figure 7 Intensity and duration measurements per contrast level and phrase type

As far as phrasing is concerned, results on /s/ voicing and pre-boundary lengthening have slightly contradictory implications. More specifically, the percentage of /s/ voicing is higher for topics, indicating a weaker boundary

(Figure 8). On the other hand, duration of pre-boundary material is more or less the same across conditions (with the exception of corrective topics), indicating a boundary of equal strength. Nevertheless, results on both /s/ voicing and pre-boundary lengthening corroborate the special status of correction in topics. Corrective topics were produced with a stronger boundary, as implied by the decreased voicing percentage and the increased pre-boundary lengthening value respectively. According to RM Anovas the effect on /s/ voicing was not statistically significant. In contrast, the effect on lengthening was statistically significant for both IS Partition ($F(1,31) = 10.329$, $p = 0.003$, $\eta^2_{partial} = 0.25$) and Contrast Level ($F(2,62) = 26.806$, $p < 0.0001$, $\eta^2_{partial} = 0.464$). Follow up tests indicated that correction differed from other contrast levels within topic alone. Corrective topic and focus also differed in pairwise comparisons.

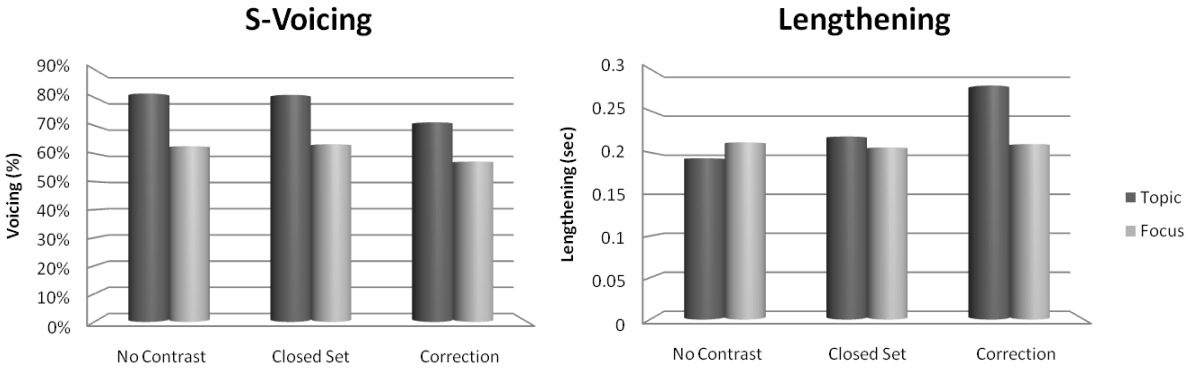

Figure 8 /s/ voicing and pre-boundary lengthening results

5 Discussion

The results of this pilot study support the special status of correction in the grammar. With regards to topics, only correction is consistently distinguished from other contrast levels within topic phrases, as it is produced with a different, more emphatic pitch accent, stronger boundary, increased intensity and duration. Furthermore, if parameters related to phrasing and syntagmatic prominence are factored out (i.e. lengthening, duration, deaccenting), then correction is prosodically realized in the same manner (L+H* nuclear pitch accent) in both

topic and focus. The latter similarity between topics and foci is in line with our initial hypothesis supporting the postulation of an independent low-level contrast feature (c-feature hereafter) that functions within both topic and focus and is associated with similar phonological and phonetic cues on a paradigmatic axis of prominence. In Modern Greek (MG), this c-feature surfaces prosodically marked in the case of correction only, indicating that with regards to MG prosody at least, only correction is truly contrastive.

Nevertheless, if correction corresponds to a structurally encoded independent feature, we should expect a similar effect of correction for the focus condition as well. However, the effect is much more subtle in the case of focus, as correction is produced with the same accent as the other contrast levels, showing minor gradual variation in the remaining of the parameters examined (increased H target F0 and duration in particular). Based on empirical evidence from related studies on contrast in MG[1], we argue that this more or less similar rendition of different contrast levels is due to the sentence initial position of the focus phrase. More specifically, Stavropoulou et al. (2010, 2012) show that correction is distinguished from other contrast levels on the basis of PA type (L+H*), when the focused word is in *sentence final* position; that is, in sentence final position there was a significantly higher variation in the distribution of NPAs for the "no contrast" and "closed set" conditions (ranging from H*, to H*+L, to L+H*) compared to correction, in which case L+H* was the predominant accent. In contrast, in the study at hand, all focus types were indiscriminately rendered with an emphatic L+H* accent, resulting in the neutralization of the correction vs. no contrast/closed set opposition in *non final* position. This latter empirical finding may be attributed to the fact that sentence

[1] With the exception of Gryllia (2008), as noted in section 2.

initial position[2] is the non default and arguably least predictable NPA position in Modern Greek. Therefore speakers are more likely to resort to an increasingly marked rendition, so as to efficiently draw the hearer's attention to the informative part of the utterance (signaled by the presence of the NPA), speeding up processing and facilitating understanding. Accordingly, the following continuum of markedness is proposed (in rising value of markedness): NPA default position, –contrast → NPA default position, +contrast → non default position, –contrast → non default position, +contrast.

It is further argued that the NPA type is determined by the contrast feature alone, contrary to what has been suggested in the literature for English for example, where different types of NPAs are claimed to be a reflection of the topic-focus distinction instead (Steedman, 2000). Apart from the use of the same L+H* accent for both corrective topic and focus, the above argument is further supported by the interchangeable use of the same tonal patterns for the topic and focus phrases conditioned on the sentence type (declarative vs. interrogative) in which they appear (cf. section 1.2). Therefore, in structurally non-contrastive conditions, the NPA type seems to depend more on the boundary tone (and consequently on the discourse role of the utterance as a whole) rather than the topic-focus partition. A similar high correlation between NPA type and boundary tone type has been shown in Dainora (2002), suggesting that it is the boundary tone that selects the NPA type, unless contrast imposes the use of a marked emphatic accent (such as the L+H* accent) instead.

On a final note, even though a comparison between all new/topic-less sentences and sentences with topic is beyond the scope of this paper, it is worth pointing out the following. Preliminary results indicate that there is no

[2] Confer evidence from Rump and Collier (1996), and Watson, Arnold and Tanenhaus (2008) among others. For Greek, interested readers may refer to Revithiadou (2004) and Baltazani (2003, 2007) for a discussion of tonal patterns in neutral sentences.

significant difference in the prosodic realization of all new utterances compared to simple and contrastive topics. Given that the distinctive rendition of corrective topics can be ascribed to the low level c-feature alone, one could argue that topichood itself – as a more general notion of aboutness – is not reflected on the prosody of MG, with regards to both pitch accent type and phrasing. This is in line with e.g., Büring (2007) who associates aboutness with intonationally unmarked background material. Furthermore, as indicated by the results of this study, the accent domain of the c-feature in corrective topics may range to merely include the subject of the sentence or – less frequently – the "non-traditional" subject-verb constituent. In 19% of the corrective topics produced in this study the boundary tone delimiting the "accent" domain of the c-marked subject aligned at the end of the verb of the sentence. In this case, the verb was de-accented, so that the pitch accent of the c-marked subject would become rightmost and hence most prominent in its domain (nuclear pitch accent). Based on the above, the accent domain of the c-feature in topics does not necessarily correspond to the subject of the sentence, and is primarily constrained on the location of the c-marked constituent in the focus part, in the sense that the latter should be rightmost and there can of course be no overlap between the two accent domains.

Appendix

The appendix contains the four lexical sets that were used in the production experiment. Instantiations within each lexical set corresponding to different experimental conditions are presented in the following order: simple topic (1), corrective topic (2), contrastive topic (3), information focus (4), contrastive focus (5), corrective focus (6). In the case of corrective topic and focus

additional context is provided. For reasons of space, we only give the English translation of the additional context.

Lexical set 1

1. *Trigger phrase*
[ja ti 'milise o kaɟe'larios]
of what speak-3SG the-NOM chancellor-NOM
"What did the chancellor speak of?"
Target phrase
[o kaɟe'larios ' milise ja ana'pofefkti xreoko'pia]
the chancellor-NOM speak-3SG of inevitable-ACC bankruptcy-ACC
"The chancellor spoke of inevitable bankruptcy."

2. *Trigger phrase*
[ti 'ipan i 'ðio 'sineðri]
what speak-3PL the-NOM two-NOM convention.participants-NOM
"What did the two convention participants spoke of?"
Target phrase
[o ipur'ɣos 'milise ja ti 'lipsi 'neon
the-NOM minister-NOM speak-3SG of the-ACC taking-ACC new-GEN
'metron]
μέτρων.
measures-GEN
[o kaɟe'larios ' milise ja ana'pofefkti xreoko'pia]
the chancellor-NOM speak-3SG of inevitable-ACC bankruptcy-ACC
"The minister spoke of taking new measures. The chancellor spoke of inevitable bankruptcy."

3. *Context*
"The conversation is about the meetings of the Greek prime minister in Germany and the subsequent press conference. Your interlocutor has misunderstood and is under the impression that the prime minister met with the German minister of finance and that they made statements together. However, the prime minister actually met with the chancellor. So your interlocutor wants to know what statements were made, however he/she thinks the statements were made by the minister of finance. You need to correct this misconception and at the same time answer what it was that the chancellor stated."

Trigger phrase
[o ipur'ɣos ti 'ipe]
the-NOM minister-NOM what say-3SG
"What did the minister say?"
Target phrase
[o kaɟe'larios ' milise ja ana'pofefkti xreoko'pia]
the-NOM chancellor-NOM speak-3SG of inevitable-ACC bankruptcy-ACC
"The chancellor spoke of inevitable bankruptcy."

4. *Trigger phrase*
[pços 'milise ja ana'pofefkti xreoko'pia]
who speak-3SG of inevitable-ACC bankruptcy-ACC
"Who spoke of inevitable bankruptcy?"
Target phrase
[o kaɟe'larios ' milise ja ana'pofefkti xreoko'pia]
the-NOM chancellor-NOM speak-3SG of inevitable-ACC bankruptcy-ACC
"The chancellor spoke of inevitable bankruptcy."

5. *Trigger* phrase
[pços 'milise ja ana'pofefkti xreoko'pia]
who speak-3SG of inevitable-ACC bankruptcy-ACC
[o kaɟe'larios 'i o ipur'ɣos mas]
the-NOM chancellor-NOM or the-NOM minister-NOM our
"Who spoke of inevitable bankruptcy? The chancellor or our minister?"
Target phrase
[o kaɟe'larios ' milise ja ana'pofefkti xreoko'pia]
the chancellor-NOM speak-3SG of inevitable-ACC bankruptcy-ACC
"The chancellor spoke of inevitable bankruptcy."

6. *Context*
"The interlocutor has misunderstood."
Trigger phrase
[o ipur'ɣos ikonomi'kon 'milise ja ana'pofefkti
the-NOM minister-NOM finance-GEN speak-3SG of inevitable-ACC
xreoko'pia]
bankruptcy-ACC
"The minister of finance spoke of inevitable bankruptcy."
Target phrase
[o kaɟe'larios ' milise ja ana'pofefkti xreoko'pia]
the chancellor-NOM speak-3SG of inevitable-ACC bankruptcy-ACC
"The chancellor spoke of inevitable bankruptcy."

Lexical set 2

1. *Trigger phrase*
[pu nosi'levete o ma'nolis]
where is.hospitalized-3SG the-NOM Manolis-NOM
"Where is Manolis hospitalized?"
Target phrase
[o ma'nolis nosi'levete sto iatri'ko]
the-NOM Manolis-NOM is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Manolis is hospitalized at Iatriko."

2. *Trigger phrase*
[pu nosi'levode i 'ðio 'fili tu]
where are.hospitalized-3PL the-NOM two-NOM friends-ACC his-GEN
"Where are his two friends hospitalized?"
Target phrase
[o ði'mitris nosi'levete sto i'jia]
the-NOM Dimitris-NOM is.hospitalized-3SG at.the-ACC Ygeia-ACC
[o ma'nolis nosi'levete sto iatri'ko]
the-NOM Manolis-NOM is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Dimitris is hospitalized at Ygeia. Manolis is hospitalized at Iatriko."

3. *Context*
"The conversation is about a car accident that one of your friends had. Your interlocutor has misunderstood and is under the impression that Dimitris had an accident and is now hospitalized, while in fact it was Manolis who had the accident. So your interlocutor wants to know where Dimitris is hospitalized. However, it is Manolis who is hospitalized. You need to correct this misconception and at the same time answer where Manolis is hospitalized."
Trigger phrase
[o ði'mitris pu nosi'levete]
the-nom Dimitris-nom where is.hospitalized-3sg
"Where is Dimitris hospitalized?"
Target phrase
[o ma'nolis nosi'levete sto iatri'ko]
the-NOM Manolis-NOM is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Manolis is hospitalized at Iatriko."

4. *Trigger phrase*
[pços nosi'levete sto iatri'ko]
who is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Who is hospitalized at Iatriko?"
Target phrase
[o ma'nolis nosi'levete sto iatri'ko]
the-NOM Manolis-NOM is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Manolis is hospitalized at Iatriko."

5. *Trigger phrase*
[pços nosi'levete sto iatri'ko]
who is.hospitalized-3SG at.the-ACC Iatriko-ACC
[o ma'nolis 'i o ði'mitris]
the-NOM Manolis-NOM or the-NOM Dimitris-NOM
"Who is hospitalized at Iatriko? Manolis or Dimitris?"
Target phrase
[o ma'nolis nosi'levete sto iatri'ko]
the-NOM Manolis-NOM is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Manolis is hospitalized at Iatriko."

6. *Context*
"The interlocutor has misunderstood."
Trigger phrase
[o ði'mitris nosi'levete sto iatri'ko]
the-NOM Dimitris-NOM is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Dimitris is hospitalized at Iatriko."
Target phrase
[o ma'nolis nosi'levete sto iatri'ko]
the-NOM Manolis-NOM is.hospitalized-3SG at.the-ACC Iatriko-ACC
"Manolis is hospitalized at Iatriko."

Lexical set 3

1. *Trigger phrase*
[o ipo'pliarxos ti 'ekane]
the-NOM lieutenant-NOM what do-3SG
"What did the lieutenant do?"
Target phrase
[o ipo'pliarxos 'ðjetakse tin e'cenosi
the-NOM lieutenant-NOM order-3SG the-ACC evacuation-ACC
tu 'pliu]
the-GEN ship-GEN
"The lieutenant ordered the evacuation of the ship."

2. *Trigger phrase*
[ti 'ekanan i 'ðio aksiomati'ci]
what do-3PL the-NOM two-NOM officers-NOM
"What did the two officers do?"
Target phrase
[o mixani'kos iðo'piise tin aktofila'ci]
the-NOM mechanic-NOM notify-3SG the-ACC coastguard-ACC
[o ipo'pliarxos 'ðjetakse tin e'cenosi
the-NOM lieutenant-NOM order-3SG the-ACC evacuation-ACC
tu 'pliu]
the-GEN ship-GEN
"The mechanic notified the coastguard. The lieutenant ordered the evacuation of the ship."

3. *Context*
"The conversation is about a boat accident outside Piraeus port. Your interlocutor has misunderstood and is under the impression that during the accident the mechanic was on the bridge giving orders, while in fact it was the lieutenant who was on the bridge. So your interlocutor wants to know the order that was given, however he/she thinks the order was given by the mechanic. You need to correct this misconception and at the same time answer what it was that the lieutenant ordered."
Trigger phrase
[o mixani'kos ti 'ðjetakse]
the-NOM mechanic-NOM what order-3SG
"What did the mechanic order?"
Target phrase
[o ipo'pliarxos 'ðjetakse tin e'cenosi
the-NOM lieutenant-NOM order-3SG the-ACC evacuation-ACC
tu 'pliu]
the-GEN ship-GEN
"The lieutenant ordered the evacuation of the ship."

4. *Trigger phrase*
[pços 'ðjetakse tin e'cenosi tu 'pliu]
who-NOM order-3SG the-ACC evacuation-ACC the-GEN ship-GEN
"Who ordered the evacuation of the ship?"
Target phrase
[o ipo'pliarxos 'ðjetakse tin e'cenosi
the-NOM lieutenant-NOM order-3SG the-ACC evacuation-ACC
tu 'pliu]
the-GEN ship-GEN
"The lieutenant ordered the evacuation of the ship."

5. *Trigger* phrase
[pços 'ðjetakse tin e'cenosi tu 'pliu
who-NOM order-3SG the-ACC evacuation-ACC the-GEN ship-GEN
o ipo'pliarxos 'i o mixani'kos]
the-NOM lieutenant-NOM or the-NOM mechanic-NOM
"Who ordered the evacuation of the ship? The lieutenant or the mechanic?"
Target phrase
[o ipo'pliarxos 'ðjetakse tin e'cenosi
the-NOM lieutenant-NOM order-3SG the-ACC evacuation-ACC
tu 'pliu]
the-GEN ship-GEN
"The lieutenant ordered the evacuation of the ship."

6. *Context*
"The interlocutor has misunderstood."
Trigger phrase
[o mixani'kos 'ðjetakse tin e'cenosi
the-NOM mechanic-NOM order-3SG the-ACC evacuation-ACC
tu 'pliu]
the-GEN ship-GEN
"The mechanic ordered the evacuation of the ship."
Target phrase
[o ipo'pliarxos 'ðjetakse tin e'cenosi
the-NOM lieutenant-NOM order-3SG the-ACC evacuation-ACC
tu 'pliu]
the-GEN ship-GEN
"The lieutenant ordered the evacuation of the ship."

Lexical set 4

1. *Trigger phrase*
[ti mele'tuse o jeo'loɣos]
what study-3SG the-NOM geologist-NOM
"What did the geologist study?"
Target phrase
[o jeo'loɣos mele'tuse apoksira'menes 'limnes]
the-NOM geologist-NOM study-3SG dried-ACC lakes-ACC
"The geologist studied dried lakes."

2. *Trigger phrase*
[ti mele'tusan i 'ðio epi'stimones]
what study-3PL the-NOM two-nom scientists-NOM
"What did the two scientists study?"
Target phrase
[o perivalodo'loɣos mele'tuse tin pa'niða
the-nom environmentalist-nom study-3sg the-acc fauna-acc
tis perio'çis]
the-gen area-gen
[o jeo'loɣos mele'tuse apoksira'menes 'limnes]
the-NOM geologist-NOM study-3SG dried-ACC lakes-ACC
"The environmentalist studied the fauna of the area. The geologist studied dried lakes."

3. *Context*
"The conversation is about some scientific experiments that took place in the area. Your interlocutor has misunderstood and is under the impression that the experiments were conducted by an environmentalist, while in fact they were conducted by a geologist. So your interlocutor wants to know what the environmentalist studied. However it was a geologist who conducted the studies. You need to correct this misconception and at the same time answer what it was that the geologist studies."
Trigger phrase
[ti mele'tuse o perivalodo'loɣos]
what study-3SG the-NOM environmentalist-NOM
"What did the environmentalist study?"
Target phrase
[o jeo'loɣos mele'tuse apoksira'menes 'limnes]
the-NOM geologist-NOM study-3SG dried-ACC lakes-ACC
"The geologist studied dried lakes."

4. *Trigger phrase*
[pços mele'tuse apoksira'menes 'limnes]
who study-3SG dried-ACC lakes-ACC"
"Who studied dried lakes?"
Target phrase
[o jeo'loɣos mele'tuse apoksira'menes 'limnes]
the-NOM geologist-NOM study-3SG dried-ACC lakes-ACC
"The geologist studied dried lakes."

5. *Trigger phrase*
[pços mele'tuse apoksira'menes 'limnes
who study-3SG dried-ACC lakes-ACC"
o jeo'loɣos 'i o perivalodo'loɣos]
the-NOM geologist-NOM or the-NOM environmentalist-NOM
"Who studied dried lakes? The geologist or the environmentalist?"
Target phrase
[o jeo'loɣos mele'tuse apoksira'menes 'limnes]
the-NOM geologist-NOM study-3SG dried-ACC lakes-ACC
"The geologist studied dried lakes."

6. *Context*
"The interlocutor has misunderstood."
Trigger phrase
[o perivalodo'loɣos mele'tuse apoksira'menes 'limnes]
the-NOM environmentalist-NOM study-3SG dried-ACC lakes-ACC
"The environmentalist studied dried lakes."
Target phrase
[o jeo'loɣos mele'tuse apoksira'menes 'limnes]
the-NOM geologist-NOM study-3SG dried-ACC lakes-ACC
"The geologist studied dried lakes."

References

Arvaniti, Amalia and Baltazani, Mary. 2005. Intonational Analysis and Prosodic Annotation of Greek Spoken Corpora. In Jun, S-A (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*. Oxford: Oxford University Press, 84-117.

Baltazani, Mary. 2003. Broad Focus across sentence types in Greek. In Proceedings of Eurospeech-2003, Geneva, Switzerland.

Baltazani, Mary. 2006. On /s/-voicing in Greek. In Proceedings of the 7th International Conference on Greek Linguistics. York, UK.

Baltazani, Mary. 2007. Intonation of polar questions and the location of nuclear stress in Greek. In C. Gussenhoven & T. Riad (eds), *Tones and tunes, volume II, experimental studies in word and sentence prosody*. Berlin: Mouton de Gruyter, 387-405.

Büring, Daniel. 2007. Semantics, Intonation and Information Structure. In Gillian Ramchad and Charles Reiss (eds), *The Oxford Handbook of Linguistic Interfaces*. Oxford University Press, 445-474.

Büring, D. (2003). On D-Trees, Beans, and B-Accents. *Linguistics and Philosophy* 26, 511-545.

Dainora, Audra. 2002. Does intonational meaning come from tones or tunes? Evidence against a compositional approach. *SP-2002*, 235-238.

Frota, Sonia. 2000. *Prosody and Focus in European Portuguese: Phonological Phrasing and Intonation*. New York: Garland Publishing.

Greif, Markus. 2010. Contrastive Focus in Mandarin Chinese. In Speech Prosody 2010. Chicago, USA.

Gryllia, Stella. 2008. On the nature of preverbal Focus in Greek. A theoretical and experimental approach. Leiden University. PhD Thesis. Utrecht: LOT Dissertation Series 200.

Gundel, Jeanette. 1989. *The Role of Topic and Comment in Linguistic Theory*. Garland.

Gussenhoven, Carlos. 2007. Types of Focus in English. In C. Lee, M. Gordon, and D. Büring (eds), *Topic and Focus: Cross-linguistic Perspectives on Meaning and Intonation*. Heidelberg, New York, London: Springer, 83-100.

Halliday, Michael. 1967. Notes on Transitivity and Theme in English, Part II. *Journal of Linguistics*, 3, 199–244.

Hartmann, Katharina. 2008. Focus and Emphasis in Tone and Intonation Languages. In Steube, Anita (ed.), *The discourse-potential of underspecified structures: Event structures and information structure*. Berlin: de Gruyter, 389-411.

Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge, MA: MIT Press.

Kainada, Evia. 2007. Prosodic Boundary Effects on Durations and Vowel Hiatus in Modern Greek. In Proceedings of the XVIth ICPhS. Saarbruecken, Universitaet des Saarlandes, 1225-1228.

Krifka, Manfred. 2008. Basic notions of information structure. Acta Linguistica Hungarica, Vol.55 (3–4). 243–276.

Kruijff-Korbayová, Ivana and Steedman, Mark. 2003. Discourse and information structure. In: Journal of Logic, Language and Information. Special Issue on Discourse and Information Structure, 12(3), 249-259.

Ladd, Robert D. 1996. *Intonational Phonology*. Cambridge: Cambridge University Press.

Lambrecht, Knud. 1994. *Information Structure and Sentence Form. A Theory of Topic, Focus, and the Mental Representations of Discourse Referents.* Cambridge: Cambridge University Press.

Molnár, Valeria. (2002). Contrast - from a contrastive perspective. In H. Hallelgard, S. Johansson, B. Behrens and C. Fabricius-Hansen (eds), *Information Structure in a Cross-Linguistic Perspective*. Amsterdam/New York: Rodopi, 147-161.

Pelekanou, Theodora and Arvaniti, Amalia. 2001. Postlexical Rules and Gestural Overlap in a Greek Spoken Corpus. In Proceedings of the 5th International Conference on Greek Linguistics, Paris, 13-15 September 2001, 71-74.

Revithiadou, Anthi. 2004. Focus phrasing in Greek. In G. Katsimali, E. Anagnostopoulou, A. Kalokerinos and I. Kappa (eds.), Proceedings of the 6th International Conference of Greek Linguistics. University of Crete, Rethymnon, 64-74.

Roberts, Craige. 1996. Information Structure in Discourse: Towards an Integrated Formal Theory of Pragmatics. In J.H. Yoon and Andreas Kathol (eds.), *OSU Working Papers in Linguistics 49: Papers in Semantics*, 91–136.

Rump, Hans H. and Collier, Rene. 1996. Focus Conditions and the prominence of pitch-accented syllables. Language & Speech 39, 1-17.

Schwarzschild, Roger. 1999. GIVENness, AvoidF and Other Constraints on the placement of Accent. Natural Language Semantics 7(2), 141–177.

Selkirk, Elisabeth. 1995. Sentence Prosody: Intonation, Stress, and Phrasing. In John A. Goldsmith (ed.), *The Handbook of Phonological Theory*, 550–569. London: Blackwell.

Silverman, Kim, Beckman, Mary, Pitrelli, John, Ostendorf, Mari, Wightman, Colin, Price, Patti, Pierrehumbert, Janet and Hirschberg, Julia. 1992. Tobi: a standard for labeling English prosody. In Proceedings, Second International Conference on Spoken Language Processing, Vol. 2, Banff, Canada, 867-870.

Stavropoulou, Pepi, Spiliotopoulos, Dimitris and Kouroupetroglou, Georgios. 2010. Integrating Contrast in a Framework for Predicting Prosody. Lecture Notes in Computer Science 6008, Computational Linguistics and Intelligent Text Processing, Springer Berlin Heidelberg, 748-758.

Stavropoulou, Pepi. 2012. Contrast Revisited. Interaction with broad and narrow focus domain. In preparation.

Steedman, Mark. 2000. Information structure and the syntax-phonology interface. Linguistic Inquiry 31:4, 649-689.

Vallduví, Enric. 1992. *The Informational Component.* New York: Garland Publishers.

Vallduví, Enric and Vilkuna, Maria. 1998. On Rheme and Kontrast. In P. Culicover and Michael Wagner (eds), *Givenness and Locality. The Limits of Syntax*. San Diego: Academic Press, 79-108.

Watson, Duane G., Arnold, Jennifer E. and Tanenhaus, Michael K. 2008. Tic tac TOE: Effects of predictability and importance on acoustic prominence in language production. Cognition, 106, 156-1557.

Zimmermann, Malte. 2008. Contrastive Focus and Emphasis. Acta Linguistica Hungarica 55, 347-360.

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Scrambling and Interfaces*

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This paper proposes a novel analysis of the Russian OVS construction and argues that the parametric variation in the availability of OVS cross-linguistically depends on the type of relative interpretative argument prominence that a language encodes via syntactic structure. When thematic and information-structural prominence relations do not coincide, only one of them can be structurally/linearly represented. The relation that is not structurally/linearly encoded must be made visible at the PF interface either via prosody or morphology.

Keywords: Information Structure, Russian Scrambling, PF Interface

1 Introduction

The issue of the parametric variation in the availability of OVS constructions cross-linguistically is intrinsically linked to the question of what licenses this type of argument reordering interpretatively and formally. In this paper, I explore two related hypotheses. First, I argue that OVS requires a formal license. That is to say, it is permitted only in case the grammatical functions (or, more precisely, the relative thematic prominence relations) of the arguments can be established by means other than their surface structural position. For instance, morphological case marking on Russian NPs allows the assignment of grammatical functions without reference to a specific syntactic position.

The second hypothesis defended here is that whenever the thematic prominence relations of arguments are recoverable without reference to

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syntactic structure, syntax is used to encode relative information-structural (henceforth IS) prominence of arguments. As a result, for a given numeration, SVO and OVS can be truth-conditionally identical, but OVS is used iff it maps transparently onto the IS template in (1), as SVO requires twisted mapping.[1]

(1) *Information Structure*
ARGUMENT ARGUMENT
[+IS-prominent] >> [-IS-prominent]

When the object is interpreted as IS prominent and the subject as non-prominent, transparent mapping onto the discourse template in (1) leads to a failure to align the thematic prominence of arguments with overt c-command. As will be shown below, such misalignment results in a structure that is more costly than its canonical counterpart, as OVS has more information content. I will argue that the costly nature of the OVS must be made visible at the PF interface either via morphological case (henceforth m-case) or agreement markers (see Bobaljik (2006) for arguments that agreement and m-case are at PF). That is, PF detects the marked nature of the OVS structure in its input and makes it visible in its representation. The resulting PF representation can therefore be said to be marked *by inheritance* from syntax. By economy, a marked PF representation cannot be linked to a discourse interpretation that is already captured by its unmarked variant, resulting in the above-mentioned interpretative restriction on OVS. Hereafter, when mapping from syntax onto IS is mentioned, the above indirect mapping through PF is assumed.

Crucially, in a language that disallows costly syntactic representations, e.g. English, thematic prominence is consistently structurally represented. This,

[1] The IS template in (1) is an abstract representation of the principle of Communicative Dynamism (Firbas 1964, 1971, 1984, 1992, Sgall et al. 1986), according to which, elements that are contextually prominent (for instance, in virtue of being present in the context) precede those that convey information that is not yet prominent in the discourse.

however, results in a failure to linearly represent IS prominence when the two prominence relations misalign. In this case, IS prominence is made visible at the PF interface via a marked prosodic operation of stress shift to the subject. By economy, the resulting *prosodically* marked PF representation cannot be used in the same context as its unmarked variant. Consequently, it is used only when the object is IS prominent and the subject is IS non-prominent, which is exactly the interpretation captured by the *inherently* marked PF representation in Russian.

Thus, the grammar of both Russian and English produces two PF representations (unmarked and marked) for a numeration containing a mono-transitive verb. The generation of the alternative, i.e. marked, representation is taken here to be a universal phenomenon. That is, the grammar of any language must be capable of producing enough representations to capture all IS interpretations at the post-grammatical level of discourse. The parametric variation, on the other hand, results from the fact that a PF representation can be either prosodically marked or marked by inheritance from syntax.

The paper is organised as follows. Section 2 argues that Russian OVS structures have properties of A-scrambling and are better analysed as base-generated. Section 3 discusses the formal and interpretative restrictions on the generation of OVS structures. Section 4 discusses the parametric variation in the availability of OVS constructions.

2 The Syntax of OVS

2.1 A or A'-scrambling?

Russian OVS displays several properties typical of A-relations (Ionin 2001, King 1995). It does not give rise to weak crossover effects (see (2)), is clause-

bounded (see (3)), does not give rise to scope-reconstruction (see (4)) and feeds anaphoric binding (see (5)).[2,3,4]

(2) Každuju devočku$_1$ ljubit EË$_1$ MAMA
every girl-ACC loves her mum-NOM
'Every girl is loved by her mum.'

(3) [Who do you want to kiss Anna?]$_{CONTEXT}$

a. Ja xoču, čtoby Anju pocelovala KATJA
I want that Anna-ACC kissed Catherine-NOM
'I want Catherine to kiss Anna.'

b. # Anju$_1$, ja xoču, čtoby KATJA pocelovala t_1
Anna-ACC I want that Catherine-NOM kissed

---

[2] In (3b) and (3c), long-distance movement of the discourse-prominent object is illicit regardless of the position of the discourse-new subject with respect to the verb, unless the fronted object is interpreted as a contrastive topic and Anna-ACC is construed as contrasted to another individual, possibly not yet present in the discourse, who I want to be kissed by someone possibly other than Catherine. Contrastive categories undergo optional A'-scrambling in Russian and are therefore allowed to move long-distance.

[3] In (4a), the apparent wide scope reading of the existential quantifier is accessible due to the availability of a specific interpretation for the indefinite.

[4] Ionin (2001) argues on the basis of the examples like (i) that scrambling in Russian OVS structures does not feed anaphoric binding, suggesting that the derived position of the object is not an A-position.

(i) a. * Roditeli drug druga$_1$ videli DETEJ$_1$
parents-NOM each other-GEN saw children-ACC

b. * Detej$_1$ videli roditeli DRUG DRUGA$_1$
children-ACC saw parents-NOM each other-GEN

However, the ungrammaticality of (ib) appears to be due to an independent factor: the Russian reciprocal resists being embedded in an animate argument carrying the most prominent θ-role in the predicate's argument structure. This claim is supported by the fact that native speakers of Russian find the phrase *roditeli drug druga* 'parents-NOM each other-GEN' ungrammatical on its own. This suffices to explain the ungrammaticality of (ib). It is beyond the scope of the present paper to investigate this selective behaviour of the Russian reciprocal. What matters is that embedding the reciprocal in an inanimate argument, as in (5b), results in a grammatical sentence, strongly suggesting that anaphoric binding is possible in Russian scrambled OVS sentences.

c. # Anju$_1$, ja xoču, čtoby t_1 pocelovala KATJA
Anna-ACC I want that kissed Catherine-NOM

(4) a. Každuju otkrytku podpisali DVA STUDENTA
every postcard-ACC signed two students-NOM
'Every postcard was signed by two students.' ∀> ∃; ?∃>∀

b. Dve otkrytki podpisal KAŽDYJ STUDENT
two postcards-ACC signed every student-NOM
'Two postcards were signed by every student.' ∃>∀; *∀> ∃

(5) a. * Vystrely drug druga$_1$ ubili MILICIONEROV$_1$ SVO
shots-NOM each other-GEN killed milicia-men-ACC

b. Milicionerov$_1$ ubili vystrely DRUG DRUGA OVS
milicia-men-ACC killed shots-NOM each other-GEN
'Milicia men were killed by each others shots.'

Following Mahajan's (1990) diagnostics for A and A'-position, the sentences in (2)–(5) should be analysed as involving A-scrambling.[5] However, A-movement analyses of Russian OVS structures face a number of problems discussed in the next subsection.

[5] It has been claimed that scope reconstruction and WCO effects are unreliable tests for an A-relation in Russian because this language has so-called 'frozen' scope and obviates WCO effects in general (King 1995, Ionin 2001, Bailyn 2004). However, the examples in (i) and (ii), below, demonstrate that WCO violations and scope reconstruction do obtain whenever an A'-moved quantifier undeniably crosses an argument, suggesting that the scrambled sentences that are taken to have 'frozen' scope or to lack WCO violations involve reconstruction of an A'-moved object to an A-position above the sentence-final focused subject, into which the object binds and which it outscopes (Titov 2007).

(i) * [Každuju devočku]$_{TOP1}$, eë$_1$ mama xočet, čtoby t_1 poceloval IVAN
every girl-ACC her mum-NOM wants that kissed Ivan-NOM

(ii) [Každuju devočku]$_{TOP1}$, dva mal'čika xotjat, čtoby t_1 poceloval IVAN
every girl-ACC two boys-NOM want that kissed Ivan-NOM
'Two boys want every girl to be kissed by Ivan (but I don't know about every grandma).' ∃>∀; *∀> ∃

2.2 Base-generated OVS

An account that sees Russian OVS structures as involving A-movement must speculate that there is no scope reconstruction in the A-chains formed by this operation (see (4)). However, a Russian passive does allow for scope reconstruction of the A-moved argument. That is, unlike the A-scrambled structure in (4b), the minimally distinct passive in (6) is scopally ambiguous.

(6) [Dve otkrytki]$_1$ byli podpisany t_1 KAŽDYM STUDENTOM
two postcards-NOM were signed every student-INSTR
'At least two postcards were signed by every student.' ∃>∀; ∀> ∃

Since the A-moved indefinite can take scope below the VP-adjoined instrumental in (6), an A-movement account of OVS predicts that the object should be able to take scope below the subject, contrary to fact (see (4b)).

Moreover, an A-movement account of OVS additionally involves a Relativized Minimality violation (Rizzi 1990), as it allows for A-movement of object NPs across c-commanding subject NPs.

Finally, one of the biggest challenges that an A-movement analysis of OVS structures faces has to do with the position of the subject with respect to the verb. One way to resolve this complication is to assume that the verb either moves to, or is generated in I^o, with the subject in SpecVP (Bailyn 2004, King 1995). However, such an analysis is not supported by adverb placement tests:

(7) a. Ja dumaju, čto Ivan často celuet Mašu
I think that Ivan-NOM often kisses Masha-ACC
'I think that Ivan often kisses Masha.'

b. * Ja dumaju, čto Ivan celuet často Mašu
I think that Ivan-NOM kisses often Masha-ACC

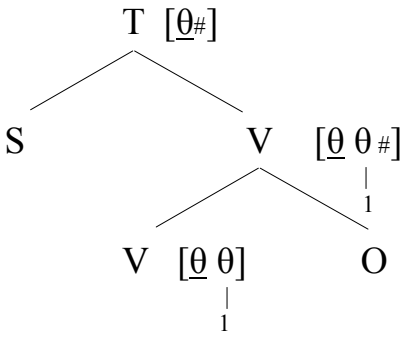
(8) a. Ja dumaju, čto Mašu často celuet Ivan
I think that Masha-ACC often kisses Ivan-NOM
'I think that Ivan often kisses Masha.'

b. * Ja dumaju, čto Mašu celuet často Ivan
I think that Masha-ACC kisses often Ivan-NOM

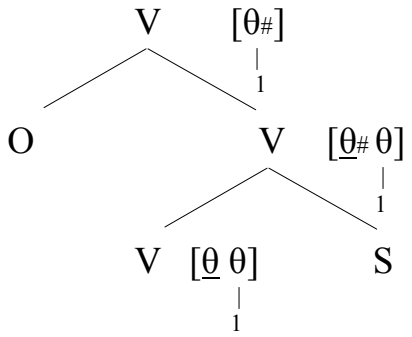
In both SVO and OVS, the temporal adverb marking the left edge of the VP must precede the verb, strongly suggesting that the verb remains within the VP.

The problems faced by A-movement analyses can be avoided if it is assumed that OVS is base-generated. Here, I adopt the base-generation analysis developed in Neeleman and van de Koot (2012) (henceforth NvdK). According to NvdK, scrambled structures are costly because they involve late assignment of a θ-role that is linked to the predicate's ordering tier, as in (9b).[6]

(9) a.



b.



The most economical order of assignment of θ-roles is the one that maximally reduces the content of the projecting predicate (see (9a)). Marked orders, on the other hand, result from the assignment of an 'unexpected' θ-role, one whose assignment does not maximally reduce the content of the projecting predicate (see (9b)). Assuming that only the external θ-role is not linked to the ordering tier, copying it is cheaper than copying a linked θ-role. This is because copying

[6] Theta-role assignment is assumed to apply under direct domination, which forces copying of a θ-role to the first node above an argument ('#' signals satisfaction of a θ-role).

a linked θ-role requires simultaneous copying of a link to the ordering tier. As a result, whenever the external θ-role is assigned before an internal one, a more complex structure results.

An analysis that sees the Russian OVS as base-generated avoids the locality problem and accounts for the surface scope and the position of the subject with respect to the verb. Moreover, it is further supported by the observation made by Chtareva (2004) that Russian has idiomatic expressions that consist of a verb and a subject:

(10) Ivana zaela sovest'
Ivan-ACC ate-up conscience-NOM
'Ivan's conscience is troubling him' = 'Ivan experienced remorse'.
Chtareva (2004)

The Russian verb + subject idioms, as in (10), have idiomatic nominative subjects, idiomatic transitive verbs, and free accusative objects. It must therefore be assumed that the subject in (10) is base-generated as an internal argument of the verb (cf. Chtareva 2004).

According to NvdK, costly base-generated structures, as in (9b), require an interpretative and a formal license. The next section discusses formal and interpretative restrictions on the generation of OVS in Russian.

3 Formal and Interpretative Restrictions on OVS

3.1 Interpretative license

In the introduction, we have hypothesized that OVS is possible iff it maps transparently onto the discourse template in (1). That is, while the unmarked SVO order can be used in a context that licenses identical IS interpretations of subject and object (see (11b) and (11c)), in the OVS construction the object must be IS prominent and the subject IS-non-prominent (see (12)).

(11) a. $S_{[+prominent]}$ V $O_{[-prominent]}$ c. $S_{[+prominent]}$ V $O_{[+prominent]}$

b. $S_{[-prominent]}$ V $O_{[-prominent]}$ d. *$S_{[-prominent]}$ V $O_{[+prominent]}$

(12) $O_{[+prominent]}$ V $S_{[-prominent]}$

By hypothesis, the unmarked SVO can capture three out of four interpretations in (11) but it is replaced with the marked OVS whenever OVS maps transparently onto (1) while SVO requires twisted mapping, as in (11d).

In Russian, the relative interpretative prominence of arguments can be established on the basis of a variety of interpretations, all of which are ranked with respect to each other (Titov 2012). For example, in an all-focus context, OVS can be licensed by definiteness/specificity:[7]

(13) [What happened?]$_{\text{CONTEXT}}$

a. MAŠU UKUSILA OSA
Mary-ACC stung wasp-NOM
'Mary was stung by a wasp.'

b. # OSA UKUSILA MAŠU
wasp-NOM stung Mary-ACC

However, whenever the context forces a narrow focus interpretation of one of the arguments, this type of encoding overrides all other interpretative requirements:

(14) [Who did a wasp sting?]$_{\text{CONTEXT}}$

[7] The arguments in (13) additionally involve an interpretative distinction as regards the <±human> feature. However, in Russian, this feature is overridden by the higher-ranked <±referential> feature that distinguishes between definite/specific NPs and non-specific indefinites (Titov 2012). Hence, it must be the <±referential> feature that licenses a marked structure in (13a).

a. Osa ukusila MAŠU
wasp-NOM stung Mary-ACC

b. # MAŠU ukusila osa
Mary-ACC stung wasp-NOM
'Mary was stung by a wasp.'

The relative interpretative prominence of arguments is established in (14) on the basis of the IS interpretation that distinguishes new information focus (NIF) from background/presupposition. I will represent this IS interpretation using the binary feature <±presupposed> and assume that background is always <+presupposed>, whereas focus is <-presupposed>.

I will assume that a syntactic constituent can be associated with this IS interpretation as a result of mapping principles that relate syntactic structures to IS templates. That is, I reject the view that syntactic representations contain features such as [Focus] or [Background] and assume instead that IS interpretations are encoded at the postgrammatical level of discourse (Reinhart 2006). The postulation of IS features in syntax requires that one stipulates that they are either stored in the mental lexicon or added to constituents in the course of the derivation. However, being a focus or a background is not a lexical property — a syntactic constituent can be categorized as such only when used in a specific context. Moreover, adding IS features in the course of the derivation demands a weakening of the Inclusiveness Condition of Chomsky (1995), according to which only those features can figure in syntactic computations that represent properties of lexical items (see also Szendrői 2001, Neeleman and Szendrői 2004, den Dikken 2006 and Fanselow and Lenertová 2011).

I will therefore argue that the interpretative license for OVS is provided by transparent mapping onto (1), with the outcome that, when the IS prominence of arguments is established on the basis of the <±presupposed> feature, the object is <+presupposed> and the subject <-presupposed> (see (16b)). The

sentence in (15b), conversely, is ruled out by economy — the unmarked order in (15a) already captures the reading where both arguments are <-presupposed>.

(15) a. ANJA POCELOVALA KATJU [SVO]$_{FOCUS}$
Anna-NOM kissed Catherine-ACC
'Anna kissed Catherine.'

b. # KATJU POCELOVALA ANJA [OVS]$_{FOCUS}$
Catherine-ACC kissed Anna-NOM

(16) a. # ANJA pocelovala Katju [S]$_{FOCUS}$VO
Anna-NOM kissed Catherine-ACC

b. Katju pocelovala ANJA OV[S]$_{FOCUS}$
Catherine-ACC kissed Anna-NOM
'Anna kissed Catherine.'

3.2 Formal license

Above, we have hypothesized that PF inherits the markedness of a scrambled syntactic structure in its input and makes it visible in its representation via morphology. That is, the present analysis relies on the idea that m-case must be distinguished from syntactic licensing, with m-case being treated as a morphological phenomenon (Bobaljik 2006, Harley 1995, Marantz 2000, McFadden 2002, 2003, 2004, Schütze 1997, Sigurðsson 1991, 2003, Yip, Maling and Jackendoff 1987, Zaenen, Maling & Thráinsson 1985). Adopting the model of grammar developed within the theory of Distributed Morphology (Embick and Noyer 2001, Halle and Marantz 1993, 1994), where insertion of lexical material comes late in the derivation, i.e. after Spell-Out, I assume that m-case is also assigned at this stage (see also McFadden 2003). This means that m-case cannot affect pre-Spell-Out narrow syntax, but m-case assignment depends on its output. Following Bobaljik (2006), I assume that the proper place

of the rules of m-case assignment is the Morphological component that is a part of the PF interpretation of structural descriptions.

I will also adopt Marantz's (1991) proposal that there are three primary types of morphological case: (i) lexical (including quirky) case assigned idiosyncratically by particular lexical items, (ii) unmarked case (conventionally called nominative for nominative-accusative languages, and absolutive for ergative languages), and (iii) "dependent" case. Dependent case is assigned only when more than one NP in a single domain is eligible to receive m-case from the case-assignment rules. For nominative-accusative languages, such as Russian, the dependent case is accusative.

Marantz suggests that the assignment of morphological cases proceeds via the disjunctive hierarchy given in (17), with the dependent case assigned to the lower NP in the domain.

(17) *Case Realization Disjunctive Hierarchy* Domain: government by V+I

a. lexically governed case
b. dependent case (ACC, ERG)
c. unmarked / default case

I adopt the view that m-case assignment depends on the output of narrow syntax but maintain that it is not the hierarchical positions of two competing NPs but rather the nature of the θ-roles they satisfy that must be known in order to correctly allocate the dependent case. I propose that, whenever more than one NP is eligible to receive m-case from the case-assignment rules, the algorithm in (17) determines that the NP satisfying the θ-role linked to the predicate's ordering tier receives the dependent accusative case. The other NP receives the unmarked nominative case. I assume that the thematic interpretations are ordered in keeping with the thematic hierarchy, and the corresponding θ-roles

are ordered through linking to the ordering tier. The algorithm in (17) ensures that m-cases are also ordered with respect to each other, with the least prominent dependent m-case being linked to the least prominent (i.e. linked) θ-role and therefore to the least prominent thematic interpretation, as in (18).

(18) a. Ivan [$_{VP}$ poceloval Katju] SVO
Ivan-NOM kissed Catherine-ACC
'Ivan kissed Catherine.'

b. Katju$_1$ [$_{VP}$ t_1 poceloval IVAN] OVS
Catherine-ACC kissed Ivan-NOM
'Ivan kissed Catherine.'

Following Bobaljik (2006), I assume that the accessibility of a given NP for controlling agreement on the predicate is determined by m-case, suggesting that agreement is part of the post-syntactic morphological component operating at PF. In Russian, a violation of the structural encoding of thematic prominence can be made visible at PF via agreement markers, as shown in (19), where the thematically prominent argument (i.e. the argument that satisfies the θ-role that does not have a link to the ordering tier) shows agreement with the verb.

(19) a. Stakan pereveshivaet tarelki SVO
glass-SG-NOM/ACC outweighs-SG plates-PL-NOM/ACC
'The/a glass outweighs (the) plates.'

b. Stakan pereveshivajut tarelki OVS
glass-SG-NOM/ACC outweigh-PL plates-PL-NOM/ACC
'The/a glass is outweighed by (the) plates.'

In Russian, m-case and agreement markers are used at PF in order to recover the thematic prominence relations, which in turn makes visible the markedness of the OVS structure. This provides the formal license for OVS — the thematic prominence relations are recovered without reference to structural positions. As

expected, whenever thematic relations are not morphologically recovered at PF, an OVS structure is impossible even in Russian:[8]

(20) [What's new with mother?]$_{\text{CONTEXT}}$

Mat'	NAVESTILA	DOČ'	SVO/*OVS
mother-NOM/ACC	visited	daughter-NOM/ACC	
'Mother visited daughter.'			
'*Daughter visited mother.'			

In (20), the context licenses focus on the constituent containing the verb and the postverbal argument. Crucially, this argument must be interpreted as the object. The impossibility of interpreting the sentence in (20) as OVS must be attributed to the lack of formal license, as the interpretative license for an OVS structure is available in (20). Unsurprisingly, once the formal license is provided, OVS interpretation becomes available (see (21)).

(21) [What's new with mum?]$_{\text{CONTEXT}}$

Mamu	NAVESTILA	DOČ'	OVS
mum-ACC	visited	daughter-NOM/ACC	
'Daughter visited mum.'			

Our analysis of Russian OVS structures as being licensed by the relative IS prominence encoding of arguments predicts that the IS interpretation of verbs in such constructions is free. After all, non-arguments cannot take part in such encoding. Consequently, verbs in OVS must allow for both, <–presupposed> and <+presupposed>, readings. This prediction is borne out (see (21) and (22)).

[8] The formal license for OVS can be provided by the formal properties of the linguistic context (Titov 2012). Thus, if the reply in (20) is used in the context of either *Kto navestil mat'?* 'who-NOM visited mother-NOM/ACC' or *Kogo navestila mat'?* 'who-ACC visited mother-NOM/ACC', the grammatical function of the morphologically unidentifiable focused argument is established on the basis of the m-case carried by the wh-phrase in the contextual question, to which the focus is linked.

(22) [Who visited mum?]$_{\text{CONTEXT}}$

Mamu navestila DOČ'
mother-ACC visited daughter-NOM/ACC
'Daughter visited mum.'

The next section discusses the difference between Russian and English in the choice of prominence, thematic or IS, that is encoded in syntax and at PF.

4 Russian Versus English

Let us now see how the proposed system works for English and Russian. In English, syntax never produces representations in which thematic prominence misaligns with overt c-command. This means that for a numeration containing a monotransitive verb, English syntax generates only one representation for a given truth-conditional interpretation, i.e. SVO. When this representation is passed onto PF, PF creates a pair of representations, unmarked and marked, in prosody. The unmarked representation results from the default assignment of stress through the Nuclear Stress Rule (NSR), whereas the marked prosodic representation is brought about by the marked operation of stress shift. Both prosodic operations conform to the focus rule in (23) below. That is, the rule in (23) overrides the default NSR in English in the same way as transparent mapping onto (1) overrides the default thematic prominence alignment with overt c-command in Russian, whenever a marked representation is needed at the discourse level.

(23) *The focus set*: The focus set of a derivation D includes all and only the constituents that contain the main stress of D.

Reinhart (2006 : 158)

The marked prosodic structure is created in PF in order that there are enough representations to capture all possible IS relations at the discourse level. By economy, the marked PF representation involving stress shift to the subject is used only for the discourse interpretation that the unmarked representation fails to express, namely narrow focus on the subject.

Since the syntactic structure that is input to PF is unmarked in English, recovery of thematic prominence relations via morphology becomes redundant. That is, thematic relations are already structurally/linearly represented. The IS relations, on the other hand, are not linearly encoded. Therefore, they must be made visible at PF via prosody:

(24) [Who kissed Mary?]$_{\text{CONTEXT}}$

JÓHN kissed Mary.

In Russian, syntax generates a pair of representations: an unmarked one, in which thematic relations are aligned with overt c-command (i.e. SVO), and a marked one with an uneconomical discharge of theta-roles (i.e. OVS). PF detects the marked nature of the marked representation in its input. Since the alternative representation is already generated in syntax, PF no longer needs to create a pair of representations itself. It therefore simply applies the default NSR operation to both representations. However, as theta relations are not structurally encoded in the OVS representation, PF must recover these via morphology. The resulting two PF representations are prosodically unmarked but one of them is marked by inheritance from syntax. The markedness of the OVS order is represented in the PF representation through m-case or agreement markers. By economy, the inherently marked PF representation is used only for the discourse interpretation that the unmarked representation fails to express. When the relative IS prominence of arguments is established on the basis of the

<±presupposed> feature, OVS is used for narrow focus on the subject (or the constituent that includes the subject and the verb).

To conclude, the difference between English and Russian can be captured by the assumption that English creates PF representations that are prosodically marked/unmarked, whereas Russian produces PF representations that are marked/unmarked by inheritance from syntax. As English uses structure to represent thematic prominence relations, the IS prominence relations must be made visible at PF via prosody. In Russian, conversely, IS prominence relations are linearly encoded. As a result, thematic prominence relations must be recovered at PF via morphological markers.

What can be said about Russian, then, is that it optimizes the syntactic encoding of IS prominence. However, even in this language, a syntactic structure that maps transparently onto (1) can fail to be generated for a given numeration and truth-conditional interpretation, as it would violate a syntactic constraint, such as for instance the c-command requirement on binding (see (25b)). In such rare cases, Russian behaves exactly like English and resorts to prosodic encoding of IS prominence (see (25a)):

(25) [Kogo ljubjat ego roditeli?]$_{\text{CONTEXT}}$
who-ACC love his parents
'Who is loved by his parents?'

a. IVÀNA$_1$ ljubjat ego$_1$ roditeli
Ivan-ACC love his parents
'Ivan is loved by his parents.'

b. * Ego$_1$ roditeli ljubjat IVANA$_1$
his parents love Ivan-ACC

Prosodic encoding of IS prominence can therefore be seen as a last resort operation in Russian — it applies only when syntactic encoding is unavailable. English, conversely, consistently encodes IS prominence in prosody. Having

discovered two languages with opposite preferences for the choice of the linguistic tool used for the encoding of IS and thematic prominence, we might expect to find languages that have a free choice as to whether to represent thematic prominence in syntax and IS prominence via prosody, or linearly encode IS prominence and recover thematic prominence via morphology. Indeed, Lenerz (2001) demonstrates that in German double object constructions either strategy is freely available. That is, whenever the indirect object is the narrow focus of the sentence, and the IS prominence relations can no longer be captured by the unmarked SVIOÒ structure, they can be either prosodically represented via stress shift to the indirect object, or linearly encoded via object-across-object scrambling. In other words, in German, the relevant PF representation can be either prosodically marked or marked by inheritance from syntax, but the latter option is available iff the thematic prominence relations of objects are formally identified.

References

Bailyn, John F. 2004. Generalized Inversion. *Natural Language and Linguistic Theory* 22: 1–49.

Bobaljik, Jonathan D. 2006. Where's Phi? Agreement as a post-syntactic operation. In M. van Koppen, P. Hendriks, F. Lansbergen, M. Poss, & J. van der Wal (eds.). *Leiden Papers in Linguistcs* 3.2: 1–23.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Chtareva, Anguelina. 2004. Experiencer Analysis of Subject Idioms in Russian. In S. Franks et al. (eds.) *FASL 13 Proceedings*. Ann Arbor: Michigan Slavic Publications, 80–92.

den Dikken, Marcel. 2006. *Relators and linkers: The syntax of predication, predicate inversion, and copulas*. Cambridge, MA: MIT Press.

Embick, David & Rolf Noyer. 2001. Movement operations after syntax. *Linguistic Inquiry* 32.4: 555–595.

Fanselow, Gisbert & Denisa Lenertová. 2011. Left peripheral focus: mismatches between syntax and information structure. *Natural Language and Linguistic Theory* 29: 169–209.

Firbas, Jan. 1964. On defining the theme in functional sentence analysis. *Travaux linguistiques de Prague* 1: 267–280.

Firbas, Jan. 1971. On the concept of communicative dynamism in the theory of functional sentence perspective. *Sborník prací filozofické fakulty brněnské univerzity* A 19: 135–144.

Firbas, Jan. 1984. Carriers of communicative dynamism. *Prague Studies in English* 18: 63–73.

Firbas, Jan. 1992. *Functional sentence perspective in written and spoken communication.* Cambridge: Cambridge University Press.

Halle, Morris & Alec Marantz. 1993. Distributed morphology and the pieces of inflection. In *The view from the building 20: Essays in linguistics in honor of Sylvain Bromberger*, K. Hale & S. J. Keyser (eds.). Cambridge, MA: MIT Press, 111–176.

Halle, Morris & Alec Marantz. 1994. Some key features of distributed morphology. *MIT Working Papers in Linguistics* 21: 275–288.

Harley, Heidi. 1995. Subjects, events and licensing. Doctoral Dissertation, MIT.

Ionin, Tania. 2001. Scope in Russian: Quantifier Movement and Discourse Function. Ms, MIT.

King, Tracy H. 1995. *Configuring Topic and Focus in Russian*. CSLI Publications: Center for the Study of Language and Information, Stanford, California.

Lenerz, Jürgen. 2001. Scrambling and Reference in German. In *Issues in Formal Germanic Typology*, W. Abraham and C. J–W. Zwart (eds.). John Benjamins, 179–192.

Mahajan, Anoop. 1990. The A/A' Distinction and Movement Theory. Doctoral Dissertation, MIT.

Marantz, Alec. 1991. Case and licensing. In G. F. Westphal, B. Ao & H–R. Chae (eds.), *Proceedings of ESCOL*, 234–253. Ithaca, NY: Cornell Linguistics Club.

Marantz, Alec. 2000. Case and licensing. In *Arguments and case: explaining Burzio's generalization*, E. Reuland (ed.), 114–30. Amsterdam: John Benjamins.

McFadden, Thomas. 2002. Adventures in resolving redundancy: Case vs. the EPP. In *Proceedings of the 26th Penn Linguistics Colloquium: University of Pennsylvania Working Papers in Linguistics* 9. Philadelphia, PA: Penn Linguistics Club.

McFadden, Thomas. 2003. The underlying structures of German inherent case. Presentation at the *Joint meeting of the FGLS and the SGL*, London.

McFadden, Thomas. 2004. The position of morphological case in the derivation: a study on the syntax-morphology interface. Doctoral dissertation, University of Pennsylvania, Philadelphia.

Neeleman, Ad & Kriszta Szendrői. 2004. Superman sentences. *Linguistic Inquiry* 35: 149–159.

Neeleman, Ad & Hans van de Koot. 2012. Plan B: In defence of theta-roles. Ms. UCL.

Reinhart, Tanya. 2006. *Interface Strategies: Optimal and Costly Computations*. Cambridge, MA: MIT Press.

Rizzi, Luigi. 1990. *Relativized Minimality*. Cambridge, MA: MIT Press.

Schütze, Carson. 1997. Infl in child and adult language: Agreement, case and licensing. Doctoral Dissertation, MIT.

Sgall, Petr, Eva Hajičová & Jarmila Panevová. 1986. *The meaning of the sentence in its semantic and pragmatic aspects*. Dordrecht: Kluwer.

Sigurðsson, Halldór Ármann. 1991. Icelandic Case-marked PRO and the licensing of lexical arguments. *Natural Language and Linguistic Theory* 9: 327–363.

Sigurðsson, Halldór Ármann. 2003. Case: Abstract vs. morphological. In E. Brandner & H. Zinzmeister (eds.), *New perspectives on case theory*, 223–268. Stanford, CA: CSLI Publications.

Szendrői, Kriszta. 2001. Focus and the syntax–phonology interface. Doctoral dissertation, UCL.

Titov, Elena. 2007. Pragmatic effects on Russian word (dis)order: Evidence from syntactic and semantic reconstruction. Ms. UCL.

Titov, Elena. 2012. Information structure of argument order alternations. Doctoral Dissertation, UCL.

Yip, Moira, Joan Maling & Ray Jackendoff. 1987. Case in tiers. *Language* 63.2: 217–250.

Zaenen, Annie, Joan Maling & Höskuldur Thráinsson. 1985. Case and grammatical functions: The Icelandic passive, *Natural Language and Linguistic Theory* 3: 441–483.

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The Meaning of the Avatime Additive Particle *tsyɛ*[*]

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Avatime, a Kwa language of Ghana, has an additive particle *tsyɛ* that at first sight looks similar to additive particles such as *too* and *also* in English. However, on closer inspection, the Avatime particle behaves differently. Contrary to what is usually claimed about additive particles, *tsyɛ* does not only associate with focused elements. Moreover, unlike its English equivalents, *tsyɛ* does not come with a requirement of identity between the expressed proposition and an alternative. Instead, it indicates that the proposition it occurs in is similar to or compatible with a presupposed alternative proposition.

Keywords: additive particle, focus particle, contrast, Kwa languages

1 Introduction

Additive particles have traditionally been analyzed as focus particles (König, 1991). They associate with the focused constituent in the clause and presuppose an alternative proposition that differs from the expressed one only in the element in focus.

In Avatime, a Kwa language spoken in Ghana, the additive particle *tsyɛ* 'also, too' cannot be analyzed in this way. This particle frequently associates with elements that are not in focus. Moreover, unlike English and German additive particles, *tsyɛ* does not require identity between the expressed proposition (minus the particle and the element it modifies) and its presupposed alternative.

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In this paper I explore how to best define the semantics of the particle and I point out differences to additive particles as described in the literature. I show that the Avatime particle *tsyɛ* needs its own, language-specific, definition.

I will proceed as follows. In Section 2, I discuss the information-structural notions that will be relevant for this paper. I then briefly introduce the language in Section 3 and describe my research methods in Section 4. In Section 5 I discuss the meaning and use of the Avatime particle *tsyɛ* and Section 6 is for conclusion and discussion.

2 Theoretical Background

2.1 Topic and focus

The notions of topic and focus have been defined in various ways in the literature. In this section, I will describe how I use these notions in this paper.

I define focus as the part of the sentence by which the speaker intends to augment the common ground between herself and the interlocutor. The focused element can be seen as the answer to the implicit question under discussion (Roberts, 1996), or as the asserted part of the proposition (Lambrecht, 1994). Focus is not necessarily always marked in all languages. Whereas some languages obligatorily distinguish between focused and non-focused elements, others may only mark a certain subtype of focus.

I will use Gundel's (1988, 210) definition of topic: *"An entity, E, is the topic of a sentence, S, iff in using S the speaker intends to increase the addressee's knowledge about, request information about, or otherwise get the addressee to act with respect to E."* This captures the idea that the topic is 'what the sentence is about' (Reinhart, 1981). The part of the sentence that is assessed relative to the topic is the comment. The comment

contains the focused part of the sentence. There are no good tests to determine the topic of a sentence, but there are some properties that topics frequently have crosslinguistically. Topics tend to be sentence-initial, the subject tends to be the topic in unmarked sentences, left-dislocated elements often function as topics and topics usually contain 'old' information.

2.2 Additive particles

König (1991) describes additive particles as presupposing *"that at least one of the alternative values under consideration in a context satisfies the complex predicate represented by the* λ*-expression"*, where the λ-expression corresponds to the meaning of the sentence minus the element modified by the additive particle. This means that the additive particle presupposes an alternative proposition in which the additive particle and the constituent it modifies are replaced by a contextually relevant alternative to this constituent. For the purpose of this paper, I will subdivide this definition into three parts, which can be seen in (1). Note that (1c) is an implicit assumption in the original definition, but it will play a crucial role in my discussion of the Avatime additive particle.

(1) Definition of additive particles (of the English/German type).

   a. the additive particle associates with an element of the proposition (the added constituent)

   b. it presupposes a contextually relevant alternative proposition

   c. the alternative proposition is identical to the expressed one, except that the additive particle and added constituent are replaced by a contextually relevant alternative to the added constituent

Additive particles have traditionally been described as focus particles (König, 1991), based on the observation that they associate with the accented and thus focused element in the clause. An example can be seen in (2), where the particle *also* associates with *book* in (2a) but with *Mark* in (2b) (focus accents are indicated by capitalization). Example (2a) evokes the presupposition that I gave Mark something other than a book, whereas (2b) evokes the presupposition that I gave a book to a person other than Mark.

(2) a. *I also gave Mark a BOOK.*
b. *I also gave MARK a book.*

Several authors have noticed, however, that English and German additive particles can also associate with contrastive topics (Krifka, 1999; Dimroth, 2002). In this case, the particle occurs towards the end of the sentence and is marked with a pitch accent. An example can be seen in (3) where *Peter* is the added constituent but is also topical, as the preceding sentence is a question about him. *Peter* is marked as a contrastive topic by a rising pitch accent, while the falling focus accent is realized on the additive particle.

(3) [I know that Pia visited the exhibition. But what did Peter do?]
Péter hat die Ausstellung àuch besucht
Peter has the exhibition also visited
'Péter visited the exhibition, tòo.' (Krifka, 1999, 113)

It thus seems that at least some additive particles can associate with both foci and contrastive topics. In Kwa languages (related to Avatime), additive particles have also been discussed in connection with contrastive topics (Ameka, 2010; Fiedler, 2009). But how can contrast be defined, and how does it relate to additivity? These questions will be discussed in the next section.

2.3 Contrast

Contrast can be defined in a broad and a narrow sense. According to the broad definition, contrast means indicating the presence of contextually relevant alternatives to the contrasted element (e.g. Krifka, 2007; Vallduví and Vilkuna, 1998; Büring, 2003; Chafe, 1976).

Broadly defined contrast thus includes additivity, as additive particles indicate alternatives. Note that focus is often also defined as indicating alternatives (Rooth, 1992) and thus is not different from contrast. On this view, additive particles do not evoke alternatives themselves, but operate on the alternatives evoked by the focus. Such an analysis does not work for a language like Avatime in which focus is not obligatorily marked and the additive particle can associate with elements that are not focused (see Section 5.1).

The narrow definition of contrast is proposed by Prince (1998). She claims that "*contrast is not a primitive notion but rather arises when alternate members of some salient set are evoked and, most importantly, when there is felt to be a salient opposition in what is predicated of them*" (290–291). This definition does not include additives and captures the observation that marking a topic as contrastive in English usually implies that what is predicated of it does not hold for an alternative[1]. For instance, if Peter and Pia are a salient set and example (4) is uttered (with a contrastive topic accent on *Peter* and a focus accent on *exhibition*), the listener can infer that Pia did not go to the exhibition.

(4) *Péter visited the exhibìtion.*

Repp (2010) also defines contrast in a more restricted way, noting that contrasted elements are somehow different or opposite. This narrow definition of contrast has in common with additives that next to

[1] This is also noted by Büring (2003) who treats it as a conversational implicature rather than part of the meaning of contrast.

indicating the presence of alternatives, there is a relation between what is predicated of these alternatives. In the case of additives, this relation is identity (see (1c)) and in the case of narrow contrast it is opposition.

3 Avatime

Avatime is a Kwa (Niger-Congo) language, belonging to the group of Ghana-Togo-Mountain languages. It is spoken by about 10,000 speakers in the South-East (Volta Region) of Ghana.

Like other Kwa languages, Avatime is a tone language. It has three level tones and one contour tone: low (marked ˋ), high (unmarked), extra-high (marked ˊ) and rising (marked ˇ).

Avatime is a noun-class language. It has seven genders, six of which consist of singular-plural pairings.[2] Noun-class/number is marked by a prefix on the noun.

Subject agreement prefixes on the verb are obligatory. In the absence of a lexical subject, they have a pronominal function. There is no object marking on the verb. Zero objects are possible but they seem to be mainly restricted to certain types of serial verb constructions.

Constituent order in Avatime is rigidly SVO. The only way to deviate from this order is by focus marking or left-dislocation. To mark an element for focus, it is placed in the focus position immediately preceding the subject and marked with an extra high tone on the final syllable (5). Focus marking is optional and seems to indicate contrastive focus. Left-dislocated elements precede focused ones and are repeated by a resumptive element (usually a pronoun) in the main clause (6). Left-dislocation is used to introduce referents into the discourse and may also indicate

[2] The noun classes are numbered 1–7, which means that each gender has its own number. This is different from the Bantu tradition, where noun classes can usually not be grouped into fixed singular-plural pairs and each different agreement pattern gets its own number.

topicality. However, most of the time topics do not receive any special marking in Avatime.

(5) *kị-bɔ̀ɛ́* *bɛ-tá-kpɛ* *kí* *yɛ*
C_4S-money:FOC C_1P-INT-put.in give him
'They put [money]$_{FOC}$ in for him.' (conv-street_100720_1) [3]

(6) *lị̀-fi̱flị̀-nɛ* *èɛ́-sɔlì* *lɛ*
C_3S-porridge-DEF C_1S.PROG-catch C_3S
'The porridge, he was catching it.' (kadzidzia_110406_QM)

4 Methods

This paper is based on data recorded in the village of Vane in the Avatime area. Over the course of several fieldtrips, I have collected a corpus of recordings of different genres of speech. For an initial investigation of the properties of the particle *tsyɛ*, a diversified corpus was used, consisting of 22 elicited and non-elicited narratives, interviews, procedural texts, official meetings and casual conversations. The overall annotated length of this corpus is 2 hours and 44 minutes. In this corpus, I found 195 instances of the particle *tsyɛ*.

For the analysis of the semantics of *tsyɛ*, I used a smaller corpus of narratives only. I made this choice because the use of the particle depends a lot on the common ground shared between interlocutors, and in narratives, this common ground is relatively well controlled: we can assume it consists only of what has been mentioned before in the narrative. The corpus of narratives consists of 13 recordings, with a total length of

[3] Each Avatime example in this paper is followed by a reference to the filename of the recording it appears in. These filenames start with a keyword describing their content and/or the genre, followed by the recording date in a yymmdd format, which may in turn be followed by the initials of the speakers who are recorded. All recordings can be found in the language archive at the Max Planck Institute for Psycholinguistics.

one hour. The narratives are either folk tales or stories elicited by using pictures or video material. In all cases, a native listener was present. A total of 79 instances of the particle *tsyɛ* was found in this corpus.

5 The Particle *Tsyɛ*

In this section, I will discuss the distribution and semantics of the Avatime additive particle *tsyɛ*, based on a corpus study. In Section 5.1, I describe the distribution of *tsyɛ*, based on my wide corpus of 195 instances. In Section 5.2, I present a preliminary analysis of the semantics of *tsyɛ*, based on my narrow corpus of 79 instances found in narratives. Finally, in Section 5.3 I discuss whether *tsyɛ* can be analyzed as an additive or contrastive particle, using the definitions given in Section 2.

5.1 Distribution

The particle *tsyɛ* always directly follows the added constituent. This can be seen in (7), where it associates with *banùvɔ̀wa* 'the children'.

(7) *èɛ́-trɛ rrr lɛ̌ ba-nùvɔ̀-wa* ***tsyɛ*** *bɛ-sɛ̀ bèɛ́-trɛ*
C_1S.PROG-go ID then C_1P-child-DEF ADD C_1P-leave C_1P.PROG-go
'He was going and the children, too, left and were going.'
(pear_100719_PhA-DQ)

The added constituent is usually a noun phrase, as in (7), but it may also be a predicate. Out of 195 instances of *tsyɛ*, 11 associate with a predicate. An example can be seen in (8), where the particle *tsyɛ* associates with the entire predicate *do gbe da ní ba litukpo* 'pray for them'.

(8) *lɛ lósò kíà-zo-dí ba kù-do nu*
so 1P.POT-REC-look C_1P C_5S-road opening
'So we'll be looking forward to their coming.'

kíà-zo-do_gbè_da ní ba li-tukpo ***tsyɛ***
1P.POT-REC-pray LOC C_1P C_3S-head ADD
'We'll also be praying for them.' (avopa_100512_1-1)

When the added constituent is a noun phrase, it is usually a subject, as in (7). Out of 180 NPs marked by *tsyɛ*, 129 (72%) are subjects.

When the added constituent is not a subject, it is frequently left-dislocated (24 out of 51 non-subject NPs). An example can be seen in (9), where 'him', the object of the verb 'catch' is left-dislocated.

(9) [Two people have jumped down from a burning house and have been caught by firemen. The third person is initially afraid and refuses to jump. After a while the firemen come back to him.]

àblɔ́ɔ gì kị-fụ-yɛ̀ ki-na yɛ pɔ́=ɛ a-bá-dị̀mɛ
now REL C_4S-fire-DEF C_4S-reach C_1S finish=CM C_1S-VEN-agree
'Now that the fire had reached him, he agreed.'

a-yɔ… yɛ ***tsyɛ,*** *bɛ́-sɔ́li yɛ*
C_1S-jump C_1S ADD C_1P-catch C_1S
'He jumped… Him too, they caught him.' (FinSto_100524_SO)

Non-subjects in canonical position only form 9% of the total number of NPs marked by *tsyɛ* (17 cases). An example can be seen in (10).

(10) *a-mɔ̀ li-we-lè*
C_1S-see C_3S-sun-DEF
'He saw the sun.'
a-mɔ̀ ɔ-dzị̀dzị-ɛ ***tsyɛ***
C_1S-see C_1S-moon-DEF ADD
'He saw the moon, too.' (famprob_110401_MeD-BeK_story)

These distributional facts indicate a problem with the analysis of *tsyɛ* as a focus particle. As I mentioned in Section 2.1, subjects and left-dislocated elements tend to be topics, whereas objects are typically in

focus. If *tsyɛ* only associated with focused constituents, we would not expect the observed bias for subjects and we would expect more examples like (10). The particle *tsyɛ* thus seems to have a preference for associating with topics, but may also associate with focused constituents. Note that the 'focused constituents' I am referring to are all unmarked cases of focus as in (10). There are no instances in my corpus of *tsyɛ* associating with an element overtly marked for focus.

5.2 Semantics

In the examples we have seen so far, it looks like *tsyɛ* conforms to the definition of additivity as given in (1). *Tsyɛ* associates with an element in the proposition (1a) and presupposes an alternative proposition (1b). So far, *tsyɛ* also seems to conform to (1c), as the alternative proposition has so far been identical to the expressed one, except for the added constituent. This last part of the definition will be called the 'identity requirement' in the remainder of this paper. In this section, I will show that this requirement does not hold for Avatime. In the corpus of narratives, there are 19 cases out of 79 in which there is no identity requirement.

We can thus not simply equate *tsyɛ* to German/English additive particles. How can it be defined, then? Do we simply remove the identity requirement from the definition, or can we change it to fit the Avatime data? My initial investigation suggests the latter option: *tsyɛ* does require a relation between the asserted proposition and its alternative, but rather than a relation of identity, this is one of similarity or compatibility.

Consider the third sentence in example (11). The added constituent is *Taga Kofi*, but there is no presupposition that a person other than Taga Kofi will go to the second house downtown. There is thus no identity requirement. There is a clear similarity between the two sentences though, as in both someone is going to a house to see what is being cooked there.

(11) *ńtekuma trɛ ní ke-pé ké-ya mɛ ka-lị kalaɛ*
ntekuma go LOC C_6S-house C_6S-PROX inside C_6S-be.at top
'Ntekuma, go to that house at the top.'

zɛ-di sị egé bɛ-tá-tɔ́ na
IT-look COMP what C_1P-INT-cook Q
'Go and look what they are going to cook there.'

*wɔ taga kofí wɔ **tsyɛ** trɛ ní ke-pe bla mɛ ní kaba*
2S taga kofi 2S ADD go LOC C_6S-house second inside LOC down
'You, Taga Kofi, you in turn go to the second house downtown.'

di sị kɔ egé bɛ-tá-tɔ́ na
look COMP then what C_1P-INT-cook Q
'Look what they are going to cook there.' (kadzidzia_110409_AB1)

Another example of similarity can be seen in (12). Here the particle *tsyɛ* indicates that something similar to 'standing beside the boy' holds for another topic. This is the case, even though it is not said overtly: it follows that if the dog is standing beside the boy, the boy must be standing beside the dog. The boy is thus the alternative topic and 'standing beside the dog' is sufficiently similar to 'standing beside the boy' to use the particle *tsyɛ*.

(12) *ɔ-nùvɔ-ɛ èɛ́-kpɛ è-wù-la*
C_1S-child-DEF C_1S.PROG-put C_3P-clothes-DEF
'The child was putting on his clothes.'

ma-mɔ̀ sị ɛ-lɛ-pɛ àkpɔ̀kplɔ-ɛ
1S-see COMP C_1S-IT-look.for frog-DEF
'I think he is going to look for the frog.'

*ka-drụ̀i-a **tsyɛ** ka-lɛ ní yɛ kapà*
C_6S-dog-DEF ADD C_6S-be LOC C_1S side
'The dog is standing beside him.' (frog_100719_DQ-PhA)

There are also cases where what is predicated about the two topics is not similar, but can be said to be compatible. In these examples, what is predicated of the two topics conforms to what is expected of them in a common type of situation. This can be seen in (13), where proposing and accepting form compatible parts of a common type of situation, in which each participant plays an expected role.

(13) *lɛ̌ ó-ŋyime sị o e-ti a-pɔnì yɛ sị̀*
and C_1S-man say o C_1S-follow C_1S-move.closer C_1S COMP
yáà-gbanì yɛ
LOG.POT-marry C_1S
'And the man said 'o'; he got close to her and said he would marry her.'

ɔ́-dzɛ ***tsyɛ*** *ó-gbe kóŋ lɛ̌ a-dị̀mɛ sị̀*
C_1S-woman ADD C_1S.NEG-refuse at.all and C_1S-agree COMP
áà-ze nì yɛ
C_1S.POT-marry C_1S
'The woman, in turn, did not refuse at all and she agreed to marry him.' (kadzidzia_110406_AuA)

In example (14), the 'common situation' is that of a struggle, in which one participant is trying to escape the other.

(14) [In the forest, Atrodze and Lulu want to eat leftover porridge at the location of a mysterious party. They are hungry, but Lulu wants to wait until the people have gone before going to take the porridge. Atrodze does not agree.]

àtrodze e-tsyidzyì sị̀ yí-ze-halì lị̀-fɪ̀flị̀-nɛ
Atrodze C_1S-impatient COMP LOG.SBJV-IT-collect C_3S-porridge-DEF
'Atrodze was impatient to go and collect the porridge.'

lulu ***tsyɛ*** *e-vu yɛ sị̀ ɔ-kí-trɛ*
Lulu ADD C_1S-hold C_1S COMP C_1S-PROH-go
'Lulu was holding him so he would not go.' (kadzidzia_110406_QM)

Example (15) is perhaps a less obvious example of this use of *tsyɛ*. Here, the scenario is one of being away from home for a long time, in which it could be expected that your wife would forgive you and your children would grow up.

(15) [After being in prison for a long time, a man returns home.]

ye-dze *á-kɔ* *tsya* *yɛ* *kɪ́lɛ* *gì* *a-bɪ̀tɛ* *petee*
C_1S.POS-wife C_1S-take forgive C_1S how REL C_1S-do all
'His wife forgave him everything he has done.'

lóso *ye-bie* ***tsyɛ*** *a-é-tsì* *e-dzi* *ɔ-yásɔwi*
so C_1S.POS-child ADD C_1S-VEN-grow C_1S-become C_1S-young.man
'His child, on his part, has grown up to become a young man.'
(famprob_110401_MeD-BeK_story)

Out of the 19 cases of *tsyɛ* in which there is no identity requirement, five do not seem to be analyzable in terms of similarity or compatibility. In these cases, *tsyɛ* seems to be used as a mere topic-switch device (16).

(16) *bɛ̀ɛ́-ŋà* *e-séwi-là* *xé* *bɛ̀ɛ́-za*
C_1P-eat C_3S-fruit-DEF and C_1P-pass
'They (the children) were eating the fruit and were passing.'

kɔ *ó-vì* *wa* *liboeboe* *tsyɛ* *e-dì* *wa* *dɪ̃ɪ̃ɪ̃*
then C_1S.NEG-ask C_1P anything ADD[5] C_1S-look C_1P ID
'And he did not even ask them anything, he just stared at them.'

lɛ̌ *ba-nɪ̀vɔ̀-wa* ***tsyɛ*** *bɛ́-sɛ́* *lɛ̌* *yɛ* ***tsyɛ*** *a-kɔ̀*
then C_1P-child-DEF ADD C_1P-leave then C_1S ADD C_1S-take
dɔ̀mɛ *kpɛ* *ní* *kà-sɔ-ya* *mɛ̀*
thing put LOC C_6S-basket-DEF inside
'And the children left and then he put the things into the basket.'
(pear_100719_PhA-DQ)

[5] The additive particle can also have a scalar meaning, as in this example.

Interestingly, all these five cases were produced in the same text, by the same speaker. Perhaps for this speaker, the semantics of *tsyɛ* has bleached, losing the similarity / compatibility requirement and keeping only the aspect of indicating an alternative topic.

All in all, in this section we have seen that in 25% of its occurrences, *tsyɛ* does not come with an identity requirement. In most of these cases, *tsyɛ* seems to come with a more general requirement of similarity or compatibility between the expressed proposition and its alternative.

This is of course only a first approximation of the possible semantics of *tsyɛ*. A corpus study clearly has its limits for this kind of research, as it shows only where *tsyɛ* is found and not where it cannot be used. A more controlled study of the use of *tsyɛ* in different kinds of contexts, including information on when it cannot be used, would be necessary to draw firmer conclusions. Nevertheless, the data above does show a pattern in the use of *tsyɛ* and it clearly shows that the identity requirement used to describe English/German additive particles is insufficient to account for the use of the Avatime additive particle.

5.3 Additive or contrastive?

In this section I discuss whether the semantics of the particle *tsyɛ* can be captured using the notions of additivity and contrast as described in Section 2. In the previous section, I already mentioned that the usual notion of additivity, including an identity requirement, does not adequately capture the meaning of *tsyɛ*. However, there is one way in which the identity requirement could possibly be upheld, which is to assume that *tsyɛ* may associate with the entire sentence. If the entire sentence is the added constituent, it does not have to be identical to anything in the presupposition. This can account for English cases like (17). The particle *also* associates with the entire last sentence and connects it to the previ-

ous sentence. On a higher level, there is some kind of identity between the two sentences, as both refer to consequences of what is described in the first sentence: the bad state of the economy.

(17) *The economy in the USA is going through rough times these days. Banks are struggling and the value of homes is rising.* ***Also****, many employees are being laid off.* (example found on an internet forum: http://forum.wordreference.com/showthread.php?t=1337878)

However, I would like to argue that the Avatime examples in the previous section do not involve the association of *tsyɛ* with the entire sentence. Firstly, unlike English additive particles, *tsyɛ* has a fixed position with respect to the added constituent: it directly follows it. If we want to analyze examples (11–16) as involving the entire sentence as the added constituent, we would have to stipulate an additional rule that *tsyɛ* may associate with the entire sentence, perhaps whenever it follows a sentence-initial element. This is not very elegant, because *tsyɛ* normally associates with preceding rather than following material (unlike English *also*). In fact, as I showed in Section 5.1, there are cases in which *tsyɛ* associates with the entire predicate (8). In these cases, *tsyɛ* occurs sentence-finally. We might thus expect that *tsyɛ* would also occur sentence-finally if it associated with the entire sentence. Secondly, proposing association with the entire sentence fails to explain the relation of similarity or compatibility between the part of the sentence not marked by *tsyɛ* and its alternative. Instead, we would expect identity on a 'higher level' as in (17), which we do not find. The particle *tsyɛ* is thus better analyzed as always associating with the immediately preceding constituent.

As *tsyɛ* cannot be defined as additive, can it perhaps be analyzed as contrastive? If contrast is defined in the narrow sense, as explained in Section 2.3, the answer is no. The Avatime particle *tsyɛ* does not indicate

an opposition between the element it associates with and an alternative. There are in fact other Avatime particles which have exactly this function, the most frequent of which is *kɔ*. An example can be seen in (18), where what is predicated about *Atrodze* is opposite to what is predicated about its alternative, the old man.

(18) *o kɪ̀lɛ gì agì ɔ-kàtsie xunyɔ e-tsée xé ɔ̀-fɔɛfɔɛ-nɔ̀*
oh how REL ? C_1S-old.man CTR2 C_1S-die and C_2S-spirit-DEF
e-dó yɛ mɛ̀
C_2S-move.out:LOC C_1S inside
'Oh, how the old man died and his spirit left him.'

kɔ àtrodze ***kɔ*** *ɔ-í-tse*
so atrodze CTR1 C_1S-NEG-die
'As for Atrodze, he didn't die.' (kadzidzia_110406_QM)

The particle *tsyɛ* does express contrast in the broad sense, as it indicates the presence of alternatives. However, the broad notion of contrast is not specific enough to define the semantics of *tsyɛ*. Firstly, it also includes narrowly contrastive particles such as *kɔ* and secondly, it does not capture the relation of similarity/compatibility between propositions that *tsyɛ* also expresses. The particle *tsyɛ* thus needs its own definition. Its meaning is in some sense in between additivity in the traditional sense and narrow contrast. As I mentioned in Section 2.3, both the notions of additivity and contrast in the narrow sense presuppose an alternative proposition and specify a relation between the expressed and presupposed propositions. In the case of additive particles of the English/German type, this relation is one of identity and in the case of narrow contrast, this relation is one of opposition. The Avatime additive particle adds another possibility to these relations in requiring the alternative propositions to be similar or compatible.

6 Conclusion and Discussion

In this paper I have investigated the semantics and use of the Avatime additive particle *tsyɛ*. The two most important findings are (i) that *tsyɛ* is not a focus particle, but can associate with either topical or focused elements and (ii) that *tsyɛ* does not necessarily indicate that the presupposed proposition is identical to the expressed one (without the added constituent). Instead of this 'identity requirement', there seems to be a more general constraint requiring the presupposed proposition to be similar to or compatible with the expressed one.

There are of course limitations to the corpus studies presented in this paper and these yield questions for further research. The main unclarity is the exact nature of the relation between the expressed proposition containing *tsyɛ* and the alternative proposition. 'Similarity or compatibility' is not a very satisfying definition and preferably one concept that encompasses both would be found. It is also not clear where the boundaries on the use of *tsyɛ* are. In which contexts is it infelicitous to use *tsyɛ*? This question can only be answered using elicitation methods and so must remain the topic of a future study.

Nevertheless, the findings presented here are important, as they show that even particles that seem to have rather straightforward functions can differ widely crosslinguistically. There is no concept, proposed in theoretical or typological work, that exactly maps onto the Avatime particle *tsyɛ*. The notions of additivity and contrast are relevant in describing the semantics of *tsyɛ*, but a more detailed, language-specific definition is needed to adequately define it.

Abbreviations

1	first person	NEG	negative
2	second person	P	plural
ADD	additive	POS	possessive
C_{number}	noun class	POT	potential
CM	clause marker	PROG	progressive
COMP	complementizer	PROH	prohibitive
CTR	contrastive	PROX	proximal demonstrative
DEF	definite	Q	question particle
FOC	focus	REC	recurrent
ID	ideophone	REL	relative
INT	intentive	S	singular
IT	itive	SBJV	subjunctive
LOC	locative	VEN	ventive
LOG	logophoric		

References

Ameka, Felix K. 2010. Information packaging constructions in Kwa: Micro-variation and typology. *Topics in Kwa syntax*, volume 78 of *Studies in natural language and linguistic theory*, ed. by Aboh, Enoch O. and James Essegbey, 141–176, Dordrecht: Springer.

Büring, Daniel. 2003. On D-trees, beans and B-accents. *Linguistics and Philosophy* 26: 511–545.

Chafe, Wallace L. 1976. Givenness, contrastiveness, definiteness, subjects, topics, and point of view. *Subject and topic*, ed. by Li, Charles N., 27–55, New York: Academic Press.

Dimroth, Christine. 2002. Topics, assertions, and additive words: how L2 learners get from information structure to target-language syntax. *Linguistics* 40(4): 891–923.

Fiedler, Ines. 2009. Contrastive topic marking in Gbe. *Current issues in unity and diversity of languages. Collection of papers selected from the CIL 18, held at Korea University in Seoul, on July 21-28, 2008*, 295–308, Seoul: The Linguistic Society of Korea.

Gundel, Jeanette K. 1988. Universals of topic-comment structure. *Studies in syntactic typology*, ed. by Hammond, Michael; Edith Moravcsik and Jessica Wirth, 209–239, Amsterdam: Benjamins.

König, Ekkehard. 1991. *The meaning of focus particles: a comparative perspective*. London: Routledge.

Krifka, Manfred. 1999. Additive particles under stress. *Proceedings of SALT 8*, ed. by Strolovitch, Devon and Aaron Lawson, 111–128, Cornell: CLC Publications.

Krifka, Manfred. 2007. Basic notions of information structure. *Interdisciplinary studies on information structure* 6: 13–55.

Lambrecht, Knud. 1994. *Information structure and sentence form: topic, focus, and the mental representations of discourse referents.*, volume 71 of *Cambridge Studies in Linguistics*. Cambridge: Cambridge University Press.

Prince, Ellen F. 1998. On the limits of syntax, with reference to left-dislocation and topicalization. *The Limits of Syntax*, volume 29 of *Syntax and Semantics*, ed. by Culicover, Peter and Louise McNally, 281–302, San Diego, Cal.: Academic Press.

Reinhart, Tanya. 1981. Pragmatics and linguistics: an analysis of sentence topics. *Philosophica* 27: 53–94.

Repp, Sophie. 2010. Defining 'contrast' as an information-structural notion in grammar. *Lingua* 120: 1333–1345.

Roberts, Craige. 1996. Information structure: Towards an integrated formal theory of pragmatics. *Papers in Semantics*, volume 49 of *OSU Working Papers in Linguistics*, ed. by Yoon, Yae Hak and Andreas Kathol, 91–136, Columbus, OH: The Ohio State University Department of Linguistics.

Rooth, Mats. 1992. A theory of focus interpretation. *Natural Language Semantics* 1: 75–116.

Vallduví, Enric and Maria Vilkuna. 1998. On rheme and kontrast. *The limits of syntax*, volume 29 of *Syntax and semantics*, ed. by Culicover, Peter and Louise McNally, 79–108, San Diego, Cal.: Academic Press.

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‘Also’ in Ishkashimi: Additive Particle and Sentence Connector*

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The paper discusses the distribution and meaning of the additive particle *-məs* in Ishkashimi. *-məs* receives different semantic associations while staying in the same syntactic position. Thus, structurally combined with an object, it can semantically associate with the focused object or with the whole focused VP; similarly, combined with the subject it can semantically associate with the focused subject and with the whole focused sentence.

Keywords: Ishkashimi, focus, additive particle, bracketing paradox

1 Introduction

This paper deals with the interaction between information structure and word order in Ishkashimi[1]. In particular the paper investigates the distribution and meaning of an additive particle *-məs*, comparable to English ‘also/even’. It appears that *-məs* is able to receive different semantic associates in one and the same syntactic position. When attached to the object, *-məs* can semantically associate with the focused object-DP, the whole focused VP, and in some cases even with the focused verb. Similarly *-məs* attached to the subject can semantically associate with the focused subject, the whole focused sentence, and the

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[1] The data were collected during fieldwork carried out in September 2011 for Project A5 of the SFB 632 “Information structure” in the Badakhshan Province of Tajikistan (the Pamirs). Example (14) stems from a manuscript of Ishkashimi stories collected by Zurbek Abibov.

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focused VP. The ability of *-məs* to take wide scope over the VP or TP while being "inside" it presents a structural paradox. The broad VP or TP focus scope cannot be derived compositionally if we assume that in Ishkashimi *-məs* appears below the VP or TP in the structure. Furthermore, Ishkashimi exemplifies a crosslinguistic tendency for some focus particles to prefer nominal hosts, independently of their semantic scope. Similar problems have been attested in other languages: Tangale (Hartmann & Zimmermann 2007), Japanese (Kotani 2009), Vietnamese (Hole 2008), Turkish (Kamali & Karvovskaya in preparation) — they all raise the question as to what extent the focus association can be explained by the syntactic notions of scope and C-command.

The ability of focus particles to associate with focus (as defined in Krifka (2006), an operator associates with focus if its interpretation depends on focus) makes them useful tools for the investigation of syntax-information structure and semantic-information structure interfaces. The standard theories of information structure assume that an informative sentence answers an implicit or explicit question in the discourse. The most prominent part of the sentence (the actual answer) is the focus. The placement of the focus particles can be flexible, but the surface order plays an important role. A focus particle should (precede and) C-command the focus associate, so that the focused part would be in the scope of the operator (Krifka 2006; Zimmermann 2012). Focus indicates the presence of relevant contextually salient alternatives. Additive and additive-scalar particles indicate that at least one other alternative is true for the same sentence (König 1991; Krifka 2006). The sentence topic might be focused as well (contrastive topic); those sentences can answer questions like WHO *did* WHAT opening two sets of alternatives: different participants and different actions.

The following section discusses the language and additive particles in general. Section 2 discusses the distribution of *-məs* in Ishkashimi as well as its associational behavior and the structural mismatches. Section 3 discusses possible ways of dealing with the structural paradox without favoring any particular

one of them. Section 4 discusses the semantics of *-məs* as a sentence connector. Section 5 is the conclusion.

1.1 Language background and focus in Ishkashimi

Ishkashimi belongs to the eastern group of Iranian languages. It is spoken in the Tajik province Badakhshan and in adjacent Afghanistan (the current study is based on the Ishkashimi language of Tajikistan). UNESCO includes Ishkashimi in the “Atlas of the World’s Languages in Danger” (Christopher 2010) — the number of speakers is estimated to be 1000. Ishkashimi is a non-written language; the dominant language of the area is Tajik.

The basic word order in Ishakshimi is SOV. As shown in (1) this word order is used in a broad focus context[2]. There is no specific morphological marking for focus, but the word order might change depending on the information structure of the sentence (Pakhalina 1959).

(1) Q: ‘What’s new?’
A: Az-m mošin xərənd-ok
1SG-1SG car bought-PERF
‘I bought a car.’[3].
#Mošin-m az xərənd-ok
#Mošin-m xərənd-ok az

Generally, all focused constituents in Ishkashimi can be in a position immediately preceding the verb. The narrow subject focus is compatible with both

[2] The following glosses are used: ACC accusative; COMPL complementizer; DAT dative; DEM demonstrative; DUR durative; EZ ezafe; GEN genitive; INF infinitive; M mood; OBJ object; PERF perfective; PL plural; PRT particle; REFL reflexive; SG singular.

[3] Ishkashimi exhibits some interesting linguistic phenomena. One of these is the existence of **moving agreement particles** (MAPs) in the past tense (Payne 1980: 438). For example, in (1) the person-number marker appears after the subject and not after the verb. Most often MAPs attach to the first major constituent; they may also appear several times in the clause note. The third person singular marker can be omitted; thus there are no MAPs in (2).

S_FOV and OS_FV word orders, as shown in (2).

(2) Q: 'Who cooked this food?'

A1: **Lena** ma awqot goxt
Lena DEM food made
'LENA cooked the food.'

A2: Ma awqot **Lena** goxt
DEM food Lena made
'LENA cooked this food.'

Narrow focus on the object is compatible with SO_FV word order; speakers occasionally also accept O_FSV.

(3) Q: What did the boy eat?

A1: Zoman **tarbəz** xůl.
boy watermelon ate
'The boy ate watermelon.'

A2: **Tarbəz** zoman xůl.
watermelon boy ate
'The boy ate watermelon.'

1.2 Additive and scalar particles

"Focus sensitive particle" is a general term for a "function word" like *only*, *even*, and *also* (König 1991: 10); those words have a large number of semantic and syntactic properties in common in different languages. One of them is association with focus. The contribution of those particles to the sentence meaning depends on the position of the focus in the sentence (Krifka 2006).

(4) a. Jacob **also** watches FOOTBALL.
b. Jacob **also** WATCHES football.
c. Jacob **even** watches FOOTBALL.

Thus in (4) the presence of *also* changes the **felicity-conditions** of the sentences: (4-a) is FELICITOUS if Jacob watches football and watches something else (the alternatives are generated by the implicit questions in the discourse; thus possible alternatives to *football* in (4-a) are other sports: *volleyball*, *basketball*, etc.), and it is INFELICITOUS if Jacob watches only football. (4-b) is FELICITOUS if Jacob watches football and does something else related to foot-

ball (maybe plays football) and INFELICITOUS if Jacob only watches football. According to König (1991: 62) **additive particles** like ‘also’ entail the corresponding sentence without the particle and introduce a presupposition: at least one of the alternative values under consideration in the context must be true. **Scalar additive particles** like ‘even’ carry the same presupposition as the additive and also involve a scalar ‘conventional implicature’ (König 1991: 68). Thus (4-c) would be FELICITOUS if Jacob watches football and something else related to football and in the given context, football is extreme compared to the other alternatives.

2 The Particle -*məs* in Ishkashimi

A large percentage of Ishkashimi vocabulary has been borrowed from other languages due to intensive language contact. For example, another focus particle *faqat* ‘only’ was borrowed from Persian which in turn borrowed the word from Arabic. Interestingly, *-məs* is not a result of a borrowing. The etymology of *-məs* is Iranian; it is cognate with Avestian *masiiah* ‘bigger’, Middle Persian *meh* (Bartholomae 1904: 1156), and Sogdian *mas* ‘further’ (Durkin-Meisterernst, p.c.). In Ishkashimi, *məs* can be interpreted either as an additive or a scalar additive particle, depending on the context and prosody, cf (5). Some speakers of Ishkashimi use an additional particle *daže* (< Russian) or *hatto* (< Tajik) to stress scalar meaning.

(5) Mə bibi pə da **koncert-məs** šed.
1SG.GEN grandmother to DEM.ACC concert-PRT went
‘My grandmother **also/even** went to the CONCERT.’

A test for additivity in (6) (adopted from Berger & Höhle (2012)) confirms that *-məs* has the property of additivity[4]:

[4] The test works as follows: in the context two objects are provided (such as the apple and the apricot in (6)). The question addresses one of the objects, *Did you eat the apple?*, and the answer mentions the other, *I ate the apricot!*, this could be a contradiction, but the addi-

(6) … The mother goes away and leaves the child an apple and an apricot. When she returns, she asks if the child ate the apple.
Q: Did you eat the apple?
A: Az-əm čwənḍ-**məs** xůl!
1SG-1SG apricot-PRT ate
'I ate an apricot as well.' (meaning: I ate both)

The rest of this section discusses the distribution of *-məs* and its association behavior. I will argue that *-məs* can associate with a constituent (VP or TP) while being structurally inside it and that *-məs* can function both as an additive particle and as a conjunct, coordinating VPs or TPs.

2.1 The particle *-məs*: distribution

If a nominal expression is focused, *-məs* cliticizes to its associate NP, as illustrated in (5) and (6). Syntactically *-məs* can only combine with nominal expressions. It cannot appear after a finite verb. Note that infinitives in Ishkashimi are close to nouns syntactically (Pakhalina 1959: 57), and *-məs* is licensed after infinitives, cf. (7). Other Ishkashimi clitics, for example, the mood marker *-əs* and MAP-s, normally appear after *məs*, cf. (7).

(7) Aw rənigi gap-du-k-**məs-əs** baisu
DEM Ryni speak-hit-INF-PRT-M can.3SG
(She can speak German and Russian.) 'She/he[5] can **also/even** speak Ryni (Ishkashimi).'

However, the alignment of *-məs* and MAP-s may vary; in (8) number-person markers appear before *-məs*. Similarly, the object marker *-i* can appear after *-məs* or before, as illustrated in (8)–(9).

tive particle in the answer, ***I also** ate the apricot!*, changes the semantics of the sentence. It becomes true for both objects (the contribution of the additive meaning component).

[5] **Third person** pronouns in Ishkashimi are identical to demonstratives (DEM).

(8) The teacher asked a question. I knew the answer …

… mə amsinf-o-**n-məs** / amsinf-o-**məs-on** pəzind.
1SG classmate-PL-3PL-PRT / classmate-PL-PRT knew.
‘MY CLASSMATES also knew the answer.’

(9) Q: You bought tomatoes and onions, but you did not buy potatos?
A: Az-əm kartoš-**məs-i** / kartoš-**i-məs** xərnəd
1SG-1SG potatoe-PRT-OBJ / potatoe-OBJ-PRT bought
‘I bought potatoes as well.’

2.2 A structural paradox

Example (10) demonstrates narrow object focus. *-məs* is attached to the object, this is similar to (6). A2 demonstrates that subject attachment would be infelicitous in this context.

(10) Q: Salima is baking bread today. What else is she baking?
A: Salima **kulča-məs** pacu
Salima kulcha-PRT bake.3SG
‘Salima also bakes KULCHA (a sweet pie).’
A2: #Salima-**məs kulča** pacu
intended: ‘Salima also bakes KULCHA.’

Interestingly, (10) is structurally identical to (11), where the semantic associate of *-məs* is the whole VP ‘bakes kulcha’.

(11) Q: Salima is washing the dishes. What else is she doing?
A: Salima **kulča-məs pacu**
Salima kulcha-PRT bake.3SG
‘Saima also BAKES KULCHA.’
A2: *Salima **kulča pacu-məs**
Intended: ‘Salima also BAKES KULCHA.’

So far we have seen that *-məs* appears to the right of its semantic associate, but this does not happen in (11); the whole VP is in focus, but *-məs* stays inside the VP, and it does not move to its right edge. The syntactic associate of *-məs* in (11) is only the object-NP 'kulcha'; alignment such as V-*məs* is not possible. We are confronted with a structural paradox as illustrated in (12). The position of the particle is different in the semantic and the syntactic representation of the sentence.

(12) PF: Salima [$_{VP}$ kulcha$_{DP}$***-məs*** bakes]
LF: Salima [$_{VP}$ kulcha bakes]***-məs***

2.3 *-məs* as sentence connector: structural paradox revisited

Similar to the VP level, there is a structural paradox at the sentence level. The subject can be the morphological and the semantic host of the additive (13). But attachment to the subject is also possible if the particle associates with the whole sentence focus, cf (14).

(13) [Lena šir-čoy pəvu$_{TP}$], [məx-**məs** šir-čoy pəv-on$_{TP}$].
Lena milk-tea drink.3SG 1PL-PRT milk-tea drink-2PL
'**Lena** drinks milk tea, and (also) **we** drink milk tea.'

(14) **Wai mol-məs** xi dust-o-i zənayu isu
DEM husband-PRT REFL hand-PL-OBJ wash.3SG come.3SG
'(One woman cooked pilau and called her husband to come and eat...)
and her husband goes to wash his hands.'

If one would just consider the structure of (14), taken without any context such a sentence could answer *Q1: Who else went to wash his hands?* However, this is not compatible with the existing discourse. The woman did not go to wash her hands and there were no other people present (sentence (14) is taken from a story). There is no other salient participant who went to wash his hands with the husband; the predicate *went to wash his hands* would not be true for

any other alternative. If the associate of *-məs* is only the subject, the additive meaning component of *-məs* is missing. However, the discourse is well-formed if we translate *-məs* not as ‘also’, but as ‘and’. Let us consider the other possibility, that the associate of *-məs* is the whole TP; *Q2: What happened then?* If the semantic associate of *-məs* is not the subject but the whole sentence, the additive meaning of *-məs* establishes the connection between two things that happened: (i) *the woman invited her husband to eat* and (ii) what happened after: *the husband went to wash his hands*.

This usage of *-məs* is not that surprising if we consider the existing affinity between additives particles and conjunctions; this is noted for instance by König (1991: 65) for Latin, Greek, Russian, and other languages. This affinity is also confirmed by the works of Zeevat & Jasinskaja (2007) and Jacobs (1988), which show that at least in some of their usages English *and* and German *und* can function as additive particles. Jacobs (1988) differentiates between “non-focusing” and “focusing” coordinators (those that interact with Focus-Background alignment). Thus, “focusing” *und* coordinates phrases which must show parallels in their Focus-Background alignment. Zeevat & Jasinskaja (2007) explain the asymmetry between two conjuncts connected with *and* with the help of focus and the “current question in discourse”. The research in this area (including the recent work by Toosarvandani (2010) on ‘but’ in Persian as a two-place focus operator) indicates that the division between conjunctions and particles might not be that clear — in many cases the same item actually fulfills both functions.

(13) and (14) demonstrate the structural ambiguity on the TP level, where *-məs* can take scope over the whole clause and functions as a sentence connector. It is exactly parallel to the ambiguity in (12), where the particle attached to the object connected two VPs.

(15) PF: [$_{TP}$ Her husband$_{DP}$-**məs** goes to wash his hands]
LF: [$_{TP}$ Her husband goes to wash his hands]-**məs**

2.4 Coordinated structures: structural paradox reloaded.

Interestingly, the additive particle *-məs* can appear twice or more in coordinated structures (similar to English 'both ... and', 'either ... or'). König (1991: 66) classifies such cases of "emphatic conjunction" as additional evidence of the affinity between additive particles and conjunctions. The placement of the coordinator seems to follow the rules observed for VP and TP focus association. In (16) the particle attached inside the VP marks **VP coordination**[6].

(16) Lena [anglisi-**məs** pəzinu]-t [rənigi-**məs**-s bexou pəzin-uk].
Lena English-PRT know.3SG-and Ryni-PRT-M want.3SG know-INF
'Lena knows **English**, she (also) wants to know **Ryni** (Ishkashimi).'

Note that the first usage of *-məs* is not additive in the strict sense of the word. It is reminiscent of cataphora as it only corefers with the later *-məs* but does not have an additive meaning component on its own.

2.5 *-məs* to the left of its associate.

There are puzzling cases where *-məs* appears to the left of its associate, in contrast to what has been observed in (10). Thus in (17) *-məs* is attached to the object; the context, however, is supposed to trigger narrow verb focus (note that in (17) the question is only targeting the action).

(17) Q: What did Usuf do with the book?
A: Aw **kitob** zughd-ət **kitob-i-məs** / **wani-məs** bəlavd
DEM book took-and book-OBJ-PRT / DEM.ACC-PRT read
'He took (bought) a book, he also READ this book.'

[6] See also three occurrences of *-məs*:

(i) Lena [gola-**məs**-i paced], [čogo-**məs**-i zənud], [auqot-**məs**-i goxt].
Lena bread-PRT-3SG baked dishes-PRT-3SG washed food-PRT-3SG cooked
'Lena baked the bread, washed the dishes, and cooked the food.'

The structural paradox appears “on two levels”, for the verb and for the VP: structures like (17), where *-məs* takes scope over the verb “from outside”, are parallel to the sentences where *-məs* appears after the subject and takes scope over the VP (18). The associate of *-məs* in (18) is a pronoun referring to the subject of the previous clause; it most probably belongs to the background. This presents a puzzle — an A2 which is exactly parallel in (10) is blocked.

(18) **Ad čondor** oghad-uk Rən-bo. Ad-**məs** pəzind-uk za
DEM goat came-PERF Ryn-to DEM-PRT knew-PERF COMPL
Rənjeon tabjat-gol uk...
Ryn.people nature-with one
‘**This mountain goat** came to Ryn. **And then he** found out that Ryni people love nature (are united with nature)…’

(19) is a summary of those cases where the semantic associate of *-məs* differs from its syntactic associate. (19-a) shows the VP association, (19-b) the TP association (sentence connector), (19-c) the coordinated structures, (19-d) and (19-e) are the cases where *-məs* appears to the left of its associate.

(19) a. PF: SUBJ [$_{VP}$ OBJ$_{DP}$***-məs*** V]
LF: SUBJ [$_{VP}$ OBJ$_{DP}$ V]***-məs***
b. PF: [$_{TP}$SUBJ$_{DP}$***-məs*** OBJ V]
LF: [$_{TP}$SUBJ$_{DP}$ OBJ V]***-məs***
c. PF: SUBJ [$_{VP}$ OBJ$_{DP}$***-məs*** V], [$_{VP}$ OBJ$_{DP}$***-məs*** V]
LF: SUBJ [$_{VP}$ OBJ$_{DP}$ V]***-məs***, [$_{VP}$ OBJ$_{DP}$ V]***-məs***
d. PF: SUBJ [$_{VP}$ OBJ$_{DP}$***-məs*** V]
LF: SUBJ OBJ$_{DP}$ [V]***-məs***
e. PF: [$_{TP}$SUBJ$_{DP}$***-məs*** OBJ V]
LF: SUBJ$_{DP}$ [$_{VP}$ OBJ V]***-məs***

3 Possible Analysis

The observed mismatches between semantic and syntactic association of the particle *-məs* are very interesting from a cross-linguistic perspective. There seems to be a tendency across languages for some focus particles to prefer nominal hosts, independently of their semantic scope. For example, the data strongly resemble the structural paradox in Tangale (Hartmann & Zimmermann 2007: 123), where different narrow foci (object, VP, V) come with identical syntactic surface structures, while the particle *núm* 'only' in Tangale can syntactically associate only with DPs. Note the similarity between these two unrelated languages: *-məs* in Ishkashimi shows strictly adnominal behavior, as does Tangale *núm*; similar to Tangale, the surface structure in Ishkashimi is identical for narrow object, VP-, and V-focus. In this case, it becomes problematic to explain the notion of the scope of the focus particles via C-command, at least on the surface. So far no general solution has been proposed to capture this lack of direct mapping between syntactic and semantic interfaces in some languages. In this chapter, I discuss three possible ways of approaching the problem: a phonological effect (without syntactic structure being involved), syntactic movement involving an EPP feature, and mapping between prosody and syntax (focus projection). I will review these approaches, but in this paper I will not adopt any single one of them.

3.1 Phonological process

One of the possible ways of explaining the placement of *-məs* in Ishkashimi is to assume that it is governed by phonological constraints. Thus, in many languages there is a phonological process which can flip the order of two words (Embick & Noyer 2001). A typical example is the Latin conjunction *que*, which does not appear between the conjuncts but embedded inside the conjunct (Embick & Noyer 2001: 575). In case *-məs* were one of these particles, it could be syntactically attached to the VP and could take scope over the VP, but phono-

logically it could be flipped with the object (Merger occurs in Morphology after the Vocabulary Insertion and exchanges structural relations between a clitic and a Morphological Word on the PF). This kind of analysis is assumed by Kotani (2009) for Japanese.

A good test case for this approach seems to be an object which consists of several morphological words. If the process is phonological in nature for the cases where the particle semantically scopes over the VP, one would expect *-məs* to appear inside the object when the object consists of more than one word. As far as my elicitations show this is not the case; cf. (20).

(20) Lena kruš-i zənud-ət [tort-i bamaza-i ajoib-i$_{Obj}$]-məs paced.
Lena dish-OBJ washed-and cake-EZ tasty-EZ great-EZ-PRT baked
‘Lena washed the dishes and also baked a wonderful, tasty cake.’

The object in (20)[7] consists of a noun and two adjectives. However, even in this case, contrary to what the phonological analysis predicts, *-məs* does not appear embedded inside the object but appears after the object. The phonological approach does not make the right predictions for Ishkashimi.

3.2 EPP feature

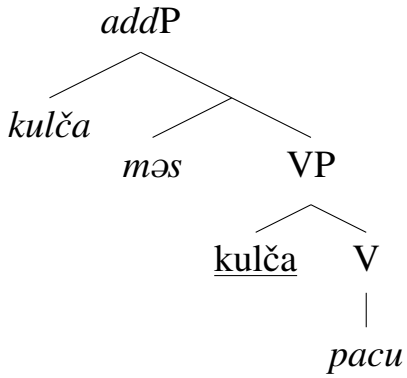
A syntactic analysis for the placement of *-məs* has been proposed by Kamali & Karvovskaya (in preparation); it is inspired by similar analyses by Bayer (1996), Kahnemuyipour & Megerdoomian (2010), Kamali (2011). This analysis would assume two different syntactic structures: one for the narrow focus association

[7] *-məs* appears after the object even when it contains a relative clause:

(i) Lena kruš-i zənud-ət [tort-i bamaza-i za pə iw xon fri ce
Lena dish-OBJ washed-and cake-EZ tasty-EZ that in DEM.GEN house COMPL good
dir-on$_{OBJ}$] məs-i paced.
see-3PL PRT-EZ baked.
‘Lena washed the dishes and also baked a tasty cake, which her family (in her house) loves (lit. good sees).’

and the other for the broad scope of the particle. For narrow object and subject focus, the particle is merged with its associate. In order to obtain VP scope, the particle appears above the VP as proposed by Bayer (1996). A head 'add' (*-məs*) merges with the v/VP. Importantly, the addP has an EPP feature which attracts the object NP, thus yielding the order Obj Additive V even in VP association. A parallel analysis is assumed for the TP association. An addP that merges with the TP provides the correct scope while causing the subject to superficially occur to its left.

(21)



There is a group of problems which pertain to differences between Turkish and Ishkashimi, which the analysis does not account for yet (see also Kamali & Karvovskaya (in preparation)). First, structures like (22) are marginally accepted in Ishkashimi. This is a modification of (14) with DOS_FV word order. The sentence appears to be marked but somewhat acceptable for the speakers. However it is ruled out by the analysis, which predicts when the object is scrambled to the beginning of the sentence, *-məs* appears immediately after it.

(22) Xi dust-o-i **wai mol-məs** zənayu isu
REFL hand-PL-OBJ DEM husband-PRT wash.3SG come.3SG
'**And** her husband goes to wash his hands.'

Second[8], the “optional” object marker *-i* in Ishkashimi can appear after *-məs*, cf. (9). The analysis would have to explain why the case marker can follow the particle having VP scope. Ishkashimi allows both alignments: the object marker can appear after *məs* or precede *məs*. It is not clear if the object is being moved out of the VP after the case marking has been assigned or if the case marking is assigned after the movement and why Ishkashimi can choose between these two strategies (see the order of Merge and Agree application in Müller (2009)).

3.3 Focus projection: mapping IS and prosody

The third way to approach the problem could be to explain the placement of the particle via mapping between information structure and prosody. The way in which *-məs* receives a wider focus than one would predict from its syntactic placement resembles one of the notions of focus projection. It has been argued by Büring (2006) for English that any subconstituent (not only heads and arguments) can project focus. In certain contexts, for example, even the subject of a transitive verb can project focus, as illustrated in (23) from Büring (2006).

(23) Q: Why did Helen buy bananas?
A: [Because JOHN bought bananas$_F$]

[8] Additionally one would need to explain some differences between Turkish and Ishkashimi which do not follow directly from the analysis. In Ishkashimi, *-məs* is exclusively adnominal and never appears on the verbs; in Turkish the additive particle can also appear in the post-verbal region. In Ishkashimi, the particle does not appear in sentences with focused intransitive verbs unless there is a ‘dummy’ object like ‘cry’ in (i) (note that this structure does not indicate verb focus; it is contingent on the presence of *-məs*, which requires a nominal host).

(i) A: You always laugh.
B: Yes, I do laugh a lot . . .
. . . Noiza šid-uk-məs šid-əm.
But cry-INF-PRT cry-1SG
‘. . . but I also cry.’

Thus the “positional” phenomena has additional “nominality” restriction.

Placement of pitch on JOHN in (23) resembles the sentences where *-məs* syntactically attaches to the subject but semantically receives TP scope. The semantic scope of *-məs* can be as wide as the focus projection can go. One could assume that placement of *-məs* functions similarly to English pitch: the constituent is either focused or is not focused and is new in the discourse (Büring 2006).

This explanation immediately runs into some problems with Ishkashimi. First, although this observation needs to be tested, in sentences like (14), the constituent which has more prosodic prominence seems to be the one before the verb (which would be a mismatch between pitch placement and *-məs* placement). Second, there are sentences like (18) in section 2.5, where *-məs* attaches to the given constituent (subject) instead of to the non-given one (VP). This contradicts the F-marking principles known from English.

A more detailed study of Ishkashimi prosody is needed to see if mapping between these two interfaces can help to explain the particle placement. It might turn out that in terms of sentence melodies, Ishkashimi is a *phrasal* language, similar to Turkish (Güneş to appear) or Hindi (Féry to appear). Thus Güneş (to appear) and Kamali (2011) note that in Turkish, information structure does not really affect the tone alignment. There are only phrasal tones and no tonal marking on the focus/topic. If Ishkashimi turns out to be similar to Turkish, one could argue that the placement of *-məs* is affected by the phrasing rules (for example, Güneş (to appear) claims the ordering of the verb in Turkish is constrained by prosodical phrasing).

4 Semantics of *-məs*: a "Real Focus Particle"

In this section I would like to discuss the properties of *-məs* in its sentence connector function. Note that the differences in the associational behavior of *-məs* in Ishkashimi and *also* in English provide an alternative explanation to some of the phenomena noticed by Matthewson (2006) for St'át'imcets. Thus, Matthewson (2006) explains some unexpected occurrences of *t'it* 'also' via cross-linguistic

variation of the presupposition status in the common ground (in St’át’imcets the presuppositions can be in the speaker’s knowledge only). The cases discussed are strongly reminiscent of Ishkashimi examples such as (14) and (16)[9], where *-məs* attached to the subject takes scope over the whole TP and receives meaning similar to English *and*. The presupposition in this case is ‘something else took place’ which is very easy to accommodate. It is an interesting question if *t’it* in St’át’imcets can function as a sentence connector. The prediction is that *-məs*, being in-between an additive particle and a conjunction would not be infelicitous out of the blue as has been argued for *also* and *too* (Kripke 1999; Tonhauser et al. to appear).

One should not assume that all additives which can serve as sentence connectors have equal semantics. As shown in Kamali & Karvovskaya (in preparation), the sentence connector function of additive *-məs* is different from the very similar additive particle *dA* in Turkish. Crucially, *dA* can mark contrastive topics; as Göksel & Özsoy (2003: 1161) note, in sentences like (24-a) there are two sets of alternatives: people and places. I could not elicit such examples with Ishkashimi, as shown in (24-b):

(24) a. [LENA$_{CT}$ sinema-ya$_F$ gidi-yor], [BESTE$_{CT}$ **de** konser-e$_F$ (gidi-yor)].
Lena cinema-DAT go-DUR, Beste PRT concert-DAT go-DUR
‘Lena is going to the movies **and** Beste is going to a concert.’

b. #[FARZONA$_{CT}$ teatr šed] [ZUHRO$_{CT}$-**məs** kino$_F$ šed].
Farzona theater went Zuhro-PRT cinema went
Intended: ‘FARZONA went to the theater and ZUHRO went to the cinema.’
Comment: they should do the same thing if you want to use *-məs*, as in (24-c).

[9] According to Matthewson (2006: 69), a sentence in St’át’imcets such as ‘Henry is **also** going to Paris at Christmas’ can be uttered in a situation where “[the] addressee has no knowledge of anyone planning a trip to Paris”.

c. [Farzona oghad] [Zuhro-**məs** dəštarək oghad].
Farzona came Zuhro-PRT later came
'Farzona came, **and** Zuhro came later.'

It appears that *-məs* in Ishkashimi does not tolerate double contrast (different participants, different actions). This observation shows that there are significant differences between the members of the family of "additive particles" which also serve as sentence connectors (TP scope). We observe following groups of additives: (i) additives which can be used to conjoin sentences, *-məs*, (*also* in Zeevat & Jasinskaja (2007)); (ii) additives which can be used in contrastive topic contexts when the comment part is parallel (German stressed *auch*, English *too* (Krifka 1999)); (iii) Additives which can be used in contrastive topic contexts in which the comment is not parallel (Turkish *dA*, which simultaneously belongs to (i) and (ii)). The question would remain whether there is another group, (iv) additives which cannot be sentence connectors.

Note that the particles grouped in (i) do not behave exactly alike. On the one hand, (24-b) could be well-formed in English: *Q: So, how was the evening? Did the students go somewhere? A: Well, yes. Lena went to the cinema. Also, Beste went to the theater* (modification of Zeevat & Jasinskaja (2007)). On the other hand, (14) would not be well-formed with *also*. It seems that in the sentence-connector function, the additive particles undergo some rules of discourse organization which would also apply for conjunctions.

Zimmermann (2012) suggests that those cases where association with focus is strict and the additive gives a comment on the immediate question under discussion (QUD) (see also Beaver & Clark 2008, Roberts 2004) are special instances of the general pattern (Bole, Ngizim, Serbo-Croatian). In this sense, *-məs* in contrast to *dA* can be called a "real focus particle": it can only give a direct answer to QUD; it can not refer to the higher structures in the discourse tree and show that the question under discussion has been only partially answered.

5 Conclusion

In this paper I have given an overview of some properties of the additive particle *-məs* in Ishkashimi. The main observation is that the semantic association of *-məs* does not correspond to its syntactic association. Crucially, *-məs* can have broader scope than one would predict from its syntactic placement. We have observed that the distribution of *-məs* is parallel at the VP and the TP level. *-məs* can appear inside the constituent and have semantic scope over it (attachment to the object inside the VP and to the subject inside the TP). *-məs* can appear in one sentence several times and coordinate VPs or TPs; in this case the first occurrence of *-məs* will be more like a cataphora than an additive. In some cases, *-məs* adjoined to the subject or to the object can scope to its “right” and take scope over the VP or V externally.

The differences in the associational behavior of *-məs* in Ishkashimi predict problems with elicitations including felicity judgments. While interpreting a sentence which contains *-məs*, the speaker chooses between different possible strategies. For example, if *məs* is adjacent to the subject, the consultant can choose between narrow-subject or whole-focus association. In the first case, the subject cannot be the only unique participant, but in the second case it can (see sentences like (14) in section 2). Thus, the “cancellation test” (Renans et al. 2011) is not really applicable for *-məs* when it is adjacent to the subject and the object. One more interesting property of *-məs* as a sentence connector is that it is blocked from occurring in partial answers to QUDs, in contrast to additive particles in Turkish or German. It turns out that in this function, *-məs* is more similar to English *also*. My paper does not provide a solution for the observed structural paradox. I give a preliminary overview of the theories which could explain the data. One could approach the problem as a phonological phenomena (Embick & Noyer 2001), a syntactic movement (Kamali & Karvovskaya in preparation) or maybe even a result of syntax-prosody mapping. Finding a solution will be the subject of future research.

References

Bartholomae, Christian. 1904. *Altiranisches Wörterbuch*. Strassburg: Trübner.

Bayer, Josef. 1996. *Directionality and logical form: On the scope of focusing particles and wh-in-situ*. Dordrecht: Kluwer.

Beaver, David & Brady Clark. 2008. *Sense and sensitivity*. London: Blackwell Publishing.

Berger, Frauke & Barbara Höhle. 2012. Restrictions on addition: Children's interpretation of the focus particles *auch* (also) and *nur* (only) in German. *Journal of Child Language* 39. 383–410.

Büring, Daniel. 2006. Focus projection and default prominence. In Valéria Molnár & Susanne Winkler (eds.), *The architecture of focus*, Berlin, New York: Mouton De Gruyter.

Christopher, Moseley (ed.). 2010. *Atlas of the World's Languages in Danger*. Paris: UNESCO Publishing 3rd edn.

Embick, David & Rolf Noyer. 2001. Movement operations after syntax. *Linguistic Inquiry* 32(4). 555–595.

Féry, Caroline. to appear. The intonation of Indian languages: an areal phenomenon. In Imtiaz Hasnain & Shreesh Chaudhary (eds.), *Festshrift in honor of Rama Kant Agnihotri*, 288–312. Delhi: Aakar Books.

Göksel, Asli & Sumru Özsoy. 2003. dA: A focus/topic-associated clitic in Turkish. *Lingua* 113. 1143–1167.

Güneş, Guliz. to appear. On the Role of Prosodic Constituency in Turkish. In *Proceedings of WAFL8*, Cambridge, MA: MIT.

Hartmann, Katharina & Malte Zimmermann. 2007. Focus strategies in Chadic - the case of Tangale revisited. *Studia Linguistica* 61(2). 95–129.

Hole, Daniel. 2008. Even, also and only in Vietnamese. In Shinichiro Ishihara, Svetlana Petrova & Anne Schwarz (eds.), *Interdisciplinary Studies on Information Structure (ISIS)*, vol. 8, 1–54. Universitätsverlag Potsdam.

Jacobs, Joachim. 1988. Fokus-Hintergrund-Gliederung und Grammatik. In Hans Altmann (ed.), *Intonationsforschungen*, 89–134. Tübingen: Max Niemeyer.

Kahnemuyipour, Arsalan & Karine Megerdoomian. 2010. Second position clitics in the vP phase. *Linguistic Inquiry* 42(1). 152–162.

Kamali, Beste. 2011. The question particle in Turkish: Consequences for the interfaces. In *Online complement to Proceedings of WCCFL 28*, University of Southern California.

Kamali, Beste & Lena Karvovskaya. in preparation. 'Also': similarities and differences between Turkish and Ishkashim. In *Proceedings of WAFL 8*, University of Stuttgart.

König, Ekkehard. 1991. *The Meaning of Focus Particles*. London: Routledge.

Kotani, Sachie. 2009. *Focus particles and their effects in the Japanese language*: University of Delaware dissertation.

Krifka, Manfred. 1999. Additive particles under stress. In *Proceedings of SALT 8*, 111–128. Cornell: CLC Publications.

Krifka, Manfred. 2006. Association with focus phrases. In Valérie Molnár & Susanne Winkler (eds.), *The architecture of focus*, 105–136. Berlin: Mouton de Gruyter.

Kripke, Saul. 1999. Presupposition and anaphora: Remarks on the formulation of the projection problem. *Linguistic Inquiry* 40. 367–386.

Matthewson, Lisa. 2006. Presuppositions and cross-linguistic variation. In Christopher Davis, Amy Rose Deal & Youri Zabbal (eds.), *Proceedings of nels 36*, 63–76. Charleston: Booksurge Publishing.

Müller, Gereon. 2009. Ergativity, Accusativity, and the Order of Merge and Agree. In Kleanthes K. Grohmann (ed.), *Explorations of Phase Theory. Features and Arguments*, Berlin: Mouton de Gruyter.

Pakhalina, Tatjana N. 1959. *Ishkashimskiy jazik*. Moskva: Nauka.

Payne, John R. 1980. The Decay of Ergativity in Pamir Languages. *Lingua* 51(2-3). 47–186.

Renans, Agata, Malte Zimmermann & Markus Greif. 2011. Questionnaire on focus semantics. In Svetlana Petrova & Mira Grubic (eds.), *Interdisciplinary Studies on Information Structure (ISIS)*, vol. 15, 2–152. Universitätsverlag Potsdam 2nd edn.

Roberts, Craige. 2004. Context in dynamic interpretation. In Laurence R. Horn & Gregory Ward (eds.), *The handbook of pragmatics*, 197–220. Oxford: Blackwell.

Tonhauser, Judith, David Beaver, Craige Roberts & Mandy Simons. to appear. Towards a taxonomy of projective content .

Toosarvandani, Mazir. 2010. *Association with foci*: University of California, Berkeley dissertation.

Zeevat, Henk & Katja Jasinskaja. 2007. 'And' as an additive particle. In Mixel Aurnague, Kepa Korta & Jesús M. Larrazabal (eds.), *Language, Representation and Reasoning*, 315–340. Bilbao: UPV-EHU.

Zimmermann, Malte. 2012. ‘Even’ gives even more information. Presentation at 34. Jahrestagung der Deutschen Gesellschaft für Sprachwissenschaft.

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Doubling in RSL and NGT: a Pragmatic Account*

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In this paper, doubling in Russian Sign Language and Sign Language of the Netherlands is discussed. In both sign languages different constituents (including verbs, nouns, adjectives, adverbs, and whole clauses) can be doubled. It is shown that doubling in both languages has common functions and exhibits a similar structure, despite some differences. On this basis, a unified pragmatic explanation for many doubling phenomena on both the discourse and the clause-internal levels is provided, namely that the main function of doubling both in RSL and NGT is foregrounding of the doubled information.

Keywords: Russian Sign Language, Sign Language of the Netherlands, doubling, Information Structure, foregrounding

1 Introduction

Doubling, whereby some constituent occurs twice referring to the same object or action, is commonly attested in many signed and spoken languages. The Russian Sign Language (RSL) examples in (1) and (2) illustrate the phenomenon and also show that the two occurrences of the doubled constituent can be either identical (1) or differ in terms of grammatical markers (2).

(1) IX GIRL CL:STAND STILL CL:STAND[1] [RSL:x2-6]
'The girl is still standing'

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[1] Notational conventions: Signs are glossed in SMALL CAPS. Fingerspelled words are represented with dashes: G-R-U-Š-A. IX stands for index (pointing), CL:STAND stands for a classifier construction meaning approximately 'go', ASP — aspectual marking, # — hesitation. Each example from RSL and NGT is followed by a label referring to the text

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(2) CLOSE CL:GO THERE CL:GO-ASP.CONT [RSL:g1-1]
'There he is going now' (progressive meaning)

From a theoretical point of view, doubling is a challenging phenomenon because one of the main principles that is said to determine language structure and use is economy. Producing the same constituent twice is obviously uneconomic; linguists therefore always try to find a motivation for this operation that can overrule economy. The functions that have been related to doubling in spoken and signed languages are emphasis, contrastive or non-contrastive verification (Kandybowicz 2007; Corver & Nunes 2007). In addition, doubling can be used to "save" constructions that would otherwise be ungrammatical because of the limitations on the amount of inflection or incorporation.

In this paper, doubling in RSL and Sign Language of the Netherlands (further NGT, for Nederlandse Gebarentaal) is discussed. In both sign languages different constituents (including verbs, nouns, adjectives, adverbs, and whole clauses) can be doubled. I will show that doubling in the two languages has common functions and exhibits similar structure, although there are differences with respect to what kinds of constituents can be doubled. On this basis, I will provide a unified explanation for many doubling phenomena on both the discourse and the clause-internal level, claiming that the main function of doubling both in RSL and NGT is foregrounding of the doubled information. In addition, a possible diachronic relation between discourse doubling and clause-internal doubling in terms of grammaticalization is discussed.

and the signer: for instance, NGT:4-3 means that this example is from the speech of the signer 3 from text 4.

2 Doubling in Spoken and Signed Languages

Doubling is a phenomenon attested in many spoken and signed languages (Kandybowicz 2007). Sign languages in which doubling has been attested are, among others, American Sign Language (ASL: Fischer & Janis 1990, Nunes & de Quadros 2008), Brazilian Sign Language (LSB: Nunes & de Quadros 2008) and Hong Kong Sign Language (HKSL: Sze 2008).

Several explanations for the doubling phenomenon have been proposed both for signed and spoken languages. Cheng and Vicente (2008) argue that the relation between the occurrences of the doubled element is one of movement, and that double realization of the copies is a strategy to save a derivation that would otherwise crash. Along the same lines, Fischer and Janis (1990) claim that verb doubling in ASL occurs when the verb would otherwise become too heavy, namely when an overt object is present and the verb is inflected or contains a classifier. Similarly, Kegl (1985) discusses limitations on the number of arguments that can be incorporated in the verbal stem in ASL and suggests that in order to incorporate more arguments than would be possible the verb can be doubled, splitting the incorporation burden between the two occurrences.

A different line of reasoning connects doubling to notions of emphasis or affirmation. Based on the theory developed in Nunes (2004), many authors argue that double realization can be triggered when one of the occurrences of the doubled element undergoes morphological fusion with some functional head, such as an emphatic head or a focus head. Doubling in SL has been explained along these lines as well (Nunes & de Quadros 2008).

However, as this paper will show, these traditional explanations for doubling cannot account for the RSL and NGT data. Therefore, an alternative account is proposed. For more detailed discussion of previous research on doubling in sign languages, see Kimmelman (to appear).

3 Methodology

3.1 Types of data

In order to study doubling in RSL and NGT, I have analyzed two small corpora of these sign languages. For RSL, a corpus of narratives collected and annotated by Prozorova (2009) was used. It consists of 13 stories told by 9 signers. Two stories were based on the *The Pear Film* (Chafe 1980), the other 11 stories were based on several comic strips. Nine Deaf[2] signers participated: four men and five women. The average age of the informants at the time of the recording was 31 years. Five subjects came from Deaf families, but the remaining four did not acquire RSL until school (approximately at the age of 6); they also used spoken Russian at home.

For NGT, I have analyzed a small subset of the Corpus NGT (Crasborn, Zwitserlood & Ros 2008; Crasborn & Zwitserlood 2008), namely 3 fables (texts labeled 92, 93, 1058) and 4 sessions of retelling of life events (4, 94, 170, 208). The texts were signed by 9 signers. All signers are deaf and have NGT as their dominant language; they all come from the Amsterdam region. Their average age at the time of recording was 55 years. Given that the NGT texts are spontaneous narratives or retellings of the fables signed by other signers, the corpora of NGT and RSL are not directly comparable. One should also notice that the sociolinguistic characteristics of the NGT signers are different from the characteristics of the RSL signers, which might account for some of the differences between the corpora. Therefore, no direct quantitative comparison will be made between the two languages.

The RSL corpus was annotated by Prozorova (2009) for the purpose of prosodic analysis. She transcribed it using ELAN software with several

[2] *Deaf* is used to refer to Deafness as a cultural notion as opposed to *deaf* referring to a medical condition.

transcription tiers, including glosses for signs. I have added several tiers necessary for the analysis of doubling, such as one for notions of information structure (topic, focus etc.). The NGT texts contained some glosses created by the Corpus NGT team: a sign-by-sign translation was included. As in the RSL corpus, I have added several extra tiers. The translation of the sentences was done with the help of a native signer.

3.2 Defining doubling

If two constituents are used to refer to the same object, action or situation, they were analyzed as doubling. Thus my list of doubling constructions of RSL and NGT contained not only the prototypical cases of verbal doubling, but also doubling of all types of constituents. The purpose of using this definition was to collect as many *potential* instances of doubling as possible and then to classify and analyze them.

I did not consider lexical identity of occurrences to be a necessary condition for doubling. For instance, if two different verbal signs refer to one event they are considered an instance of doubling. I made this decision based on examples from RSL and NGT like the one given in (3a). At first glance, this looks like prototypical verbal doubling, but the two verbs are in fact lexically unrelated: the verb STEAL is a lexical verb with no classifier, while the verb CL:TAKE is a classifier construction; however, both verbs refer to the same action performed by the boy. At the surface, this construction looks very similar to (3b), where a classifier construction is repeated.

(3) a. STEAL LIPSTICK CL:TAKE [RSL:x1-4]
‘[The boy] stole the lipstick’

b. BOY CL:TAKE LIPSTICK CL:TAKE [RSL:x2-6]
‘The boy took the lipstick’

Because lexical identity at the word level is not considered necessary, I also did not consider identity a necessary criterion in the cases of clause doubling. For a more prolonged discussion of methodology see Kimmelman (to appear). As a result, the RSL data pool contains 79 instances of doubling, while the NGT data pool contains instances of doubling.

4 Data

In this section the properties of doubling in RSL and NGT are presented. First I briefly discuss doubling of the form X X due to speech errors or hesitation and doubling for clarification/elaboration (section 4.1), and then doubling of the form X Y X, which is the most important type of doubling for the present paper (section 4.2). After that, some properties of the occurrences of doubled constituents are considered, namely morphological and quantitative differences between the occurrences.

4.1 The X X and X X' models

Just as in spoken languages, doubling may occur in both sign languages when the signer hesitates or makes a speech error and corrects herself. Hesitation can result in doubling because it gives the signer time to think and plan the further discourse while repeating the sign. This kind of repetition usually involves the X X model, with several consecutive repetitions of the sign (4). A speech error is another cause for doubling, when the erroneous sign is repeated in the correct form.

(4) NOT.FAR CL:GO IX CL:GO IX BOY# BOY [RSL:g1-1]
'Not far [from there] goes a boy… a boy.'

Another common type of doubling can be described by the scheme X X'. In this type, the second occurrence of the sign appears immediately after the first one but usually the second occurrence is different from the first because it clarifies or specifies the first occurrence. One phenomenon that is common in RSL but is not used in the NGT data is fingerspelling of the sign. The sign is first produced in its lexical form, then it is fingerspelled, and sometimes repeated again in the lexical form. In (5) the sign SNOWBALL is clarified by fingerspelling the Russian word *snežok* 'snowball'.

(5) BOY OTHER BOY CL:THROW SNOWBALL S-N-E-Ž-O-K CL:THROW [RSL:z3-7]
'Another boy threw a snowball'

It is clear that these two types of doubling are not regulated by the grammars of RSL and NGT but result from processing factors. For the sake of space, these models are not discussed in any detail here.

4.2 The X Y X model of doubling

The type of doubling which appears most frequently in both our RSL and NGT data — and which is actually the type most frequently discussed for other SLs — follows the X Y X model, where the occurrences of the doubled constituent are separated by some constituent (or constituents). The RSL corpus contains 46 such cases (58% of all cases of doubling), and the NGT corpus 97 cases (71%).

4.2.1 Clause-internal doubling

When doubling of the X Y X type occurs clause-internally, it is usually the predicate that is doubled, while some dependent constituent separates the two occurrences — be it an object (6), a subject, or an adjunct[3].

[3] It might be useful for the reader to know that the unmarked word order in both RSL and NGT (in the Amsterdam region) is SVO for verbs and SOV for classifier predicates.

(6) a. LOOK PEAR LOOK [RSL:g2-2]
'He looks at the pears'

b. 1 BRING SCHOOL BRING [NGT:170-9]
'At 1 I brought her back to school'

In both sign languages, nouns can be doubled with an adjective appearing in between, and wh-words may be doubled in clause-initial and clause-final position. Modal verbs can also be doubled in RSL, with the rest of the clause being placed in between the two occurrences. There are also a few instances of doubling both in RSL and NGT where the doubled element is a modifier of a constituent, be it an adjective or an adverb.

In addition, in NGT yet another kind of doubling exists, namely topic copying (Crasborn, van der Kooij, Ros & de Hoop 2009 call it "topic agreement"). According to the literature, many sentences in NGT, ASL and HKSL contain a pronoun in the final position referring back to the topic of the sentence (7). The topic itself can be either pronominal or a full NP, and both situations can be analyzed as doubling, but in the corpus I used only the former type of situation occurred, so in all instances of topic doubling a pronoun was doubled.

(7) IX-1 STILL IX-1 [NGT:94-1]
'I'm still'

Topic copying in NGT occurs rather often. My corpus includes 39 instances of topic copying (29% of all doubling in NGT). In the RSL corpus this phenomenon does not occur. Although the corpus is small, it is unlikely that the absence of this phenomenon is accidental. Rather, I take it to suggest that this

kind of doubling does not occur in RSL or is very rare. However, this should be checked in future work.

4.2.2 Clause doubling

Both in RSL and NGT, clauses can be doubled, and sometimes the occurrences of the clauses are separated by another clause (8). Thus, clause doubling can be said to occur in accordance with the X Y X model. This phenomenon is relatively common both in RSL and NGT. In RSL we found 8 instances of clause-doubling by this model (10% out of all instances of doubling) and in NGT 9 instances (7%).

(8) a. CL:FALL. HAT CL:FLY.AWAY. CL:FALL [RSL:g2-2]
'He fell and his hat flew away'

b. BE.STARTLED. SCREAM. BE.STARTLED [NGT:4-2]
'He is afraid and he cries'

4.3 Identical and modified copies

4.3.1 Identical doubling

The occurrences of the doubled constituent can be either identical or differ morphologically. In the RSL corpus, in 33 of 46 instances of X Y X doubling (71% out of all instances of doubling) the two occurrences were identical. In the NGT corpus, 83 cases out of a total of 97 (85%) were identical. These cases involved various types of doubled elements: verbs (including modal verbs), adverbs, nouns, adjectives, and clauses. As for topic doubling, I only found identical copies of pointing signs in NGT. It is difficult to imagine how indexical signs referring to the same referent can be non-identical.

4.3.2 Non-identical doubling

In the remaining cases of the X Y X model, the occurrences were not identical (13 cases including verb, clause, and adjective doubling in RSL and 14 cases in NGT). In the case of clause-internal doubling, the second occurrence is usually more marked or more specific in meaning. As for non-identical verbs, in two cases in RSL the second occurrence of the verb was marked with a meaningful (emotional) non-manual expression. In three cases in RSL the occurrences of a doubled classifier construction differed in the shape of the movement: the second occurrence contained a more iconic, detailed movement. In several cases in RSL and NGT, the second occurrence of a verb carried aspectual inflection such as the progressive (9). Sometimes the second occurrence was marked with a distributive marker.

(9) a. CLOSE CL:GO THERE CL:GO-ASP.CONT [RSL:g1-1]
'There he is going now' (progressive meaning)

b. LOOK IX WINDOW IX PLANE IX LOOK-ASP.CONT [NGT:4-1]
'He is looking out of the window'

Looking at non-verbal signs, the two occurrences of a sign can also differ in some phonological aspect such as location or movement. Sometimes the occurrences of the signs are different synonymous lexemes, as is true for the two signs meaning 'whole' in (10). In this case, it is not possible to tell whether one lexeme is more marked than the other. The signs in (10) are of equal length.

(10) WHOLE1 BOY WHOLE2 DIRTY [RSL:z3-7]
'The boy is all dirty'

When clause doubling occurs, the second clause can contain a different number of overtly expressed arguments. Usually, the second clause contains fewer arguments than the first one (11).

(11) BOY CRY. CL:FALL. CRY [RSL:x2-6]
'The boy cries because he has fallen'

4.3.3 Phonetic differences

If we look only at doubling involving identical occurrences, the copies are still not always completely identical, because in many cases one of the occurrences is shorter and weaker in articulation than the other. Thus, one of the occurrences is made in the dictionary form (that is, in the location and with the handshape lexically specified for this sign) and with normal length, while the other can be articulated at a lower location, with shorter movement, or laxer handshape, and it can also be shorter in duration. In both sign languages, the first occurrence of the doubled constituent is usually longer and more strongly articulated than the second one. When clauses are doubled, the second occurrence is also usually shorter. Moreover, the fact that arguments are overtly expressed in the first clause but not in the second may be an instantiation of the same phenomenon at the clause level.

5 Analysis

In this section, I attempt to answer the question why doubling (built by the X Y X model) occurs in RSL and NGT. More specifically, I want to uncover the function of doubling in these languages, as this function can be the motivation for doubling. First, possible morphosyntactic motivations for doubling previously offered on the basis of sign languages are discussed. Then, emphasis as one of the functions of doubling is considered. Finally, based on the insights

from Shamaro (2008), I offer a pragmatic explanation of doubling in RSL and NGT.

5.1 Morphosyntactic motivation

As discussed in section 2, for some of the doubling phenomena, morphosyntactic explanations have been offered. For instance, doubling can occur when the predicate is "too heavy", in other words, when it is marked for aspect or contains a classifier and also an object of the verb is present (Fischer & Janis 1990) or it can result from limitations on argument incorporation (Kegl 1985).

As Shamaro (2008) has shown for RSL (the same arguments can be made for NGT), these explanations are not relevant when the occurrences of the doubled element are identical, because in this case the two occurrences do not differ in heaviness and neither of them incorporates less arguments than the other. Recall that most instances of doubling in RSL and NGT involve identical doubling. Moreover, the verb that is doubled is sometimes not inflected or does not contain a classifier at all. In addition, these explanations only apply to verbs; however, not only verbs can be doubled, but all kinds of elements including clauses.

5.2 Emphasis and doubling

In both signed and spoken languages, doubling can be used to express emphasis. In RSL and NGT, we find some examples that seem to involve emphasis on the doubled constituent, so for these examples an analysis in the spirit of Nunes and de Quadros (2008) could be offered. I suggest that emphasis can be a motivation for doubling of modal verbs in RSL (12) and for doubling of quantifiers and wh-words in both languages (13). However, in both languages these examples constitute a minority, while most examples cannot be reasonably considered

emphatic. Therefore, although emphasis might motivate some of the occurrences of doubling, it certainly cannot explain all of them.

(12) CANNOT CL:GRAB CANNOT [RSL:g2-2]
'He cannot grab it'

(13) WHY PANIC WHY [NGT:208-11]
'Why the panic?'

5.3 Pragmatic explanation

5.3.1 The one new idea constraint

Shamaro (2008) noticed that in all cases, the material intervening between the occurrences of the doubled element was *new information*. I have checked this observation on the RSL and NGT data I analyzed and found it to be true, with very few exceptions. Shamaro suggested that doubling occurs because of the limitation on the amount of new information. Based on Chafe (1994), she claimed that one discourse unit can express one new idea. When both the predicate and the object of the predicate are new information, they should be placed in separate discourse units. This happens, according to Shamaro, by dislocating the object into the post-verbal position yielding the VO order. The verb is then repeated to return the focus of attention to the predicate, a strategy which helps to maintain cohesion of the discourse.

However, there are several objections to this theory. Firstly, according to my research (Kimmelman 2012), the VO order is the unmarked order, at least for plain verbs in RSL. Secondly, Shamaro's explanation is not sufficient to also account for the cases of clause doubling. Thirdly, it cannot account for topic doubling in NGT, as topics are (mostly) old information. Fourthly, as Shamaro herself acknowledges, the verb is not always repeated in the case of the VO order.

5.3.2 Foregrounding and backgrounding

I suggest that instead of old/new information, the notions of *fore-* and *backgrounding* should be used to account for doubling in RSL and NGT. Both old and new information can be foregrounded or backgrounded by the language user (Foley & Van Valin 1985). The speaker foregrounds the information that she considers most important for the hearer, and backgrounds the information that bears less importance. In other words, foregrounding information increases its saliency (Wilbur 1994). If we suppose that the doubled constituent is foregrounded, while the material placed between the occurrences is backgrounded, then the facts can be explained.

Firstly, both old information (topics in NGT) and new information (both in RSL and NGT) can be foregrounded. This makes it possible to account for RSL and NGT doubling. Secondly, backgrounding is indeed used mostly for new information for reasons discussed by Shamaro (2008): if the new information is not used in further discourse and/or is not relevant for the following discussion, its status may be lowered. I have checked this intuition and found out that in almost all cases, the information that is placed between the occurrences of the doubled constituent is not referred to or mentioned again afterwards. In the few cases in which the information was mentioned again, doubling was used for emphasis and thus had a different motivation. On the other hand, emphasis itself is functionally related to foregrounding, as the emphasized information is obviously foregrounded. In the case of topic doubling in NGT, one would expect that if the topic is foregrounded, the following sentence will have the same topic. This expectation is confirmed in most cases, too.

This analysis does not only capture instances of verb doubling and topic doubling. For instance, a noun can be doubled with an adjective placed in between the occurrences. Again, the importance of the adjective for the further discourse may be low.

5.3.3 Clause doubling and grammaticalization

Clause doubling can be explained by a similar mechanism. When we look at the discourse level, there is a chain of events described by a sequence of clauses. Sometimes the signer purposefully or accidentally breaks the chain of events, so that the clause Y that follows clause X describes a situation that does not follow the situation of X temporally or logically. For instance, clause Y can clarify some unclear situation. Subsequently, the signer may want to repeat clause X to return to the chain of events (see example 14). I would like to hypothesize that clause repetition is the origin of clause-internal doubling (of the form X Y X) in RSL and NGT. In particular, I would like to suggest that clause repetition has grammaticalized into clause-internal doubling partially preserving the function of repairing the storyline.

(14) CAR CL:POUR.WATER. CAR CL:RIDE. CL:POUR.WATER. [RSL:z1-3]
'The car poured water over him. There was a car driving there.
So it poured water over him'

Let me sketch out a possible grammaticalization path. Both in NGT and RSL arguments can be covert if they are recoverable from the context. Thus quite often a clause consists of just one verb, which already implies that it is not always possible to distinguish between clause repetition and verb-doubling. For instance, in (15) the doubled sign BE.STARTLED can either be analyzed as a clause or as a verb, while the sign SCREAM can be an embedded clause (which would yield the meaning 'He is afraid to the stage of screaming').

(15) BE.STARTLED(.) SCREAM(.) BE.STARTLED. [NGT:4-3]
'He is afraid and he cries'

Examples like (15) may give rise to the emergence of clause-internal doubling, because the language users reanalyze clause doubling as clause-internal verb doubling. While in examples like (15) the function can still be described as returning to the chain of events after disruption, this model is then extended to other types of intervening constituents and finally to other types of doubled constituents. At the next stage, the function of the construction changes to a more general/grammatical one, namely foregrounding of the doubled material. Finally, once this construction has been established, it can also be used for other purposes related to foregrounding, such as emphasis.

When the X Y X model is conventionalized and becomes part of the grammar of a signed language, it could be used with non-identical doubling. Thus, the foregrounded constituent does not have to be identical anymore in its occurrences, because the signer may decide to further elaborate on its content in the second occurrence.

On the other hand, when the occurrences are identical, the second occurrence naturally becomes less long and strong in pronunciation as it is in fact redundant information and thus less important perceptually. In this way, most of the properties of the X Y X(') model in RSL and NGT receive a unified explanation.

6 Discussion

In this paper, I have analyzed doubling in RSL and NGT based on small corpora of naturalistic monologue signing. The research has shown that doubling can result from hesitation or a speech error, but at the same time doubling is a grammatical mechanism regularly used in these languages. RSL and NGT are similar with respect to doubling, but NGT has a mechanism of topic doubling which RSL lacks. The central case of doubling follows the X Y X model and is

used for foregrounding of the doubled constituent and for emphasis. This analysis accounts for doubling of different types of constituents, including topic doubling in NGT. In contrast, previous analyses of doubling in other sign languages (Nunes & de Quadros 2008; Fischer & Janis 1990) cannot be directly applied to RSL or NGT.

I have also proposed a possible path of grammaticalization from repetition of clauses to clause-internal doubling. This path of grammaticalization describes the emergence of both formal properties and functions of doubling in RSL and NGT. Although no direct evidence can be given to support this path of development, the synchronic data supports the hypothesis.

Furthermore, I suggest that emphatic doubling might be a sub-case of foregrounding doubling in RSL and NGT. It is therefore possible to speculate that doubling in ASL and LSB that is used for emphatic reasons could have developed via a similar grammaticalization path. The same can be said about emphatic doubling in spoken languages that may have developed in a similar way. Considering the parallels between clause-doubling and clause-internal doubling in RSL and NGT and the frequency of the former, it would be interesting to look at clause doubling in other sign languages such as ASL and LSB in order to find out whether similar phenomena are attested in them.

The paper has a theoretical consequence, namely that in order to account for the data discussed, the inventory of notions of information structure should include the fore- versus backgrounding distinction, which is orthogonal to the topic/focus distinction.

There is another question that has been left unanswered, namely, why doubling is so prominent in those two sign languages, as well as in other SLs of the world (and not that prominent in spoken languages). One possible answer is that it is connected to short term memory (STM). It has been shown (Geraci, Gozzi, Papagno & Cecchetto 2008 among others) that the STM span is shorter

when signs of a sign language are recalled in comparison to words of a spoken language. Therefore, users of a sign language have limited ability of holding long sequences of signs in the short term memory necessary for processing. Doubling might be a strategy of coping with this limitation, as the most important pieces of information are presented to the addressee not once, but twice. This explanation is in line with the pragmatic function of doubling found for RSL and NGT in this paper.

However, it is important to distinguish cognitive motivation for doubling as discussed in this section and the function of doubling in SL. The fact that doubling is a frequent phenomenon in SL might be connected to the STM limitations; however, it is not the case that doubling is not a part of the grammar of the SL in question. In this paper I have shown that doubling in RSL and NGT is a grammatical phenomenon, while the reason for developing this phenomenon might be cognitive (namely, STM limitations).

References

Chafe, Wallace (ed.). 1980. *The pear stories. Cognitive, cultural, and linguistic aspects of narrative production.* Norwood, NJ: Ablex.

Chafe, Wallace. 1994. *Discourse, consciousness, and time. The flow and displacement of conscious experience in speaking and writing*. Chicago: University of Chicago Press.

Cheng, Lisa & Luis Vicente. 2008. Verb fronting in Mandarin Chinese. Ms, University of Leiden.

Corver, Norbert & Jairo Nunes (eds.). 2007. *The copy theory of movement*. Amsterdam/Philadelphia: John Benjamins.

Crasborn, Onno, Els van der Kooij, Johan Ros & Helen de Hoop. 2009. Topic agreement in NGT (Sign Language of the Netherlands). *The Linguistic Review,* 26: 355–370.

Crasborn, Onno, Inge Zwitserlood & Johan Ros. 2008. *Corpus NGT. An open access digital corpus of movies with annotations of Sign Language of the Netherlands*. Centre for Language Studies, Radboud University Nijmegen. URL: http://www.let.ru.nl/corpusngt/.

Crasborn, Onno & Inge Zwitserlood. 2008. The Corpus NGT: an online corpus for professionals and laymen, In: *Construction and Exploitation of Sign Language Corpora*, eds. Onno Crasborn, Thomas Hanke, Eleni Efthimiou, Inge Zwitserlood & Ernst Thoutenhoofd, 44–49. Paris: ELDA.

Fischer, Susan & Wynee Janis. 1990. Verb sandwiches in American Sign Language. In *Current trends in European sign language research: Proceedings of the third European Congress on Sign Language Research*, eds. Siegmund Prillwitz & Tomas Vollhaber, 279–294. Hamburg: Signum.

Foley, William A. & Robert D. Van Valin, Jr. 1985. Information packaging in the clause. In *Language typology and syntactic description,* ed. Timothy Shopen, 282–364. Cambridge: Cambridge University Press.

Geraci, Carlo, Marta Gozzi, Costanza Papagno & Carlo Cecchetto. 2008. How grammar can cope with limited short-term memory: Simultaneity and seriality in sign languages. *Cognition,* 106: 780–804.

Kandybowicz, Jason. 2007. On fusion and multiple copy spell-out. The case of verbal repetition. In *The copy theory of movement,* ed. Norbert Corver & Jairo Nunes (eds.), 119–150. Amsterdam/Philadelphia: John Benjamins.

Kegl, Judy. 1985. Locative relations in American Sign Language: word formation, syntax, and discourse. Doctoral dissertation, MIT.

Kimmelman, Vadim. 2012. Word order in Russian Sign Language. *Sign Language Studies,* 12(3): 414–445.

Kimmelman, Vadim. To appear. Doubling in Russian Sign Language and Sign Language of the Netherlands: a unified account. *Proceedings of IATL 27*, MITWPL, 61–86.

Nunes, Jairo. 2004. *Linearization of chains and sideward movement.* Cambridge, MA: MIT Press

Nunes, Jairo & Ronice M. de Quadros. 2008. Phonetically realized traces in American Sign Language and Brazilian Sign Language. In *Signs of the time. Selected papers from TISLR 8,* ed. Josep Quer, 177–190. Hamburg: Signum.

Prozorova, Evgenija V. 2009. Markery lokal'noy struktury diskursa v russkom žestovom jazyke (Markers of local discourse structure in Russian Sign Language). Doctoral dissertation, Moscow State University.

Shamaro, Elena J. 2008. Dublirovanie predikata v diskurse russkogo žestovogo jazyka (Doubling of predicates in Russian Sign Language discourse). Term paper, Moscow State University.

Sze, Felix. 2008. Topic constructions in Hong Kong Sign Language. Doctoral dissertation, University of Bristol.

Wilbur, Ronnie B. 1994. Foregrounding structures in American Sign Language. *Journal of Pragmatics,* 22: 647–672.

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Information Status and Prosody: Production and Perception in German*

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In a production experiment and two follow-up perception experiments on read German we investigated the (de-)coding of discourse-new, inferentially and textually accessible and given discourse referents by prosodic means. Results reveal that a decrease in the referent's level of givenness is reflected by an increase in its prosodic prominence (expressed by differences in the status and type of accent used) providing evidence for the relevance of different intermediate types of information status between the poles given and new. Furthermore, perception data indicate that the degree of prosodic prominence can serve as the decisive cue for decoding a referent's level of givenness.

Keywords: prosody, information status, discourse referent, degree of givenness, cognitive activation, prominence, pitch accent, perception

1 Introduction

This paper concentrates on investigations of a referent's level of *givenness* (also called *information status*) within a discourse context and (a) its prosodic marking in the production as well as (b) its decoding by prosodic means in the perception of read German.

The aim is to find evidence for the basic assumption that changes in a referent's level of givenness are reflected in corresponding changes in its prosodic marking. In addition to discourse-new and immediately evoked (given) referents, we distinguish referents that are accessible due to implicit (inferentially accessible) and non-immediate explicit (textually accessible)

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previous mention. The status[1] and type of accent used as prosodic marker is supposed to differ in its degree of prominence as follows: the 'newer' the referent, the higher the produced prominence. We expect that the listener in turn is able to interpret the referent's information status by means of its degree of prosodic prominence.

Several studies on English and German (see section 2) have shown that differences in a referent's level of givenness cannot adequately be described by a simple accented vs. unaccented dichotomy. Instead, they provide evidence that the tonal configuration on a referent is important for encoding its givenness.

The following section 2 provides a more detailed account of the notion of givenness and the relation between a discourse referent's information status and its prosodic marking in German and English. The resulting research questions and hypotheses were tested in three carefully controlled experiments on read German. These are a production study (section 3) and two follow-up perception experiments (section 4). A summary of the main results and final conclusions are given in the last section 5.

2 Information Structure and Accentuation

In a conversation participants usually exchange information via propositions, which represent specific states of affairs. The set of propositions being valid in a communicative situation are often referred to as *(shared) knowledge* (e.g. Clark & Haviland 1977) or *common ground* (e.g. Stalnaker 1974; Chafe 1976; Krifka 2007). Depending on the discourse context a proposition is said to be informative if it is not entailed by the common ground (cf. Büring 2007). To put it simply, *new* (informative) information is usually expressed with respect to information that is already *given* ('known' by the interlocutors). Accordingly,

[1] *Status* refers to an accent's status in the prosodic hierarchy.

the referents [2] of single sentence constituents that are usually encoded in argument categories such as NPs/DPs, PPs or pronouns, can be assigned a particular information status (cf. Prince 1992) or degree of givenness.

The dimension of *given* versus *new* information is a central part in the investigation of information structure. Nevertheless, the various approaches to givenness in the literature differ with respect to the level this notion applies to (see Prince 1981 for an overview). Since an analysis of givenness requires considering the position of both speaker and listener, our notion of givenness/information status is based on the (cognitive) *activation cost* approach proposed by Chafe (1976, 1994) and Lambrecht (1994). Chafe defines givenness as the degree of activation of a referent or proposition that the speaker assumes to be in the listener's consciousness at the time of utterance. Following Lambrecht (1994) the activation of a referent requires it to be *identifiable*, that is the listener is assumed to have a mental representation of it. As a consequence, a referent that is stored in the listener's long term memory needs to be activated in the listener's consciousness by the discourse context in order to be considered as given. The less activated or given an item is the more activation costs a speaker has to invest for its activation. Chafe and Lambrecht postulate three steps of cognitive activation that correspond to three levels of givenness. On the one hand information can be already fully activated or *given* and on the other hand information can still be inactive or so to speak *new*. They additionally propose an intermediate level of cognitive activation between these poles that can be referred to as *accessible* (semi-active) information.

Prince's model (1981, *Assumed Familiarity Scale*) also acts on the speaker's assumption about the listener's level of knowledge and differentiates a middle category of givenness, namely *inferable* information. A referent is

[2] The (non linguistic) mental representation of objects, persons and abstractions.

inferable, when it is accessible from the preceding discourse (by logical reasoning). An anaphora 'the driver' is for example inferable from an antecedent 'a bus', since it is common knowledge that buses have drivers. Following Clark (1977) this implicit reference involves cognitive *bridging* between a non-coreferring antecedent and an anaphora referred to as *bridging inference*. Generally the accessibility of a referent is indicated by its morphosyntactic marking as a definite NP. Concerning *new* information Prince distinguishes between *unused* referents, marked as definite, and non accessible *brand-new* referents, marked as indefinite. As opposed to brand-new information, unused information is assumed by the speaker to be known to the hearer but has not yet been introduced in the current discourse. Although an unused referent is 'discourse-new' (cf. Prince 1992) it is marked as definite in order to indicate its *identifiability* (see also Lambrecht 1994).

A referent's level of givenness has often been shown to be marked by prosodic means. For West Germanic languages like German and English it is commonly assumed that new referents are marked by pitch accents and given referents are not accented or more precisely are deaccented[3] (e.g. Cruttenden 2006). However, there is evidence that given referents are often accented in prenuclear/prefocal position (e.g. Terken & Hirschberg 1994) when they are a second focus element (SOF, Féry & Ishihara 2009) or due to rhythmical reasons (see Baumann, Becker, Grice & Mücke 2007; Féry & Kügler 2008).

Furthermore, several studies on English (e.g. Brazil 1975; Gussenhoven 1984, 2002; Pierrehumbert & Hirschberg 1990; Chen, den Os & de Ruiter 2007) and German (e.g. Kohler 1991; Baumann 2006; Baumann & Grice 2006) provide evidence that variations in the tonal configuration also mark important differences concerning an item's information status. In particular, Pierrehumbert

[3] *Deaccentuation* indicates the absence of a pitch accent on a word that is expected to be accented in an analogous unmarked 'all-new' utterance (cf. Ladd 1980).

& Hirschberg's study suggests a ternary distinction between high accents for new, low accents for accessible and no accents for given referents. Kohler's perception experiments reveal a categorical change in perception indicating an interrelation between medial/late peaks and some kind of *new* information on the one hand and between early peaks and *established* information on the other. The relation between higher pitch accents and later accentual pitch peaks to the expression of 'newness' is also reflected in Gussenhoven's (2002) *Effort Code*. In addition these differences in pitch have been shown to lead to an increase in perceived prominence (cf. Gussenhoven 2002, 2004; Ladd & Morton 1997).

Moreover, there is evidence that different accent types are used to discriminate between different types of accessible information. Baumann & Grice (2006) found a significant preference for H+L* accents over H* accents and deaccentuation in whole-part-relations and scenario conditions whereas deaccentuation was preferred over H+L* and H* accents in relations such as converseness, part-whole, synonymy and hypernym-hyponym (in either order).

To sum up, the results of the presented studies are indicative of the following relation: The higher the pitch on a lexically stressed syllable and the later the pitch peak, the higher the perceived prominence and the 'newer' the discourse referent. Furthermore, accessible information cannot be treated as just one uniform intermediate category between the poles *given* and *new* and, different types of more or less activated information demand different accent types as linguistic markers with the degree of prominence being the determining factor (Baumann 2006; Bauman & Grice 2006; Schumacher & Baumann 2010).

In order to find further evidence for this tendency we conducted a production experiment (see section 3; Röhr & Baumann 2010) and two follow-up perception experiments (see section 4; Röhr & Baumann 2011) on carefully controlled read data in German (Baumann, Röhr & Grice, submitted). The concept of givenness is actually understood to be potentially continuous. Since

the experimental setup does not guarantee absolute continuity of *degrees* of givenness, we rather distinguish different *levels* of semantic-cognitve activation. We investigated four classes of definite discourse referents that differ in their level of givenness, due to a varied salience in a text-internal discourse: On the one hand the referents are discourse-*new* or *unused*, referring to items that are generally known and that are identifiable from their own linguistic description. On the other hand the referents are *given* since they corefer to an antecedent in the immediately preceding discourse. In addition two types of accessible information are distinguished: One class of referents is textually accessible due to previous mentioning that is non-immediate or *displaced* (cf. Yule 1981). The other class of referents is inferentially accessible from a previously introduced scenario involving cognitive *bridging*.

3 Production Study

Our working hypothesis is based on the assumption that new, accessible and given information differs in the degree of cognitive activation in the listener's consciousness, which leads to differences in the activation effort by the speaker. For the two types of accessible information we assume that inferentially accessible information (due to the bridging inference) probably requires more activation cost than the explicit repetition of a referent, however displaced. Different reading comprehension tasks provide evidence for this. Haviland & Clark (1974) and Clark & Haviland (1977) showed in psycholinguistic experiments that accessible referents that require inferential bridging take longer to process than given ones. Furthermore, Clark & Sengul (1979) found referents that have not been previously mentioned within two or three preceding sentences to be significantly less activated than referents whose previous mention is immediate. Recent neurolinguistic experiments using event-related

brain potentials (ERPs) provide further support for an activation cost model (Burkhardt 2006, 2007; Burkhardt & Roehm 2007).

Since the speaker's activation effort is expected to be encoded by variations in the prosodic prominence we hypothesize that prosodic prominence produced increases with an increase in a referent's newness. This means, the less given or activated a discourse referent is:

(i) (a) the more likely it is to be marked by a pitch accent.
(b) the more likely it is to be accented with a *nuclear*[4] pitch accent. (The prominence of prenuclear accents is only secondary in relation to nuclear accents (cf. Jagdfeld & Baumann 2011; Ladd 2008))
(c) the more likely it is that the accent's (relative) pitch is higher and the accentual peak later in relation to the accented syllable.

3.1 Method

The reading material is composed of ten different target words denoting discourse referents. Each of them is embedded in four target sentences in three different contexts in order to elicit four different types of information status of the target words (new, bridging, given-displaced, given). The target words are bi- and tri-syllabic nouns in feminine gender (*Ballade* 'ballad', *Banane* 'banana', *Dame* 'lady', *Lawine* 'avalanche', *Rosine* 'raisin') and proper names (*Janina, Nina, (Dr.) Bahber/Bieber, Romana*), always with stress on the penultimate syllable and a comparable segmental structure. The structure of the target sentences and their NP are simple and kept constant in all contexts: That is, each target sentence starts with a pronominal subject followed by the finite part of the separable verb and the target word and ends with the verbal particle

[4] A *nuclear* pitch accent is defined as the last pitch accent in an intonation unit (e.g. Crystal 1996; Ladd 2008). It constitutes the only obligatory element in the phrase and is considered to be the *structurally* (phonologically) most important element determining the interpretation of the phrase's information structure.

(i.e. the prefix of the separable verb). The target word is always encoded with a **definite** direct object which is supposed to indicate its *identifiability* (cf. Lambrecht 1994). An example for the target word 'banana' is given in table 1.

Table 1: Sample reading material for the target word 'banana' in English translation. The target sentences are printed in bold face and the target words are underlined.

CONTEXT 1: (a) new / unused (b) given-displaced
(a) ***Ich*** [***nehme die Banane mit.***] Focus
(b) ***Er*** [***steckt sich die Banane ein.***] Focus
"What would you like?" **(a) "I'll take the banana (along)"**, says Thomas to the fruit merchant. He usually eats very unhealthily and he is always eating sweets between meals. He hardly ever plays sport, and if he does he prefers mini golf. **(b) He pockets the banana.** The banana looks delicious. Maybe he'll buy them more often in future.
CONTEXT 2: (c) inferentially accessible / bridging
(c) ***Er*** [***steckt sich die Banane ein.***] Focus
Today Thomas is allowed to feed his favourite monkey in the zoo. With great anticipation he's about to set off (for the zoo). **(c) He pockets the banana.** He's just been to the green grocer's at the market especially to get one.
CONTEXT 3: (d) given
(d) ***Er*** [***steckt sich***]Focus ***die Banane*** [***ein***.] Focus
Thomas has just bought a banana at the market. **(d) He pockets the banana.** In the future he wants to eat much more healthily.

In target sentence (a), the target word is mentioned for the first time and is not derivable from the previous context sentence. The target referent is identifiable, but at this point still inactive in the minds of speaker and listener and can therefore be classified as (discourse-)*new* or *unused* (cf. Prince 1992). After two or three intervening context sentences with a change in topic, the target word is repeated in target sentence (b). Due to the displacement of the target word (antecendent) in sentence (a) from the centre of attention, the target word (anaphora) in sentence (b) is no longer fully activated (cf. Clark & Sengul 1979; see also *Centering Theory*: Grosz, Aravind & Weinstein 1995) but textually accessible. The target word's information status will be classified as *given-*

displaced. The second context sets up a scenario, from which the target word in target sentence (c) is *inferentially accessible.* That is, the target word has not been explicitly mentioned before but is derivable from the preceding contextual frame via a *bridging* process (e.g. the banana is inferable from a zoo-monkey-food context). In sentence (d), the target word is a repetition of an antecedent in the immediately preceding context sentence. In contrast to sentence (b), this target word is already fully activated and thus *given*. Furthermore, only in sentence (d) the target word is part of the background due to its immediate previous mention. In target sentences (a), (b) and (c), the target words are part of a broad focus domain.

We recorded nine native speakers of Standard German (six female, three male), aged between 22 and 31 (mean = 25, SD = 2.7). All of them originated from the area around Cologne and Düsseldorf. Before the acoustic recordings, each subject was asked to read through the material quietly in order to guarantee full comprehension. After that, their task was to read out the reading material (three times in randomised order) in a contextually appropriate manner to a potential hearer as for example in a role-play. A total of 120 target sentences per speaker entered into the analysis.

We annotated the F0 minima and maxima relating to pitch accents **on the target words** and classified them according to GToBI (cf. Grice & Baumann 2002; Grice, Baumann & Benzmüller 2005). In addition we distinguished whether a pitch accent on the target word occupies a prenuclear or nuclear 'position' which indicates its *status* in the prosodic hierarchy. The structure of the target sentences, with the argument in non-final position, allows the nuclear accent either to fall on the target word or on the sentence-final verbal particle. In the latter case the target word is either deaccented (marked by 'Ø'), or receives a prenuclear accent (marked by 'PN', e.g. in *Er steckt sich die BaNAne EIN.*). In

the following the results concerning the accent's *status* on a target word refer to the distinction between nuclear, prenuclear and no accents.

3.2 Results and Discussion

The results of the production study prove a significantly different distribution of nuclear pitch accent types, prenuclear accents and no accents depending on the target word's information status (chi-square test: $p<0.001$) as shown in figure 1. We do not distinguish different prenuclear accent *types* since 96% of all prenuclear accents exhibit a low starred element. The results are presented in order of the hypotheses starting with the analysis of accent status followed by the analysis of different nuclear accent types.

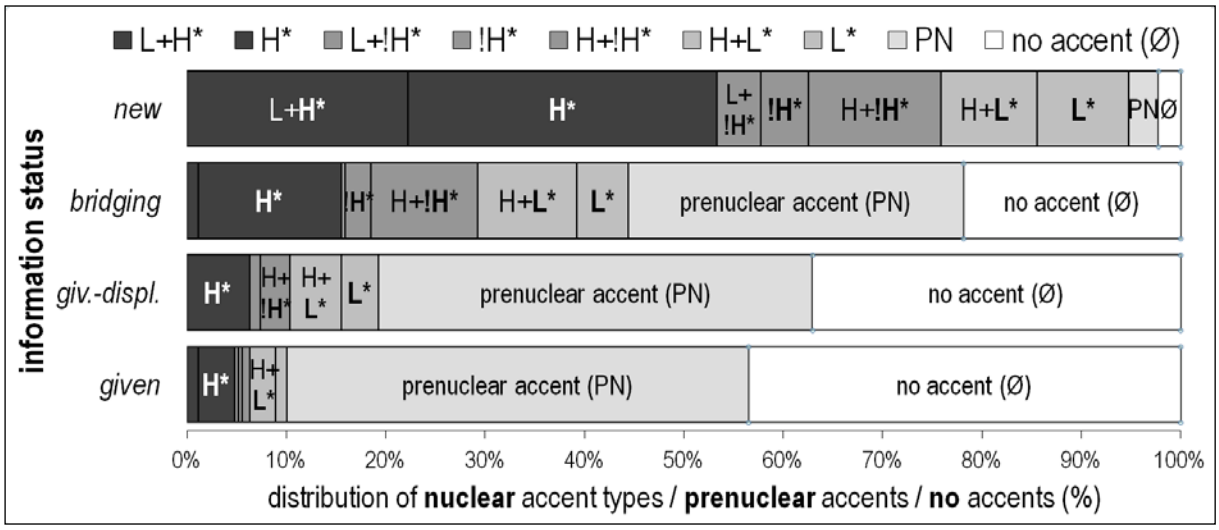

Figure 2: Relative distribution of nuclear accent types, prenuclear accents (PN) and no accents (Ø) on all target words per information status (all speakers).

Generally the analysis of accent status shows that the target words are preferably marked by pitch accents (nuclear and prenuclear, always over 56%)) rather than being not accented at all. Nevertheless, a target word is more frequently deaccented, as it increases in givenness (cf. Hypothesis (i)/(a)). As for the accented material, the number of nuclear pitch accents progressively increases,

the newer a target word is (cf. Hypothesis (i)/(b)), while the number of prenuclear pitch accents decreases.

Thus discourse-new information is primarily marked by nuclear pitch accents (94.8%) (cf. Gussenhoven 1983; Selkirk 1984). Given target words rarely receive a nuclear accent (10.0%) but are realized almost equally often with prenuclear accents (46.5%) or no accents (43.5%). The two types of accessible information take an intermediate but significantly distinct position: Given-displaced target words predominantly exhibit prenuclear accents (43.7%) or no accents (37.0%), whereas inferentially accessible (bridging) target words more frequently bear a nuclear accent (44.4%).

Collapsing accent categories into three groups, depending on the starred tone, the results show that the proportion of all three *nuclear* accent groups (H*, !H*, L*) increases from given to new information. This increase is particularly clear for accents with an H* element, since high accents with a medial (H*) or late peak (L+H*) are most commonly used to mark new information (53.5%). For accessible and given information, lower accent types are more important, in particular accent types with an early peak (H+!H*, H+L*). Thereby a relative tendency towards L* accents as opposed to !H* accents becomes apparent the more given a target word is. (cf. Hypothesis (i)/(c))

The results generally confirm that changes in a referent's level of givenness are reflected in corresponding changes in its prosodic marking: The distribution of accent types (including differences in accent status) reveal a progressive increase in the prosodic prominence from given through textually accessible to inferentially accessible and finally to new referents. This indicates an increase in the *likelihood* of particular accent types on the respective types of information status (cf. Calhoun 2010).

4 Perception Studies

In order to verify the results of the production study (see section 3) from the perspective of the hearer, we aimed to test whether variations in prosodic prominence have an effect on the perception of a referent's information status. Therefore we conducted two perception experiments on a selection of target sentences of the production study, both in sentences in isolation (section 4.1, perception *without context*) and in context (section 4.2, perception *with context*).

For each information status (new, bridging, given-displaced, given) we selected seven target sentences (and their original corresponding contexts) of the production study that differed in the status and type of accent realised **on the target words**. That is, we tested five nuclear pitch accents H*, !H*, H+!H*, L*, H+L*; one low prenuclear pitch accent (PN) and no accent (Ø). In order to keep the variation in the prosodic realisation of the 28 test sentences to a minimum, they all showed a prenuclear rising accent on the finite part of the separable verb with a peak in medial (H*) or late position (L+H*) and a sentence-final low boundary tone (L-%). In test sentences with a prenuclear or no accent on the target word the nuclear accent falls on the sentence-final verbal particle and is realized with an H+L* accent.[5] No adjustments of the original utterances were made, except for an equalization of the sound level of the test material.

The web-based perception experiments were developed by means of a software package named "oFB - der *onlineFragebogen*" (SoSciSurvey 2011). Each experiment was provided via an open URL. 83 native German speakers (no experts in speech analysis) took part in each experiment (*without context*: 65% female; *with context*: 61% female).[6] They were aged between 19 and 75

[5] For sample pitch contours see Röhr & Baumann (2011) and Baumann et al. (submitted).

[6] The group of subjects for the perception experiment *without context* partly overlaps with the group of subjects for the perception experiment *with context*.

(*without context*: mean = 30.6, SD = 13.7; *with context*: mean = 29.1, SD = 12.5) and grew up in 14 different German Federal States.

4.1 Perception *without Context*

If no context is provided, we assume that a referent's prosodic marking has an effect on its perceived degree of givenness. With regard to the results of the production study we hypothesize the following:

(ii) An increase in a referent's prosodic prominence by (a) the presence of an accent, (b) a nuclear accent status and (c) a (nuclear) accent type with a higher pitch and later pitch peak all trigger a decrease in its perceived degree of givenness.

4.1.1 Method

In this experiment the target sentences were tested in isolation, no context was given. The participants' task was to evaluate whether the target word in a test sentence sounded as if it was (rather) known or unknown. A test sentence was automatically played twice, separated by a pause of one second, without being presented orthographically.

Subjects gave their judgements by placing a roll bar on a continuous line between two end-points and without apparent scaling (visual analogue scale (VAS)). The responses on this *givenness scale* are encoded as interval data[7] with the lowest numerical value (1%) at the left pole 'known' and the highest numerical value (100%) at the right pole 'new'. The evaluation was carried out for each test sentence separately three times in randomised order (a total of 84 stimuli for evaluation in the main part of the experiment).

[7] However, VAS does not guarantee that the differences between the points of measurement are equally distant and that they are interpreted similarly by different subjects. In order to eliminate subject effects relating to the use of VAS we therefore used a repeated measures ANOVA for statistical analysis.

4.1.2 Results and Discussion

As an overall result, the responses on the *givenness scale* were significantly influenced by the *status* of accent as well as the nuclear accent *type* on a target word (repeated measures ANOVA (RMAOV): accent status $F(2,83) = 24.406$, $p<0.001$; nuclear accent type $F(4,83) = 13.458$, $p<0.001$).

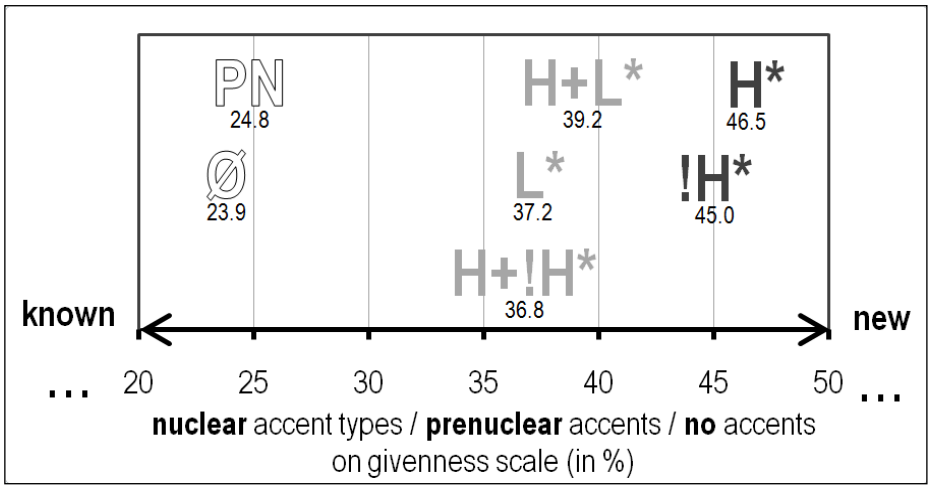

Figure 2: Distribution of nuclear accent types, prenuclear accents (PN) and no accents (Ø) on the givenness scale according to their mean response values.

As shown in figure 2 the results reveal that a target word realized with no accent or a low prenuclear accent (mean = 24.4%, SD = 24.6) is most likely to be perceived as known, or *given*, whereas target words that show a local F0 rise to the accentual peak (H*, !H*) are perceived as least given (mean = 45.8%, SD = 31.5). Low accents and early peak accents (L*, H+L*, H+!H*) with a predominant falling part onto the accented syllable take an intermediate but significantly distinct position (mean = 37.3%, SD = 28.0). Thus, hypothesis (ii) is generally confirmed: A referent is perceived as less given the more prominent it is prosodically marked. However, the significant difference between accent types is not necessarily reflected by the relative pitch height of the starred element but by the tonal movement before the accented syllable (cf. Grice, Mücke & Ritter 2012; Ritter, Riester & Grice 2012).

Strikingly, the perceptual differences solely reside in the first half of the evaluation scale which belongs to the side of the 'known' pole. This may be due to the definite article, which marks the target word as being identifiable/known (see section 2) and affects the perception of newness.

4.2 Perception *with Context*

Based on the assumption that a referent's information status can be marked and interpreted by means of prosody we hypothesize that the appropriateness of a prosodic marking varies depending on the referent's degree of activation by the discourse context as follows:

(iii) An increase in a referent's prosodic prominence by (a) the presence of an accent, (b) a nuclear accent status and (c) a (nuclear) accent type with a higher pitch and later pitch peak is perceived as contextually more appropriate for referents with a decreasing level of givenness.

4.2.1 Method

In this experiment, the test sentences were rated in relation to their corresponding contexts. For this, the entire context (including the target sentence) was presented orthographically and automatically played once. The task was to evaluate how well the melody of the test sentence fits into the context. The scale used for evaluation was the same as in the perception experiment *without context* (VAS, see section 4.1) but with the left pole (1%) labelled as 'not at all', meaning not appropriate, and the right pole (100%) labelled as 'very well', meaning appropriate (*acceptability scale*).

The experiment consisted of four parallel sub-experiments. That is, in a sub-experiment we only tested test sentences with the same type of information status originating from the same single context type. Each test stimulus had to be evaluated separately three times in randomised order adding up to 21 stimuli for

evaluation in the main section of each sub-experiment. Since the four sub-experiments are provided randomly by selecting the open URL the sub-experiment with the *given-displaced* condition has 23 participants, 20 subjects participated in the other three sub-experiments each.

4.2.2 Results and Discussion

The results reveal differences in the appropriateness of the *status* of an accent used with respect to its role as prosodic marker of different types of information status as shown in figure 3.

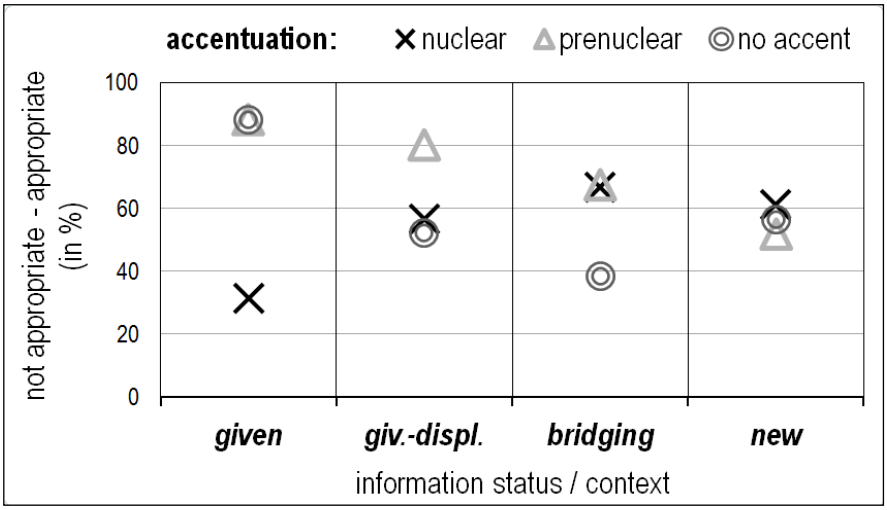

Figure 3: Distribution of nuclear accents (all accent types pooled), prenuclear accents (PN) and no accents (Ø) on the acceptability scale according to their mean response values in the four sub-experiments.

The prosodic marking by nuclear accents is increasingly more appropriate, the *less* given a target word is, whereas the appropriateness of prenuclear accents and deaccentuation increases the *more* given a target word is (with the exception of new information). In the following the results are presented in more detail from given through given-displaced and bridging to new target words.

Deaccentuation (88%, SD = 11.6) and low prenuclear accents (88%, SD = 12.4) turned out to be best qualified to mark given target words, while nuclear accents (31.1%, SD = 29.3) are least qualified as their prosodic marker

(RMAOV: $F(2,20) = 107.118$, $p<0.001$). Low prenuclear accents (80.1%, SD = 14.4) also seem to be an appropriate prosodic marker for given-displaced target words while the appropriateness of no accents (52.2%, SD = 30.5) and nuclear accents (56.4%, SD = 24.4) takes an intermediate position on the acceptability scale (RMAOV: $F(2,23) = 12.126$, $p<0.001$). In the bridging condition, nuclear (66.6%, SD = 27.9) as well as prenuclear accents (67.4%, SD = 22.6) were both judged rather appropriate and deaccentuation rather inappropriate (38.4%, SD = 32.0) (RMAOV: $F(2,20) = 11.039$, $p<0.01$). As an exception, we did not find significantly different ratings attributed to the status of accent for new target words: nuclear, prenuclear and no accents take an intermediate position on the acceptability scale. This is probably due to the preceding context question eliciting a broad focus in the target sentence that is exclusively composed of discourse-new items, which leaves room for a wide variety of possible prosodic realizations of the target sentence. [8]

Hypothesis (iii) was confirmed in terms of accent *status*, even for the two types of accessible information: The less given a referent is the more appropriate is a prosodic marking with a higher prominence (no accent < prenuclear accent < nuclear accent). Concerning the acceptability of different nuclear accent types we found no significant differences depending on the target word's information status.

5 Summary and Conclusions

In a production experiment and two follow-up perception experiments on read German we investigated the (de-)coding of discourse-new, inferentially accessible, textually accessible and given discourse referents by different

[8] In the perception experiment with the new condition the whole context after the target sentence was not presented. This might have led to a different interpretation of the informativeness of the target sentence/word than in the production experiment.

nuclear accent types, prenuclear accents and deaccentuation. We found that changes in a referent's level of givenness are reflected in changes in its production (differences in *status* and *type* of accent used) and perception (*acceptability* of differences in the *status* of accentuation *within context*): The 'newer' the referent (from given through accessible to new), the more appropriate is an increase in the pronounced prosodic prominence. As expected, inferentially accessible items involve a higher degree of prosodic prominence than textually accessible items. This seems to confirm that a bridging inference between an anaphora and its antecedent involves more activation cost than the explicit repetition of a displaced referent (e.g. Haviland & Clark 1974; Clark & Haviland 1977) providing further evidence for the relevance of **different** intermediate levels of (cognitive) *activation/givenness* between the poles *active /given* and *inactive/new*.

Deaccentuation and (low) prenuclear accents were mostly interpreted as encoding given items, and turned out to be best qualified to mark given referents. In these cases the nuclear accent falls on the following verbal particle leading to a weaker prominence of the target word's accent in relation to the nuclear accent (cf. Jagdfeld & Baumann 2011; Ladd 2008). Accordingly, referents with nuclear accents were perceived as least given. They are also more frequently used and perceived as more appropriate the newer a referent is.

These results show that the relation between a referent's information status and its (de-)coding by prosodic means is primarily reflected by differences in the prosodic *status* of accentuation on the referent (cf. Baumann & Riester, submitted). Furthermore, they confirm that given information does not necessarily need to be deaccented (e.g. Baumann et al. 2007; Féry & Kügler 2008). Thus an appropriate account of the (de-)coding of a referent's givenness requires a more fine-grained differentiation of prosodic prominence by means of differences in the *status* of accent.

In terms of the form and function of different accent types the perception study (*without context*) suggests that the determining factor for the decoding of a referent's information status is the tonal movement onto the accented syllable (cf. Grice et al. 2012; Ritter et al. 2012): Falling accents with an F0 minimum (L*) and/or an early peak (H+L*, H+!H*) lead to the perception of a higher degree of givenness than rising accents with a high or downstepped accentual peak (H*, !H*).This is also reflected by trend in the results of the production study and will be further investigated in future work.

To sum up, we finally showed that a referent's prosodic marking *can* serve as an important cue for the interpretation of its information status or level of givenness. For future work the investigation of the interplay between prosody and other (lexicogrammatical) markers of information status will lead to a better understanding of how prosody contributes to the structuring of information.

References

Baumann, Stefan. 2006. *The intonation of givenness - evidence from German* (Linguistische Arbeiten 508). Tübingen: Niemeyer.

Baumann, Stefan, Johannes Becker, Martine Grice & Doris Mücke. 2007. Tonal and Articulatory Marking of Focus in German. *Proceedings of the 16th International Congress of Phonetic Sciences (ICPhS XVI)*, Saarbrücken. 1029-1032.

Baumann, Stefan & Martine Grice. 2006. The intonation of accessibility. *Journal of Pragmatics* 38. 1636-1657.

Baumann, Stefan & Arndt Riester. (submitted). Coreference, Lexical Givenness and Prosody in German. In Jutta Hartmann, Janina Radó & Susanne Winkler (eds.). [Special Issue "Information Structure Triggers"]. *Lingua.*

Baumann, Stefan, Christine T. Röhr & Martine Grice. (submitted). Prosodische (De-)Kodierung des Informationsstatus im Deutschen. *Zeitschrift für Sprachwissenschaft*.

Brazil, David. 1975. *Discourse Intonation* (Volume 1). Birmingham: Birmingham University.

Büring, Daniel. 2007. Intonation, Semantics and Information Structure. In Gillian Ramchand & Charles Reiss (eds.), *The Oxford Handbook of Linguistic Interfaces*, 445–468. Oxford: OUP.

Burkhardt, Petra. 2006. Inferential bridging relations reveal distinct neural mechanisms: Evidence from event-related brain potentials. *Brain and Language* 98(2). 159-168.

Burkhardt, Petra. 2007. The P600 reflects cost of new information in discourse memory. *Neuroreport* 18(17). 1851-1854.

Burkhardt, Petra & Dietmar Roehm. 2007. Differential Effects of Saliency: An Event-related Brain Potential Study. *Neuroscience Letters* 413(2). 115-120.

Calhoun, Sasha. 2010. The centrality of metrical structure in signaling information structure: A probabilistic perspective. *Language* 86(1). 1-42.

Chafe, Wallace. 1976. Givenness, Contrastiveness, Definiteness, Subjects, Topics and Point of View. In Charles Li (ed.), *Subject and Topic*, 25-56. New York: Academic Press.

Chafe, Wallace. 1994. *Discourse, Consciousness, and Time*. Chicago & London: University of Chicago Press.

Chen, Aoju, Els den Os & Jan Peter de Ruiter. 2007. Pitch accent type matters for online processing of information status: Evidence from natural and synthetic speech. *The Linguistic Review* 24. 317-344.

Clark, Herbert H. 1977. Bridging. In Phil N. Johnson-Laird & Peter C. Wason (eds.), *Thinking: Readings in Cognitive Science*, 411-420. Cambridge: Cambridge University Press.

Clark, Herbert H. & Susan E. Haviland. 1977. Comprehension and the Given-New Contract. In Roy Freedle (ed.), *Discourse Production and Comprehension*, 1-40. New Jersey: Ablex.

Clark, Herbert H. & C. J. Sengul. 1979. In Search of Referents for Nouns and Pronouns. *Memory and Cognition* 7. 35-41.

Cruttenden, Alan. 2006. The De-accenting of Given Information: a Cognitive Universal? In Giuliano Bernini & Marcia L. Schwartz (eds.), *Pragmatic*

Organization of Discourse in the Language of Europe, 311-355. The Hague: Mouton de Gruyter.

Crystal, David. 1969. *Prosodic Systems and Intonation in English*. Cambridge: Cambridge University Press.

Féry, Caroline & Shinichiro Ishihara. 2009. The Phonology of second occurrence focus. *Journal of Linguistics* 45(2). 285-313.

Féry, Caroline & Frank Kügler. 2008. Pitch accent scaling on given, new and focused constituents in German. *Journal of Phonetics* 36(4). 680-703.

Grice, Martine & Stefan Baumann. 2002. Deutsche Intonation und GToBI. *Linguistische Berichte* 191. 267-298.

Grice, Martine, Stefan Baumann & Ralf Benzmüller. 2005. German intonation in Autosegmental-Metrical Phonology. In Sun-Ah Jun (ed.), *Prosodic Typology: The Phonology of Intonation and Phrasing*, 55-83. Oxford: OUP.

Grice, Martine, Doris Mücke & Simon Ritter. 2012. Focus Marking: Tonal Onglides and Oral Gestures. Talk at Workshop on Dynamic Modeling of Articulation and Prosodic Structure, IfL Phonetik, University of Cologne, 7-8 May.

Grosz, Barbara J., Aravind K. Joshi & Scott Weinstein. 1995. Centering: A Framework for Modeling the Local Coherence of Discourse. *Computational Linguistics* 2(21). 203-225.

Gussenhoven, Carlos. 1983. Focus, Mode, and the Nucleus. *Journal of Linguistics* 19. 377-417.

Gussenhoven, Carlos. 1984. *On the Grammar and Semantics of Sentence Accents*. Dordrecht: Foris.

Gussenhoven, Carlos. 2002. Intonation and Interpretation: Phonetics and Phonology. *Proceedings of the 1st International Conference on Speech Prosody*, Aix-en-Provence. 47-57.

Gussenhoven, Carlos. 2004. *The Phonology of Tone and Intonation*. Cambridge: Cambridge University Press.

Haviland, Susan E. & Herbert H. Clark. 1974. What's New? Acquiring New Information as a Process in Comprehension. *Journal of Verbal Learning and Verbal Behavior* 13. 512-521.

Jagdfeld, Nils & Stefan Baumann. 2011. Order Effects on the Perception of Relative Prominence. *Proceedings of the 17th International Congress of Phonetic Sciences (ICPhS XVII)*, Hong Kong. 958-961.

Kohler, Klaus J. 1991. Terminal intonation patterns in single-accent utterances of German: Phonetics, phonology, and semantics. *Arbeitsberichte des Instituts für Phonetik und digitale Sprachverarbeitung der Universität Kiel (AIPUK)* 25. 115-85.

Krifka, Manfred. 2007. Basic Notions of Information Structure. In Caroline Féry, Gisbert Fanselow & Manfred Krifka (eds.), *Working Papers of the SFB632, Interdisciplinary Studies on Information Structure (ISIS)* 6, 13-55. Potsdam: Universitätsverlag Potsdam.

Ladd, D. Robert. 1980. *The Structure of Intonational Meaning: Evidence from English.* Bloomington: Indiana University Press.

Ladd, D. Robert. 2008. *Intonational phonology*. Cambridge: CUP.

Ladd, D. Robert & Rachel Morton. 1997. The Perception of Intonational Emphasis: Continuous or Categorical? *Journal of Phonetics* 25. 313-342.

Lambrecht, Knud. 1994. *Information Structure and Sentence Form*. *Topic, focus and the mental representations of discourse referents* (Cambridge Studies in Linguistics 71). Cambridge: Cambridge University Press.

Pierrehumbert, Janet B. & Julia Hirschberg. 1990. The Meaning of Intonational Contours in the Interpretation of Discourse. In Philip R. Cohen, Jerry Morgan & Martha E. Pollack, (eds.), *Intentions in Communication*, 271-311. Cambridge: MIT Press.

Prince, Ellen F. 1981. Toward a Taxonomy of Given-New Information. In Peter Cole (ed.), *Radical Pragmatics*, 223-256. New York: Academic Press.

Prince, Ellen F. 1992. The ZPG letter: subjects, definiteness, and information-status. In Sandra Thompson & William Mann (eds.), *Discourse description: diverse analyses of a fund raising text*, 295-325. Philadelphia & Amsterdam: John Benjamins.

Ritter, Simon, Arndt Riester & Martine Grice. 2012. Onglides von Nuklearakzenten: Brauchen wir Leading Tones? Talk at Workshop Deutsche Intonation: Modelle und Annotation II (DIMA II), University Konstanz, 21-22 March.

Röhr, Christine T. & Stefan Baumann. 2010. Prosodic marking of information status in German. *Proceedings of the 5th International Conference on Speech Prosody* 100019, Chicago. 1-4.

Röhr, Christine T. & Stefan Baumann. 2011. Decoding information status by type and position of accent in German. *Proceedings of the 17th International Congress of Phonetic Sciences (ICPhS XVII)*, Hong Kong. 1706-1709.

Schumacher, Petra & Stefan Baumann. 2010. Pitch accent type affects the N400 during referential processing. *NeuroReport* 21(9). 618-622.

Selkirk, Elisabeth. 1984. *Phonology and Syntax. The Relation between Sound and Structure.* Cambridge, MA: MIT Press

SoSciSurvey. 2011. oFb - der onlineFragebogen. https://www.soscisurvey.de.

Stalnaker, Robert. 1974.. Pragmatic presuppositions. In Milton K. Munitz & Peter K. Unger (eds.), *Semantics and Philosophy*, 197-214. New York: New York University Press.

Terken, Jacques & Julia Hirschberg 1994. Deaccentuation of Words Representing 'Given' Information: Effects of Persistence of Grammatical Role and Surface Position. *Language and Speech* 37. 125-145.

Yule, George. 1981. New, Current and Displaced Entity Reference. *Lingua* 55. 41-52.

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