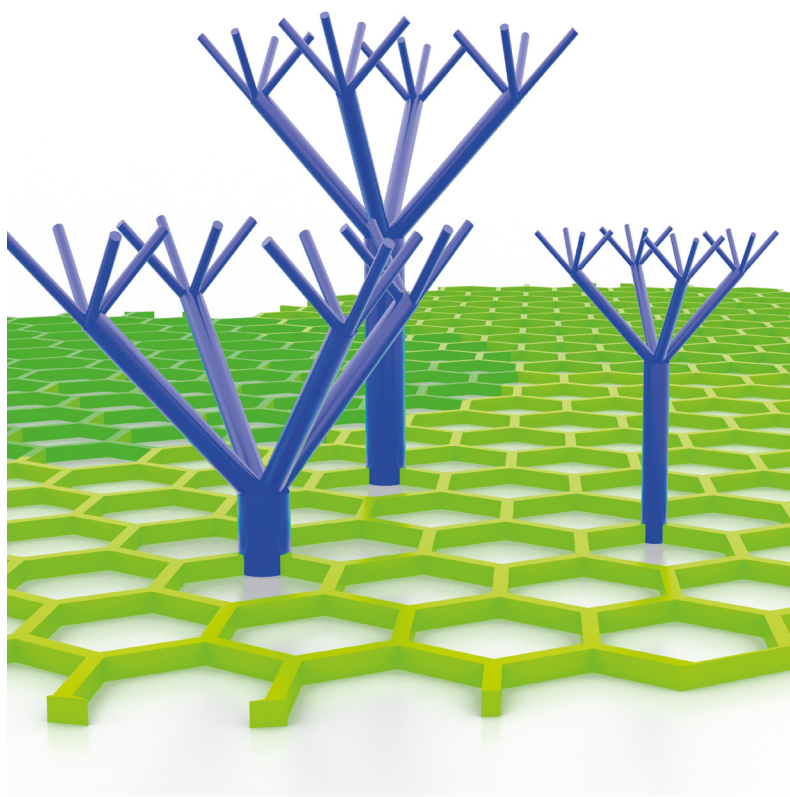Edited by
Markéta Janebová, Joseph Emonds, and Ludmila Veselovská

Language Use and Linguistic Structure

Proceedings of the Olomouc Linguistics Colloquium 2021

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Palacký University
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Finally, we would like to express gratitude to our colleagues and students from the Faculty of Arts of Palacký University, Olomouc, for their efforts related to the organization of the Olomouc Linguistics Colloquium (OLINCO), which took place online in June 2021. We greatly appreciate the assistance of our fellow organizers Michaela Martinková, Václav Jonáš Podlipský, and Šárka Šimáčková, as well as the support provided by Rosalia Calle Bocanegra, Michaela Čakányová, Petra Charvátová, Markéta Dančová, Šárka Dvořáková, Lucie Přibylová, and Halina Zawiszová. Without them, organizing the conference during the global pandemic would have been an almost impossible task.

Markéta Janebová, Joseph Emonds, and Ludmila Veselovská

Introduction

The articles in this volume are based on papers and posters presented at the Olomouc Linguistics Conference (OLINCO) at Palacký University in the Czech Republic in June 2021. At this conference, papers combine analyses of language structure with generalizations about language use. The essays included here can be seen, we think, as a representative sample of the conference contributions; several of the papers were presented at the thematic sessions. The first one, entitled Constraining Allomorphy, was organized by Jonathan Bobaljik and Pavel Caha; three of the papers from this thematic session can be found in the Part I of the volume (authored by Pamela Goryczka, Natascha Pomino and Eva-Maria Remberger, and Leonardo M. Savoia and Benedetta Baldi). The convenors of the other thematic session, entitled Language Processing from a Psycholinguistic and Cognitive Perspective, were Jan Chromý and Norbert Vanek. Three papers from this session can be found in Part III of this volume (Luca Cilibrasi, Kateřina Hasalová, and Alžběta Brabcová; Elisa Piccoli and Francesca Volpato; Šárka Šimáčková and Václav Jonáš Podlipský).

Part I. Explorations in Morphology

In the opening paper, **Svitlana Antonyuk** discusses the status of East Slavic languages with respect to the Rich Agreement Hypothesis (RAH), arguing that despite appearances, East Slavic, along with the rest of Slavic languages, is well within the scope of what is predicted by the weak RAH.

In her contribution, **Michaela Čakányová** considers two types of derived nominals in Czech, analyzing one type as derived from the verbal stem and the other originating directly from the verbal root. These origins result in distinct properties and can account for the more verbal nature of the stem derived nominals and the more nominal nature of the root derived nominals.

The objectives of **Pamela Goryczka**'s paper are twofold: for one, it provides empirical support from Italian for span-conditioned theme (vowel) allomorphy; one the other hand, it aims to add a valuable contribution to the theoretical advancement of the framework of Distributed Morphology.

Dalina Kallulli and Sabine Laszakovits investigate the feature composition of so-called (morphologically) "simplex" wh-elements in German, providing an account of doubly-filled complementizer effects observed in embedded questions and relative clauses in Bavarian and other Southern German varieties.

In their contribution, **Natascha Pomino and Eva-Maria Remberger** argue that not only Spanish, Italian etc., but also French regular verbs possess Theme Vowels and that some irregularities of verbal inflection is linked to athematicity also in French. Using a Spanning approach within the framework of Distributed Morphology, they show the accuracy of the Suppletion Generalization.

In this section's closing paper, **Leonardo M. Savoia and Benedetta Baldi** discuss the realization of 3rd person object clitics in auxiliary contexts in some Southern-Italian dialects, where the auxiliary stem allomorphy *ɛ-/a-* is involved. The core question the authors investigate is the theoretical status of morphology: the idea is that the same computational rules of syntax and (pair-)merge operations combine subword elements based on agreement in φ-features.

Part II. Explorations in Syntax

In his contribution, **Tamás Csontos** focuses on multiple complement verbs in passive constructions in English. He provides an explanation for the fact that recipients in the dative construction and themes in the double object constructions are not passivized.

Predrag Kovačević shows that Serbian psych verb SE anticausatives behave differently from typical antiacuasatives in that they license instrumental causers characteristic of structures involving an external argument (e.g. transitives or reflexives).

Chang Liu's paper examines the syntax of the verbs that can participate in the formation of the Locative Inversion with an obligatory localiser phrase in Mandarin Chinese.

The joint paper by **Mark Newson and Krisztina Szécsényi** seeks to account for why some movements allow case change while others do not. The authors have argued that whether the case of a moved DP changes is dependent on both the case involved and the domain which contains it.

Zsolt Prohászka, Gábor Alberti, Anna Szeteli, and Judit Farkas have contributed a paper devoted to a comprehensive (i.e. syntactic, semantic, statistical) description of the Hungarian modal existential *wh*-construction(s). The authors have also positioned the pronominal component of this family of constructions, which is ultimately an indefinite pronoun formally identical to interrogatives in Hungarian, in Haspelmath's (1997) semantic map of indefinites.

In **Seid Tvica**'s paper, it is argued that a uniform head movement analysis as proposed by Clemens and Coon (2018) does not straightforwardly account for verb-initial orders in Kaqchikel, as the VSO-VOS alternation appears to be syntactic, rather than post-syntactic. Two potential ways of deriving the VSO-VOS alternation are discussed, involving antisymmetric (with uniform leftward movement) and symmetric analyses.

Part III. Explorations in Language Use across Modalities

Luca Cilibrasi, Kateřina Hasalová, and Alžběta Brabcová investigate nonword repetition in Czech-English bilinguals and show that the patterns observed are comparable to those found in monolinguals with a language impairment. This partly contradicts previous work that claimed that nonwords may be used to disentangle difficulties related to bilingualism from difficulties related to an impairment.

In his study, **Volker Gast** provides an exploratory analysis of eyebrow raises in a corpus of TV interviews. The hypothesis that eyebrow raises metaphorically signal openness receives support from the data, especially with respect to their occurrence in the context of epistemic modal expressions and additive operators.

Nikola Malečková and Markéta Malá explore the various functions of the adverbs *absolutely* and *totally* in present-day informal spoken British English. The paper shows that they both appear to be following the same trajectory of change from an intensifier, via a stance adverbial to a discourse (response) marker; however, they are currently at different stages of the process of grammaticalization.

Tilda Neuberger's study aims to investigate the perception and production of the Hungarian singleton and geminate voiceless stops /p, t, k/. The paper explores the relationship between the acoustic and perceptual domains and shed light on the primary/ secondary acoustic features of consonant length opposition in Hungarian.

Elisa Piccoli and Francesca Volpato investigate oblique relative clauses, structures typical of formal registers, in a group of Italian-speaking adolescents with developmental dyslexia compared to a group of typically developing age-matched peers.

Šárka Šimáčková and Václav Jonáš Podlipský's psycholinguistic study explores phonetic effects of switching between languages during speech production of bilinguals highly proficient in a foreign language. It compares voice onset time shifts induced via elicited code switching and language switching in a picture naming task.

In the concluding paper, based on data from Czech Sign Language, **Hana Strachoňová and Lucia Vlášková** refine the phonological Hand-Tier Model (Sandler 2006) by proposing solutions to a number of theoretical problems. Moreover, the authors present a lexicographic application of the phonological model to categorize Czech Sign Language lexemes into variants and synonyms.

We hope that readers will find the papers included in this volume to be of interest to them and their fellow researchers. It was both challenging and gratifying to organize and participate in the conference, in 2021 more than ever because of the globac pandemic, and now we want to extend the challenges and the results of this linguistics forum to a wider audience of those who can participate via the written word, which was, as we traditionally like to say at this place by way of conclusion, invented by our species so that the pleasures and benefits of language use could be extended to the widest possible audience.

Markéta Janebová and Joseph Emonds

Part I. Explorations in Morphology

Object-Shifting and Head-Raising One's Way to Discourse Configurationality

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Abstract: I discuss the question of the status of East Slavic languages with respect to the Rich Agreement Hypothesis (henceforth the RAH), arguing that despite appearances, East Slavic, along with the rest of Slavic languages, is well within the scope of what is predicted by the weak RAH. This conclusion relies on a particular conception of head raising, namely that developed in Roberts (2010), i.e., syntactic raising as Defective Goal incorporation. To the extent the analysis proposed here is successful, it provides further support for Roberts (2010) while removing Slavic languages from the list of challenges for the RAH. Overall, two types of head raising are posited in East Slavic Russian and Ukrainian: obligatory V-to-Asp and optional raising above Asp/into the T domain, and both are treated as syntactic in nature.

Keywords: head movement; East Slavic; Rich Agreement Hypothesis; optionality; discourse configurational languages

1. Introduction

There is an important well-known observation about the existence of a correlation between the complexity of verbal (inflectional) morphology and word order in a language according to which the presence of rich agreement morphology positively correlates with the raised/vP-external position of the verb and specifically with the verb being located in T (Rohrbacher 1999; Vikner 1997; Bobaljik 2002 i.a.):

(1)   (a) þú   veist   [að   ég   **skil**   **alls**   **ekki**   japönsku].

             you   know   that I   understand at.all   not   Japanese

             "You know that I don't understand Japanese at all."   **Icelandic**

     (b) Du   vet   [att jag   **inte**   **alls**   **förstår**   japanska].

             you   know   that I   not   at.all   understand Japanese

             "You know that I don't understand Japanese at all."   **Swedish**

In the above examples, due to Holmberg and Roberts (2013), an inflectionally rich language, Icelandic (1a), has the lexical verb in an obligatorily raised position (as indicated by its placement to the left of the adverb and negation) whereas in Swedish (1b), the verb has not raised, occurring to the right of these vP-edge-marking elements and is thus widely regarded to be inside the vP in such cases. The same well-known pattern is found in French (2a), where a temporal adverb marks the verb's obligatorily raised position (Pollock 1989), compared to (Modern) English (2b), in which the verb must follow the adverb and is believed to remain vP-internal.

(2)   (a) Jean   **embrasse**   *souvent*   Marie.   **French**

             John   kisses   often   Mary

             "Jean often kisses Marie"

     (b) John   *often*   kisses   Mary   **English**

Again, there is a correlation in these and similar cases between the richness of verbal agreement morphology and verb raising: while French exhibits both, present day English lacks both (see Roberts 1993; Holmberg and Roberts 2013). There is a debate in the literature on whether a strong (bi-conditional) or a weak (unidirectional) version of the Rich Agreement Hypothesis (3) is correct, the exact nature of morphology that is relevant to the RAH as well as the directionality of the correlation, i.e., whether it is richness of morphology that is responsible for rich functional structure or whether it is rich(er) functional structure that drives movement.[1]

(3)   **Move V to T iff T has rich inflection** (RAH, the strong version)

Whichever view of the RAH and the related issues one takes, however, one thing is immediately apparent: Slavic languages, known for their morphological richness, especially

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1   See Bobaljik and Thrainsson (1998); Bobaljik (2002) i.a. on the untenability of the strong RAH and the directionality going from rich functional structure to rich morphology to V-to-T.

richness of verbal agreement morphology, are predicted by the RAH to exhibit obliga-tory verb raising to Tense of the kind found in Icelandic and French. As is well-known, however, Slavic languages such as Russian, Ukrainian, B/C/S or Polish do not in fact exhibit verb raising, thus posing a significant challenge even for the weak version of the RAH (see Koeneman and Zeijlstra 2014, henceforth K&Z). In section 2 of the paper I review the data from Russian as presented in the literature and argue (contra K&Z) that the actual empirical picture is actually worse than the one they argue against. Nevertheless, in section 3 I argue that one view of verb raising, namely that in Roberts (2010), coupled with certain assumptions about functional structure and featural content of (East) Slavic (henceforth ES) present a straightforward solution to this problem, one that places Slavic languages firmly within the purview of the weak RAH. Furthermore, I argue that the account captures the peculiar distribution of head movement in (E)S and briefly discuss some of the predictions. Section 4 presents my conclusions.

2.   Head Movement in East Slavic: The Empirical Picture

As far as the status of verb raising in Russian is concerned, the existing syntactic literature appears to be in almost complete agreement that the verb in Russian does not undergo V-to-T (Bailyn 1995; 2012; cf. King 1993; see Dyakonova 2009 and Gribanova 2017 on verb raising into AspP).[2] Thus, sentences such as (4a–b) from Bailyn (2005) show the canonical placement of the verb, its position to the right of low manner or frequency adverbs generally taken to indicate it remains vP-internal.

(4)   (a) My   vnimatel'no   pro-čitali   pravila.   **Russian**
            we   carefully   PERF.read   rules
            "We have carefully read the rules."

        (b) My   často   čitali   pravila.
             we   often   IMP.read   rules
             "We read the rules often."

2.1 Koeneman and Zeijlstra (2014)

Such facts are of course highly problematic even for the weak RAH, presenting direct counterevidence to the prediction that a language with rich verbal agreement morphology

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2   Bailyn (2004) argues that the only context in which the Russian verb undergoes V-to-T of the French kind is OVS sentences. This conclusion has been heavily criticized (see Slioussar 2007; 2011 i.a.) and largely abandoned, though Antonyuk (2021) argues that the verb in OVS *can* indeed appear in a raised position; crucially though, the raised position of the verb in such cases is argued to correlate with the verb's status as given/D-linked material. Some of this evidence is reviewed in section 2.3.

will exhibit mandatory V-to-T, suggesting that the RAH might be nothing more than a correlation. Recognizing the problem, K&Z set out to reanalyze the above Russian data and argue that (4) is in fact fully compatible with the predictions of the weak RAH. Specifically, they argue that Russian is a language with obligatory high attachment of manner/frequency adverbs, thus the typically assumed adjunction option in (5a) is argued to be ungrammatical, with the sentences in (4) having a structure roughly as in (5b), with a manner adverb *vnimatel'no/attentively* attached to TP.

(5)   (a) $[_{IP}$ my $[_{vP}$ vnimatel'no   pročitali   pravila]]

      (b) $[_{FP}$ my $[_{IP}$ vnimatel'no $[_{IP}$ pročitali $[_{vP}$ t_{Vfin} pravila]]]]

The evidence for the above claim comes from sentences involving sentential negation, which is proclitic to the verb in Russian, with NEG moving to C together with the verb in imperatives (6a) and interrogatives (6b), schematized in (7):

(6)   (a) **Ne**   **pey**   vodku   často!
           NEG   drink   vodka   often
           "Do not drink vodka often!"

      (b) **Ne**   **p'eš**   li   ty   vodku   často?
           NEG   drink   Q   you vodka   often
           "Don't you often drink vodka?"

(7)   [CP   [ne-V$_i$]$_j$ [NegP t$_j$ [vP t$_i$]]]

As argued by K&Z, the vP-attachment site view of manner/frequency adverbs predicts that sentences with sentential negation such as (8) will be grammatical, which they claim is contrary to fact, whereas a high-attachment view correctly entails the ungrammaticality of (8) and grammaticality of (9) and (10), the latter case involving an adverb TP-attached on the right.[3]

(8)   (a) ??/*Ty   ne   pro-čitala   vnimatel'no   pravila.
           you   NEG   PERF.read   carefully   rules
           "You haven't read the rules carefully."

---

3   The data in (8)–(10) are given here with K&Z's grammaticality judgments.

(b) ??/*Ty   ne   čitala   často   pravila.
    you   NEG   IMP.read   often   rules
    "You haven't read the rules often."

(9) (a) Vnimatel'no   ty   ne   pro-čitala   pravila.
        carefully   you   NEG   PERF.read   rules
        "You haven't carefully read the rules."

    (b) Často   ty   ne   pro-čitala   pravila.
        often   you   NEG   IMP.read   rules
        "You haven't often read the rules."

(10) (a) Ty   ne   pro-čitala   pravila   vnimatel'no.
         you   NEG   PERF.read   rules   carefully
         "You haven't carefully read the rules."

     (b) Ty   ne   čitala   pravila   často.
         you   NEG   IMP.read   rules   often
         "You haven't often read the rules."

On the basis of these data K&Z conclude that adverbs in Russian must be attached higher than vP or involve right-adjunction, therefore low adverbs cannot diagnose verb movement and Russian thus fails to provide evidence against the weak RAH.

2.2 Another Look at East Slavic Head Raising Possibilities

It should be noted, however, that the empirical data in (8)–(10) that K&Z's account of Russian verb raising is based on is far from straightforward. To my ear, the sentences in (8) are in fact the most neutral way of expressing sentential negation, which means that the vP-attachment of low adverbs is not only possible, but is in fact preferred. Furthermore, if low adverbs are vP-attached and negation is generated left of the adverbs (as is minimally suggested by the neutral word order in (8), but see also Gribanova 2017) the natural conclusion then is that in sentences with sentential negation the verb raises from vP into NEG head, with any further movement then taking place with negation procliticized to the verb, effectively as schematized in K&Z's (7). Examples in (9), on the other hand, are highly marked, and are only acceptable on a particular non-neutral prosody (where the sentence-initial adverb and verb carry the strongest rising and falling pitch accents respectively), which suggests that this attachment option, if available to speakers, is marked compared to (8). Finally, the examples in (10) have a more likely derivation: they can be straightforwardly derived by object raising to the left of the adverb, thus again implicating the verb's vP-external (raised into NEG) position in such cases.

In the closely related Ukrainian, where the verb raising options appear to be the same as in Russian, Object Shift (Middle Object Scrambling in Mykhaylyk 2011) targets the position to the left of the adverb, which obligatorily results in semantic effects for the shifted XP (specificity/partitivity interpretation, see also Antonyuk and Mykhaylyk 2022). The default assumption of parallelism between the two languages as far as object raising possibilities are concerned thus suggests a way to test the hypothesis about the derivation of (10): if the order in (10) is derived via verb and object vacating the vP (rather than via adverb TP-right adjunction), the object in (10) will have to be obligatorily interpreted as specific/carrying an existence presupposition. The prediction is, indeed, correct.

Two additional observations are relevant here. As argued in Antonyuk (2021), on the analysis of Quantifier Float (QF) proposed in Bošković (2004), object-associated QF distribution strongly suggests that the object undergoes A-movement, with a number of landing sites available to it, both vP-internally and vP-externally. The data is thus simply incompatible with an obligatory TP-adjunction of low adverbs. To see why, consider (11), which indicates the canonical vP attachment of low adverbs:

(11) Maks (vse) korobki s domašnej utvar'ju **Russian**
Max (all) boxes with home furnishings
(vse) medlenno (vse) [složil (vse) v mašinu (vse)].
(all) slowly (all) put (all) in car (all)
"Max put in the car all the boxes with home furnishings"

First, in a sentence with a heavy object as in (11), a sentence-final adverb placement would be marginally possible, but a placement immediately following the subject is not merely dispreferred, it is highly unnatural. Furthermore, attempting to nevertheless analyze the order in (11) as reflecting TP-attachment of the adverb and the verb raised into T would suggest that the subject and the object are higher than TP, which implicates A-bar positions. However, there is plenty of evidence to suggest that the subject in both SVO and SOV sentences is in its canonical A-position, Spec,TP, in ES (see Bailyn 2012 on Russian; Antonyuk and Mykhaylyk 2022 on Ukrainian), hence the order in (11) is incompatible with obligatory TP-attachment of low adverbs. I conclude that the position of the verb in ES is only compatible with it being vP-internal when preceded by a low adverb and vP-external when preceding the adverb.

2.3 Clarifying the Empirical Domain

Nevertheless, to draw the conclusion that the verb in ES never raises outside the vP would be an oversimplification. We have seen that the verb does raise across an adverb in sentences with sentential negation such as (8) and (10). Furthermore, there is evidence that the verb in ES *can* in fact occur vP-externally even when sentential negation is not involved, and, presumably, these cases involve verb raising into the Tense domain.

Consider the following data from Ukrainian (the hashtag symbol indicates infelicity of the examples, rather than ungrammaticality):[4]

(12) (a) Ščo   Marijka   robyt'   zranku?   **Ukrainian**
          What   Mary   does   in.morning
          "What does Mary do in the morning?"

     (b) Marijka   švydko   gotuje   #(švydko)   jaješnju
          Mary.NOM   quickly   cooks   (quickly)   scrambled eggs.ACC
          i   bižyt'   na   robotu.
          and   runs   on   work
          "Mary quickly cooks scrambled eggs and hurries off to work"

(13) (a) Ščo   #(može)   Marijka   (može)   prygotuvaty švydko?
          What   can   Mary   can   cook   quickly
          "What can Mary cook quickly?"

     (b) Marijka   ##(švydko)   gotuje   švydko   lyše jaješnju.
          Mary.NOM   (quickly)   cooks   quickly   only scram. eggs.ACC
          "Mary cooks only scrambled eggs quickly"

(14) (a) Ščo   vidomo   pro   tsju   kvitku?
          What   known   about   this   flower
          "What is known about this flower?"

     (b) Tsju   kvitku   dobre   znaly   ##(dobre) drevni   greky.
          This   flower   well   knew   (well)   ancient   Greeks.NOM
          "This flower was well known to Ancient Greeks"

     (c) ###/*Drevni   greky   dobre   znaly   tsju   kvitku.
          Ancient   Greeks   well   knew   this   flower.ACC
          "Mary cooks only scrambled eggs quickly"

(15) (a) Xto   znaje   ščos'   pro   tsju   kvitku?
          Who   knows   something   about   this   flower.ACC
          "Who knows anything about this flower?"

---

4   The Russian counterpart of (14b) is due to Natalia Slioussar (p.c.).

(b) Tsju   kvitku   ##(dobre)   znaly   dobre   lyše   drevni   greky.
    This   flower   (well)   knew   well   only   ancient Greeks
    "Ancient Greeks were the only ones to know this flower well"

The data above demonstrate the following descriptive generalization, which holds true of many languages cross-linguistically as well as of all Slavic languages: the word order in Slavic is (re)arranged in such a way as to place given/D-linked material before new elements (see esp. Kučerová 2007; 2012). Thus, (13b), for instance, shows that the verb *can* raise to the left of low adverbs; however, this order is fully determined by the verb's Information Structural (IS) status and is not as acceptable in (12b), where the verb represents new information. A novel observation is that the lexical verb in ES tends to raise outside the vP mostly in OVS clauses, that is, there appears to be a positive correlation between the givenness/vP-external position of the object on the one hand and the D-linking/vP-external position of the verb on the other. A final point to note is that most of the above orders that are non-neutral are nevertheless not ungrammatical, merely dispreferred (marked with hashtag signs); and even those cases that are very strongly degraded (on neutral intonation) can be made fully acceptable via prosodic recontouring, that is, via a change in the prosodic realization of the sentence which acts as an alternative means of signaling the intended semantics (see Antonyuk and Mykhaylyk 2013 for an experimental investigation). In the context of our discussion, coupled with our earlier conclusions, this yields the following broad empirical generalization to account for:

(16) the verb in ES does not undergo V-to-T but is able to raise into the Tense domain for IS reasons. This raising is optional, with prosodic recontouring providing an alternative means of encoding IS-relevant features (givenness/D-linking).

While this generalization is not entirely new, it is almost never acknowledged in studies focused on the status of Slavic languages with respect to the RAH, portraying Russian, for instance, as either patterning with English in not allowing V-to-T (Bailyn 1995) or with French in requiring it (Koeneman and Zeijlstra 2014). Furthermore, generative literature on Russian mostly treats this empirical situation as clear evidence of the phonological nature of head movement in Russian, which reflects mapping to IS (Bailyn 1995; Kallestinova and Slabakova 2008; Slioussar 2007 i.a.). In this paper and in Antonyuk (in preparation) I argue that this empirical picture, which extends to all of Slavic, shows that instead of a two-way typological split, i.e., (Modern English, Swedish, Russian) vs (Early Modern English, Icelandic, French), there is a three-way split, with most Slavic languages representing the third group, where verb raising into the Tense domain *is* possible, but never obligatory. The challenge for the RAH, of course, at this point appears to be all but insurmountable, since such an empirical profile of ES

effectively reduces the otherwise fairly robust typological generalization to a correlation that holds robustly in select languages, at best.[5]

In the next section I will argue that one conception of head raising, that of Roberts (2010), allows for a natural inclusion of Slavic languages within the purview of the RAH. Specifically, I will argue that the verb in ES undergoes head raising to Asp and no further for reasons that are fully compatible with the RAH, tracing the differences between ES on the one hand and English, Icelandic, French, etc., on the other to differences in the richness of functional projections (Bobaljik and Thrainsson 1998; Bobaljiik 2002 i.a.) and to Defective Tense in ES which precludes V-to-T, allowing only V-to-Asp. Finally, I will elucidate briefly how this account deals with the optional head movement beyond AspP observed in the data.

3. Head Raising in East Slavic: The Account
3.1 Roberts (2010) on V-to-T as Incorporation

Roberts (2010) proposes a reanalysis of head raising as Goal incorporation, where features of a Defective Goal, defined as in (17), copied onto the Probe upon the AGREE relation are pronounced on the Probe, which for all intents and purposes is indistinguishable from movement.

(17) **Defective Goal:** a Goal G is defective iff G's formal features are a proper subset of those of G's Probe P. (Roberts 2010, 62)

Consider the ingredients implicated in the French V-to-T, for example. According to Roberts, T in French has an interpretable T feature (**iT**) and an uninterpretable V feature (**uV**), while V has the opposite: an interpretable V feature (**iV**) and an uninterpretable T feature (**uT**):

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5   This conclusion crucially depends on the assumption that head raising in Slavic is fully comparable in this regard to head movement in other languages, both those with and without V-to-T. Specifically, if head raising in ES is treated as post-syntactic primarily due to its apparently optional character, then the obligatoriness of head raising in French would provide a reason to treat it as syntactic movement. However, such an approach is not sustainable; it also leaves no hope of providing a uniform account for head raising from a crosslinguistic, typological perspective. The assumptions that (i) head raising is syntactic and (ii) languages with and without V-to-T do not fundamentally differ in this regard are thus two of the most central assumptions adopted in this paper. See Antonyuk and Mykhaylyk (2022); Matushansky (2006); Roberts (2010), i.a. for various types of evidence supporting this conclusion and Dékány (2018) for a comprehensive overview of various approaches to head movement and their challenges; see den Dikken and Dékány (2020) on the application of Roberts (2010), with some modifications, to the typology of clitics and noun incorporation.

(18)   **AGREE configuration** (ignoring the φ-features in T):

$$T^{min} \qquad\qquad v^{min}$$
$$[iT, uV] \qquad\qquad [iV, uT]$$
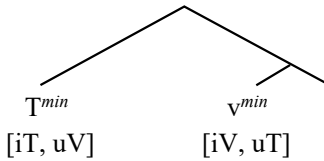
Upon AGREE, V's features get copied into T and are thus now present in two places:

(19)   **French and other V-to-T languages upon AGREE**:

$$T^{min} \qquad\qquad v^{min}$$
$$\qquad\qquad\qquad [iV, uT]$$
$$v^{min} \qquad T^{min}$$
$$[iV, uT] \qquad [iT, uV]$$
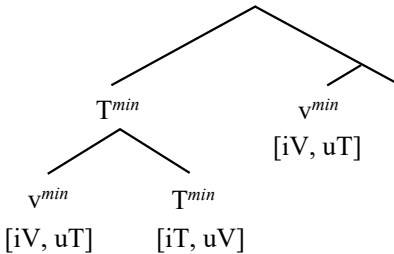
Since T c-commands V, the V feature in T and the V feature in V now form a chain; upon linearization, the head of the chain (i.e., V features in T) are pronounced, with the tail of the chain silenced, thus giving the impression of verb raising into T. On this conception of head raising, the difference between French and Modern English comes down to the fact that T in English does not have a V feature, therefore the output of AGREE cannot be head incorporation, resulting in lack of V-to-T.

3.2 Roberts (2010) Applied to East Slavic

To derive the ES facts, we need to adopt the above mechanism from Roberts (2010) coupled with several independent assumptions about Slavic. Let us first consider the logic of this account and what one would need to derive the absence of V-to-T in ES. A straightforward view of the differences between English, French and ES in the context of Roberts (2010) is that the ES verb must have a feature that T lacks, to ensure that the features in V are not in a proper subset relation to the features in T. The crucial question is, what could this feature be? I believe the answer is provided by what is arguably the most prominent morphological property of the Slavic verb – its aspectual system,

the relevant feature thus having to do with Aspect, and the presence of AspP would ensure that v/V cannot agree with T directly, having to agree with Asp first.[6]

I will assume, following Dyakonova (2007) and Gribanova (2017) on Russian that ES languages have an intermediate functional projection between vP and TP, namely AspP, yielding the structure in (20), as defended in Gribanova (2017). (20) shows the lexical verb raising into Asp, followed by raising into NEG, schematically representing the examples such as (8)/(10).[7] The claim is thus that the verb undergoes head raising/ incorporation into Asp, followed by raising into Neg (in cases of sentential negation), but not higher, thus differing from French in this regard.[8]

(20)
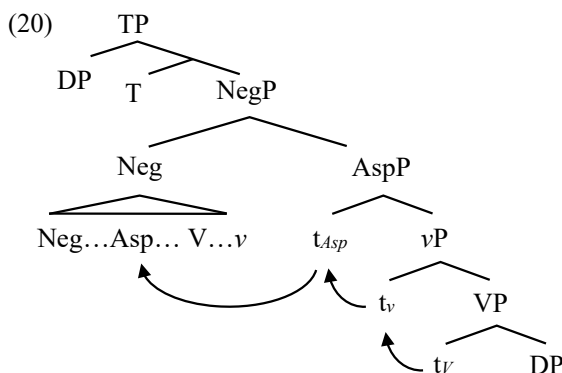
It is crucial for this account to not only assume that ES languages have an intermediate projection AspP as schematized above, but also that French, for instance, does not. As it happens, there is independent evidence to suggest that this is indeed so. It is well known

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6   This is strictly speaking not so. As pointed out in Dékány (2018), Roberts' head raising qua incorporation mechanism allows for a situation where the Probe and the Goal of AGREE are not in a local relation, thus the mere presence of AspP does not by itself preclude AGREE between T and V from taking place. However, I will argue further that V in Slavic must contain an uninterpretable Asp feature, which means that in effect the verb will need to agree with Asp before it can agree with T, thus deriving the correct result.

7   I further assume, following Dyakonova (2009), that the manner/frequency adverbs attach to AspP rather than vP. See Dyakonova (2009) for arguments in support for this view.

8   The optional movement into T discussed earlier is thus treated here not as optional V-to-T but as *syntactic* movement with IS-related consequences that feeds on the output of head raising qua incorporation, its optional character following naturally from the fact that the same semantics can be encoded prosodically. I thus assume with Roberts (2010) that in addition to incorporation, which is most definitely a syntactic phenomenon, there can be other types of syntactic head movement. See also the discussion in Dékány (2018) on this score.

that Slavic aspectual perfective morphology encodes certain semantic properties: Russian bare plurals and bare mass nouns are interpreted as definite or specific in the context of a perfective verb, whereas they can be interpreted as definite or indefinite in the context of an imperfective verb (see de Swart 2012 for an overview):

(11) (a) Petja   čit-a-l   stat'i/literaturu   **Russian**
         Peter   read.IMP-PAST-SG.MASC   articles/literature.ACC
         "Peter was reading articles/the articles/literature/the literature"

     (b) Petja   pro-čit-a-l   stat'i/literaturu
         Peter   PERF-read-PAST.SG.MASC   articles/literature.ACC
         "Peter read the articles"   (Borik 2002)

Whether Slavic prefixes should be treated as perfectivity markers (Smith 1991/1997, Borik 2002 for Russian) or whether they are telicity inducing, as is the case in (21b) above (see Filip 1999 for Czech, Arsenijević 2006 for Serbo-Croatian), as argued in de Swart (2012), grammatical aspect and aspectual class are clearly intertwined in Russian but (crucially for our purposes), separate from Tense. The idea that Aspect may be what is responsible for the additional features in V in Russian and other Slavic languages appears to be further supported by the fact that aspect in Romance not only does not encode the same definiteness/specificity distinctions as do Slavic languages, but French and Romance languages more generally exhibit fusing of past tense and perfective/imperfective aspectual morphology. Consider the following examples in (22a–b) from de Swart (2012), which demonstrate the impossibility of mapping (22a) to a compositional structure in which the past tense and the perfective aspectual operators are separate. Such differences between Slavic and Romance languages are thus crucial for my account, implicating a separation of Tense and Aspect into independent functional projections in East Slavic but their fusion into a single functional projection in French.

(22) (a) Il   écrivit   sa   tèse   en   2009.   **French**
         He   wrote.PST   his   thesis   in   2009
         "He wrote his thesis in 2009."

     (b) [past   [perf   [he   write   his   thesis]]]

While the above discussion about Slavic Aspect encoding semantic features such as definiteness and specificity makes it tempting to propose that the feature that Asp and V heads share to the exclusion of T has to do with definiteness/specificity semantics, I believe this step would be an overcomplication and that it is sufficient for us to assume that V hosts an uninterpretable Asp feature (**uAsp**), while an interpretable Asp feature

(**iAsp**) is hosted in the Asp head, thereby modeling this proposal exactly on the reasoning in Roberts (2010). Upon establishing AGREE between Asp and V, with respect to which V acts as a Deficient Goal, the V feature in Asp will be pronounced as the head of the chain, whereas the V feature in V will be silenced as the tail of the chain.[9] Crucially though, T must not have the Asp feature, thus precluding incorporation of Asp into T due to Asp not being a Deficient Goal with respect to T.

3.3 A Simpler Alternative (No-Tense-Projection) Account?

At this point we should address typological research that posits the absence of the Tense projection in those Slavic languages that lack dedicated Tense morphology (Bošković 2012; Migdalski 2006; 2013; Jung and Migdalski 2015; Todorović 2016 i.a.), which appears to suggest a much simpler take on the lack of V-to-T in ES.[10] The absence of the Tense projection in (E)S would derive the lack of V-to-T quite trivially: there can be no head raising into T if there is no Tense projection, hence no T to probe V. In order to preserve the account developed here, one might thus be tempted to disregard the above research and assume the universality of TenseP. I believe taking this position would not be beneficial as it would lead to overlooking a wealth of relevant typological generalizations and insights. In fact, I argue that assuming the above accounts must be fundamentally correct can help us strengthen the present account and extend its coverage to all of Slavic.

Interestingly, the no-Tense-projection accounts do not suggest that the functional Tense layer is absent in all of Slavic: in fact, Bulgarian and Macedonian are argued to be different from the rest of Slavic in exhibiting robust Tense morphology and straightforward Tense-Aspect separation and are therefore argued to project Tense, in contrast to languages with poor/residual tense morphology such as Russian/Ukrainian/B/C/S/Polish, etc. (see esp. Migdalski 2006; 2013; Todorović 2016).[11] Crucially, Bulgarian is also said to have V-to-T.[12] This, of course, appears to falsify the present account and provide strong support for the no-Tense-projection accounts in terms of the reason for the lack of V-to-T. I believe there is another way to interpret the data, however. Todorović argues that "the absence of morphological realization is the reflex of structural deficiency in

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9   This discussion assumes that the same AGREE-based incorporation has already taken place between v and V, thus the features of V are already in v at the time Asp and v undergo AGREE. I continue to refer to V rather than v for ease of exposition.

10   The relevance of this view of ES was pointed out to me by Boban Arsenijević (p.c.)

11   Macedonian is reported to be less straightforward, having started the process of losing Tense-Aspect distinctions that Bulgarian still makes. In what follows I therefore refer to Bulgarian alone.

12   See Krapova (1999) on the Bulgarian auxiliary system and Harizanov (2019) for a recent overview of the literature as well as an argument, based on Bulgarian participle fronting, for the unification of head movement with XP movement.

terms of the absence of a particular projection" (here, Tense) (Todorović 2016, 245). I propose that the ES vs Bulgarian contrast, viewed in the context of Roberts' (2010) proposal, provides us with another perspective on what structural deficiency could mean. Specifically, I propose that structural deficiency of Tense in most of Slavic (as diagnosed in Todorović 2016) be understood in terms of featural deficiency.

Consider the details of this proposal. The difference between Russian and Ukrainian on the one hand and Bulgarian on another cannot reside in the presence/absence of the AspP as I have argued to be the case with French, as the above research makes a strong case for well-developed Tense *and* Aspect systems in Bulgarian, yet Bulgarian has V-to-T and Russian and Ukrainian do not.[13] I propose the key difference is that the ES Tense itself is deficient in lacking the **uAsp** feature while the Bulgarian T head is not and does have the **uAsp** feature. Consider what this gives us: if Bulgarian T has a **uAsp** feature, then the Asp head will count as a Deficient Goal wrt T (assuming, of course, with Roberts, that T *always* has other features) and Asp incorporation into T will take place in Bulgarian in the same way that V-to-T takes place in French. The result we have derived is that the absence of V-to-T in ES is not merely due to the presence of an intermediate projection between T and v and the presence of a corresponding feature in v/V. Crucially, for the Goal not to count as deficient with respect to the Tense Probe, Tense must itself be deficient in lacking the corresponding feature. The account of ES developed here also illustrates another property of Roberts' account, pinpointed in Dékány (2018), namely that the notion of Goal deficiency is a relative rather than an inherent one: a Goal can be deficient with respect to one Probe (here, T) yet non-deficient with respect to another (here, Asp). The elaboration of the ES vs Bulgarian case further illustrates an important related point: a Goal is non-deficient when it has features that are not also present in the Probe, which entails that whenever a Goal is non-deficient, a Probe must be.[14,15] I conclude that as far as V-to-T phenomena are concerned, recasting the no-TenseP position in terms of featural deficiency of TenseP appears quite promising.[16]

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13   Note that B/C/S, Slovenian, Polish and other Slavic languages pattern with ES in this regard and in terms of the lack of V-to-T. Thus, the proposal made here for Ukrainian and Russian extends naturally to these languages.

14   While these notions are clearly interrelated, Goal and Probe deficiency are still quite different, even opposite notions: a Goal is deficient when it has more features relative to its Probe while a Probe is deficient when it has fewer features relative to a specific Goal (while potentially having many other features not related to the Goal).

15   Tense being a deficient category is quite a familiar concept in East Slavic syntactic literature. See esp. Lavine and Freidin (2002) on Defective Tense. While covering different phenomena, these notions are still connected by the idea that Tense lacking certain features affects the outcome of AGREE.

16   It remains to be seen to what extent the phenomena accounted for in the no-TenseP tradition (see esp. Bošković 2012) can be captured in the Deficient Tense account developed here.

3.4 On Optional IS-Related V Raising in (East) Slavic

Let us now return to the problematic aspect of East Slavic verb raising into the T domain, namely its apparently optional character. I believe the empirical facts of ES demonstrate an intuition pursued in a number of recent accounts on head movement, most prominently Matushansky (2006), Roberts (2010), Harizanov and Gribanova (2019), namely the idea that what is referred to as 'head movement' likely subsumes more than one operation. Thus, I propose that ES languages have V-to-Asp, which, on Roberts' (2010) account assumed here can only be understood as a syntactic operation (with AGREE at its core). What we observe in East Slavic OVS and other contexts where the verb appears to optionally raise into the Tense domain when it is given/D-linked, is, I argue, syntactic movement as well, though distinct from the syntactic operation implicated in V-to-Asp.

While numerous accounts have treated such movement as post-syntactic, not in the least because of its optional and (presumably) syntactically vacuous character (though see esp. Matushansky 2006 on this latter point), I believe there is important overlooked evidence which implicates the syntactic nature of optional IS-related verb movement in East Slavic, namely its similarity to Object Shift in Ukrainian. As shown in Antonyuk and Mykhaylyk (2013), Ukrainian Object Shift exhibits the same type of apparent optionality described for IS-related verb movement earlier in this paper. Specifically, Object Shift, which is obligatory in situations where contextual information implicates the specific/partitive semantics of the object is nevertheless optional in that the same semantic interpretation can be obtained without syntactic movement via prosodic recontouring. That is, encoding the relevant semantics *is* obligatory, what is optional is merely the means of encoding, i.e., via syntactic movement or via prosody. Now, Ukrainian Object Shift is, beyond doubt, a syntactic operation[17]; the fact that the exact same pattern of movement/prosodic encoding alternation is also observed with verb raising then strongly suggests that the verb movement in question is also syntactic. Thus, while length considerations prevent me from elucidating many of the relevant details, if the account broadly sketched here is on the right track, it achieves several things: (i) removes Slavic languages from the list of challenges to the weak RAH; (ii) provides further crosslinguistic support for Roberts' (2010) treatment of head raising; (iii) relates typological differences wrt V-to-T to differences in the functional sequence (Bobaljik and Thrainsson 1998; Bobaljik 2002) and featural specification of both Probe and Goal of AGREE relation (iv) identifies two types of head raising in ES (V-to-Asp and IS-related movement) and (v) argues for the purely syntactic character of both types of movement.[18]

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17   See esp. Antonyuk and Mykhaylyk (2022) on the interaction of OS with quantifier scope in Ukrainian.

18   See Antonyuk (in preparation) for a larger cross-Slavic proposal encompassing the issues discussed here.

3.5 The Predictions

The account proposed here makes a number of testable predictions that cannot be properly explored here for space reasons. As an illustration, however, consider the following. The idea that differences wrt V-to-T are to be traced to differences in the functional sequence and the featural specification of heads suggests that there will likely be other significant differences between the languages under investigation that are similarly traceable to the presence/absence of AspP unbundled from the TenseP. I suggest this is indeed so and the numerous observable differences manifest themselves in the expected direction. For instance, as is well-known, constructionist approaches to argument structure face challenges due to observed limitations on syntactic malleability of roots (see Ramchand 2008; 2013 i.a.). Thus, theories that attribute no idiosyncratic lexical meaning to verbs beyond the encyclopedic meaning of roots (e.g., Borer 2005) predict greater syntactic freedom on the part of roots than what is actually observed. For instance, (23) in English on such theories is predicted to be a grammatical sentence, contrary to fact:

(23)   *Mary   slept   the   baby.   **English**

Slavic aspectual morphology has been known to interact with argument structure in numerous non-trivial ways, e.g., by contributing an argument, adding a Result phrase or by creating whole argument structure alternations such as the *Spray-Load* alternation (Antonyuk 2015; 2020 a,b; Arsenijević 2006; 2007a,b; Quaglia et al., under review; Svenonius 2004; Tatevosov 2010; Žaucer 2009 i.a.). As discussed in Antonyuk (in preparation), for instance, the counterpart of (23) is perfectly grammatical in Ukrainian and Russian, with aspectual morphology providing the mechanism needed for coaxing the root '*sleep*' into an (obligatorily) transitive frame taking an optional Inanimate Causer argument:

(24) Marijka   pry-spa-l-a   dytynu
     Mary.NOM   ASP-sleep-PST-FEM.SG   baby.ACC
     (svojim   spivom   /pisneju)   **Ukrainian**
     self.INSTR   signing.INSTR   song.iNSTR
     "Mary put the baby to sleep with her singing/the song"
     = lit.: Mary slept the baby (with her singing/the song).

What we observe here suggests, on the extreme take, the possibility that the extent of syntactic malleability of roots is determined by the functional vocabulary available to the native speakers rather than by any inherent limitations imposed by the lexicon. The fact that Slavic languages show more flexibility in this regard than English thus follows from their richer functional structure, in particular, from the presence of AspP, with aspectual morphology ensuring greater malleability of the root.

4.   Conclusions

This paper provides an account of the lack of V-to-T movement in East Slavic in which it is argued that while the Russian and Ukrainian data appear to provide an apparently insurmountable challenge to the Rich Agreement Hypothesis, this challenge can be straightforwardly overcome assuming wholesale Roberts' (2010) treatment of head movement as Goal incorporation, coupled with independently needed assumptions about typological differences in the functional sequence and featural specification of heads. The proposed analysis not only removes the ES languages from the list of empirical challenges for the weak RAH, it is straightforwardly extendable to all of Slavic. Finally, I have posited two types of head movement in ES: obligatory V-to-Asp and optional Information Structure-related head raising into the T domain and argued that both are strictly syntactic phenomena. The predictions made by this account, while only briefly discussed here, both further support the account as well as suggest that tracing typological cross-linguistic differences to the presence/absence of AspP in a language's functional sequence is a worthwhile undertaking.

Works Cited

Antonyuk, Svitlana. 2015. "Quantifier Scope and Scope Freezing in Russian." PhD diss., Stony Brook University.

Antonyuk, Svitlana. 2020a. "East Slavic Lexical Aspectual Prefixation as the Locus of Argument Structure Information." Paper presented at XLIX Simposio de la SEL (Sociedad Española de Lingüística), Universitat Rovira i Virgili, Tarragona, Spain.

Antonyuk, Svitlana. 2020b. "The Puzzle of Russian Ditransitives." In *Dative Constructions in Romance and Beyond*, edited by Anna Pineda and Jaume Mateu, 43–74. Berlin: Language Science Press. DOI:10.5281/zenodo.377653

Antonyuk, Svitlana. 2021. "Russian OVS: Towards a Better Understanding of the Construction's Properties and Significance." *Journal of Slavic Linguistics* 29: 1–16. FASL extra issue, edited by Andrei Antonenko, John F. Bailyn, Lei Liu, and Anna Melnikova.

Antonyuk-Yudina, Svitlana, and Roksolana Mykhaylyk. 2013. "Prosodic Effects in Word Order: Evidence from Ukrainian." *Proceedings of 40th Annual Meeting of the North East Linguistic Society*, edited by S. Kan et al., 31–45. GLSA Amherst, MA.

Antonyuk, Svitlana, and Roksolana Mykhaylyk. 2022. "Scope Freezing and Object Shift in Ukrainian: Does Superiority Matter?" *Syntax* 25:122–146. https://doi.org/10.1111/synt.12229

Arsenijević, Boban. 2006. "*Inner Aspect and Telicity*." Utrecht: LOT Publication.

Arsenijević, Boban. 2007a. "A Unified Analysis of Two Classes of Slavic Verb Prefixes." In *Proceedings of ConSole XIV (Vitoria, December 15–17, 2005)*, edited by Sylvia Blaho, Erik Shoorlemmer, and Luis Vincente, 21–36. Leiden: SOLE.

Arsenijević, Boban. 2007b. "Slavic Verb Prefixes Are Resultative." *Cahiers Chronos* 17: 197–213. DOI: 10.1163/9789401204446_013.

Bailyn, John Frederick. 1995. "Underlying Phrase Structure and 'Short' Verb Movement in Russian." *Journal of Slavic Linguistics* 3 (1): 13–58.

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

Bailyn, John Frederick. 2005. "Free Word Order and Minimalism." In *St. Petersburg State University Linguistics Papers.*

Bailyn, John Frederick. 2012. "*The Syntax of Russian.*" Cambridge Syntax Guides. Cambridge: Cambridge University Press.

Bobajik, Jonathan David. 2002. "Realizing Germanic Inflection: Why Morphology Does Not Drive Syntax." *The Journal of Comparative Germanic Linguistics* 6: 129–167.

Bobaljik, Jonathan David, and Höskuldur Thráinsson. 1998. "Two Heads Aren't Always Better than One." *Syntax* 1(1): 37–71.

Borer, H. 2005. *Structuring Sense: The Normal Course of Events*. Oxford: Oxford University Press.

Bošković, Željko. 2004. "Be careful where you float your quantifiers." *Natural Language and Linguistic Theory* 22: 681–742.

Bošković, Željko. 2012. "On NPs and Clauses." In *Discourse and Grammar: From Sentence Types to Lexical Categories*, edited by G. Grewendorf and T. E. Zimmermann, 179–242. Berlin: Mouton de Gruyter.

Chomsky, Noam. 2001. "Derivation by Phase." In *Ken Hale: A Life in Language*, edited by Michael Kenstowicz, 1–52. Cambridge, Mass: MIT Press.

den Dikken, Marcel, and Éva Dékány. 2020. "Rethinking 'Defective Goal': Clitics and Noun Incorporation." In *Syntactic Architecture and Its Consequences: Synchronic and Diachronic Perspectives*, Vol. 2, *Inside Syntax*, edited by András Bárány, Theresa Biberauer, J. Douglas and Stan Vikner, 465–496. Berlin: Language Science Press.

Dyakonova, Marina. 2009. "A Phase-Based Approach to Russian Free Word Order." PhD diss., Utrecht University,

Filip, Hana. 1999. "*Aspect, Eventuality Types, and Noun Phrase Semantics.*" New York: Garland Publishing.

Gribanova, Vera. 2017. "Head Movement and Ellipsis in the Expression of Russian Polarity Focus." *Natural Language and Linguistic Theory* 35(4): 1079–1121.

Harizanov, Boris. 2019. "Head Movement to Specifier Positions." *Glossa* 4 (1): 140.1–36.

Harizanov, Boris, and Vera Gribanova. 2019. "Wither Head Movement?" *Natural Language and Linguistic Theory* 37(2): 461–522.

Holmberg, Andreas, and Ian Roberts. 2013. "The Syntax–Morphology Relation." *Lingua* 130: 111–131.

Kallestinova, Elena, and Roumyana Slabakova. 2008. "Does the Verb Move in Russian?" In *Proceedings of FASL 16: The Stony Brook Meeting 2007,* 199–214. University of Michigan, Ann Arbor: Michigan Slavic Publications.

Koeneman, Olaf, and Hedde Zeijlstra. 2014. "The Rich Agreement Hypothesis Rehabilitated." *Linguistic Inquiry* 45 (4): 571–615. DOI: 10.1162/LING_a_00167

Krapova, Iliyana. 1999. "The system of auxiliaries in Bulgarian." In *Topics in South Slavic Syntax and Semantics*, edited by Mila Dimitrova-Vulchanova and Lars Hellan, 59–90. Amsterdam: John Benjamins. DOI:https://doi.org/10.1075/cilt.172.05kra

Kučerová, I. 2007. *The Syntax of Givenness*. PhD diss., MIT.

Kučerová, Ivona. 2012. "Grammatical Marking of Givenness." *Natural Language Semantics* 20 (1): 1–30.

Lavine, James and Freidin. 2002. "The subject of Defective T(ense) in Slavic." *Journal of Slavic Linguistics* 10: 253–289.

Matushansky, Ora. 2006. "Head Movement in Linguistic Theory." *Linguistic Inquiry* 37:69– 109.

Migdalski, Krzysztof. 2006. The Syntax of Compound Tense in Slavic. Utrecht: LOT Publications, PhD diss., Tilburg University.

Migdalski, Krzysztof. 2013. "Diachronic Source of Two Cliticization Patterns in Slavic." In *Challenging Clitics*, edited by Christine Maklenborg Salvesen and Hans-Peter Helland, 135–158. John Benjamins Publishing Company. https://doi.org/10.1075/la.206

Mykhaylyk, Roksolana. 2011. "Middle Object Scrambling." *Journal of Slavic Linguistics* 19 (2): 231–72.

Pollock, Jean-Yves. 1989. "Verb Movement, Universal Grammar and the Structure of IP." *Linguistic Inquiry* 20: 365–424.

Quaglia, Stefano, Boban Arsenijević, Marko Simonović and Svitlana Antonyuk. Under review. "Allomorphy, Morphological Operations and the Order of Slavic Verb-Prefixes." *Journal of Slavic Linguistics*.

Ramchand, Gillian Catriona. 2008. *Verb Meaning and the Lexicon*. Cambridge: Cambridge University Press.

Ramchand, Gillian Catriona. 2013. "Argument Structure and Argument Structure Alternations." In *Cambridge Handbook of Generative Syntax*, edited by Marcel den Dikken. Cambridge: Cambridge University Press.

Roberts, Ian. 1993. *Verbs and Diachronic Syntax: A Comparative History of English and French*. Dordrecht: Kluwer.

Roberts, Ian. 2010. *Agreement and Head Movement: Clitics, Incorporation, and Defective Goals*. Cambridge, MA: MIT Press.

Rohrbacher, Bernard.1999. *Morphology-Driven Syntax. A Theory of V to I Raising and Pro Drop.* Amsterdam: John Benjamins.

Slioussar, Natalia. 2007. "Grammar and Information Structure. A Study with Reference to Russian." PhD diss., Utrecht University.

Slioussar, Natalia. 2011. "Russian and the EPP Requirement in the Tense Domain." *Lingua* 121: 2048–2068.

Smith, Carlota. 1991/1997. *The Parameter of Aspect*. Dordrecht: Kluwer.

Svenonius, Peter. 2004. "Slavic Prefixes inside and outside VP." *Nordlyd* 32 (2): 205–253. Special issue on Slavic prefixes, edited by Peter Svenonius. DOI:10.7557/12.68

Tatevosov, Sergei. 2010. "Building Intensive Resultatives." In *Formal Approaches to Slavic Linguistics 18: The Cornell Meeting* 2009, edited by Wayles Browne, 289–302. Ann Arbor, MI: Michigan Slavic Publications.

Todorović, Neda. 2016. "On the Presence/Absence of TP: Syntactic Properties and Temporal Interpretation." PhD diss., University of Connecticut. https://opencommons.uconn.edu/dissertations/1273

Vikner, Sten. 1997. "V-to-I Movement and Inflection for Person in All Tenses." In *The New Comparative Syntax*, edited by S. Vikner and L Haegeman, 189–213.London: Longman.

Žaucer, Rok. 2009. "A vp-Internal/Resultative Analysis of 4 'vp-External' Uses of Slavic Verbal Prefixes." PhD diss., University of Ottawa.

Deverbal Nominals in Czech: Stem and Root Nominalization

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Abstract: Czech deverbal nominals have two different kinds of morphological endings. The confusing thing about these is that either form can actually be used as a complex event nominal (CEN) or result nominal (RN). It is the origin of their derivation which can explain this. One type of derived nominals (DN) is derived from the verbal stem and the other type originates directly from the verbal root. These origins result in distinct properties and can account for the more verbal nature of the stem derived CENs and the more nominal nature of the root derived RNs of both morphological types of DNs in Czech. A further analysis also explains how these two types of DNs share some properties and why there can be two morphologically different DNs from the same verb.

Keywords: derived nominals; Czech; roots; stem derivation; feature switch

1. Introduction

There have been many approaches towards deverbal nominals in English and other languages. One of the most influential works on this topic is without doubt Grimshaw (1990). Her analysis of *complex event nominals* (CEN), *event nominals* (EN) and *result nominals* (RN) and their distinct properties is still valid, and many use it as a point of departure for their analyses of various languages. A more generativist perspective is assumed by Borer (1993). In her approach the treatment of DNs is seen as two different kinds of derivation, one of which is lexical, meaning that the noun is derived at the level of lexicon before being inserted in the D structure, and the other one is syntactic, when the noun can be derived later after the insertion into D structure. She applies this to English CENs, which she calls *process nominals*, and claims that these are derived post syntactically while English RNs are derived pre-syntactically. The lexical pre-syntactic

derivation puts RNs on the par with non-derived nominals and could help explain why RNs have purely nominal properties. CENs are derived through a raised verbal head which moves to the N head affix.

In her subsequent work Borer (2003) turns her focus on the presence or absence of the *argument structure* (AS) and distinguishes between AS nominals and *referential nouns*. This means that only the nouns derived syntactically from verbs can have the argument structure from the verb and the suffix itself does not carry any verbal features. The derivation is still taking place at two different levels – for this reason she uses the term *parallel morphology*. This approach differs from the Distributed Morphology (DM) framework namely in the pre-syntactic level of insertion, which is something not acceptable for DM. In the DM framework Marantz (2000, 2001) treats the derivations as originating from the roots with the application of an abstract categorizer, a *v* or *n* to yield the particular part of speech. These categorizers are phonologically empty.

Borer (2014) updates her analysis and joins the two ideas. To distinguish between AS nominals and R nominals she deems it necessary to consider, on the one hand, the level of derivation and on the other hand the combination of roots with categorial functors (C-functors). Both AS and R nominals (those without AS) are morpho-phonologically identical. The difference between the two lies according to Borer in their "distinct syntactic properties of the larger nominal constituent within which the derived nominal is embedded" (2014, 80). She applies a top-down, constructionist approach to event/argument structure because she claims that the argument structure cannot originate from the embedded verb nor can it emerge from the root. Roots are devoid of any semantic and syntactic properties; they serve as mere phonological indices and moreover they do not have arguments.[1] The derivation of R nominals happens when a root gets embedded within a C-structure with a particular C-functor, which results in their category. The structure of AS nominals is more complex with up to two additional layers, X and Y of the extended verbal projection. They layer Y is optional, licensing a direct internal argument, and the layer X licensing an event argument or even external argument.

The most important part of her study concentrates on the compositionality of the DNs. AS nominals are seen as always compositional, i.e., they include a verbal stem and also the nominalizing suffix. R nominals, on the other hand, can be either compositional or non-compositional. This is not surprising since "[e]vent denotation, as such, is not restricted to AS-nominals and is rather found in underived nominals as well" (Borer 2014, 72). An example of that would be nouns such as *class* or *wedding* (EN according to Grimshaw) which can have the eventive meaning. Their duration cannot be expressed through a PP (**the class for two hours*), but they need to follow a light verb, e.g., *the class lasts two hours*.

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1   This is in contrast with Harley (2009), who claims that roots can actually take internal arguments.

In our analysis, we are going to build on Borer's and DM analyses, but we will need to adjust these according to the particularities of Czech DNs.

2.   Czech Deverbal Nominals

The Czech deverbal nominals are traditionally divided into two categories based solely on their final suffix. The two types of derived nominals in Czech according to their endings are:

- **type 1**: has the ending *ní*/*tí* as in *balení* 'packaging' or *psaní* 'writing'
- **type 2**: has a greater variety of possible nominalizing endings (including a zero suffix), but the most typical suffixes include *ba*/*ka* as in *malba* 'painting' or *četba* 'reading'

They are typically further specified as to their semantics. Type 1 nouns tend to refer to events and actions. Type 2 nouns refer either to agents, instruments, results but also states and events.

(1)   učení, mytí, vyšívání, zkoušení
      'teaching, washing, embroidering, examining'

(2)   učitel, myčka, výšivka, zkouška
      'teacher, dishwasher, embroidery, examination'

In the previous literature (Panevová 2000; Karlík 2002; Dvořáková 2014) Czech DNs have been thoroughly treated mostly with regard to their dis(similar) morphosyntactic properties, but there has been a deeper syntactic analysis lacking. Namely, their derivation processes were not paid sufficient attention to and the explanation of their different syntactic properties thus fell short. In this paper I am trying to address this gap from the point of view of their different origin, and in the light of that I am trying to explain their syntactic behavior which is sometimes different and sometimes almost identical.

These two types of nominals have many similarities with most regular non-derived nouns. Following Karlík and Nübler (1998) and Karlík (2000), some of their key features include: the ability to appear after a preposition (3), the ability to follow a determiner (4) and allowing for a relative clause post-modification (5)–(6).

(3)   bez zkoušky/zkoušení
      'without an exam/examination'

(4)   ta zkouška/to zkoušení
      'this exam/examination'

(5)   zkouška, která trvala hodinu
      'an exam which lasted an hour'

(6)   zkoušení, které trvalo hodinu
      'examination which lasted an hour'

Regarding their inner structure, both type 1 and type 2 can form (C)ENs with some parts of the AS and RNs.[2] These two kinds of nominals differ in their more or less verbal or nominal properties. The RNs have strictly nominal properties, which means that they resist aspect (7), resist instrumental (INS) agent (8), can be modified by genitive (GEN) and a PP (9), are countable (10), and do not require an internal argument (11):

(7)   (napsat)   *napsaní   (vysbírat)   *vysbírka
      write.PERF   writing.PERF   collect.PERF   collection.PERF

(8)   psaní *Petrem   sbírka *Petrem
      writing Petr.INS   collection Petr.INS

(9)   psaní mojí sestry   sbírka našeho kostela
      writing my.GEN sister.GEN   collection our.GEN church.GEN
      'a letter of my sister'   'a collection of our church'

(10) dvě psaní   tři sbírky
      'two writings'   'three collections'

(11) (a) Petr sbírá mince   Petr psal Janě
           Petr collects coins.acc   Petr wrote Jana.dat
           'Peter collects coins'   'Peter wrote to Jane'

      (b) Petrova sbírka (mincí)   Petrovo psaní (Janě)
           Petr's collection (coins.gen) Petr's writing (Jana.gen)
           'Peter's collection of coins' 'Peter's letter to Jane'

(C)ENs on the other hand can keep the original verbal argument structure and are therefore less nominal than RNs. There are many examples of (C)ENs of type 1 and 2 from the

2   With type 2 I am not using CEN but only EN as the type of event depicted by this kind of nominal is slightly different than the CEN, namely lacking the full argument structure. I show further differences between CENs and ENs in section 3 after I have introduced their different derivation process.

same verb used in similar contexts (12)–(13). However, their structure is not identical. If type 2 expresses an EN, then it can keep the argument structure of the verb – the object is realized as an NP in GEN.[3] For type 1 this is necessary (with transitive verbs) (13).

(12) Prodání   bytu   zabralo   Petrovi   celé   odpoledne.
     selling.CEN.TYPE1 flat.GEN   took   Peter.DAT whole   afternoon
     'Selling the flat took Peter whole afternoon.'

(13) Prodej   (bytu)   zabral   Petrovi   celé   odpoledne.
     sale.EN.TYPE2   flat.GEN   took   Peter.DAT whole   afternoon
     'The sale (of the flat) took Peter whole afternoon.'

This is but one of many differences between the types 1 and 2 (C)ENs. This and further differences which will be presented all stem from the nature of the type of derivation of these nominals.

Let us take a look at type 1 CENs first. These nominals can be derived from almost any verb (except for modals and some stative verbs). They form a much bigger category including mass nouns in singular neuter only. It is a highly productive category including nominals derived from loan verbs. The loan verbs are easily transformed into nominals just by adding the suffix -*ní* as in the case of verb *sharovat* 'to share' in infinitive and the DN *sharování* 'sharing'. Type 2 ENs typically do not allow for this as their derivation is not that productive. They come in different kinds of genders as they have full grammatical paradigms.

3.   Two Different Derivations of Czech DNs

The Czech DNs of both morphology types can and do function as (C)ENs and RNs, but the above-mentioned analysis suitable for English does not seem to work too well for Czech. The problem is that type 1 visibly keeps a part of the verbal stem while type 2 does not seem to have enough verbal properties to be deemed derived from a verb at all, but instead it seems that it is derived directly from the root. So, the question is, how it is possible that one form can function as both RNs and (C)ENs.

Deverbal nominals in Czech originate either from (verbal) stem derivation or directly from the root. In case of type 1 (*ní/tí*) we talk about the stem derivation as in: $V_{stem} \rightarrow CEN \rightarrow RN$. This can help account for the fact that all type 1 DNs are primarily CENs and only some of these can function as RNs as well. In the case of type 2 (*ba/ka*) we are talking about acategorial ROOTs in the sense of Halle and Marantz (1993). The root combines with a nominalizing *n* head and becomes a RN. The next possible step

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3   I am using a NP rather than a DP for Czech because unlike English, Czech does not require the determiner layer for singular nouns, the D layer is optional.

is the eventive use of this DN: $\sqrt{} \rightarrow$ **RN** $\rightarrow$ **EN.** This results in the fact that all type 2 DNs are first and foremost RNs and only some of these can function as ENs.

The stem derivation of type 1 is a sequential procedure. Following Borer (2014) I claim that first the CEN is derived from the verbal stem and then in some cases a RN is derived from the CEN. This kind of consecutive derivation explains why there is no RN of type 1 that would lack its CEN type 1 counterpart. The stem-derivation of CEN happens at the syntactic level (phase-final) of insertion (Emonds 2000; Veselovská 2001).

(14) vybavit   vybavení   vybavení
     equip.ɪɴꜰ   equipping.ᴄᴇɴ equipment.ʀɴ

The thematic affix present in these DNs is what distinguishes them from the other type of ENs and is responsible for their more verbal properties.

The most difficult question is how one and the same form can function as two different kinds of nominals. I claim that the initial derivation process is the same for CENs and RNs of type 1; however, the CEN can be 'coerced' (Harley 2009) into becoming a RN.[4] So, the next step involves a kind of a 'feature switch' through the uninterpretable features (Panagiotidis and Grohmann 2009; Havranová 2020) of RN. Therefore, there is no further morpheme added to the CEN but it simply switches its category.[5]

(15) žehlit   žehlení   Ø
     iron.ɪɴꜰ ironing.ᴄᴇɴ

CEN of type 1 in a tree schema which shows the stem derivation and the retained aspectual structure.

(16) toto   zdlouhavé **malování** pokoje
     'this lengthy painting of the room'

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4   Harley (2009, 338) interestingly notices that just as mass nominals can frequently become countable nominals, so can AS nominals get the resultative reading, acquiring the capacity to express grammatical number. This process (and the Num head) as a by-product excludes the presence of a syntactic object.

5   There have been prior attempts at the explanation of the seeming polysemy of DNs in various languages. Bierwisch (1990) comes up with the idea of the conceptual shift applicable to German DNs, which is a sort of a semantic lexical drift of certain items – this is not much different from the categorial switch idea. The applicability of the shift depends on the semantic-syntactic properties of the given verb. Another such example is Pustejovsky (1995), who treats DNs as polysemous, to be precise, complementary polysemous. This is a property that other non-derived nouns have as well. We can see this in the case of zero morpheme derivations of e.g., *to call* and *a call* or in metaphorical use of nouns.
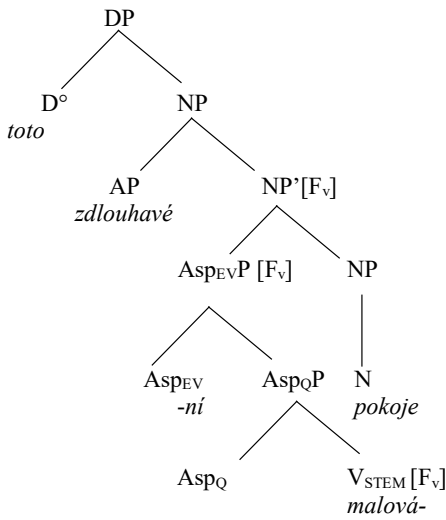
Figure 1. Czech CEN.

RN of type 1 in a tree schema including the categorial feature switch from CEN to RN.

(17) toto červené **vyznamenání**
'this red award'
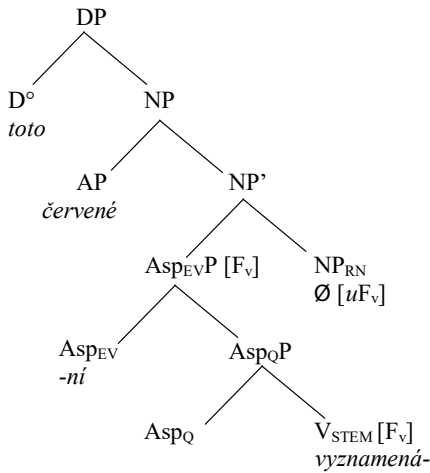
Figure 2. Czech RN of type 1.

The other type of the nominalizing process is a direct root nominalization yielding a type 2 RN. The process of type 2 nominalization must be different from that of type 1 as not all RNs of type 2 have their EN counterpart. The process is a root nominalization in the sense of Marantz (2001) and Harley (2008) where the acategorial root merges with the specific type of nominalizing suffix n°. And also here, in order to get a corresponding EN, the feature switching is applied.

(18) malovat   √ mal-ba   malba
     paint.INF   picture.RN   painting.EN

(19) skočit   √ sk-ok   Ø
     jump.INF   jump.RN

RN of type in a tree schema showing the nominalization from the root.

(20) tato krásná **malba**
     'this beautiful painting'
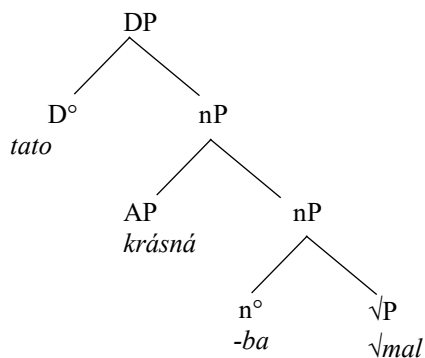
Figure 3. Czech RN of type 2.

EN of type 2 in a tree schema showing the categorial switch from RN.

(21) tato zdlouhavá **malba** pokoje
     'this lengthy painting of the room'

```
                          DP
                        /    \
                      D°      NP
                     tato    /   \
                           AP     NP'[Fᵥ]
                       zdlouhavá   /    \
                               nP [Fᵥ]    NP
                              /    \       |
                            nP      NP_EN   N
                           /  \     Ø [Fᵥ]  pokoje
                         n°    √P
                        -ba    √mal
```
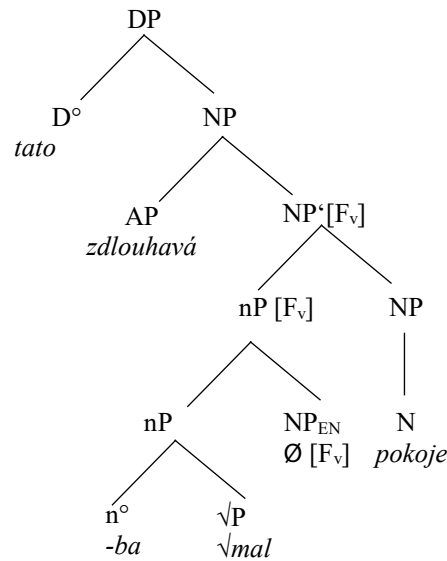
Figure 4. Czech EN.

The properties of both morphological types of Czech DNs can be summarized in the following table:

	Suffix	CEN	EN	RN	Derivation
Type 1	*ní/tí*	all type 1	—	some type 1	Stem: V→ **CEN→RN**
Type 2	*ba/ka*	—	some type 2	all type 2	Root: √→**RN→EN**

Table 1. Summarizing table

4. Different Properties Based on the Particular Kind of Derivation

The RNs of either type of DNs seem to share rather similar purely nominal properties. However, depending on the origin of the (C)EN, we can see their different behavior. This is specifically applicable to their argument structure. Based on the analysis above, it is not surprising to see that type 1 CENs retain more verbal features than type 2 ENs; these features namely include the ability to take reflexive pronouns (22), to express repetition and aspect (23), and take negation (24), and the ability to be modified by As expressing frequency (25).

CEN type 1 (vs. Type 2)

(22) Type 1:   malování se = 'painting oneself'
     Type 2:   *malba se

(23) Type 1:   sbírání (hodinu / *za hodinu)
              'picking for an hour'
              vysbírání (*hodinu / za hodinu)
              'having picked in an hour'

     Type 2:   stavba (hodinu / za hodinu)
              (innert)   'building for / in an hour'
              dostavba (hodinu / za hodinu)
              'having built for / in an hour'

(24) Type 1:   nemalování, nesbírání
              'not-painting, not-picking'
     Type 2:   *nemalba, *nesběr

(25) Type 1:   časté malování
              'frequent painting'
     Type 2:   ?častá malba
              'frequent painting'

Moreover, only the CENs, which denote an event, can keep the argument structure, which corresponds to the argument structure of the verb, i.e., they have both the internal and external argument. The ENs of type 2 can keep just the internal argument, but they do not necessarily need it (27).

(26) Přednášení   *(látky)   (naším   profesorem).
     presenting.CEN   topic.GEN   our.INS   professor.INS
     'Presenting the topic by our teacher'

(27) (a) Dnešní   malba   zátiší   *(studenty)   trvala   hodinu.
         today's   painting.EN still-life.GEN students.INS took   hour
         'Today's painting of the still life (by the students) took an hour.'

     (b) Dnešní   malba   ___   trvala   hodinu.
         today's   painting.EN   took   hour
         'Today's painting ___ took an hour'

Perfective verbs (PERF) and nouns alike need objects to be expressed (28) unless they are inherently understood, while imperfective (IMPF) verbs and nominals derived from them do not need them but can have them included (29). Since the perfective aspect is not compatible with type 2 ENs (30), this only applies to type 1 CENs.

(28) Přemalování /pomalování *(domu) nám zabralo celé odpoledne.
Repainting.PERF painting.PERF house us took all afternoon
'Repaintintg/painting the house took us all afternoon.'

(29) Malování (domu) nám zabralo celé odpoledne.
painting.IMPF house us took all afternoon
'Painting the house took us all afternoon.'

(30) *Pomalba (domu) nám zabrala celé odpoledne.
Painting.EN.PERF house us took all afternoon

According to Grimshaw (1990), only CENs could be modified by modifiers which indicate agenthood as the external argument is somewhat preserved in the structure. The ENs do not seem to operate too well with such modifiers.

(31) záměrné porušování pravidel
intentional violating.CEN rules.GEN
'an intentional violation of rules'

(32) *záměrná porucha technického zařízení
intentional failure technical.GEN mechanism.GEN

Another of Grimshaw's original tests includes the applicability of adverbial modifiers. If we apply such modifiers to Czech CENs and ENs, we can see the difference at first glance. Even though it is mostly more natural to use adjectival modifiers for both types of DNs, it is downright ungrammatical to modify ENs with adverbials.

(33) (a) odprezentování tématu jasně a srozumitelně
'presenting the topic clearly and understandably'

(b) jasné a srozumitelné odprezentování tématu
'clear and understandable presenting of the topic'

(34) (a) jasná a srozumitelná prezentace (tématu)
'clear and understandable presentation of the topic'

(b) *prezentace (tématu) jasně a srozumitelně
presentation (topic.GEN) clearly and understandably

5. The Arguments of Czech CENs

Depending on the verb's valency the DN can have zero, one or two arguments. DNs derived from mono-transitive verbs have the patient in genitive case and the agent is typically expressed by an instrumental case NP. Both arguments appear post nominally, and the agent assumes the position of an adjunct.

(35) (a) posekání   zahrady   zahradníkem
mowing   garden.GEN   gardener.INS
'gardener's mowing the garden'

(b) prodej   domu   *otcem
sale   house.GEN   father.INS

Moreover, if the agent is animate and singular, it can appear pre-nominally as a possessive NP. This works for both CENs and ENs and also any other non-derived noun.

(36) (a) zahradníkovo posekání   zahrady
gardener's   mowing   garden.GEN
'gardener's mowing the garden'

(b) otcův   prodej   domu
father's   sale   house.GEN
'father's sale of the house'

If there is only one argument present, then it is in genitive case and the meaning can be ambiguous as to whether it is the agent or the patient, especially if both NPs are animate.

(37) pokoušení   Jany
temtping   Jane.GEN
'Jane's tempting/Jane is being tempted'

It is, however, necessary to add that the patient (verbal object) is not compulsory for imperfective DNs with argument structure, only for the perfective ones as we have seen in (28)−(29).

With ditransitive verbs in Czech, we expect to get two NPs, one in the accusative and one in dative case. These verbal objects typically fulfill the roles of theme/patient and recipient respectively. After nominalization, the cases change from accusative to genitive for the patient and dative remains the same for the recipient. This is not surprising as it is the structural case which changes while the (inherent) lexical case stays the same. There is also a strict left-right order of cases in Czech: NOM-ACC-GEN-DAT-INS (cf. Caha 2009, 47). So, the GEN needs to precede the DAT.[6] The theme/patient is the obligatory argument of the verb and in the nominalized structure it is an obligatory GEN case marked argument of the DN.

(38) Starosta letos daroval (dětem) hračky.
'The mayor gave (children) toys this year.'

(39) Darování *(**hraček**) (dětem) přineslo starostovi nove hlasy.
'Giving **the toys** (to children) secured the mayor new votes.'

(40) Eva napsala (Adamovi) dopis.
'Eva wrote a letter (to Adam).'

(41) Napsání *(**dopisu**) (Adamovi) trvalo Evě týden.
'Writing **the letter** (to Adam) took Eva a week.'

The CENs with AS (unlike ENs) are compatible with different aspects through prefixes but also through the stem -*vá*- morpheme, which triggers the imperfective aspect.

(42) (a) zastavit   zastavovat
         stop.PERF   stop.IMPF

     (b) zastavení   zastavování
         stopping.PERF stopping.IMPF

The aspect layer of the CENs has two consequences, firstly that nouns derived from transitive perfective stems have to have an overt patient expressed as an NP (28)–(29). This holds in almost all cases with the exception of understood objects with a limited number of verbs, such as *vytírání* 'mopping' or *žehlení* 'ironing' as it is assumed that the unexpressed objects are *vytírání podlahy* 'mopping the floor' and *žehlení prádla* 'ironing the laundry'.

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6   According to Dvořák (2014), the Czech DNs of type 1 with AS contain a passive voice layer (*n/t* can actually be found in Czech passives) and are thus unable to check the accusative case or case mark anything at all. That is the reason for the genitive case.

Secondly, Dvořák (2014, 97-98) notices that the presence of the aspect triggers the inability to combine with durative adverbials. We have already seen that type 1 CENs can combine with time adverbials such as *in an hour* / *for an hour*. But this applies only as long as they are derived from an imperfective verb (43). When a CEN is derived from a perfective verb it cannot combine with durative adverbials but only with the terminative ones (44).

(43) malování jednoho obrazu za hodinu / hodinu
      'painting one picture in an hour / for an hour'

(44) namalování jednoho obrazu za hodinu / *hodinu
      'having painted one picture in an hour'

The DNs derived from intransitive verbs also mirror their inner structure, unergative verbs like *arrive* or *stutter* have just the external argument, which is the agent.

(45) Jan   koktal
      Jan.NOM   stuttered
      'Jan stuttered'

(46) koktání   Jana/*Janem
      stuttering   Jan.GEN/*Jan.INS
      'Jan's stuttering'

Another subclass of intransitive verbs are unaccusatives such as *fall* or *die*. These do not express the agent in the subject position but rather a patient or theme.

(47) dědeček   upadl
      'a grandfather fell'

(48) upadnutí   dědečka/*dědečkem
      falling   grandfather.GEN/grandfather.INS
      'grandfather's fall'

These DNs mirror the argument structure of the verbs they are derived from, namely not being compatible with the agents expressed in an INS case phrase.

6. Conclusions

The DNs are of three different syntactic types in Czech, complex event nominals, event nominals and result nominals. RNs of both suffix type 1 and 2 show identical (nominal)

properties and they do not retain any verbal features. CENs of type 1 suffix retain more verbal properties because they are derived from the verbal stem and ENs of type 2 are less verbal because they are derived through RNs. This means that they do not have the verbal argument structure. They are at best eventive nominals on the par with some eventive non-derived nouns such as *hodina* 'class' or *svatba* 'wedding'. The verbal stem derivation of CENs and the root origin of the RNs explains their different syntactic properties.

References

Bierwisch, Manfred. 1990. "Event Nominalizations: Proposals and Problems." *Acta Linguistica Hungarica* 40 (1−2): 19–84.

Borer, Hagit. 1993. "Derived Nominals." Ms. University of Massachusetts, Amherst.

Borer, Hagit. 2003. "Exo-skeletal vs. Endo-skeletal Explanations." In *The Nature of Explanations in Linguistic Theory*, edited by J. Moore and M. Polinsky, 31–67. Chicago: CSLI and University of Chicago Press.

Borer, Hagit. 2014. "Derived Nominals and the Domain of Content." *Lingua* 141: 71–96.

Caha, Pavel, 2009. "The Nanosyntax of Case." PhD Diss. University of Tromsø.

Dvořák, Věra. 2014. "Case Assignment, Aspect, and (Non-)expression of Patients." In *Noun Valency*, edited by Olga Spevak. 89−111. Amsterdam: John Benjamins.

Emonds, Joseph. 2000. *Lexicon and Grammar: The English Syntacticon*. Mouton de Gruyter: New York.

Grimshaw, Jane. 1990. *Argument Structure*. Cambridge, MA: MIT Press.

Halle, Morris, and Alec Marantz. 1993. "Distributed Morphology and the Pieces of Inflection." In *The View from Building 20*, edited by K. Hale and S.J. Keyser, 111–176. Cambridge, MA: MIT Press.

Harley, Heidi. 2008. "Compounding in Distributed Morphology." In *Oxford Handbook of Compounding*, edited by R. Lieber and P. Stekauer, 129–144. Oxford: Oxford University Press.

Harley, Heidi. 2009. "The Morphology of Nominalizations and the Syntax of vP." In *DP, QP and Nominalizations*, edited by M. Rathert and A. Giannakidou, 320–342. Oxford: Oxford University Press.

Havranová, Kateřina. 2020. "The Nominalization Process in English, Dutch, and Czech." PhD diss., Palacký University.

Karlík, Petr. 2000. "Valence substantiv v modifikované valenční teorii." In *Čeština − univerzália a specifika 2*. Edited by Z. Hladká and P. Karlík, 181–192. Brno: Masarykova univerzita.

Karlík, Petr. 2002. "Ještě jednou k českým deverbálním substantivům." In *Čeština − univerzália a specifika* 4, edited by Zdena Hladká and Petr Karlík, 13–23. Praha: Lidové noviny.

Karlík, Petr, and Norbert Nübler. 1998. "Poznámky k nominalizaci v češtině." *Slovo a slovesnost 59*:105–112.

Marantz, Alec. 2000. "Roots: The Universality of Root and Pattern Morphology." Paper presented at the Conference on Afro-Asiatic Languages, University of Paris VII, June 2000.

Marantz, Alec. 2001. "Words." Paper presented at the West Coast Conference on Formal Linguistics, University of Southern California Los Angeles, 24 February 2001. Available online at https://babel.ucsc.edu/~hank/mrg.readings/Marantz_words.pdf

Panagiotidis, Phoevos, and Kleanthes K. Grohmann. 2009. "Mixed Projections: Categorial Switches and Prolific Domains." *Linguistic Analysis* 35: 141–161.

Panevová, Jarmila. 2000. "Poznámky k valenci podstatných jmen." In *Čeština – univerzália a specifika 2*, edited by Zdena Hladká and Petr Karlík, 173–180. Brno: Masarykova univerzita.

Pustejovsky, James. 1995. *The Generative Lexicon. Cambridge*, MA: MIT Press.

Veselovská, Ludmila. 2001. "K analýze českých deverbálních substantiv." In *Čeština − univerzália a specifika* 3, edited by Zdeňka Hladká and Petr Karlík, 11–27. Brno: Masarykova univerzita.

Allomorphy Conditioned by Post-Linearization Spanning: Evidence from Italian Theme Elements

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Abstract: This contribution provides empirical support from Italian for span-conditioned theme (vowel) allomorphy. Crucially, following Merchant's (2015) Span Adjacency Hypothesis and Haugen and Siddiqi's (2016) proposal of adopting post-linearization spanning for non-lexicalist realizational models of morphology such as Distributed Morphology (DM, Halle and Marantz 1993), it is argued that the preferable model of spanning is indeed the one which targets linearly adjacent formal features without reference to structural constituency. With regard to previous analyses involving Italian theme formatives (Embick 2016, Calabrese 2019), the analysis presented here manages to hold without having to resort to additional morphological operations such as fusion and impoverishment.

Keywords: allomorphy; theme formatives; distributed morphology; spanning

1.   Introduction

In recent years, research on the Romance verbal system has often focused on providing evidence for the presence of paradigmatic patterns known as morphomes (Maiden 2004, 2005, 2018). From this perspective, Italian third conjugation verbs displaying the so-called *-isc-* augment are considered to represent the type of distributional regularity expressed by one of the most prominent morphomes in Romance verb morphology known as the N-pattern (Meul 2010, 2013, Da Tos 2013)[1]: the augment appears only in

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[1]   According to Maiden (2009), the source of the N-pattern is in fact phonological, i.e., brought on by the quality differentiation between stressed and unstressed vowels as can be observed in the verb *morire* 'die' wherein the Present Tense singular forms, the 3PL and the 2SG imperative share a root distinct from the rest of the paradigm (e.g., 1SG *muoio* 'I die' vs. 1PL *moriamo* 'we die'). Apparently the pattern then appealed also to other verbs whose root alternation was not due to phonological reasons but which nevertheless showed the same distributional pattern.

the Present Indicative and Subjunctive forms – except for the 1PL and the 2PL – as well as the 2SG Imperative (cf. Table 1).[2]

	Present Indicative	Present Subjunctive	Imperative
1SG	fin-[isk]-o	fin-[isk]-a	
2SG	fin-[iʃʃ]-i	fin-[isk]-a	fin-[isk]-a
3SG	fin-[iʃʃ]-e	fin-[isk]-a	
1PL	fin-[ja]-mo	fin-[ja]-mo	
2PL	fin-[i]-te	fin-[ja]-te	fin-[i]-te
3PL	fin-[isk]-o-no	fin-[isk]-a-no	

Table 1. Distribution of the augment in Italian *finire* 'end'[3]

However, while this observation may hold true for standard Italian, some Italo-Romance varieties, such as Ligurian, can give us a more varied and contrasting picture of the intra-paradigmatic distribution of -*isc*-, thus dispersing the original pattern of distribution: in Table 2, the variant /iʃ(i)/ has been extended to all person and number cells of the Present Subjunctive. The same pattern can also be observed in many Lombard dialects (e.g., Ticinese), in Upper Engadinian and is additionally found in Corsican and in related dialects in northern Sardinia (Meul 2010, 14).

	Present Indicative	Present Subjunctive
1SG	pat-[iʃi]-u	pat-[iʃ]-e
2SG	pat-[iʃ]-i	pat-[iʃ]-i
3SG	pat-[iʃ]-e	pat-[iʃ]-e
1PL	pat-[i]-mu	pat-[iʃi]-mu
2PL	pat-[i]-i	pat-[iʃ]-i
3PL	pat-[iʃ]-e	pat-[iʃ]-e

Table 2. Ligurian *patí* 'suffer' (Meul 2010, 14)

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2   For reasons of space, this paper focuses on the augment's presence in the Present Tense. As for the Imperative, a more in-depth discussion remains a desideratum of further investigation.

3   The velar /k/ in /isk/ is palatalized when it occurs before front vowels, therefore yielding the variant /iʃ/ or, more precisely, /iʃʃ/ (in intervocalic positions) in the 2SG and in the 3SG.

Finally, in some dialects such as Milanese the *-isc-* augment has also extended to the Conditional and Future tenses. As can be observed in Table 3, the elements /isa/[4] and /i/ seem to be paradigmatically complementary – either 1SG *capiróo* or 1SG *capissaróo* 'I will understand' is being used – but syntagmatically incompatible (**cap-iss-i-roo*). The sequences /isa/ and /i/ seem thus mutually interchangeable which prompts Meul (2010, 35) to conclude: "As for its 'status', the infix can generally be qualified as an allomorph of the thematic vowel /i/ of the fourth conjugation."

	Future	Conditional
1SG	cap-i-róo / cap-iss-a-róo	cap-i-ría / cap-iss-a-ría
2SG	cap-i-rée /cap-iss-a-rée	cap-i-ríet / cap-iss-a-ríet
3SG	cap-i-rá / cap-iss-a-rá	cap-i-ría / cap-iss-a-ría
1PL	cap-i-rémm / cap-iss-a-rémm	cap-i-ríom / cap-iss-a-ríom
2PL	cap-i-ríi / cap-iss-a-ríi	cap-i-ríov / cap-iss-a-ríov
3PL	cap-i-ránn / cap-iss-a-ránn	cap-i-ríen / cap-iss-a-ríen

Table 3. Milanese *capí* 'understand'

Crucially, Meul's concluding remark refers exclusively to the Milanese data. In what follows, I will address the possibility that the *-isc-* augment does indeed function as a theme allomorph, however not only in some Italo-Romance varieties but also in standard Italian.

2. Theme Vowels in Italian

Traditional analyses of Romance verbs typically divide a verb form into root, theme vowel, and inflectional suffixes. The theme vowel (or thematic extension) determines the morphophonological surface shape of the verb, however it does not contribute to its syntactic or semantic meaning. The theme vowel thus seems to facilitate the recognition of class membership as a "purely morphological marker" (Oltra-Massuet 2020). Across frameworks it is described in similar ways, as "morphological glue" (Anderson 1992), "empty morph" (Aronoff 1994) or "ornamental piece" (Embick 2010).

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4   In some varieties of Lombard (as in the Milanese example above), the presence of the augment goes together with the generalization of the first conjugation thematic vowel /a/ resulting thus in the form /isa/ (cf. Meul 2010).

Based on the form of the infinitive, Italian verbs are usually divided into three conjugation classes.[5] Verbs ending in *-are* (e.g., *cant-a-re* 'sing') constitute by far the largest class. Moreover, the first conjugation class is highly productive since new verb creations are more likely to belong to this class than to any other (e.g., *chattare* 'chat', *instagrammare* 'instagram', *selfarsi* 'take a selfie'). It also contains mainly regular verbs, i.e., verbs that have only one single stem for all tense forms. On the other end of the spectrum, second conjugation class verbs in *-ere* (*prend-e-re* 'take', *tem-e-re* 'fear') account for the smallest group; they are mostly comprised of less frequent and/or irregular verbs. Finally, third conjugation verbs in *-ire* can generally be divided in verbs presenting the augment *-isc-* in the Present Tense forms (and the 2SG imperative) except for the 1PL and 2PL (*fin-i-re* 'finish', cf. Table 1) and (a much smaller group of) verbs that are formed without the augment (e.g., *dorm-i-re* 'sleep').[6] Although assumed to be little productive as a whole, new (mostly parasynthetic) verb formations presenting the *-isc-* augment have been introduced to this class over the years (e.g., *ingiallire* 'turn yellow', *abbellire* 'improve, adorn').

The theme vowel can easily be identified in the infinitive since it is located between the root and the inflectional suffixes. In other forms, however, the theme vowel of a given conjugation class may be missing (e.g., Present Tense 1SG *cant-o* 'I sing', *prend-o* 'I take', *dorm-o* 'I sleep')[7] or may present an allomorph of the original theme vowel (e.g., Present Tense 3PL *cant-a-no* ' they sing' vs. *prend-o-no* 'they take', *dorm-o-no* 'they sleep'). Comparing any non-augmented verb with an augmented verb, it becomes rapidly clear that the presence of *-isc-* actually facilitates the classification of a given verb. The surface forms of 1SG *canto*, *prendo*, *temo* and *dormo* may as well belong to any of the conjugation classes, but *finisco* immediately evokes recognition of third conjugation affiliation.

It thus seems that *-isc-* functions as a very strong identity marker. Just as the theme vowel, the augment *-isc-* is a morphological formative necessary in some forms of the paradigm to form a stem before adding inflectional suffixes. Just as the theme vowel, it does not have any syntactic or semantic properties that could impinge on the overall

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5   There are alternative proposals such as the division of the verbs into two macroclasses: the first class contains verbs ending in *-are*, the second class comprises verbs ending in *-ere* and *-ire* (Dressler and Thornton 1991). However, many other similar analyses usually divide the second macroclass in more subgroups (Vincent 1988, Schwarze 1999). For the purpose of this paper, the exact number or type of conjugation subclass is not really relevant; in any case, all proposals separate, at some point, *-ire* verbs with augment from *-ire* verbs without augment.

6   In a recent study, Da Tos (2013, 47) analyzed 450 (non derived) verbs in *-ire* and concluded that only 19 were in fact non-augmented verbs.

7   According to Scalise (1994, 155), the theme vowel is present in the underlying form but due to an ubiquitous vowel deletion rule the theme vowel is deleted when followed by another vowel (e.g., *cant-a-o > cant-o* 'I sing').

meaning of the verb. Just as the theme vowel, it seems to be a purely morphological marker that instantiates conjugation class membership. It thus seems plausible to hypothesize that -*isc*- functions as a theme and is therefore located in the theme position of the verb.

But one last minor issue still needs to be addressed before the hypothesis can be implemented in a formal analysis. The vowel /i/ in the sequence -*isc*- and the third conjugation theme vowel /i/ are homophonous. It is important to stress that the vowel /i/ in -*isc*- is not the theme vowel /i/. This can easily be shown by looking at the 3ᴘʟ: in the augmentless *dorm-o-no* the theme vowel allomorph /o/ is present (just like in second conjugation verbs such as *prend-o-no*); in the augmented *fin-isc-o-no*, the same allomorph /o/ is also present. Since /isk/ is not situated in the verbalizing head (little *v*),[8] there only remains one position and that is the theme position. To sum up, the theme elements we are actually dealing with in third conjugation verbs presenting the augment are /iski/ and /iʃʃi/ with the second vowel /i/ getting either deleted when followed by another vowel (e.g., 1sɢ /fin-isk(i)o/, 2sɢ /fin-iʃʃ(i)-i/) or undergoing a process of backing (e.g., 3ᴘʟ / fin-isko-no/) or lowering (e.g, 3sɢ /fin-iʃʃe-∅/).

3.   Theoretical Background

I propose an analysis of Italian third conjugation verbs presenting the augment -*isc*- within the theoretical framework of Distributed Morphology (DM), as introduced in Halle and Marantz (1993, 1994) and modified ever since in much related work (Harley and Noyer 1999, Harley and Ritter 2002, Folli and Harley 2004). In DM, the lexicon is assumed to be distributed over several lists. Morphosyntactic processes derive hierarchical structures from roots and functional elements. Furthermore, morphological operations precede morphophonological realizations, by which Vocabulary Items (VI) are inserted in terminal nodes previously created by syntax. Crucially, the insertion of different VIs for the same root is dependent on properties of the subsequent syntactic context. Moreover, a realizational ("late insertion") view for both roots and functional elements is assumed (Harley 2014). Hence, allomorphy can only be triggered by elements that are linearly adjacent.

Romance theme elements (along with φ-features) are considered to be the result of a well-formedness condition on syntactic functional heads (Oltra-Massuet 1999, Arregi 2000, Pomino 2008, Pomino and Remberger 2019). More specifically, they are adjoined to little *v* via a node-insertion process (e.g., "node sprouting", Choi and Harley 2019). The tree structure in (1) shows the product of the syntactic derivation at spell-out while the structure in (2) illustrates the additional nodes (Th = Theme, φ) that have been added post-syntactically.

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8   Overall, theme vowels could be verbalizers and thus exponents of little *v* (Julien 2015, Fábregas 2017) but in Italian this seems very unlikely since in verbs such as *anal-izz-a-re* 'analyze' both an exponent of *v* – the causative suffix -*izz*- – as well as an exponent of the theme node – the theme vowel *a* – are present simultaneously.

(1)

```
              T°
            ╱    ╲
          v°      T°
        ╱    ╲
    √ROOT     v°
```

(2)

```
                        T°
                ╱              ╲
             v°                  T°
           ╱    ╲              ╱    ╲
      √ROOT      v°         T°        φ
                ╱  ╲       ╱  ╲
              v°    Th   T°    Th
```
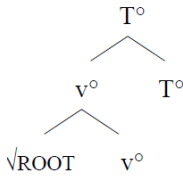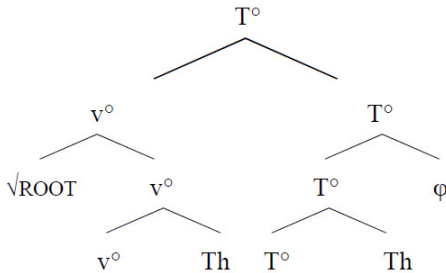
Following Oltra-Massuet's (1999) observations regarding Catalan conjugation classes, it is assumed that the different Italian conjugations are also hierarchically interrelated according to their degree of markedness. As discussed in §2, the first conjugation class contains mainly regular verbs and is, moreover, the most productive group, essentially thus the least marked class, followed by third conjugation verbs that present the augment who may be less regular and less productive but still more so than third conjugation verbs without augment and verbs of the second conjugation class, which are therefore both more marked.

To better understand the markedness hierarchy underlying the different conjugation classes, it thus seems plausible to think of theme elements as encoding conjugational information in terms of abstract features (Oltra-Massuet 1999, 2020). Theme elements can then be organized in a markedness hierarchy wherein those elements with a higher number of positive features are more marked than those with less or none positive features (cf. the concept of "feature geometry" in Harley and Ritter 2002). The theme markedness hierarchy is illustrated below.

(3)   Theme Vowel Markedness in Standard Italian (based on Napoli and Vogel 1990)

```
                        Th
                ┌────────┴────────┐
             [-α]              [+α]
           cantare        ┌──────┴──────┐
                       [-β]          [+β]
                    ┌────┴────┐   ┌────┴────┐
                 [-γ]      [+γ] [-δ]      [+δ]
              finire (+isc) dormire prendere   temere
```
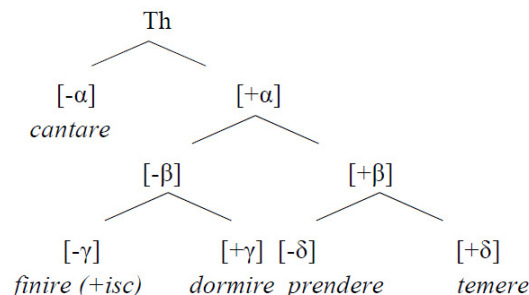
Crucially, roots have to be minimally specified for these theme features (cf. (4)), otherwise there would be no way of ensuring that a given root matches with the theme features.

(4)   (a)   Roots with no specification for conjugation
             √kant
      (b)   Roots with specification for conjugation
             √tem[+δ]   √prend[-δ]   √fin[-γ]   √dorm[+γ]

4.   Issues with Previous Analyses

In Oltra-Massuet's (1999) analysis, theme allomorphy involving the Catalan variant of -isc-, i.e., -eix- (e.g., *prefereixo* 'I prefer'), is accounted for in terms of fusion. Fusion is a morphological device used to modify syntactic structure. It combines two sister nodes into a single X°, with the features of both input nodes, but no internal structure. A fused node thus reduces the number of terminals, providing for but a single locus of vocabulary insertion (Bobaljik 2017).

      In Italian, the Present Tense encodes a semantically unmarked Tense feature – just like in Catalan – and is therefore morphophonologically never realized. The structural difference between Imperfect Tense (no fusion) and Present Tense (with fusion of T°/ φ) is shown in (5) and (6).

(5)   Imperfect Tense

```
                          T°
                 ┌────────┴────────┐
              v°                  T°
          ┌────┴────┐        ┌────┴────┐
       √root      v°       T°         φ
               ┌──┴──┐   ┌──┴──┐
              v°    Th  T°    Th
```

(6)   Present Tense

```
                    T°
              ┌─────┴─────┐
             v°          T°/ φ
         ┌────┴────┐
      √root       v°
              ┌────┴────┐
             v°         Th
```
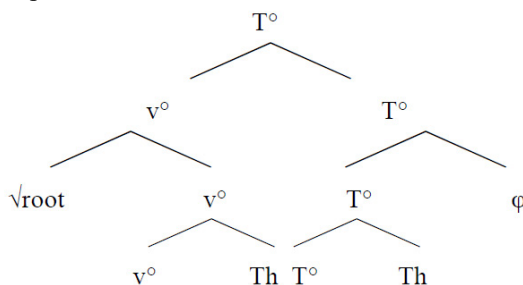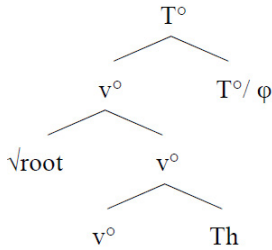
The same strategy is also applied in Embick (2016)'s formal analysis of Italian third conjugation verbs. According to Embick, -*isc*- is the phonological realization of the conjugational feature [III] in the specific context of T°[-past]. In contrast to Oltra-Massuet, Embick designates little *v* as the main locus of -*isc*- insertion (cf. (7)) though it is noted in passing that "it could just as well be treated as a Theme node" (Embick 2016, 291).

(7)   Vocabulary Items for *v* (Embick 2016, 291)
       (a) v[III] ⟷ -*isc*- / __ T[-past]
       (b) v[III] ⟷ -*i*- default

To explain why the augment is not inserted in the 1PL and in the 2PL, Embick draws on another morphological strategy that is capable of changing the syntactic structure, i.e., impoverishment. The rule proposed in (8) ensures that the feature [-past] is deleted in the context of φ[1PL/2PL] thus allowing only for the insertion of the default vocabulary item (7b).[9]

(8)   Impoverishment Rule (Embick 2016, 292)
       [-past] → Ø /____ [+part,+pl]

In an effort to reduce the number of additional processes to account for the presence of the augment, Calabrese (2019) proposes an insertion rule that ensures the insertion of -*isc*- directly into roots marked with a diacritic -*i* in the Present Tense. This implies

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9   Oltra-Massuet (1999) also proposes an impoverishment rule to account for the differing vocabulary items in the 1PL and in the 2PL. However, the author argues that it is necessary to delete the whole T° node; otherwise one could not explain the absence of the augment in the Present Subjunctive 1PL and 2PL. Deleting the whole T° node in the context of 1PL and 2PL in general would lead to some sort of neutralization of the forms in this particular Person/Number environment.

that according to Calabrese, *-isc-* does not function as a theme element but is part of the root in certain contexts, i.e., in this case we are dealing with a case of root suppletion instead of theme allomorphy.

(9) Insertion rule (Calabrese 2019)
   Insert /-isk-/ / Root$_{-i}^{-isk}$ ^ Pres

To account for the differences regarding the 1PL and the 2PL, Calabrese suggests that an impoverishment rule aimed at deleting the diacritic *-isk* in the given environment suffices to derive the correct surface forms. Although Calabrese's approach may be appealing since fusion is avoided, the amount of additional insertion and deletion rules needed does not exactly provide for a more parsimonious formal analysis.

   In the following, I propose an analysis that does indeed reduce as many post-syntactic operations as possible, in particular it will be shown that a seemingly arbitrary device such as fusion is not needed.

   There are many good reasons to be critical of operations such as fusion. First, it is well accepted that a simple, parsimonious model of syntactic derivation generally is to be preferred over a model that employs too powerful *ad hoc* devices to generate a certain end structure (Trommer 1999, Haugen and Siddiqi 2016). Second, it is still unclear what factors are actually involved in triggering fusion. Finally, a rather big issue that has not been solved yet with regard to fusion concerns its look-ahead problem (Chung 2007, Caha 2009). Since fusion is capable of rearranging the syntactic structure it naturally has to be strictly ordered before vocabulary insertion. However, fusion only occurs when there is a portmanteau item available for insertion. No matter how we try to account for fusion it thus seems that we will be going around in circles.

   But there is a solution to this problem. Fusion may be entirely unnecessary when we assume (i) a vocabulary-insertion-only model of grammar and (ii) that vocabulary insertion does not only target single terminal nodes but that two neighboring nodes may be realized by a vocabulary item at a non-terminal node (Williams 2003, Svenonius 2012, Merchant 2015, also cf. Restricted Realization Theory, as proposed by Haugen and Siddiqi 2016).

5.   Allomorphy Conditioned by Post-Linearization Spanning

The core idea of the analysis is that vocabulary insertion only targets spans (Williams 2003, Melnar 2004). A span is either a head (a minimal X°) or a complement sequence of heads in a single extended projection (Svenonius 2012, cf. also Grimshaw 2000). Contrary to fusion where – due to the fact that only one VI is available for insertion (cf. §4 regarding the look-ahead problem) – two neighboring nodes combine into one, spanning enables vocabulary insertion to operate over the hierarchical structure, thus allowing to insert phonological material not just in one terminal node at a time but also in spans

of terminal nodes that are in a complement relation with each other (cf. Williams 2003, Svenonius 2012, Merchant 2015).

In the case of fusion, the features of the fused node T°/φ may then trigger theme allomorphy.[10] According to the Span Adjacency Hypothesis, however, allomorphy can only be conditioned by an adjacent span; a nonadjacent head (e.g., Z) may also cause allomorphy but only if all intervening heads (e.g., Y) are also involved in the process (see (10), cf. Merchant 2015).

(10) Span-conditioned allomorphy (based on Pomino and Remberger 2020)
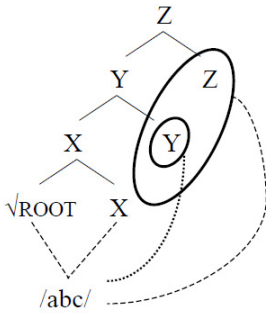
Hence, a syntactic input structure such as $[_Z [_Y [_X \sqrt{ROOT} X] Y] Z]$ (cf. (10)) would admit spans such as $<\sqrt{ROOT}>$, $<\sqrt{ROOT}, X>$, $<\sqrt{ROOT}, X, Y>$, $<\sqrt{ROOT}, X, Y, Z>$, $<X>$, $<X, Y>$, $<X, Y, Z>$, $<Y>$, $<Y, Z>$, $<Z>$, while blocking the spans $*<\sqrt{ROOT}, Y>$, $*<\sqrt{ROOT}, Z>$ etc. Essentially, this implies that Z could trigger allomorphy to the adjacent span $<\sqrt{ROOT}, X, Y>$, Y could trigger allomorphy to the adjacent span $<\sqrt{ROOT}, X>$, or $<Y, Z>$ together could trigger allomorphy to the adjacent span $<\sqrt{ROOT}, X>$.

Crucially, Svenonius' notion of spanning originally refers to syntactic structure, i.e., vocabulary insertion is assumed to target syntactic structure (cf. assumptions in approaches such as Nanosyntax). But Merchant (2015) and Haugen and Siddiqi (2016) compellingly argue that a more preferable version of spanning may be one wherein (i) vocabulary insertion targets formal features rather than syntactic structure and (ii) spanning occurs post-linearization. The principle put forward by Haugen and Siddiqi (2016, 369) and reproduced in (11) thus allows for the realization of a series of contiguous morphemes by a single vocabulary item (cf. also Merchant's (2015) similar Span Adjacency Hypothesis mentioned above).

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10   Vocabulary insertion proceeds from inside out, i.e., starting with the root. The process is guided by the principle of inward vs. outward sensitivity which means Vocabulary insertion at a node Y can see the phonological and morphological features already exponed at a previous node X but it can only see the morphosyntactic features of a not yet realized node Z (Bobaljik 2000, Embick 2010).

(11) Post-linearization contiguous insertion principle

Insertion may realize multiple adjacent X°'s (features) provided that the features realized by the inserted Vocabulary item are as large a subset of the string of adjacent X°'s (features than that which could otherwise be expressed by separate overt Vocabulary items at the contained X°'s (features). (Haugen and Siddiqi 2016, 369–370)

As an illustration of this principle we can now turn to the theme allomorphy we find in augmented Italian -*isc*- verbs.

In the Present Indicative and Subjunctive the underlying phonological variants /iski/ and /iʃʃi/ appear in all Person/Number slots except for the 1PL and the 2PL where we find /ja/ (1PL, 2PL Subjunctive) and /i/ (2PL Indicative) instead (cf. Table 1). With regard to principle (11), a trivial span such as <φ> could thus condition vocabulary insertion in an adjacent span comprising <Th[III], T°[-past], Th[Ø]>.

(12) Trivial span <φ> conditioning allomorphy on <Th[III], T°[-past], Th[Ø]>

```
                           T°
                   ╱              ╲
                 v°                 T°
              ╱    ╲             ╱      ╲
          √root     v°        T°          φ
                 ╱    ╲     ╱    ╲
               v°  ( Th[III] T°[-past]  Th[Ø] )
```
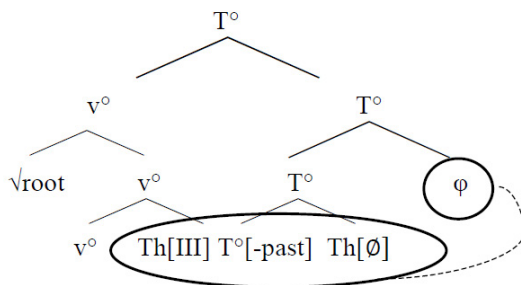
One major concern that may arise with regard to (12) is the nature of the span that comprises features that are structurally not adjacent to each other, i.e., Th[III], T°[past] and Th[Ø]. However, the idea of post-linearization spanning is precisely suited to account for this data. It is crucial to keep in mind that the portmanteau formed here concerns linearly adjacent nodes, without reference to their structural constituency (cf. also Ostrove 2018). This is a feasible approach considering that the Present Tense is a morphophonological unmarked tense in Italian. Since the theme allomorphy with -*isc*- only occurs in the Present Tense, we may thus assume that a span comprising conjugational features and tense features does not occur in other tenses where T exhibits an autonomous phonological exponent (cf. (5), e.g., 3PL Imperfect *fin-**i**-v-**a**-no* 'they finished' with /i/ being the theme vowel of the base and /a/ representing the theme vowel of the Imperfect Tense). In these cases, the VIs at our disposal have different "span sizes" as well as different feature specifications.

Based on these observations, we can identify the following spans for vocabulary insertion, depending on the syntactic context:

(13) VIs for <Th, T°, Th> (Present Tense)
  (a) <Th[III], T°[-past, +sbj], Th[∅]> ↔ /iski/ if <φ: SG/PL>
  (b) <Th[III], T°[-past, +sbj], Th[∅]> ↔ /ja/ if <φ: 2PL>
  (c) <Th[III], T°[-past], Th[∅]> ↔ /ja/ if <φ: 1PL>
  (d) <Th[III], T°[-past], Th[∅]> ↔ /iski/ if <φ: 1SG/3PL>
  (e) <Th[III], T°[-past], Th[∅]> ↔ /iʃʃi/ if <φ: SG>
  (f) <Th[III], T°[-past], Th[∅]> ↔ /i/

The items in (13) are ordered in terms of decreasing complexity but also according to language specific relations among different features involved in the competition (Halle and Marantz 1993, 150). For instance, the featural composition of the spans in (13a) and (13b) is more complex (and the context of insertion is also more specific) than the one in (13c–e); the least complex environment of insertion is (13f) which ultimately presents the default theme exponent that actually also occurs in other tenses.

The trivial spans representing the φ-features are given in (14).

(14) VIs for <φ>
  (a) <1PL> ↔ /mo/
  (b) <2PL> ↔ /te/
  (c) <3PL> ↔ /no/
  (d) <1SG> ↔ /o/
  (e) <2SG> ↔ /i/
  (f) There is no exponent for 3SG.

Now, turning back to our derivation at hand, Spell-Out occurs first. The syntactic structure that is being generated at this point can be found in (15), reproduced from (1). Our morphological starting point is however (16), reproduced from (2), wherein additional theme nodes and a φ-node have been added post-syntactically in an effort to comply to morphological well-formedness.

(15)

(16)

T°

v°   T°

√ROOT   v°   T°   φ

v°   Th   T°   Th
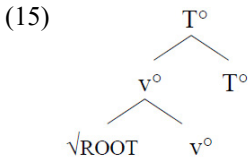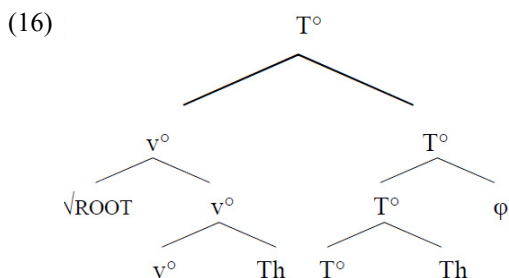
We know that the nodes in (16) will be linearized as illustrated in (17a).

(17) (a) Linearization: √root + [v] + [III] + [-past] + [Th$_{-past}$] + φ

     (b) Insertion: /fin/   /iski/   /o/

     (c) Readjustment: /finisko/   (vowel deletion)

As illustrated in (17), there are still some phonological readjustment rules that we need to apply after the vocabulary insertion process (e.g., vowel deletion in 1sɢ, cf. (17b–c)) but, contrary to morphological readjustment rules and additional operations such as fusion, these phonological rules comply with general diachronic observations regarding the Italian vowel system. We may propose alternative phonological exponents that already represent the final phonological surface form (e.g., /isko/ for the 3ᴘʟ, /iʃʃe/ for the 3sɢ) but we would then miss the unifying link between these verb forms, i.e., the main underlying forms /iski/ and /iʃʃi/ from which we can derive all other forms in a more diachronically plausible way.

6.   Conclusions

The analysis proposed in this paper provides empirical support for some aspects of Haugen and Siddiqi's (2016) Restricted Realization Theory. In particular, it has been shown that the traditional process of vocabulary insertion via terminal nodes may benefit from non-terminal insertion via post-linearization spanning. Theme allomorphy, as it was discussed in this paper, may be explained via spans of features wherein featural adjacency is more relevant than structural adjacency.

     With regard to previous analyses involving the Italian augment -isc-, the analysis presented here manages to hold without having to resort to additional morphological operations such as fusion and impoverishment. Overall, this new analysis of the Italian theme formative -isc- may hopefully give further impetus to advancing certain theoretical conceptions in DM.

Works Cited

Anderson, Stephen R. 1992. *A-Morphous Morphology*. Cambridge: Cambridge University Press.

Aronoff, Mark. 1994. *Morphology by Itself. Stems and Inflectional Classes*. Cambridge, MA: MIT Press.

Arregi, Karlos. 2000. "How the Spanish Verb Works." Presented at the 30th Linguistic Symposium on Romance Languages, University of Florida, Gainesville. Accessed October 14, 2021. http://home.uchicago.edu/~karlos/Arregi-2000-how.pdf.

Bobaljik, Jonathan David. 2000. "The Ins and Outs of Contextual Allomorphy." In *Proceedings of the Maryland Mayfest on Morphology 1999*, edited by Kleanthes Grohmann and Caro Struijke, 35–71. University of Maryland Working Papers in Linguistics 10. College Park: Department of Linguistics, University of Maryland.

Bobaljik, Jonathan David. 2017. "Distributed Morphology." In *Oxford Research Encyclopedia of Linguistics (Online Encyclopedia)*, edited by Mark Aronoff. Oxford: Oxford University Press. Accessed October 14, 2021. https://doi.org/10.1093/acrefore/9780199384655.013.131.

Caha, Pavel. 2009. "The Nanosyntax of Case." PhD diss., University of Tromsø.

Calabrese, Andrea. 2019. "Morphophonological Investigations: A Theory of PF. From Syntax to Phonology in Italian and Sanskrit Verb Forms." Unpublished Ms., University of Connecticut.

Choi, Jaehoon, and Heidi Harley. 2019. "Locality Domains and Morphological Rules: Phases, Heads, Node-Sprouting and Suppletion in Korean Honorification." *Natural Language & Linguistic Theory* 37 (4): 1319–65.

Chung, Inkie. 2007. "Suppletive Negation in Korean and Distributed Morphology." *Lingua* 117 (1): 95–148.

Da Tos, Martina. 2013. "The Italian FINIRE-Type Verbs: A Case of Morphomic Attraction." In *The Boundaries of Pure Morphology*, edited by Silvio Cruschina, Martin Maiden, and John Charles Smith, 45–67. Oxford: Oxford University Press.

Dressler, Wolfgang U., and Anna Thornton. 1991. "Doppie Basi e Binarismo Nella Morfologia Italiana." *Rivista Di Linguistica* 3: 3–22.

Embick, David. 2010. *Localism versus Globalism in Morphology and Phonology*. Cambridge, MA: The MIT Press.

Embick, David. 2016. "On the Distribution of Stem Alternants: Separation and Its Limits." In *The Morphome Debate: Diagnosing and Analyzing Morphomic Patterns*, edited by Ricardo Bermúdez-Otero and Ana Luís, 276–305. Oxford: Oxford University Press.

Fábregas, Antonio. 2017. "Theme Vowels Are Verbs." Accessed October 14, 2021. https://lingbuzz.com/j/rgg/2017/2017.05/f%C3%A1bregas_theme-vowels-are-verbs_RGG-2017-05.pdf.

Folli, Raffaella, and Heidi Harley. 2005. "Flavors of v." In *Aspectual Inquiries*, edited by Paula Kempchinsky and Roumyana Slabakova, 95–120. Studies in Natural Language and Linguistic Theory. Dordrecht: Springer.

Grimshaw, Jane. 2000. "Locality and Extended Projection." In *Current Issues in Linguistic Theory*, edited by Peter Coopmans, Martin B.H. Everaert, and Jane Grimshaw, 115–134. Amsterdam: John Benjamins Publishing Company.

Halle, Morris, and Alec Marantz. 1993. "Distributed Morphology and the Pieces of Inflection." In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, edited by Ken Hale and Samuel Jay Keyser, 111–76. Cambridge, MA: MIT Press.

Halle, Morris, and Alec Marantz. 1994. "Some Key Features of Distributed Morphology." *MIT Working Papers in Linguistics* 21: 275–88.

Harley, Heidi. 2014. "On the Identity of Roots." *Theoretical Linguistics* 40 (3–4): 225–276.

Harley, Heidi, and Rolf Noyer. 1999. "State-of-the-Article: Distributed Morphology." *Glot International* 4 (4): 3–9.

Harley, Heidi, and Elizabeth Ritter. 2002. "Person and Number in Pronouns: A Feature-Geometric Analysis." *Language* 78: 482–526.

Haugen, Jason D., and Daniel Siddiqi. 2016. "Towards a Restricted Realization Theory: Multimorphemic Monolistemicity, Portmanteaux, and Post-Linearization Spanning." In *Morphological Metatheory*, edited by Daniel Siddiqi and Heidi Harley, 343–86. Amsterdam: John Benjamins.

Julien, Marit. 2015. "Theme Vowels in North Sámi: Spanning and Maximal Expression." *Lingua* 164: 1–24.

Maiden, Martin. 2004. "Verb Augments and Meaninglessness in Early Romance Morphology." *Studi Di Grammatica Italiana* 22: 1–61.

Maiden, Martin. 2005. "La Ridistribuzione Paradigmatica Degli "Aumenti" Verbali Nelle Lingue Romanze." In *Latin et Langues Romanes. Études de Linguistique Offertes à József Herman à l'occasion de Son 80 Ème Anniversaire*, edited by Sandor Kiss, Luca Mondin, and Giampaolo Salvi, 431–40. Tübingen: Niemeyer.

Maiden, Martin. 2009. "From Pure Phonology to Pure Morphology the Reshaping of the Romance Verb." *Recherches Linguistiques de Vincennes* 38: 45–82.

Maiden, Martin. 2018. *The Romance Verb. Morphomic Structure and Diachrony*. Oxford: Oxford University Press.

Melnar, Lynette. 2004. *Caddo Verb Morphology*. Lincoln, NB: University of Nebraska Press.

Merchant, Jason. 2015. "How Much Context Is Enough? Two Cases of Span-Conditioned Stem Allomorphy." *Linguistic Inquiry* 46 (2): 273–303.

Meul, Claire. 2010. "The Intra-Paradigmatic Distribution of the Infix -I/ESC- from Latin to Modern Romance: Morphomic Patterning and Beyond." *Morphology* 20 (1): 1–40.

Meul, Claire. 2013. *The Romance Reflexes of the Latin Infixes -I/ESC- and -IDI̯-: Restructuring and Remodeling Processes*. Hamburg: Buske.

Napoli, Donna Jo, and Irene Vogel. 1990. "The Conjugations of Italian." *Italica* 67 (4): 479–502.

Oltra-Massuet, Isabel. 2020. "Conjugation Class." In *Oxford Research Encyclopedia of Linguistics (Online Encyclopedia)*, edited by Mark Aronoff. Oxford: Oxford University Press. Accessed October 14, 2021. https://doi.org/10.1093/acrefore/9780199384655.013.545

Oltra-Massuet, Maria Isabel. 1999. "On the Constituent Structure of Catalan Verbs." In *Papers in Morphology and Syntax, Cycle One. MIT Working Papers in Linguistics* 33, edited by Karlos Arregi, Benjamin Bruening, Cornelia Krause, and Vivian Lin, 279–322.

Ostrove, Jason. 2018. "Stretching, Spanning, and Linear Adjacency in Vocabulary Insertion." *Natural Language and Linguistic Theory* 36 (4): 1263–89.

Pomino, Natascha. 2008. *Spanische Verbalflexion. Eine minimalistische Analyse im Rahmen der Distributed Morphology*. Tübingen: Niemeyer.

Pomino, Natascha, and Eva-Maria Remberger. 2019. "Verbal Suppletion in Romance Synchrony and Diachrony: The Perspective of Distributed Morphology." *Transactions of the Philological Society. Special Issue: The Diachrony of Suppletion* 117 (3): 471–97.

Scalise, Sergio. 1994. *Morfologia*. Bologna: Il Mulino.

Schwarze, Christoph. 1999. "Inflectional Classes in Lexical Function Morphology: Latin -sk- and Its Evolution." In *Proceedings of the LFG 99 Conference, University of Manchester*, edited by Tracy Holloway King and Miriam Butt, 1–13. Stanford: CSLI Publications.

Svenonius, Peter. 2012. "Spanning." Ms., Center of Advanced Study in Theoretical Linguistics, University of Tromsø. Accessed October 14, 2021. https://ling.auf.net/lingBuzz/001501.

Trommer, Jochen. 1999. "Morphology Consuming Syntax' Resources: Generation and Parsing in a Minimalist Version of Distributed Morphology." In *Proceedings of the ESSLI Workshop on Resource Logics and Minimalist Grammars*, edited by Christian Retoré and Edward Stabler. Nijmegen: Radboud Universiteit Nijmegen. Accessed October 14, 2021. http://www.ai.mit.edu/projects/dm/trommer-consuming.pdf.

Vincent, Nigel. 1988. "Italian." In *The Romance Languages*, edited by Martin Harris and Nigel Vincent, 279–313. London: Croom Helm.

Williams, Edwin. 2003. *Representation Theory*. Current Studies in Linguistics Series 39. Cambridge, MA: MIT Press.

Head Movement in Germanic Doubly-Filled Comp Constructions

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Abstract: Taking our cue from Bayer and Brandner (2008), in this paper we investigate the feature composition of so-called (morphologically) "simplex" wh-elements in German, e.g. *wer* "who" or *was* "what", versus "complex" wh-elements with internal structure, e.g. "how many" or "for which student". We show that simplex wh-elements do not contain any features other than [+wh]; in particular, they do not contain the features D (including its sub-features Person, Number, and Gender), Case, nor Animacy. This approach makes correct predictions on at least two accounts: (i) headless relatives are headed by simplex wh-words, and not by relative pronouns, due to the lack of features of the antecedent; and (ii) combined with Roberts' (2010) theory of head movement, we derive the data of Bavarian and Alemannic doubly-filled complementizer constructions reported in Bayer and Brandner (2008) for embedded questions, which despite (possibly cross-generational) speaker variation, crucially also represent our own grammar, and we also extend our analysis to doubly-filled complementizer effects in relative clauses in the same varieties.

Keywords: German; doubly-filled complementizer; wh-words; relative pronouns; r-pronouns

1. Introduction

South German varieties, such as Bavarian and Alemannic, display a Doubly-Filled Comp in some but not all embedded questions, as shown in (1a) versus (1b), and in relative clauses, as shown in (2):[1]

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1 We thank Ian Roberts for his close reading and detailed comments, and the OLINCO reviewers and audience for their questions.

(1) (a) I   frog   mi   fia   wos   dass =a   des   kauft   hot.
      I   ask   myself for   what   that =he   this   bought has
      "I wonder why he bought this."

    (b) I   frog   mi   wen   (*dass) =a   gseŋ   hot.
      I   ask   myself who   that   =he   seen   has
      "I wonder who he has seen."

(2) Da   Tisch, den   wos   i   kauft hob, gfoit   da   Mama.
    the.NOM table   REL.SG.ACC what I   bought have pleases the.DAT mom
    "Mom likes the table that I have bought."

Concentrating on their observation of the contrast between data like (1a) and (1b), Bayer and Brandner (2008) argue that wh-elements fall into two classes, namely: (i) class 1, which contains morphologically complex wh-elements, such as *wia-vü* "how much/many", *wa-rum* "what-for" (i.e. "why"), *mit wem* "with whom", which appear with *dass* "that" in C, as shown in (1a); and: (ii) class 2 wh-elements, which are morphologically simplex, such as *wos* "what", *wer* "who.NOM", *wen* "who.ACC", *wia* "how", *wo* "where" etc. In the variety of Bayer and Brandner as in ours, the latter (i.e., class 2 wh-elements) are incompatible with *dass*, as shown in (1b).

    Bayer and Brandner (2008) analyze this contrast to mean that simplex (i.e., class 2) wh-elements occupy C^0, thus blocking the insertion of *dass*, which is in their account further corroborated by evidence from clitic placement (namely, the so-called Wackernagel position) and clitic phonology, namely sandhi and *r*-epenthesis: specifically, simplex but not complex wh-elements show sandhi and *r*-epenthesis effects at vowel hiatus with clitics, as illustrated in (3) through (5)[2].

    The examples in (3) show that the simplex wh-word *wer* "who" displays sandhi before vowels (3a), but not before consonants (3b), and the complex wh-word *welch-einer* "which one" doesn't show any sandhi, even before vowels (3c).

(3) (a) I   frog   mi   wer [vea-**r**] =i   bin.
      I   ask   myself who   =I   am
      "I wonder who I am."

    (b) I   frog   mi   wer [vea]   =ma   san.
      I   ask   myself who   we   are
      "I wonder who we are."

---

2 While stating the observation, Bayer and Brandner (2008) do not illustrate sandhi and epenthesis effects; the examples in (3) through (5) are part of our own data collection.

(c) *I   frog   mi   welch-einer [vø:ç-a:na-**r**]   =a   is.
    I   ask   myself   which-one   =he   is
    Intended: "I wonder which one he is."

The examples in (4) and (5) illustrate *r*-epenthesis between vowels. In (4a) and (4b), we see *r*-epenthesis between the simplex wh-words *wo* "where" and *wia* "how" and the vowel-initial clitic. In (5a) and (5b) we see that *r*-epenthesis is not possible with the complex wh-words *von wo* "from where" and *wia-vü* "how much".

(4)   (a) I   frog   mi   wo-[r]   =a   woa.
         I   ask   myself   where   =he   was
         "I wonder where he was."

      (b) I   frog   mi   wia-[r] =a   des   gmocht   hot.
         I   ask   myself   how   =he   this   done   has
         "I wonder how he did this."

(5)   (a) *?I   frog   mi   von   wo-[r]   =a   herkommt.
          I   ask   myself   from   where   =he   comes
          Intended: "I wonder where he comes from."

      (b) *I   frog   mi   wia-vü-[r]   =a   kauft   hot.
          I   ask   myself   how-much   =he   bought   has
          Intended: "I wonder how much he bought."

Bayer and Brandner's (2008) findings are summarized in Table 1.

	Simplex wh-elements	Complex wh-elements
Dass-insertion in embedded questions	No	Yes
Sandhi with clitic pronouns	Yes	No
R-epenthesis with clitic pronouns	Yes	No

Table 1. Bayer and Brandner (2008)

The main theoretical problem with Bayer and Brandner's (2008) account, as well as Bayer's (2014), is that they propose a dubious re-Merge operation: a lexical item can contain an (effectively) Greedy selection feature, and after this item has entered the derivation, the Greedy feature will wait for a predefined context to arise and will then trigger its

re-Merge by selecting the derivation's root node. Concretely for the cases at hand, this works in the following way. Wh-words contain a Greedy ("latent") feature [?C], which is on the lookout for a configuration where the wh-word can become the sister of TP. When this possibility arises, this feature triggers to re-Merge the wh-word as C-head, projecting a CP. This possibility arises for simplex wh-words, but not for complex ones, as they are embedded inside their own phrase. Thus, complex wh-words do not become C-heads.

Empirically, Bayer and Brandner's (2008) account says nothing about the fact that the same phenomenon (i.e. Doubly-Filled Comp) is in the same varieties found not only in embedded questions with complex wh-elements, but also in relative clauses, as was shown in (2). Furthermore, unlike embedded questions, relative clauses always allow C^0 insertion, with C^0 taking the form of *wos* or *wo*, depending on the variety (Bayer 1984). Thus, a core observation we make, is that the simplex wh-word *wen* in (1b) and the relative pronoun *den* in (2) behave differently in this respect.

In what follows, we provide a uniform and unified account of the phenomenon of Doubly-Filled Comp in both embedded questions and relative clauses in these varieties of German, which also evades the theoretical problems (namely, Greed and re-Merge by selecting the derivation's root node) of this previous approach.

2. Proposal

The analysis that we propose for the data described in the previous section contains three core ingredients. Firstly, we argue that simplex wh-elements are underspecified in terms of their feature constitution. Secondly, we assume Roberts' (2010) theory of head movement. Thirdly, we assume default spell-out rules arguing in particular that the default spell-out of empty C^0 in the varieties of German that exhibit the Doubly-Filled Comp in embedded questions is *dass*. We now turn to each of these three ingredients.

2.1 The Feature Constitution of Wh-Words

We argue that wh-elements in Bavarian and other Southern German varieties have no features other than [+wh]. In particular, they do not contain the features Case, Animacy, nor D (including its sub-features Person, Number, and Gender).

As far as Case is concerned, we follow Marantz (1991) and many others who take Case to be assigned post-syntactically (i.e., Case is not a feature that is present early in the derivation).[3]

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3 Specific to such post-syntactic approaches is the idea that Case is assigned in a competitive manner:

    (i)   Assign lexical cases (as governed by verbs or adpositions);

    (ii)   Assign dependent cases (based on structural relations between arguments);

    (iii)   Assign unmarked and default cases.

Furthermore, we argue that wh-elements do not encode animacy, and more specifically that animacy is actually not grammaticalized in German. Instead, we follow Wurmbrand (2017) in that each noun has a formal gender feature out of the set {M, F, N} (for masculine, feminine, and neuter, respectively), and may have a semantic gender feature out of the set {M, F}. Inanimacy is then simply *non-animacy*: Inanimate nouns are characterized by the absence of a semantic gender feature. In this way, animacy falls out of the gender system without the need to postulate an independent feature [±animate]. This approach derives the following two constructions that could potentially be understood as counter-arguments to the absence of animacy in the syntax, namely (i) gender mismatches and (ii) so-called "R-pronouns" (van Riemsdijk 1978), to which we turn next.

There seems to exist an animacy/inanimacy split in gender mismatch constructions. For instance, the noun *Mädchen* "girl" has the formal gender N and the semantic gender F. A possessive pronoun agreeing with *Mädchen* can however appear with either feature, as shown in (6).

(6) Das   Mädchen sitzt an {✓seinem / ✓ihrem} Platz. ✓formal/✓semantic
     the.N girl(N) sits   at its.N.3SG her.F.3SG spot
     "The girl is sitting at her seat."

In contrast, as shown in (7), an inanimate noun like *Gabel* "fork" with formal gender F can only take possessive pronouns that agree with F, not with N as might be expected given that a fork is a thing.

(7) Die   Gabel   liegt an {✓ihrem /   *seinem} Platz. ✓formal/*semantic
     the.F fork(F) lies   at her.F.3SG its.N.3SG spot
     "The fork is lying in its spot."

We argue that the absence of neuter agreement for *Gabel* "fork" in (7) is not due to this word's inanimacy, but to *Gabel* "fork" not having a semantic gender feature.[4]

Turning to R-pronouns (such as e.g. *darauf* "there on"/"thereafter", *darüber* "above"/"across"/"furthermore", etc.), these expressions in German can famously refer to inanimate nouns, but not to animate nouns.[5] We argue that the class of expressions that R-pronouns can refer to is correctly characterized not by inanimacy, but rather by *non-animacy*, which derives why R-pronouns may not only refer to inanimate nouns,

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4   This argument is analogous to the discussion of formal versus semantic number features in Hiaki (Harley 2019).

5   As, to our knowledge, first generalized by Helbig (1974). See also van Riemsdijk (1978), Fleischer (2002), among many others.

but also to infinitives (8a), CPs (8b), and events (8c), none of which are characterizable in terms of (in)animacy features.

(8) (a) Ich   warte darauf,   ihn   morgen zu   sehen.
          I   wait   there-on   him   tomorrow to   see.INF
          "I am waiting to see him tomorrow."

     (b) Ich   warte darauf,   dass   ich   ihn   morgen   sehe.
          I   wait   there-on   that   I   him   tomorrow see.1SG
          "I am waiting that I see him tomorrow."

     (c) Er   hat   ihr   gratuliert.   Darüber   freut   sie   sich.
          he   has   her   congratulated there-over   is.happy   she   REFL
          "He congratulated her. She is happy about that."

Finally, we argue that wh-elements do not contain the feature D when they are not D-linked. In this, they differ from D-linked wh-elements, which we argue to contain D, building on Pesetsky (1987) and Heck and Müller (2000). Along with many others, notably Richards (2004, 2008) and Bárány (2017), we understand the features Person, Gender, and Number to be sub-features of D, and therefore to be absent in non-D-linked wh-elements.

As we discuss in more detail in section 2.2, the third person singular agreement of simplex wh-words such as *wer* "who" and *was* "what" with verbs and pronouns is not agreement triggered by a Person or Number probe, but just default agreement. Evidence for this abounds: infinitives (9a), finite CPs (9b), and impersonal passives (9c) also trigger third person singular neuter agreement.

(9) (a) Genug   zu   schlafen   ist   wichtig.
          enough   to   sleep.INF   is.3SG   important
          "It is important to get enough sleep."

     (b) Dass   du   gekommen   bist,   hat   auch   seinen   Vorteil.
          that   you   come.PPP   are   has.3SG   also   its.3SG.N   advantage
          "There is also an advantage to your having come."

     (c) Im   Saal   wird   getanzt.
          in.the   ballroom   becomes.3SG   danced.PPP
          "People are dancing in the ballroom."

That wh-words are featureless is evidenced from their appearance in headless relative clauses. While in headed relative clauses as in (10) the relative pronoun *d-* carries the features Number and Gender as copied from the head noun, in headless relatives the appearance of the relative pronoun *d-* is impossible even with the default features for animates M.SG. Instead, a wh-word appears, as in (11).

(10) Ich mag   den   Arzt,   {✓den /   *wen } sie   mag.
     I   like   the.M   doctor(M)   REL.M.SG   who   she   likes
     "I like the doctor she likes."

(11) Ich   mag,   {*den /   ✓wen }   sie   mag.
     I   like   REL.M.SG   who   she   likes
     "I like who(ever) she likes."

We now turn to the second core ingredient of our analysis, namely syntactic head movement, as developed in Roberts (2010).

2.2 Roberts' (2010) Theory of Head Movement

Roberts (2010) develops a syntactic theory of head movement, which we adopt wholesale. Specifically, Roberts (2010) argues that for a constituent α to attach to β via head movement, two conditions need to be met, namely: (i) α must be simultaneously a minimal and a maximal projection; and (ii) α's features must be a subset of β's features.

With this background, let us now see how we derive (1b), repeated here for ease of reference:

(1) (b) I   frog   mi   wen   (*dass)   =a   gseŋ   hot.
         I   ask   myself   who   that   =he   seen   has
         "I wonder who he has seen."

In (1b), the embedded C is C[wh,fin]. As we have argued above, *wen* "who" has exactly the feature set [wh], and it does not have internal structure. This means that both of Roberts' conditions for head movement are fulfilled: [wh] is a subset of [wh,fin]. The derivation would thus include the following steps: (i) C needs to check its [wh] feature; (ii) C attracts a constituent with [wh], namely *wen;* (iii) *wen* moves into C via head movement thus blocking the presence of the overt complementizer *dass* "that" and turning C into a complex head, as shown in (12):

(12)

```
            C
          /   \
      [wh]    C[wh,fin]
        ┆
      wen
```
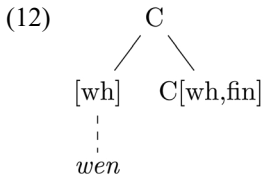
In contrast, with complex wh-elements there can be no head movement to C and only phrasal movement is possible. Thus, in (1a), repeated below for ease of reference, the embedded C is C[wh,fin] and *fia wos* "for what" is a complex wh-element with internal structure since the wh-element in it is the complement of a prepositional head, which means that Roberts' (2010) first condition for head movement is not fulfilled since the mover is not a minimal category; see the structures in (13) and (14).[6]

(1)	(a)	I	frog	mi	fia	wos	dass	=a	des	kauft	hot.
		I	ask	myself	for	what	that	=he	this	bought	has

"I wonder why he bought this."

(13)

```
          PP
         /  \
       P    [wh]
       ┆      ┆
      fia    wos
```

(14)

```
                 CP
              /      \
           PP          C'
          /  \        /   \
        P   [wh]  C[wh,fin]  TP
        ┆    ┆       ┆       /\
       fia  wos     dass    /__\
```

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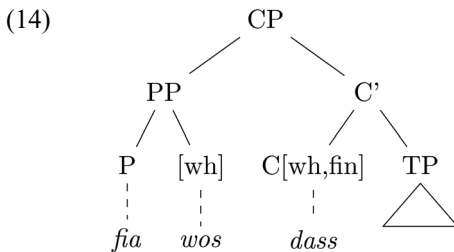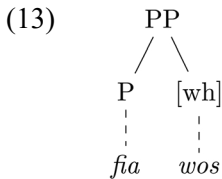
6 Nota bene that movement of *wos* alone, stranding *fia*, is not possible in general since German does not have English-style preposition stranding. The only preposition-stranding available in German occurs with R-pronouns, and only in some German dialects, crucially not in the ones discussed here.

We also correctly derive that simplex wh-words undergoing successive-cyclic move-ment do not land in C of intermediate landing sites, since these Cs' features are not a superset of [+wh].

Let us now turn to Doubly-Filled Comp in relative clauses as in (2), repeated here for ease of reference.

(2) Da   Tisch den   wos   i   kauft hob   gfoit   da   Mama.
    the.NOM table REL.SG.ACC   what I   bought have pleases the.DAT mom
    "Mom likes the table that I have bought."

Relative pronouns such as *den* in (2) agree with their antecedent in gender and number. The C in a relative clause, namely *wos* in (2), has the feature [rel] but certainly not the features gender and number since this is invariable no matter what the gender and number of the head noun is. Head movement of *den* to the embedded C is not possible because its features are not a subset of the features of the attachment site, which means that Roberts' (2010) second condition for head movement is violated. More specifically, the derivation in this case includes the following steps: (i) C[rel] attracts the relative pronoun *den*, and (ii) *den* undergoes phrasal movement to Spec,CP, as given in (15).

(15)
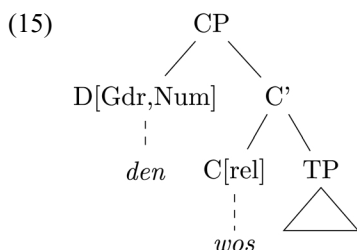
2.3 Default Spell-Out of Empty C

We propose that Bavarian (and similar varieties such as Alemannic) differ from Stan-dard German in a micro-parameter (Roberts 2019) setting, namely: (i) Bavarian/Alemannic empty C[wh] is spelled out as *dass*; (ii) Bavarian/Alemannic empty C[rel] is spelled out as *wos* or *wo*; (iii) Standard German empty C[wh] and empty C[rel] remain unpronounced.

The motivation for this involves the following reasoning. While Standard German does not have clitic pronouns (Cardinaletti and Starke 1999), in Bavarian and Alemannic many pronouns are clitics that attach themselves, or move, to C, which is traditionally known as the Wackernagel position. When clitics attach to a host, the host must be phonologically overt. Thus, C must be overt in contexts with clitics for the derivation to succeed. We propose that C is overt not only in these cases, but has been grammaticalized

into being overt. Simplex wh-words fill C themselves, and they can host clitics, as the presence of sandhi (3a) and r-epenthesis (4) evidence (as reported in Bayer and Brandner 2008). Complex wh-words on the other hand move to Spec,CP, and they cannot host clitics, as witnessed by the absence of sandhi (3c) and r-epenthesis (5) (see again Bayer and Brandner 2008). In these cases, C is filled by *dass* or *was* or *wo*, depending on C's features and the variety.

3.   Conclusion

Our aim was to provide an account of doubly-filled complementizer effects observed in embedded questions and relative clauses in Bavarian and other Southern German varieties. We have followed Bayer and Brandner's (2008) observation about embedded questions, particularly that there are two classes of wh-words with different syntactic properties and that only the simplex ones (which are located in C), but not the complex ones (which are located in Spec,C) show doubly-filled complementizer effects, and we have provided a simpler account of these data. Our analysis relies on and provides additional empirical coverage for Roberts' (2010) theory of head movement, which is based on two conditions, namely no internal structure of the mover, and features of the mover being a subset of the features in the landing site. We have shown that complex wh-elements violate Roberts' first condition for head movement, and that relative pronouns, which have φ-features, violate Roberts' second condition, and are thus unable to undergo head movement. We have furthermore proposed that if no head movement happens, C is parameterized to be filled by default with *dass* or *was/wo* in order to host clitics, which unlike in Standard German are as pervasive in these varieties as the doubly-filled comp. Further scrutiny notwithstanding, our analysis can also account for similar constructions found in other Germanic languages, such as in Swiss German embedded questions and relative clauses (van Riemsdijk 1989), in Yiddish relative clauses (Lowenstamm 1977), and even in Standard English relative clauses (Pesetsky and Torrego 2006).

References

Bayer, Josef. 1984. "COMP in Bavarian Syntax." *The Linguistic Review* 3:209−274.

Bayer, Josef. 2014. "Syntactic and phonological properties of wh-operators and wh-movement in Bavarian." In *Bavarian Syntax. Contributions to the Theory of Syntax* [Linguistik Aktuell/Linguistics Today 220], edited by Günther Grewendorf and Helmut Weiss, 23−50. Amsterdam: John Benjamins.

Bayer, Josef, and Ellen Brandner. 2008. "On Wh-Head-Movement and the Doubly-Filled-Comp Filter." In *Proceedings of the 26th West Coast Conference on Formal Linguistics*, edited by Charles B. Chang and Hannah J. Haynie, 87−95. Somerville: Cascadilla Proceedings Project.

Bárány, András. 2017. *Person, Case, and Agreement: The Morphosyntax of Inverse Agreement and Global Case Splits*. Oxford: Oxford University Press.

Cardinaletti, Anna and Michal Starke. 1999. "The Typology of Structural Deficiency: A Case Study of the Three Classes of Pronouns." In *Clitics in the Languages of Europe*, edited by Henk van Riemsdijk, 145–234. Mouton de Gruyter.

Fleischer, Jürg. 2002. *Die Syntax von Pronominaladverbien in den Dialekten des Deutschen. Eine Untersuchung zu Preposition Stranding und verwandten Phänomenen.* Franz Steiner Verlag.

Harley, Heidi. 2019. "Hiaki Root Number Suppletion." Talk given at the 12th Brussels Conference on Generative Linguistics: Suppletion, Allomorphy, and Syncretism (BCGL 12) on Dec 16–17, 2019 at KU Leuven, Belgium.

Heck, Fabian and Gereon Müller. 2000. "Successive Cyclicity, Long-Distance Superiority, and Local Optimization." In *WCCFL 19 Proceedings*, edited by Roger Billerey and Brook Danielle Lillehaugen, 218–231. Somerville, MA: Cascadilla Press.

Helbig, Gerhard. 1974. "Bemerkungen zu den Pronominaladverbien und zur Pronominalität." *Deutsch als Fremdsprache* 11: 270–279.

Lowenstamm, Jean. 1977. "Relative Clauses in Yiddish: A Case for Movement." *Linguistic Analysis* 3:197–216.

Marantz, Alec. 1991. "Case and Licensing." In *Proceedings of the 8th Eastern States Conference on Linguistics* (ESCOL 8), edited by German Westphal, Benjamin Ao and Hee-Rahk Chae, 234–253. Ithaca, NY: CLC Publications.

Pesetsky, David. 1987. "Wh-in-situ: Movement and Unselective Binding." In *The Representation of (In)definiteness*, edited by Eric Reuland and Alice ter Meulen, 98–129. MIT Press.

Pesetsky, David and Esther Torrego. 2006. "Probes, Goals and Syntactic Categories." In *Proceedings of the 7th annual Tokyo Conference on Psycholinguistics*, edited by Yukio Otsu. Tokyo: Hituzi Syobo Publishing Company.

Richards, Marc. 2004. "Object Shift, Scrambling, and Symmetrical Syntax." PhD diss., University of Cambridge.

Richards, Marc. 2008. "Defective Agree, Case Alternations, and the Prominence of Person." In *Scales* (Linguistische Arbeitsberichte 86), edited by Marc Richards and Andrej L. Malchukov, 137–61. Leipzig: Universität Leipzig.

Roberts, Ian. 2010. *Agreement and Head Movement. Clitics, Incorporation, and Defective Goals*. Cambridge, MA: MIT Press.

Roberts, Ian. 2019. *Parameter Hierarchies and Universal Grammar*. Oxford: Oxford University Press.

van Riemsdijk, Henk. 1978. *A Case Study in Syntactic Markedness. The Binding Nature of Prepositional Phrases.* Dordrecht: Foris.

van Riemsdijk, Henk. 1989. "Swiss Relatives." In *Sentential Complementation and the Lexicon. Studies in Honor of Wim De Geest*, edited by Dany Jaspers, Wim Klooster, Yvan Putsey and Pieter Seuren, 343–354. Dordrecht: Foris.

Wurmbrand, Susi. 2017. "Formal and Semantic Agreement in Syntax: A Dual Feature Approach." In *Language Use and Linguistic Structure: Proceedings of the Olomouc Linguistics Colloquium 2016*, edited by Joseph Emonds and Markéta Janebová, 19−36. Olomouc: Palacký University.

The Link between Athematicity and Irregularity in French Verbal Inflection

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Abstract: This paper takes Romance conjugation classes as derived from Latin as its starting point. We claim that theme vowels are not only retained in Spanish, Italian etc., but also in French: A reflex of athematic forms is found in latent root-final consonants, such as in forms of *vivre* 'to live', whereas in thematic classes these consonants are saved by the presence of a theme vowel, as in forms of *arriver* 'to arrive'. Based on this assumption, we propose a feature geometry for French conjugation classes, including neutralization processes for certain categorial contexts. Using a Spanning approach within the framework of Distributed Morphology, we demonstrate the accuracy of the Suppletion Generalization (Vanden Wyngaerd 2018), which states that irregularity of form is dependent on a reduced number of affixes, not only in the case of missing theme vowel positions, but also in the case of non-categorial suppletion.

Keywords: Spanning, suppletion, allomorphy, French, theme vowels

1. Introduction

Work on systematicity in suppletion and stem allomorphy has shown that irregularity in the forms of inflected elements is related to a reduced number of affixes in these forms (cf. Bobaljik 2012, Caha et al. 2019). Following this line of reasoning, Vanden Wyngaerd (2018) proposes the Suppletion Generalization in (1) which he illustrates, among other things, with the Italian past participles given in Table 1.

(1)   <u>Suppletion Generalization:</u> If there is irregularity in the form of either the root or the suffixes, the number of suffixes gets reduced (Vanden Wyngaerd 2018, 1).

regular					irregular				
am-	-a-	-t-	-o	'loved'	per-	Ø	-s-	-o	'lost'
batt-	-u-	-t-	-o	'beaten'	cor-	Ø	-s-	-o	'run'
part-	-i-	-t-	-o	'left'	eccel-	Ø	-s-	-o	'excelled'

Table 1: Italian past participles (based on Calabrese 2015)

The regular past participles are formed by adding the ending *-to* (or rather *-t-* and *-o*) to a verbal stem (highlighted in grey). The stems consist of verbal roots extended by a theme vowel (ThV), i.e. regular past participles are thematic verbal forms. The ThV indicates, in essence, membership of a specific conjugation class. In contrast, the irregular past participles show allomorphy in the ending (as in *-so* vs. *-to*) and are athematic. The root is not extended by a ThV, which leads to shorter forms. Examples of this kind indicate a possible link between athematicity and irregularity in Romance.

In this paper, we will show that the link between athematicity and irregularity also holds for French, where the presence or rather absence of ThVs has been the subject of some debate in the literature. We will first discuss the French conjugation class system and will propose that French has two thematic and several athematic conjugation classes (CCs). As will be shown, the athematic CCs are precisely those with the (most) irregular verbs. Finally, following the DM-based Vocabulary Insertion-Only model proposed by Haugen and Siddiqi (2016), we will propose an analysis for this link between athematicity and irregularity, which we will illustrate using two well-known cases of root (or rather stem) allomorphy in French: The alternation in (2a) shows that the root final consonant of the verb is deleted in some cases (see *vivre* 'to live'), but maintained in others (see *arriver* 'to arrive'). In line with Schane (1966) and others, we will associate this type of allomorphy with the absence of a ThV in those cases where the root final consonant is deleted. The second example to be considered is suppletion with French *aller* 'to go', an extreme case of allomorphy. We will show that in the present tense the indicative 1st and 2nd person plural are thematic verbal forms and have the default realization for the root GO (i.e. *all*-based forms), whereas more marked Vocabulary Items for the root GO (e.g. *va*-based forms) are clearly athematic.

(2) (a) C/Ø-alternation: e.g. *vivons* [vivɔ̃] vs. *vis* [vi] / *[viv]
                             but *arrivons* [aʁivɔ̃] vs. *arrives* [aʁiv] / *[aʁi]
   (b) Suppletion: e.g. *allons* [**al**ɔ̃] vs. *vas* [**va**]

In what follows, we will look first at the Romance conjugation classes (§2) as they are derived from Latin; we will discuss the notion of theme vowel and briefly hint at possible segmentations that have been proposed in the literature for French verbal forms (§2.1).

We will then propose our own interpretation of French CCs (§2.2), in which we consider the correlation between an assumed more complex structure with a ThV-position and reduced irregular forms to be particularly insightful. In Section 3, we present a Spanning approach to both the consonant-zero-alternation (§3.1) and GO suppletion (§3.2). In the short conclusion (§4) we once again return to the Suppletion Generalization.

2. Romance Conjugation Classes

Verbs in Latin are divided into four or five conjugations[1] distinguished as a general rule by ThVs, which appear between the root and the inflectional ending (cf. Leumann et al. [5]1977, 518ss., §398). As shown in Table 2, three CCs (I, II, IV) have a long ThV, whereas the remaining two CCs have either a short or, in some forms, an epenthetic vowel (cf. Halle 2018, Van der Spuy 2020 for more details). The third CC with /i/ is also called "consonant" or athematic, i.e. the vowel is not considered part of the stem, but is epenthetic. In addition, the thematic CCs also have athematic forms due to different phonological preferences (e.g. the avoidance of a hiatus). That is, we need to distinguish between athematic CCs and athematic verbal forms.

/a:/-conjugation	/e:/-conjugation	/i/-conjugation (cons. conj., athematic)	/i:/-conjugation	mixed conjugation
cant- -ā- -re	dēb- -ē- -re	leg- -e- -re	aud- -ī- -re	sap- -e- -re
cant- -ā- -mus	dēb- -ē- -mus	leg- -i- -mus	aud- -ī- -mus	sap- -i- -mus
cant- -ō	dēb- -ē- -ō	leg- -ō	aud- -i- -ō	sap- -i- -ō

Table 2: Latin conjugation classes

Modern Romance does not preserve the historical vowel length distinction; clearly, this loss of phonemic vowel length directly affected the evolution of CCs in the Romance languages. The Latin CC system is reduced to three main classes (with subclasses, see Figure 1) in all Romance languages, albeit with different results. However, despite many diachronic and synchronic differences, Spanish, Portuguese, Catalan and Italian have

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1   Either five CCs, including the so-called mixed conjugation (which combines features of the third and the fourth CC), or four, excluding it. Some earlier grammarians also conflated the third and fourth class into one, hence assuming only 3 CCs. If the division were based on the presence or absence of ThV, i.e. thematic and athematic CCs, we would have only 2 CCs (cf. Kühner and Holzweissig 1912, 659). Note, furthermore, that the notion "thematic" is not used in a uniform way in linguistics.

clearly preserved the thematic conjugation systems.[2] Additionally, in all these languages the respective CCs are not equally productive or equally regular and they also differ in their number of members. The first CC, i.e. that marked by ThV -*a*-, is the less marked in all these languages. It is the productive CC, it has (nearly) no irregular verbs and it has the largest number of members. Moreover, the opposition between the other CCs may be neutralized in some tenses (e.g. Sp. *partía* and *temía*). Based on these observations, Oltra Massuet (1999, 2000) argues that ThVs are bundles of subatomic abstract features organized in a markedness hierarchy or feature geometry (see Figure 1; cf. Pomino and Remberger [submitted] for more details).
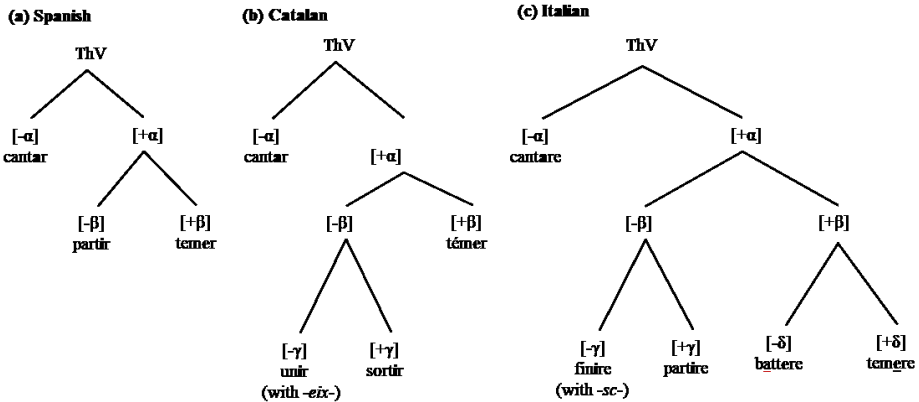
Figure 1: Conjugation Classes (regular verbs): Spanish (a), Catalan (b) (Oltra Massuet 2000, 287) and Italian (c) (based on Napoli and Vogel 1990)

ThVs in French have developed differently. To date, there has been no consensus in the literature with respect to whether or not Modern French has ThVs or how the CCs are to be described. In what follows, we will present our line of reasoning with regard to these two questions without discussing alternative analyses in detail for reasons of space (cf. Pomino and Remberger [submitted] for a detailed discussion).

2.1 Are There ThVs in French?

There are two main proposals in the literature with regard to possible segmentations of the infinitival forms of French verbs (see Table 3; El Fenne [1994] offers a detailed discussion): The "outcome" of the former Latin ThVs can be (a) attributed to the verb ending (see proposal II) (e.g. Michaut 1934; Dupuis 1935; Larousse 1936; Grevisse 1969; Schane 1968; Paradis and El Fenne 1992), (b) added to the root to form a stem

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2   Romanian has not only preserved the four CCs, but has also developed a fifth CC and various (augmented) subclasses (cf. Pană Dindelegan 2013, 18).

(i.e. root + ThV; see proposal I) or (c) seen as part of a non-divisible stem (i.e. e.g. *aimer* [ɛme-ʳ]) (e.g. Martinet 1969; Van den Eynde and Blanche-Benveniste 1970; Pinchon and Coute 1981; Plénat 1981). That is, some linguists follow the rather traditional classification and consider *-r* to be the infinitival ending, with the preceding vowel classified as the theme vowel/theme diphthong, while others propose that *-er*, *-ir*, *-oir* and other endings should be analyzed as purely infinitival, i.e. inflectional.[3]

Latin	French	proposal I		proposal II	general rule (not exceptionless)
am-ā-re >	*aimer*	[ɛm-e-ʳ]	or	[ɛm-eʳ]	Latin *-ā-* developed to *-e-*
sent-ī-re >	*sentir*	[sãnt-i-r]	or	[sãnt-ir]	Latin *-ī-* "remained" *-i-*
val-ē-re >	*valoir*	[val-wa-r]	or	[val-war]	*-ē-* diphthongizes to [wa] ("thematic diphthong")
scrib-e-re >	*écrire*	[ekri-r]			*-e-* (or rather /i/) is "lost" (= athematic)

Table 3: From Latin to French (cf. a.o. Foley 1979, 135)

In recent years, some doubt has been cast on the idea that French has TVs; one reason for this is that finite forms are at least superficially athematic (see Table 4). One question to be answered, however, is whether we are dealing with athematic forms or complete athematic conjugations. As illustrated above, Latin thematic CCs also have athematic forms.

	aimer		*sentir*		*valoir*		*écrire*	
1sg	*aime*	[ɛm]	*sens*	[sãn-ᶻ]	*vaux*	[vo-ᶻ]	*écris*	[ekri-ᶻ]
1pl	*aimons*	[ɛm-ɔ̃ᶻ]	*sentons*	[sãnt-ɔ̃ᶻ]	*valons*	[val-ɔ̃ᶻ]	*écrivons*	[ekriv-ɔ̃ᶻ]

Table 4: Selected finite verbal forms

One source of evidence for the presence of ThVs in the first CC in French comes from the consonant-zero-alternation which we will analyze in Section 3.1: The root final consonant of athematic *viv(re)* 'to live' (3rd CC) is maintained if there is a possibility for it to appear in a syllable onset, i.e. before V (e.g. *nous vivons* [vi.vɔ̃] 'we live') or

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3   Boyé (2000) assumes separate stems for infinitival forms, even for regular verbs, in order to keep inflectional endings (e.g. *-r* for the infinitive) as regular as possible. All further variation in regular verbs derives from "the unification of morpheme boundaries and the phonological representations brought forward by the distinctions between full and dissolvable segments, fixed and floating entities" (413; our translation). For Bonami and Boyé (2002), ThVs equally do not play a role in the slots of their "stem space". Starke (2020), in a nanosyntactic approach, also has no representations for ThVs.

before a C with which it can build a complex onset (e.g. *nous vivrons* [vi.vʁɔ̃] 'we will live'), but is deleted before a following consonant with which it cannot form an onset (*tu vis* [vi-(z)] 'you$_{sg}$ live' not *tu vivs [viv-(z)]). The same final consonant of thematic *arriv(er)* (1st CC), in contrast, is never deleted: *tu arrives* [aʁiv-(z)] 'you$_{sg}$ arrive' not *tu arris [aʁi-(z)]. Schane (1966) and others assume that in this case the ThV [ə], which does not surface, blocks consonant deletion (i.e. /aʁiv+(ə)+(z)/).[4]

The assumption that the 2nd CC (e.g. *finir*) contains a ThV is straightforward, since here the ThV surfaces as either [i] or [is].[5] With respect to the [i]-[is]-alternation, we follow Schwarze (2009), who assumes that the underlying form of the ThV is /is/ in all cases. The /s/ of this ThV − which is also sometimes analyzed as a stem extension (or augment) − surfaces only when it can occupy an onset position in the syllable structure (see the plural forms of *finir* in Table 5), otherwise it is deleted.

	morphological structure			syllable structure	surface form[6]		spelling
	root	ThV	φ		no liaison	liaison	
1sg	fin	is	z	fi.nisz	[fi.ni]	[fi.ni.zV]	*finis*
2sg	fin	is	z	fi.nisz	[fi.ni]	[fi.ni.zV]	*finis*
3sg	fin	is	t	fi.nist	[fi.ni]	[fi.ni.tV]	*finit*
1pl	fin	is	ɔ̃z	fi.ni.sonz	[fi.ni.sɔ̃]	[fi.ni.sɔ̃.zV]	*finissons*
2pl	fin	is	ez	fi.ni.sez	[fi.ni.se]	[fi.ni.se.zV]	*finissez*
3pl	fin	is	ət	fi.ni.sət	[fi.nis]	[fi.nis.tV]	*finissent*

Table 5: Forms of *finir* (adapted from Schwarze 2009)

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4   There are alternative analyses for this kind of allomorphy, e.g. the assumption of different stems in El Fenne (1994), stem spaces in Bonami and Boyé (2002) and in Bonami et al. (2008) and consonant epenthesis in Klausenburger (1974), Tranel (1974, 1976), Kaye and Morin (1978), Morin and Kaye (1982) among others. Bonami and Boyé (2002), for example, derive stem dependencies from conjugation patterns, which roughly correspond to what are called morphemes (cf. Aronoff 1994) or morphomic patterns (cf. Maiden 2016) in autonomous approaches to morphology. We cannot discuss further details of these approaches here for reasons of space (but see Pomino and Remberger [submitted]).

5   Again, not all linguists assume ThV for the second conjugation (see Fn. 3) (e.g. El Fenne 1994; Bonami and Boyé 2002; Bonami et al. 2008).

6   In the phonic (= spoken, as opposed to the graphic/written modality) realization of French, the phenomenon of liaison is one of the most striking *sandhi* phenomena of the language. Liaison is understood as the overt realization of a latent word-final consonant which (in a specific syntactic/ prosodic context) is not pronounced before a following word-initial consonant, but is realized before a following word-initial vowel.

Interestingly, the ThV of the second conjugation class spreads across other CCs in certain tenses, leading to a neutralization of the CC opposition (see Figure 2). The first conjugation class, however, is never affected by this neutralization process. This means that in some tenses we have a twofold opposition (i.e. 1st CC vs. other CC) and in others a threefold opposition (i.e. 1st CC vs. 2nd CC vs. other CC) and so on.

AIMER	Present indicative	Present subjunctive	Past tense	Future	Conditional	Passé simple	Past subjunctive
1SG	aime	aime	aimais	aimerai	aimerais	aimai	aimasse
2SG	aimes	aimes	aimais	aimeras	aimerais	aimas	aimasses
3SG	aime	aime	aimait	aimera	aimerait	aima	aimât
1PL	aimons	aimions	aimions	aimerons	aimerions	aimâmes	aimassions
2PL	aimez	aimiez	aimiez	aimerez	aimeriez	aimâtes	aimassiez
3PL	aiment	aiment	aimaient	aimeront	aimeraient	aimèrent	aimassent
FINIR	**Present indicative**	**Present subjunctive**	**Past tense**	**Future**	**Conditional**	**Passé simple**	**Past subjunctive**
1SG	finis	finisse	finissais	finirai	finirais	finis	finisse
2SG	finis	finisses	finissais	finiras	finirais	finis	finisses
3SG	finit	finisse	finissait	finira	finirait	finit	finît
1PL	finissons	finissions	finissions	finirons	finirions	finîmes	finissions
2PL	finissez	finissiez	finissiez	finirez	finiriez	finîtes	finissiez
3PL	finissent	finissent	finissaient	finiront	finiraient	finirent	finissent
PARTIR	**Present indicative**	**Present subjunctive**	**Past tense**	**Future**	**Conditional**	**Passé simple**	**Past subjunctive**
1SG	pars	parte	partais	partirai	partirais	partis	partisse
2SG	pars	partes	partais	partiras	partirais	partis	partisses
3SG	part	parte	partait	partira	partirait	partit	partît
1PL	partons	partions	partions	partirons	partirions	partîmes	partissions
2PL	partez	partiez	partiez	partirez	partiriez	partîtes	partissiez
3PL	partent	partent	partaient	partiront	partiraient	partirent	partissent
VENDRE	**Present indicative**	**Present subjunctive**	**Past tense**	**Future**	**Conditional**	**Passé simple**	**Past subjunctive**
1SG	vends	vende	vendais	vendrai	vendrais	vendis	vendisse
2SG	vends	vendes	vendais	vendras	vendrais	vendis	vendisses
3SG	vend	vende	vendait	vendra	vendrait	vendit	vendît
1PL	vendons	vendions	vendions	vendrons	vendrions	vendîmes	vendissions
2PL	vendez	vendiez	vendiez	vendrez	vendriez	vendîtes	vendissiez
3PL	vendent	vendent	vendaient	vendront	vendraient	vendirent	vendissent

Figure 2: CC oppositions and neutralizations[7]

2.2 The French Conjugation Class System

Considering the paradigms in Figure 2, we assume that French CCs are also hierarchically structured according to diacritic features. As shown by Oltra Massuet (1999) for Catalan, the respective features allow us to understand the neutralizations of the CCs mentioned previously and to grasp differences in markedness (i.e. productivity, irregularity, size). We propose the hierarchy in Figure 3, which is not restricted to regular verbs, but also includes irregular verbs.

---

7   We are aware of the fact that the passé simple and the past subjunctive are archaic and no longer used in Modern French. Nevertheless, this neutralization helps us to understand how the CC system is structured in French.

```
                              CC
                  _____/ _____
                 /                         \
             [-α]                          [+α]
           aim-e-r                    _____/_____
         (thematic)                 /              \
                                 [-β]              [+β]
                           _____/_____          aller
                          /              \           …
                       [-γ]              [+γ]
                  _____/\_____             |
                 /            \         vend-re
              [-δ]          [+ δ]     (athematic)
            fin-i-r         part-ir
          (ThV -iss-)     (athematic)
```
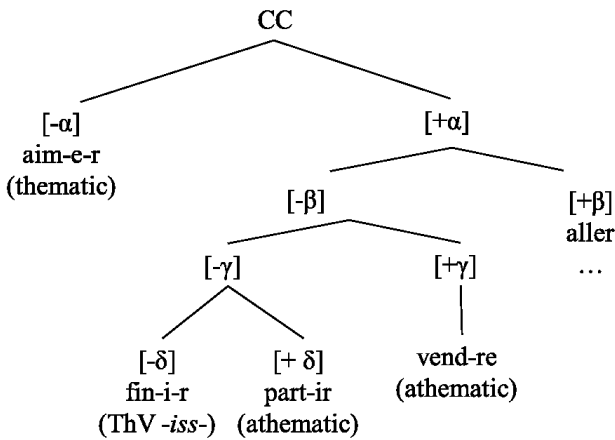
Figure 3: Feature geometry for the French conjugation classes

According to this specification, CC neutralization in the passé simple and past subjunctive relies on the common feature [-β] of *finir*, *partir* and *vendre*, whereas the neutralization in the future and conditional is due to the common feature [-γ] of *finir* and *partir*.

      At the same time, the proposed feature geometry also captures different degrees of markedness of the respective CC (from less marked to more marked; see Figure 4): *aimer > finir > partir > vendre > aller*.[8] This allows us to understand the link between athematicity and irregularity: The most marked CCs contain the (most) irregular verbs and it is precisely these CCs, leaving neutralizations aside, that are athematic. Put another way, thematic *aimer* and thematic *finir* belong to those CCs whose verbs are considered either fully regular or "irregularly" regular, i.e. verbs that undergo minor (morpho) phonologically predictable changes (e.g. vowel alternation): *lever* [lə.ve] 'to raise' ~ *lèvent* [lɛv] 'they raise'.[9] The athematic verbs *partir* and *vendre* belong instead to CCs that contain irregular verbs showing other subregularities. Finally, suppletive *aller* (with a mixed paradigm of forms from thematic and athematic verbs) belongs to the residual CC, which is a ragbag of irregular verbs with idiosyncratic alternations (cf. Gertner 1973 and Meunier and Marslen-Wilson 2004 for a classification of French irregular verbs).

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8   The degree of markedness results from the total number of features and their respective values (+ or -). For instance, *partir* has two [-]-features and two [+]-features (i.e. 2 out of 4 are marked with [+]; index = 0.5), whereas *vendre* has one [-]-feature and two [+]-features (i.e. 2 out of 3 are marked with [+]; index = 0.66) and *finir* has three [-]-features and one [+]-feature (i.e. 1 out of 4 is marked with [+]; index = 0.25) .

9   This alternation (cf. also [sə.me]~[sɛm], forms of *semer* 'to sow') is phonological, and based on vowel lowering in closed syllables (Schwarze and Lahiri 1998).

THE LINK BETWEEN ATHEMATICITY AND IRREGULARITY IN FRENCH VERBAL INFLECTION
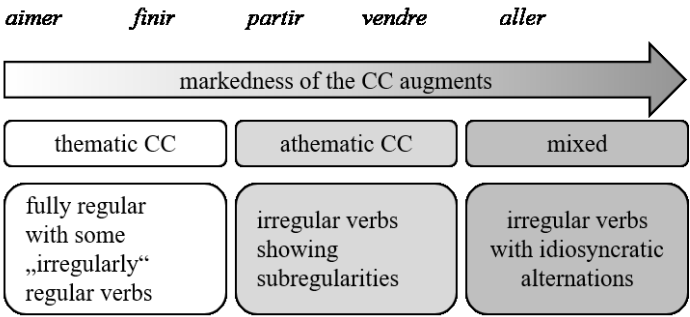
Figure 4: Markedness of CC, athematicity and irregularity

We assume that neither the syntactic derivation nor the post-syntactic well-formedness conditions are affected by the conjugation class features. This means that all CCs have the same morphological structure for Vocabulary Insertion (VI) (see Figure 5).
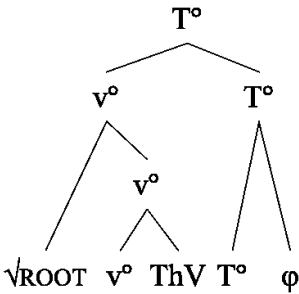
Figure 5: Morphological structure

The realization of this structure differs considerably between CCs, however. As Table 6 shows, the 1st and 2nd CCs (*atomiser*, *aimer*, *finir*) have a regular root followed by three inflectional affixes in the 1st plural imperfect. The CCs that are marked by two diacritics, instead, allow fewer affixes after the "irregular" root, i.e. the ThV is missing. What is more, as exemplified by the present tense forms of the 2nd person, only these athematic verbs show irregular forms with subregularities (*partir* and *vendre*; also *peindre*) or with idiosyncrasies (as in the case of suppletion with *aller*).

		morphological structure					syllable structure	surface form	spelling
		root	v°	ThV	T°	φ		no liaison[10]	
1pl impf.	[-α]	atom	is	ə	i	ɔ̃z	a.to.mi.sə.i.ɔ̃z	[a.to.mi.sjɔ̃]	*atomisions*
	[-α]	ɛm		ə	i	ɔ̃z	ɛ.mə.i.ɔ̃z	[ɛ.mjɔ̃]	*aimions*
	[+α,-β,-γ,-δ]	fin		is	i	ɔ̃z	fi.ni.si.ɔ̃z	[fi.ni.sjɔ̃]	*finissions*
	[+α,-β,-γ,+δ]	paʁt			i	ɔ̃z	paʁ.ti.ɔ̃z	[paʁ.tjɔ̃]	*partions*
	[+α,-β,+γ]	vãd			i	ɔ̃z	vã.di.ɔ̃z	[vã.djɔ̃]	*vendions*
	[+α,+β]	al		ə	i	ɔ̃z	a.lə.i.ɔ̃z	[a.ljɔ̃]	*allions*
1pl pres.	[-α]	atom	is	ə		ɔ̃z	a.to.mi.sə.ɔ̃z	[a.to.mi.sɔ̃]	*atomisons*
	[-α]	ɛm		ə		ɔ̃z	ɛ.mə.ɔ̃z	[ɛ.mɔ̃]	*aimons*
	[+α,-β,-γ,-δ]	fin		is		ɔ̃z	fi.ni.sɔ̃z	[fi.ni.sɔ̃]	*finissons*
	[+α,-β,-γ,+δ]	paʁt				ɔ̃z	paʁ.tɔ̃z	[paʁ.tɔ̃]	*partons*
	[+α,-β,+γ]	vãd				ɔ̃z	vã.dɔ̃z	[vã.dɔ̃]	*vendons*
	[+α,+β]	al		ə		ɔ̃z	a.lə.ɔ̃z	[a.lɔ̃]	*allons*
2sg pres.	[-α]	atom	is	ə		z	a.to.mi.səz	[a.to.mis]	*atomises*
	[-α]	ɛm		ə		z	ɛ.məz	[ɛm]	*aimes*
	[+α,-β,-γ,-δ]	fin		is		z	fi.nisz	[fi.ni]	*finis*
	[+α,-β,-γ,+δ]	paʁt				z	paʁtz	[paʁ]	*pars*
	[+α,-β,+γ]	vãd				z	vãdz	[vã]	*vends*
	[+α,+β]	va				z	vaz	[va]	*vas*

Table 6: Relation between morphological structures and CC[11]

This means that Vanden Wyngaerd's generalization, according to which irregularity in form of either the root or the suffix goes hand in hand with a reduced number of suffixes, is also valid for French verbal inflection.

3. Non-Terminal Vocabulary Insertion

In this section, we will discuss how the generalization made so far can be captured in the framework of Distributed Morphology (DM; Halle and Marantz 1993, 1994). Based on data from suppletion in particular, we follow the assumption that functional elements and roots are both inserted post-syntactically (cf. Haugen and Siddiqi 2013). As is well-known, in the standard version of DM a set of post-syntactic operations can alter the syntactic output before VI, including Fusion, Impoverishment, and Pruning,

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10   We have omitted the liaison forms for reasons of space.

11   The denominal verb *atomiser* contains the suffix *-is-*, which is not an augment, but a verbalizer inserted in v°. This derivation again, belongs to the productive 1st CC and therefore comes with a ThV.

among others. For the athematic Italian past participles mentioned above, such as *corso*, Calabrese (2015) proposes an analysis based on Pruning. Apart from the fact that the arguments in Calabrese (2015) are somehow circular,[12] his analysis is not applicable to French GO suppletion. However, other post-syntactic processes, such as Fusion, for example, also seem incorrect for the analysis of French GO suppletion, since locality restrictions on allomorphy are not met (but see Pomino and Remberger 2019). What is more, Fusion and Pruning can be avoided if VI is not limited to terminal elements, as in the non-terminal spell-out of Nanosyntax (cf. Starke 2009) and the Spanning approach of Svenonius (2012), among others. In sum, the assumption of multiple post-syntactic processes has met with some criticism and, given equal explanatory adequacy, a smaller number of processes is preferable to a larger number (cf. Haugen and Siddiqi 2016, 346; Trommer 1999 a.o.). Haugen and Siddiqi (2016) argue that the post-syntactic processes of DM should be reduced to VI only. Following Svenonius (2012, 2016) as well as Haugen and Siddiqi (2016), we will integrate Non-Terminal Insertion or rather Spanning[13] into the DM framework in order to explain the consonant-zero-alternation and suppletion in French.

3.1 Spanning and the Consonant-Zero-Alternation in French

Spanning is a specific type of VI. As in the standard version of DM, this mapping process operates over the hierarchical structure, but it allows the insertion of phonological material not only in one terminal node at a time but also in spans of terminal nodes that are in a complement relation with each other (Williams 2003; Svenonius 2012; Merchant 2015). For ease of illustration, let us assume that the output of the syntactic derivation is the complex head given in Figure 6. In the Spanning approach, VI can target any of the listed spans, i.e. the root may be realized alone or together with X (or X and Y etc.).

---

12   Pruning, according to Calabrese (2015), takes place before VI, i.e. it cannot be conditioned by the context of VI; this raises the question of why the input structure for VI is reduced only in particular (categorial or non-categorial) contexts.

13   For French morphology in Nanosyntax, cf. Starke (2020). Starke (2020) does not seem to posit CCs, nor does he consider ThVs or latent consonants in his structures. We do not adopt a nanosyntactic approach since we assume that morphophonological exponence cannot be directly represented in syntactic structures, but it is syntax that serves as an input to VI, which is guided by the Subset Principle. Nevertheless, some of the ideas from Nanosyntax, e.g. the insertion of regular and irregular lexical items into differently sized structures, seem to mirror a Spanning approach to some extent (although the other way round: irregular forms like [saʃ] from *savoir* 'to know', lexically realize less structure in Starke (2020) than regular forms like [sav]).

Syntax

Complex head

Spans

<√ROOT>   *<√ROOT, Y>
<√ROOT, X>   *<√ROOT, Z>
<√ROOT, X, Y>   etc.
<√ROOT, X, Y, Z>
<X>
<X, Y>
<X, Y, Z>
<Y>
<Y, Z>
<Z>
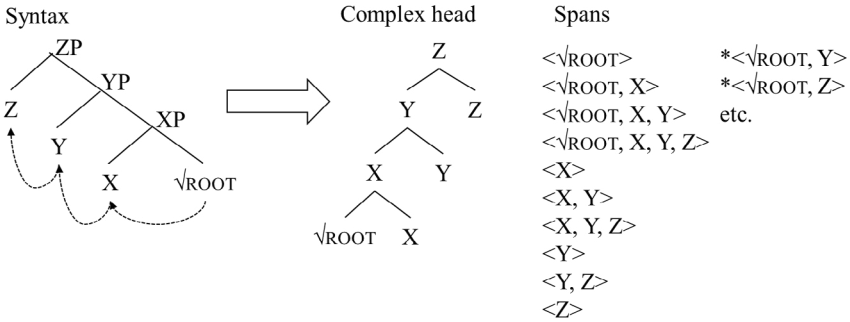
Figure 6: Spanning

We will assume that the difference between regular and irregular verbs in French (and other languages) depends on whether or not the output structure has a one-to-one realization of terminal nodes. More precisely, as soon as √ROOT and X are realized as a span and not as two separate slots, the verbal forms lose their structural transparency and may be irregular. Our analysis is based on two central assumptions: (i) Whether Vocabulary Items target only the √root or span over the √ROOT and ThV depends on the CC features (e.g. [-α]) encoded in the root; (ii) Depending on tense, T and φ are exponed together.[14] This idea is exemplified in Figure 7: In the case of *aimer/arriver* and *finir*, VI for the root realizes only the √ROOT-slot and the root-final consonants surface, since they always precede a ThV. In contrast, in the case of *partir/vendre*, VI spans over √ROOT, v° and Th and the root-final consonants may not surface. More precisely, the consonant is never saved by a ThV (which offers an open onset position) and its (non)appearance depends on how the T/φ is realized: It will surface only with an inflectional ending that has an onset position that the consonant could move into (e.g. *-ons* and *-ez*, but also *-r-ons* and *-r-ez*) and will otherwise be deleted.

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14   This is true at least for the present tense, which can also be interpreted as a non-tense and therefore usually has no visible exponent.
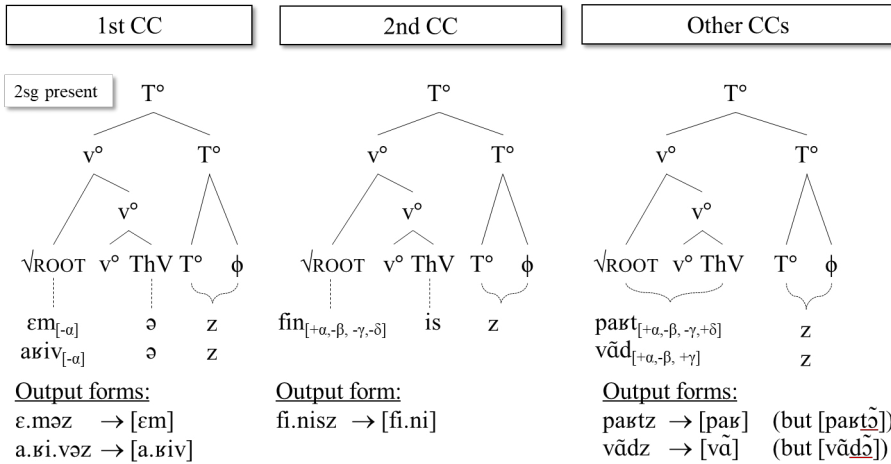
Figure 7: Spanning and the consonant-zero-alternation

With this analysis we can capture the link between athematicity and irregularity in the following way: ThVs prevent the deletion of root-final consonants. As soon as VI spans over √ROOT+v°+ThV, the realization of the final consonant depends on the realization of the following slot (or span) and, since this slot does not *per definitionem* begin with a vowel, the final consonant may be deleted leading to "irregular" verbal forms.

3.2 Spanning and French GO Suppletion

The suppletion found with French *aller* is especially interesting (cf. also Pomino and Remberger 2019) since the respective forms have their origins in verbs from different Latin CCs, i.e. some forms of *aller* are thematic and others are athematic. The three source verbs are: *īre* (athematic), *vādere* (athematic) and *ambulāre/ambitāre (*allāre, *andāre)* (thematic). In this suppletive pattern, the link between athematicity and irregularity would thus be expected to be particularly transparent.

In French, suppletion in the verbal forms of GO is, at least at first glance, sensitive to person and number (but only in the present tense and in the imperative, i.e. non-categorical suppletion; cf. Veselinova 2006) and is additionally sensitive to TAM (i.e. categorical suppletion; cf. Veselinova 2006): Forms stemming from Latin IRE are attested in French only in the future and the conditional, while those originating from athematic *vādere* are found in the present indicative (and in the imperative), but only in the singular and 3pl. All other forms are based on thematic **allāre* which we consider to be the default realization for the root GO in French. In the following analysis, we will look more closely at the present tense forms, since here we have both athematic and thematic suppletive stem-allomorphs, which seem to be contextually sensitive to φ-features (see Table 7).

	present ind.		present subj.		imperfect		future	
	sg	pl	sg	pl	sg	pl	sg	pl
1	*vais*	*all-ons*	*aille*	*all-i-ons*	*all-ais*	*all-i-ons*	*i-r-ai*	*i-r-ons*
	[vɛ]	[al-ɔ̃ᶻ]	[aj]	[al-j-ɔ̃ᶻ]	[al-ɛᶻ]	[al-j-ɔ̃ᶻ]	[i-ʁ-e]	[i-ʁ-ɔ̃ᶻ]
2	*vas*	*all-ez*	*ailles*	*all-i-ez*	*all-ais*	*all-i-ez*	*i-r-as*	*i-r-ez*
	[vaᶻ]	[al-eᶻ]	[ajᶻ]	[al-j-eᶻ]	[al-ɛᶻ]	[al-j-eᶻ]	[i-ʁ-aᶻ]	[i-ʁ-eᶻ]
3	*va*	*vont*	*aille*	*aillent*	*all-ait*	*all-aient*	*i-r-a*	*i-r-ont*
	[va]	[vɔ̃ᵗ]	[aj]	[ajᵗ]	[al-ɛᵗ]	[al-ɛᵗ]	[i-ʁ-a]	[i-ʁ-ɔ̃ᵗ]

Table 7: Selected verbal forms of suppletive *aller* (athematic forms highlighted in grey)

It is very interesting to note that the present tense forms of French GO in particular have a very reduced segmentability, i.e. there is a considerable mismatch between the hierarchical structure (e.g. √ROOT + v° + ThV + T + φ, see Figure 5) and the morphophonological realization of this structure. More precisely, the *all*-based forms have a higher degree of segmentability than the *va*-based forms and this, again, goes hand in hand with (a)thematicity: The root *all*- selects a ThV, whereas *va*- is athematic. In the Spanning approach, this means that the root *all*- realizes only the √ROOT slots, while *va*- spans over √ROOT and ThV; see Figure 8.
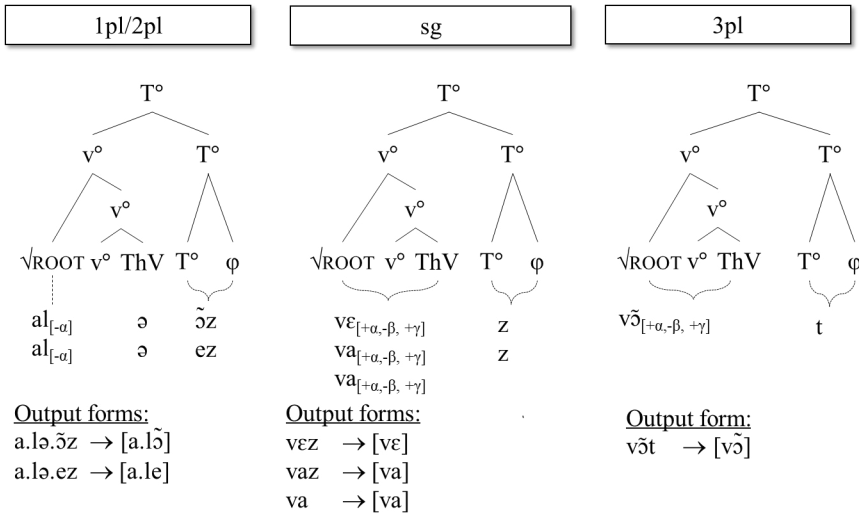
Figure 8: Spanning in case of suppletion

In the case of non-categorial suppletion, as in the present tense of *aller*, it may also be the context of the agreement features that conditions the insertion of suppletive stems. Since the T° and φ are a span in the present tense, φ can directly influence VI of the adjacent span. In the more specific insertion context in the singular and 3rd person plural more specific Vocabulary Items are inserted. In contrast, the 1st and 2nd plural represent the default, i.e. VI is not contextually driven by φ. Since *aller* belongs to the thematic CC including the diacritic [-α], the ThV /ə/ be inserted (but is then deleted for phonological reasons), which means that φ is not in an adjacent span and could therefore not influence VI of the root.

4.   Conclusion

We have argued that French has two thematic and several athematic conjugation classes which are hierarchically structured. Based on this, we have additionally shown that the *Suppletion Generalization* (Vanden Wyngaerd 2018, 1) also holds for French: "If there is irregularity in the form of either the root or the suffixes, the number of suffixes gets reduced." This generalization can be integrated into the DM framework if we admit non-terminal insertion or rather Spanning. We have shown how athematicity of the French CC – which results from VI spanning over √ROOT and ThV – impinges on the irregularity of the respective forms. (Ir)regularity can be explained by different spanning sizes of the respective roots, which is dependent on the CC-features of the roots.

5.   Works Cited

Aronoff, Mark. 1994. *Morphology by Itself*. Cambridge, MA: MIT Press.

Bobaljik, Jonathan D. 2000. "The Ins and Outs of Contextual Allomorphy." In *University of Maryland Working Papers in Linguistics* 10, edited by Kleanthes Grohmann and Caro Struijke, 35–71. Maryland: Linguistics Dep., University of Maryland.

Bobaljik, Jonathan D. 2012. *Universals in Comparative Morphology*. Cambridge, MA: MIT Press.

Bonami, Olivier, and Gilles Boyé. 2002. "Suppletion and Stem Dependency in Inflectional Morphology." In *Proceedings of the HPSG '01 Conference*, edited by Franck Van Eynde, Lars Hellan, and Dorothee Beerman, 51–70. Stanford: CSLI Publications.

Bonami, Olivier, Gilles Boyé, Hélène Giraudo, and Madeleine Voga. 2008. "Quels verbes sont réguliers en français?" In *Congrès Mondial de Linguistique Française 2008*, edited by Durand Jacques, Benoît Habert, and Bernard Laks. Paris: Institut de Linguistique Française. Accessed October 29, 2021. https://www.linguistiquefrancaise.org/articles/cmlf/pdf/2008/01/cmlf08186.pdf

Boyé, Gilles. 2000. *Problèmes de morpho-phonologie verbale en français, espagnol et italien.* Ph.D. thesis, Université Paris 7.

Caha, Pavel, Karen De Clercq, and Guido Vanden Wyngaerd. 2019. "The Fine Structure of the Comparative." *Studia Linguistica* 73 (3): 470–521.

Calabrese, Andrea 2015. "Irregular Morphology and Athematic Verbs in Italo-Romance." *Isogloss 2015, Special Issue on Italo-Romance Morphosyntax,* 69–102.

Dupuis, D. 1935. *La grammaire pour tous*. Paris: J. de Gigord.

El Fenne, Fatimazohra. 1994. *La flexion verbale en français: contraintes et stratégies de réparation dans le traitement des consonnes latentes.* Ph.D. diss., Université Laval.

Foley, James. 1979. *Theoretical Morphology of the French Verb*. Amsterdam: John Benjamins.

Gertner, Michael H. 1973. *The Morphology of the Modern French Verb*. The Hague: Mouton.

Grevisse, Maurice. 1969. *Précis de grammaire Française*. 28th ed. Duculot, Gembloux.

Halle, Morris, and Alec Marantz. 1993. "Distributed Morphology and the Pieces of Inflection." In *The View of Building 20: Essays in Honor of Sylvain Bromberger*, edited by Kenneth Hale and Samuel J. Keyser, 111–176. Cambridge, MA: The MIT Press.

Halle, Morris, and Alec Marantz. 1994. "Some Key Features of Distributed Morphology." *MIT Working Papers in Linguistics: Papers on Phonology and Morphology* 21, 275–288.

Halle, Morris. 2018. "Aspects of the Morphophonology of the Verb in Latin and in German and English." *Linguistic Inquiry* 50 (1): 3–12.

Haugen, Jason D., and Daniel Siddiqi. 2013. "Roots and the Derivation." *Linguistic Inquiry* 44 (3): 493–517.

Haugen, Jason D., and Daniel Siddiqi. 2016. "Towards a Restricted Realization Theory. Multimorphemic Monolistemicity, Portmanteaux, and Post-Linearization Spanning." In *Morphological Metatheory*, edited by Daniel Siddiqi and Heidi Harley, 343–386. Amsterdam/Philadelphia: Benjamins.

Kaye, Jonathan, and Yves Charles Morin. 1978. "Il n'y a pas de règles de troncation, voyons!" In *Proceedings of the Twelfth International Congress of Linguists*, edited by Wolfgang Dressler and Wolfgang Meids, 788–792. Innsbruck: Innsbrucker Beiträge zur Sprachwissenschaft.

Klausenburger, Jürgen. 1974. "Rule Inversion, Opacity, Conspiracies: French Liaison and Elision." *Lingua* 34: 167–179.

Kühner, Raphael, and Friedrich Holzweissig. 1912 (2021). *Ausführliche Grammatik der lateinischen Sprache*. Darmstadt: wbg.

Larousse. 1936. *Grammaire Larousse du français contemporain.* Paris: Larousse.

Leumann, Manu, Johann Baptist Hofmann, and Anton Szantyr. ⁵1977. *Lateinische Grammatik. Erster Band: Lateinische Laut- und Formenlehre.* München: C. H. Beck.

Maiden, Martin. 2016. "Morphomes." In *The Oxford Guide to the Romance Languages*, edited by Martin Maiden and Adam Ledgeway, 708–721. Oxford: Oxford University Press.

Martinet, André. 1969. *Le français sans fard*. Paris: Presses Universitaires de France.

Merchant, Jason. 2015. "How Much Context Is Enough? Two Cases of Span-Conditioned Stem Allomorphy." *Linguistic Inquiry* 46 (2): 273–303.

Meunier, Fanny, and William Marslen-Wilson. 2004. "Regularity and Irregularity in French Verbal Inflection." *Language and Cognitive Processes* 19 (4): 561–580.

Michaut, Gustave. 1934. *Grammaire française*. Paris: Hatier.

Morin, Yves Charles, and Jonathan Kaye. 1982. "The Syntactic Bases for French Liaison." *Journal of linguistics* 18: 291–330.

Napoli, Donna Jo, and Irene Vogel. 1990. "The Conjugations of Italian." *Italica* 67: 479–502.

Oltra Massuet, Isabel. 2000. "Conjugation Class." In *Oxford Research Encyclopedia of Linguistics.* Oxford: Oxford University Press.

Oltra Massuet, Maria Isabel. 1999. "On the Notion of Theme Vowel: A New Approach to Catalan Verbal Morphology." MA Thesis. MIT, Cambridge, MA.

Pană Dindelegan, Gabriela. 2013. *The Grammar of Romanian.* Oxford: Oxford University Press.

Paradis, Carole, and Fatimazohra El Fenne. 1992. "L'alternance C/Ø des verbes français: une analyse par contraintes et stratégies de réparation." *Revue québécoise de linguistique* 21: 107–141.

Paradis, Carole, and Fatimazohra El Fenne. 1995. "French Verbal Inflection Revisited: Constraints, Repairs and Floating Consonants." *Lingua* 95: 169–204.

Pinchon, Jacqueline, and Bernard Coute. 1981. *Le système verbal du français: description et application pédagogique.* Paris: Nathan-Université.

Plénat, Marc. 1981. "L' 'autre' conjugaison ou de la régularité des verbes irréguliers." *Cahiers de grammaire* 3: 1–304.

Pomino, Natascha, and Eva-Maria Remberger. Submitted. "Does French have Theme Vowels?" Ms. to be published in *Theme Vowels*, edited by Svitlana Antonyuk Yudina, Predrag Kovačević, and Stefano Quaglia.

Pomino, Natascha, and Eva-Maria Remberger. 2019. "Verbal Suppletion in Romance Diachrony: The Perspective of Distributed Morphology." In *Life-Cycle of Suppletion. Special Issue of the Transactions of the Philological Society* 117 (3), edited by Frans Plank, and Nigel Vincent, 471–497.

Schane, Sanford A. 1966. "The Morphophonemics of the French Verb." *Language* 42 (4): 746–758.

Schane, Sanford A. 1968. *French Phonology and Morphology*. Cambridge, MA: MIT Press.

Schwarze, Christoph, and Aditi Lahiri. 1998. *Einführung in die französische Phonologie*. Arbeitspapier Nr. 88. Konstanz: Fachgruppe Sprachwissenschaft der Universität Konstanz.

Schwarze, Christoph. 2009. "The French i-Conjugation from a Diachronic Perspective." In *Selected Proceedings of the 6th Décembrettes*, edited by Fabio Montermini, Gilles Boyé, and Jesse Tseng, 35–49. Somerville, MA: Cascadilla Proceedings Project.

Starke, Michal. 2009. "Nanosyntax: A Short Primer to a New Approach to Language." *Nordlyd* 36: 1–6.

Starke, Michal. 2020. "UM – Universal Morphology." Keynote talk at NELS 51, 6.-8.11.2020, University of Québec in Montréal (UQAM).

Svenonius, Peter. 2012. "Spanning." Ms., CASTL, University of Tromsø.

Svenonius, Peter. 2016. "Spans and Words." In *Morphological Metatheory*, edited by David Siddiqi and Heidi Harley, 201–222. Amsterdam: John Benjamins.

Tranel, Bernard. 1974. *The Phonology of Nasal Vowels in Modern French.* PhD diss. University of California. San Diego.

Tranel, Bernard. 1976. "A Note on Final Consonant Deletion, the Pronunciation of Cardinal Numbers, and Linguistic Change in Progress in Modem French. *Lingua* 39: 53–68.

Trommer, Jochen. 1999. "Morphology Consuming Syntax' Resources: Generation and Parsing in a Minimalist Version of Distributed Morphology." Accessed October 14, 2021. https://ling.auf.net/lingbuzz/000116.

Van den Eynde, Karel, and Claire Blanche-Benveniste, 1970. "Essai d'analyse de la morphologie du verbe français. Présentation d'hypothèses de travail." *Orbis* XIX (2): 404–429.

Van der Spuy, Andrew. 2020. "The Theme Vowels of Latin verbs." *Lingua* 243. Accessed June 2022. https://doi.org/10.1016/j.lingua.2020.102883.

Vanden Wyngaerd, Guido. 2018. "Suppletion and Affix Reduction." Accessed October 29, 2021. https://lingbuzz.net/lingbuzz/004095.

Veselinova, Ljuba. 2006. *Suppletion in Verb Paradigms: Bits and Pieces of a Puzzle.* Amsterdam: John Benjamins.

Williams, Edwin. 2003. *Representation Theory*. Cambridge, MA: MIT Press.

Ɛ- vs a- Alternation in the Auxiliary and Distribution of OCls in Calabro-Lucanian Dialects of Lausberg Area

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Abstract. This article deals with the realization of 3rd person object clitics in auxiliary contexts in some Southern-Italian dialects spoken in "Lausberg area", where the allomorphy ε-/a- in the auxiliary stem and enclisis are involved. We investigate this phenomenon in relation to the overall distribution of OCls. A crucial question is the theoretical status of morphology. Although morphology is nothing more than a way of expressing syntactic structures, it is traditionally seen as a post-syntactic component, that, according to DM, conveys an information "separated from the original locus of that information in the phrase marker" (Embick and Noyer 2001, 557) by means of rules manipulating syntactic nodes. We pursue a different approach whereby morphology is governed by the same computational rules of syntax and subword elements are fully interpretable. Inflection and clitics are the result of (pair-)merge operations (Chomsky 2020a, b), giving rise to amalgams based on agreement in φ-features.

1.   Introduction

The topic of this article is the realization of object clitics in auxiliary contexts in Southern-Italian dialects spoken in Lausberg Area. The issue at stake is the nature of morphology and its theoretical status. This is a long-term question, dating back at least to Chomsky (1972), when the lexicalist hypothesis became the general solution in the treatment of the relation between syntax and interpretation. The portion of morphology that remained within syntax however has kept representing a problem for the analysis. In fact, morphology is necessary for syntax but it seems to apply specific structural

requirements, which according to some authors respond to a linear adjacency criterion (Embick and Noyer 2001) rather than to a structural organization. Moreover, morphology shows a set of phenomena concerning the order of exponents, syncretism and other properties apparently idiosyncratic, not immediately associated with a functional or structural codification. In the following discussion, we will apply an approach that holds to the assumption that morphology is a part of the linguistic knowledge, as it is governed by the same fundamental computational tools of syntax.

The diverse morpho-syntactic realizations of 3rd person OCls in the Lausberg area dialects (cf. Lausberg 1939) involve the alternation between internal inflection and clitic, providing us with a test bench as regards the ability of the syntactic procedures to construct morphologically complex words. The article, after presenting the data and describing the different systems, discusses some theoretical points in order to clarify the salient aspects of the model we adopt, and finally it proposes an analysis of these phenomena. The aim is to reach a unified and general treatment.[1]

2.   Clitics and Internal Inflection of the Auxiliary

In Romance dialects spoken in villages within the Lausberg area, on the border between Calabria (Morano and Albidona) and Basilicata (Colobraro), 3rd person internal arguments (IA) show a specialized morphological mapping in auxiliary contexts. In some varieties, in the active form of transitive verbs the auxiliary *have* alternates two allomorphs, one with the stem vowel *a-*, and one with ɛ-. The alternant *a-* incorporates the realization of the 3rd person, as in (1a, b, c) for Morano. In the examples, we indicate with 3(PS) the exponent (or referent) of 3rd person, with 1SG/2SG/1PL/2PL the verbal agreement exponents or the OCls. INFL is the gloss of the element *-ə* that realizes the final vocalic exponents in many of these dialects; MSG / FSG / PL correspond to the agreement nominal features.[2]

(1)   (a)   aɟɟ-u   camɛt-u/a/i
              (3PS)   have-1SG   called-MSG/FSG/PL
              'I have called him/her/them'

      (b)   a: camɛt-u/a/i
              (3PS)   have.2SG   called-MSG/FSG/PL
              'you have called him/her/them'

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1   The article is the fruit of common reflection and elaboration. The data we discuss in this work have been collected through field investigations with native speakers, which we thank with sincere gratitude.

2   We use a broad phonetic transcription; in general, in these dialects stressed vowels in open syllables are long; a variable lengthening may characterize also pre-tonic vowels.

(c) a: ccamɛt-u/a/i
(3PS) have.3SG called-MSG/FSG/PL
's(he) has called him/her/them' Morano

While in the dialect of Morano this is the only realization of the object of 3rd person in these contexts, in other dialects we find two ways to introduce the object. Thus, in the dialect of Colobraro in (2), *a-/ɛ-* allomorphy characterizes the 3rd singular person of the auxiliary, in (2a), and is in complementary distribution with the realization of 3rd person OCls in enclisis on the 1st/2nd and 1st and 3rd plural persons of the auxiliary, in (2b). The 2nd plural in turn excludes the realization of the OCl, however presenting the only alternant with *a-*, as in (2c)

(2) (a) a: ccamɛt-ə
(3PS) have.3SG called-INFL
'(s)he has called him/her/them'

(b) ɛddʒ- / ɛj- / ɛm- / ɛn- u / a / i camɛt-ə
have.1SG /2SG /1PL / 3PL MSG / FSG / PL called-INFL
'I have / you have / we have / they have called him/her/them'

(c) avesə camɛt-ə
(3PS) have.2PL called-INFL
'you have called him/her/them' Colobraro

The alternant ɛ- occurs in all other contexts, including unaccusatives, reflexives and unergatives, as in (3a, a') and (3b, b').

(3) (a) ɛʝʝ-u vinut-u
have-1SG come-MSG
'I have come'

(a') ɛʝʝ-u rurmut-u
have-1SG slept-MSG
'I have slept' Morano

(b) ɛ vvənut-ə
have.3SG come-INFL
'(s)he has come'

(b') ɛ   ddurmut-ə
     have.3SG   slept-INFL
    '(s)he has slept'   Colobraro

Moreover, ɛ- characterizes active contexts where a 1st or 2nd person OCls, in (4a'), or lexical DPs occur, in (4b').

(4) (a) t   ɛɟɟ-u   vist-u
          2SG   have-1SG   seen-MSG
          'I have seen you'

    (b) ɛɟɟ-u   vist-u   a   ffratt-tə
          Have-1SG seen-MSG to   brother-your
          'I have seen your brother'   Morano

    (a') m   ɛ   ccamɛt-ə
          1SG   have.3SG called-INFL
          '(s)he has called me'

    (b')ɛ   ccamɛt-ə   a   ttuttə
         have.3SG   called-INFL to   all
         '(s)he has called all'   Colobraro

Finally, the alternant ɛ- occurs if the 3rd person OCl is independently lexicalized by the *l-* object clitic. This gives rise to a subtle micro-variation depending on the contexts where *l-* is inserted. In the dialects we are investigating negative contexts may affect the realization of the 3rd person element. Thus, in the dialect of Morano, in negative contexts *l-ɛ...* occurs, (5a), while in that of Colobraro the incorporating form appears also after the negation, as in (5a').

(5) (a)   nu   ll   ɛɟɟ-u   vist-u
          Neg   3SG   have.1SG   seen-MSG
          'I did not see him'   Morano

    (a')   illə   nɔnn   a   ccamɛt-ə
          he   Neg   (3PS) have.3SG called-INFL
          'he did not call him/ her/ them'   Colobraro

The distribution of the stem vowels ε- and *a*- shown in (4) and (5) leads us to identify ε- as the basic allomorph, considering that it occurs in all contexts where object clitics are not inserted.[3]

A third system is attested in the North-Calabrian dialect of Albidona, in which the enclisis on the 1st and 2nd singular persons of the verb, in (6a), coexists with the realization of 3rd person *l*- OCl in 2nd and 3rd singular persons of the verb, as in (6b, b') and (6c). The stem of the auxiliary has the alternant ε-. (6c) illustrates the 2nd plural form where both alternants are admitted, i.e. the incorporation on the initial *a*- of the verbal form, or the insertion of *l*-. The examples in (6d, e) illustrate the 1st and the 3rd plural persons which in turn select for enclisis. (6f) illustrates the negative form, where the OCl *l*- occurs in enclisis on the negation and the gender/ number exponent is expressed by the enclitic form on the auxiliary, here -*a*, feminine singular.

(6) (a) (ε)ddʒ-   u   / a / i   βist-ə
        have.1SG-   MSG / FSG / PL   seen-INFL
        'I have seen him/her/them'

    (b) l   ε   βist-ə
        3PS   have.2SG   seen-INFL
        'you have seen her/him/them'

    (b') l   ε   bbist-ə
        3PS   have.3s   seen-INFL
        '(s)he has seen her/ him'

    (c) (l)   aβəsə   βist-ə
        3PS   have.2PL   seen-INFL
        'You have seen her/him/them'

    (d) tə   m-   u   dat-ə
        2SG   have.1PL   3.MSG   given-INFL
        'we have given it to you'

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3   On the basis of the traditional measure of complexity for the rules, we could derive *a*- as the substitute of *OCl+ε* in a simple way, while obtaining ε- from *a*- requires a much more complex list of contexts.

(e) ɣuərə   n-   u   vist-ə
     they   have.3PL   3.MSG   seen-INFL
     'they have seen it/ him'

(f) ɔ   ll-a   ddʒə   vist-ə
     Neg   3-FSG   have.1SG   seen-INFL
     'I have not seen her'   Albidona

It is of note that in these dialects there is no phonological process or constraint preventing [l] from combining with [a] or [ɛ], as shown by the examples in (7).

(7) ['l ɛriva]   'the grass'
     ['l atʃina]   'the grapes'   Morano

     [ɛkwə]   'the needle'
     ['l atʃənə]   'the grapes'   Colobraro

More to the point, *l-* regularly occurs before *have* with the lexical reading of possession, as in (8a, b).

(8) (a) l   addʒə
          3PS   have.1SG
          'I have it'

     (b) l   ɛjə
          3PS   have.2SG
          'You have it', etc.   Colobraro

In other words, nothing suggests an origin of this phenomenon as due to the phono-logical assimilation of *l* and ɛ-, or, possibly, *a*-; rather, the distribution of the ɛ- (by hypothesis from 'be', cf. Manzini and Savoia 2005, 2011b) and *a*- (from 'have') according to syntactic properties is crucially implied. Moreover, the fact that the alter-nation concerns only the auxiliary creates a further obstacle to a morpho-phonological explanation. As to the lexical verbs initiating with a vowel we find different solutions. Typically, if the original initial vowel is unstressed, i.e. pre-tonic, it is deleted and the vocalic OCls are inserted, as in (9a); in some varieties the initial vowel can incorpo-rate the OCl of 3rd person, as in (9b). If the initial vowel is the stressed nucleus of the stem, either *l*- OCl is inserted as in (8)/(9c), or an initial consonantal segment is inserted, usually the voiced velar fricative [ɣ] or the glide [j], creating a CV syllable, like in (9d) and (9e).

(9) (a) u   / a / i   ttakkə
          MSG / FSG / PL   tie.1SG
          'I tie him/her/them'   Albidona

     (b) aspɛttɪ-rɪ
          (3PS) wait-3SG
          '(s)he wait for him/her/them'   Morano

     (c) l   addʒə
          3PS   have.1SG
          'I have it'   Albidona

     (d) a   ɣrɛ:pə
          FSG   open.1SG
          'I open it'   Colobraro

     (e) u   jɛpə
          MSG   open.1SG
          'I open'   Morano

The picture we get is the following:

✓ *have* allomorphy: ε- vs *a*-, where the latter externalizes the 3rd person internal argument in active syntax; the *a*- auxiliary form excludes the insertion of the object clitic.
✓ 3rd person OCls have the alternants: *u/a/i* in proclisis with lexical verbs or in enclisis on the auxiliary, *l(-u/a/i)* in negative/deontic/imperatives contexts;
✓ The realization of OCls is sensitive to the negative operator
✓ OCls have different realizations depending on the person: in Colobraro dialect the 3rd singular person and the 2nd plural incorporate the 3rd person OCl, while all other persons incorporate it; in Albidona the 2nd and 3rd singular persons select the proclitic *l*-, contrary to the 1st singular and plural persons and 3rd plural.

The alternation ε-/*a*- is part of a complex of well-attested South-Italian phenomena concerning the expression of 3rd person OCls in auxiliary contexts (see section 4; cf. Manzini and Savoia 2005, 2010). Manzini and Savoia propose a structural treatment whereby the auxiliary in C subsumes the 3rd person properties. Differently from that analysis, we connect the different realizations of 3rd and 1st/2nd person IA to the properties of such lexical items and rely on the idea that morphological complex forms are constructed on the basis of the same computational mechanism of syntax.

A crucial point is that the drop of 3rd person OCls before the auxiliary interplays with the enclitic occurrence in some varieties, like the one of Colobraro in (2a)–(2b). So, an interesting conjecture is that the complementarity between the allomorphy ɛ-/a-, enclisis of 3rd person OCls and, finally, their co-existence, as in (2), are the faces of the same phenomenon, implying a substantially identical morpho-syntactic procedure.

1.1 The Object Clitic System

Let us consider the clitic paradigm of these varieties. Object clitics, apart the alternants incorporated in the auxiliary seen in section 1, present three alternants:

· the simple Definiteness root *l*-, that we indicate with 3ᴘs, generally encompassing all referential properties, before verbs beginning in vowel as in (8);
· the complex forms where *l*- is combined with the inflection of gender and number, in imperative and in negative contexts (see below), indicated as 3-ꜰsɢ/ᴍsɢ/ᴘʟ
· the simple inflection of gender and number in proclisis, in declarative sentences, glossed as the bundle of agreement features ꜰsɢ, ᴍsɢ, ᴘʟ

In these dialects the plural is generally expressed by the only exponent *i*; as to the 1st and 2nd person clitics, we have, as in Standard Italian and in most Italian varieties, a single form for direct and indirect object, i.e. *mə* 1ᴘs and *tə* 2ᴘs. The clitic forms are illustrated in (10a) for Morano, in (10b) for Albidona and in (10c) for Colobraro.

(10) (a) mə / tə / u   / a / i   'virɪ-rɪ
          1sɢ/2sɢ/ᴍsɢ/ꜰsɢ/ ᴘʟ   see-3sɢ
          '(s)he sees me/you/him/her/them'   Morano

    (b) mə / tə / u / a / i   ′ßiðə-nə
          1sɢ/2sɢ/ᴍsɢ/ꜰsɢ/ ᴘʟ   see-3ᴘʟ
          'they see me/you/him/her/them'   Albidona

    (b) mə / tə / u / a / i   ′viəðə-nə
          1sɢ/ 2sɢ/ ᴍsɢ/ꜰsɢ/ ᴘʟ   see-3ᴘʟ
          'they see me/you/him/her/them'   Colobraro

(11a), (11b) and (11c) illustrate the *dative* in the dialects of Morano, Albidona and Colobraro. (11a'), (11b' and (11c') illustrate the string *dative/accusative* in the corresponding dialects. The following distribution emerges:

· Accusative and dative of the 1st and 2nd person clitics are syncretic, presenting a single alternant in the two contexts;

- The dative in the dialect of Morano is realized by *i* when it is alone, as in (11b), and by the syncretic dative/partitive OCl *nə* when it precedes an object clitic, as in (11b').
- In Colobraro dialect the dative is realized in all contexts by the partitive *nə*.
- The order of clitics in the string provides for the dative and 1st and 2nd person clitics before the accusative, i.e. the same as in many Romance varieties.

In the glosses, TV indicates the Thematic Vowel, i.e. the morpheme occurring between the root and the inflection.

(11) (a) i   / tə   rɔn-a   kkwist-ə
          3ps.dat   / 2sg give-3sg   this-Infl
          '(s)he gives this to him/her/them/you'

    (a') n   / t   u   rɔn-iri
          3ps.dat   / 2sg 3.msg   give-3sg
          '(s)he gives it to him/her/them/you'   Morano

    (b) ʎə   / mə   ð-a   kkwistə
         3ps.dat / 1sg   give-3sg this
         '(s)he gives this to her/him/them/me'

    (b') ʎ   / m   u   ðaɣə
          3ps.dat / 1sg   3.msg   give.1sg
          'I give it to him/her/them/me'   Albidona

    (c)   nə   d-ɛ   kkwist-ə
          3ps.dat   give-TV   this-Infl
          '(s)he gives this to him/her/then'

    (c)   n   u   d-ɛ-tə
          3ps.dat   3.msg   give-TV-3sg
          '(s)he gives this to him/her/then'   Colobraro

As shown by the comparison of (10a) and (11a) for Morano, and (10b) and (11b) for Albidona, dative and accusative plural are syncretic, so that *i* and *ʎə* encompass both the 3pl and that of 3rd person dative. Manzini and Savoia (2017a, 2018, 2020) account for this coincidence, assuming that both plural and dative are based on the semantic relation of inclusion, ⊆, i.e. part-whole of a set. Plural implies the sub-set reading (cf. Chierchia 1997), while dative can be traced back to the elementary predicative relation where

an argument is included into or part of an other, its domain (cf. Belvin and den Dikken (1997)[4] and Manzini and Savoia (2011a,b)). In other words, this analysis suggests that the order dative/ 1st/2nd person – accusative manifests the scope of the inclusion over the possessum, as in the case of the order possessive-DP in many languages.

A specialized alternant including the Definiteness base *l-* followed by the inflectional elements *a, u, i* 'her, him, them', is inserted when the OCl is preceded by negation (cf. (5)) and in enclisis on imperatives. In both contexts, however, the order of clitics remains the same. This allomorphy presents a subtle micro-variation also attested in our sample of dialects. In the negative contexts, not all dialects introduce *l-* forms, as evidenced by the comparison between (12a, b) for Morano and Albidona with *l-*, and (12c) for Colobraro, preserving vocalic OCls. As indicated in the examples in (12a, a') for Morano, *l-* forms combine the definiteness root *l-* with the gender/ number inflection, which in turn is however sufficient to realize the object clitics in the declarative positive contexts in (10).

(12) (a) nu   ll-u   / ll-a   / ll-i   'virɪ-rɪ
          Neg   3-msg   / 3-fsg   / 3-pl   see-3sg
          '(s)he does not see him/ her/ them'   Morano

     (b) ɔ   ll-u   / ll-a   / ʎʎ-ə   'ßiðə-nə
          Neg   3-msg   /3-fsg   / 3.pl-Infl   see-3pl
          'they do not see him/ her/ them'   Albidona

     (c) nɔnn   u / a / i   'viəðə-nə
          Neg   msg / fsg / pl   see-3pl

          'they do not see him/ her/ them'   Colobraro

---

4   The idea that all types of possession, including inalienable and psych state possession, fall under the same basic relarion resumes the analysis of possession in Belvin and den Dikken (1997, 170) according to whom "entities have various zones associated with them, such that an object or eventuality may be included in a zone associated with an entity without being physically contained in that entity… The type of zones which may be associated with an entity will vary with the entity".

Imperatives[5] require the insertion of OCls in enclisis selecting *l-V* forms, as in (13a, b, c); *l-V* forms occur also in clitic clusters, as in (13a', b', c'), associating the word stress with the penultimate vowel, as in (13a, a', b', c').

(13) (a) caˈm-ɛ-   l-u   / l-a   / l-i
         call-TV-   3-MSG   / 3-FSG   / 3-PL
         'Call him/ her/ them!'

    (a') rɔn-a-   nˈni-   l-u
         give-TV-   3PS.DAT-   3-MSG
         'Give it to her / him!'   Morano

    (b) caˈma-   ll-ə
        call   3-INFL
        'Call him/ her!'

    (b') da-   ˈm-   ill-ə
         give   1SG-   3-INFL
         'Give me it!'   Albidona

    (c) caˈm-a-   ll-ə
        Call-TV-   3-Infl
        'Call him/ her/ them!'

    (c') d-a-   mˈm-   ill-ə
         Give-TV-   1SG-   3-INFL
         'Give me it!'   Colobraro

---

5   In Southern Italian dialects in imperatives clitic clusters attract the main stress of the word, associated with the first clitic of the cluster, giving rise to a trochaic foot as in (13a', b', c'), e.g. *rɔna-nˈn-ilu* 'give him it' (Morano), as illustrated in (i).

(i)   F
                       | \
        rɔna nni lu

In some dialects also simple object clitics following the imperative attract the word stress, as in the examples in (13a, b, c). The reassignment of the main stress in post-verbal position goes together with the insertion of 3rd person clitics with the base *l-*. Manzini and Savoia (2017a) conclude that the stress together with a richer morphology are required in contexts where definite elements must be read outside of the scope of the modal operator.

Imperatives of 1st/2nd plural person trigger mesoclisis of 1st person and dative/ locative object clitics (characterizable as deictic), in contexts where the 3rd person clitic occurs in enclisis (cf. Manzini and Savoia 2017a, Baldi and Savoia 2020). In other words, mesoclisis shows up only in *deictic/ dative/ locative clitics + verbal inflection + 3rd person clitics* strings, as in (14) and (15). (14a) and (15a) and (14b) and (15b) illustrate mesoclisis of deictic clitics in the contexts of 1st plural and 2nd plural forms respectively. (15c) illustrates the post-verbal position of simple object clitics. In the dialect of Albidona 1st/2nd plural OCls are realized by the form *mə-sə/ sə* (in enclisis and mesoclisis).[6] As for the imperative person inflections, these dialects have a paradigm similar to the Italian: 1st and 2nd plural coincide with the present indicative forms; 2nd singular of the first class has the specialized ending *–a*, as in (15a) for Morano. In Albidona in final unstressed position the inflectional vowels have changed to *-ə*.

(14) (a) d-a-   ʎʎə-   'mu-   ll-ə
         give-TV-   3PL-   1PL-   3-Infl
         'Let us give her/him/them it!'

     (b) pɔrt-ə_   sə-   'tɛ-   ll-ə
         bring-TV   1PL-   2PL-   Def-Infl
         'Bring us it!'   Albidona

(15) (a) rɔn-a-   n'ni-   mu-   l-u
         give-TV-   3PS.DAT-   1PL-   Def-MSG
         'Let us give it to him/ her!'

     (b) rɔn-a-   m'mi-   ti-   l-u
         give-TV-   1SG-   2PL-   Def-MSG
         'Give it to me!'   Morano

As noted above, in these systems mesoclisis is admitted only on condition that the 3rd person clitic is present in final position, as in (15a, b) for Morano, so that with a single OCl we have enclisis, as in (14'a) and (15'a) for 1st plural and (14'b) and (15'b) for 2nd plural.

(14')(a) pɔrt-a-   'mu-   llə
         bring-TV-   1PL-   Def-Infl
         'Let us bring it!'

---

6   The alternant *mə-sə* seems to be traceable back to the combination of the 1st plural exponent *mə* with *sə*, the reflexive/impersonal element (Manzini and Savoia 2005).

(b) cam-ə-   ′tɛ-   mə
call-TV-   2PL-   1SG
'Call me!'   Albidona

(15')(a) caˈm-a-   mu- l-u
call-TV-   1PL- Def-MSG
'Let us call him!'

(b) ru′n-a-   tə-   mə   kwiss-u
give-TV-   2PL- 1SG   that-MSG
'Give me that!'   Morano

In negative imperatives OCLs, alone or in the string *dative+accusative*, occur in proclitic position, between the negative marker and the verb. The 2nd singular is lexicalized by the infinitive, as in (16a) and (17a, a'). In the other persons the usual inflection occurs, as in (16b, c, c') and (17b, c). We find the 3rd person *l-* forms, in (16a) and (17a), while in Colobraro variety the simple 3rd person form is preserved, as in (18a). The strings *dative+accusative* are exemplified in (16b, c, c') and (17a', b, c) and (18b).

(16) (a) ɔ-   ll-u   caˈm-a
Neg   3-MSG   wait-TV
'Don't call him!'

(b) ɔ-   ʎʎ   u   d-a-mə
Neg   3PS.DAT   It.MSG   give-TV-1PL
'Let us not give it to her/him/them!'

(c) ɔ-   mm   u   d-a-tə
Neg   1SG   MSG   give-TV-2PL
'Don't give it to me!'

(c') ɔ-   ʎʎ   u   d-a-tə
Neg   3PS.DAT   MSG   give-TV-1PL
'Don't give it to her/him/them!'   Albidona

(17) (a) nu-   ll-u   caˈm-ɛ
Neg   3-MSG   wait-TV
'Don't call him!'

(a') nu-   nn   u   ruˈn-ɛ
    Neg   to. 3PS   MSG   give-TV
    'Don't give it to her/him/them!'

(b) nu-   nn   u   run-ɛ-mu
    Neg   to.3PS   MSG   give-TV-1PL
    'Let us not give it to her/him/them!'

(c) nu-   mm   u   purt-ɛ-ti
    Neg   1SG   MSG   give-TV-2PL
    'Don't give it to me!'   Morano

(18) (a) nɔnn-   u   caˈm-ɛ-tə
        Neg   MSG   call-TV-2PL
        'Don't call him!'

    (b) nɔ   mm-   u   d-ɛ
        Neg   1PS   It.MSG   give-TV
        'Don't give it to me!'   Colobraro

Summarizing:

- ✓ The enclitic form of accusatives includes the definiteness lexical base *l-*, missing in proclitic elements.
- ✓ Mesoclisis is triggered only by clitic clusters in 1st and 2nd forms of imperative.
- ✓ Dative/locative and 1st person clitics occur between root and inflection while accusatives occur to the right of inflection.
- ✓ Negative imperatives require clitics and clitic clusters to be inserted between the negation and the verb, in proclisis.
- ✓ *l-* clitics occur when immediately preceded by the negative head.

3.   Is There a Morphological Component?

In the generative syntax framework, the best known generalization concerning the distribution of inflectional morphemes is Baker's (1988) Mirror Principle, whereby the verb moves to combine with the closest suffix: V attaches itself to T, and then T-V moves to AgrS, that closes the complex word, as in (19), representing the 2nd plural of the Italian imperfect *lava-va-te* 'you(pl) washed'. The Mirror Principle substantially translates into syntactic operations the idea, traditional in generative grammar, that the composition of complex words is an ordered cyclic mechanism. At once, it associates the treatment of inflection with syntax.

(19)

AgrSP

AgrS
te

IP

I
va-

VP

V
lav-a-
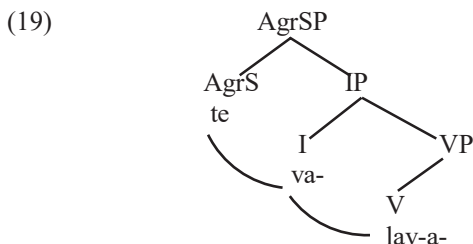
Distributed Morphology (DM) (Halle and Marantz 1993, 1994), the traditional approach to morphology within the generative framework, identifies morphology with an autonomous component, in which the insertion of morphemes is however based on an insertion mechanism in which subword elements (affixes and clitics), are understood as "dissociated morphemes" conveying an information "separated from the original locus of that information in the phrase marker" (Embick and Noyer 2001, 557) and involving post-syntactic rules of linear adjacency (Local dislocation) (Embick and Noyer 2001). Hence, agreement and case morphemes are not represented in syntax but they are added postsyntactically "during Morphology". Thus, we can expect there are morphological elements devoid of any syntactic import, "ornamental pieces of morphology" as in the case of Thematic Vowels of Romance languages (Embick 2010; cf. Calabrese 2015).

As an illustration, coming back to the alternation *a-* vs ε-, in DM framework the change from ε- to *a-* could be seen as the outcome of a "Fusion" adjustment rule of the type in (20), where the φ-features defining the object clitic are associated to the auxiliary head. As a result, the insertion of the object clitic is prevented and the specialized form of the auxiliary is inserted.

(20) $[_{OCl}$ φ-features] Aux → ∅ [Aux, φ-features]

The motivation of rules such as (20) is to create the correct slot for the subsequent Vocabulary insertion. The question is why languages, also understood in broad sense (Hauser, Chomsky and Fitch 2002), should commit themselves to obscure the relation between sensory-motor (SM) and interpretive (IC) interfaces (Manzini and Savoia 2011a, 2018). Naturally, we defend a vocabulary-based framework in the sense of Bobaljik (2002, 53), that is "the pieces that constitute paradigms and rules for gener-ating them". More precisely, approaches based on abstract constructs such as basic paradigms, understood as the grammatical level organizing the morphological structure and accounting for syncretism (Williams 1994), appear to add a costly and unmotivated explanatory structure in the grammar (Bobaljik 2002). On the contrary, it is possible to think of the relation between syntax and morphology as based on the lexical content of those "pieces".

We will follow a different approach to morphology, based on the idea that morphology is part of the syntactic computation and there is no specialized component for the morphological structure of words (Manzini and Savoia 2017b, 2011a, Manzini et al. 2020, Savoia et al. 2018). Morphosyntactic features of lexical elements, including morphemes, are fully interpretable, and contribute to externalizing the syntactic structure. Morphemes are endowed with semantic content, so excluding Late Insertion and the adjustments provided by Distributed Morphology, such as the manipulation of terminal nodes, impoverishment and fusion rules of φ-features, that feed it.

Inflected words are analyzed as the result of a Merge operation that combines inflectional heads with a category-less lexical root R, interpreted as a predicate. In the case of nominal elements, inflectional contents are Class (gender feminine/masculine) and other classificatory properties such as number and case (Manzini and Savoia 2011b). In inflected verbal forms agreement features and mood/ tense/ voice inflections are merged with R. Specifically, syncretism and other kinds of ambiguity imply a treatment based on the interpretive properties of the items/inflectional exponents and not on different syntactic structures. Similar conclusions are now supported by Wood and Marantz (2011), and specifically for morphology/ syntax relation theorized in Collins and Kayne (2020).

As we noticed, also subword elements are bona fide lexical entries endowed with interpretive content and contribute to forming the relevant structure. So, we can assume that the Merge operation (Chomsky 2020a,b) in (21) underlies the combination of morphemes in complex words:

(21) Merge (X,Y) → [X,Y]

Specifically, morphology involves the combination of heads, roots and other morphemes. Chomsky (2020a: 55) sees in pair-merge the way of treating head raising: "It's always described incorrectly. If a verb raises to inflection, say to T, it's always described as if the T-V complex becomes a T; but it's not, it's a V-the outcome of the adjunction is really verbal, not inflectional." As for modification as in the case of an adnominal adjective expression such as *young man*, Chomsky concludes that it is the result of an operation of conjunction where the same categorizer *n* (Link) is shared by the conjuncts; R(oots) merge with the Link/categorizer *n*. Chomsky, referring to Marantz (1997), speaks of categorizers such as *v, n*, that we can conceptualize as the bundles of φ-features that characterize the functional content of words entering into the agreement operations.

Drawing on Manzini (2021) and Baldi and Savoia (2021), it seems natural to assume that *n* is the label for the class and number features of nominal agreement. Extending this idea to verbs it is possible to identify *v* with the verbal categories of tense, aspect and mood that make an eventive/ stative root a verb. Trivially, we can observe that the inflection, for instance of tense or agreement, is sufficient to make a root, generally used as a noun, a verb, as in the case of *(s)he water-s/-ed*. In the model proposed here,

Agreement can be accounted for as the morphological manifestation of the identity between referential feature sets corresponding to the arguments of the sentence. In other words, there is no uninterpretable category triggering raising of a goal (see Chomsky et al. 2019, Chomsky 2020a,b).

An effective intuition proposed by Marantz (2001, 2007) is that words correspond to phases, substantially to work spaces, formed by combining the uncategorized lexical root with inner and outer morphological elements, where typically the latter are the inflections. Inflectional morphemes select for the compound including the root and its immediately attached morpheme. This model, therefore, excludes the separation between inflectional morphology, introduced in syntax, and derivational morphology, substantially lexical as implied in Baker's and usually in the generative approach. Again the idea is that "syntax perform[s] all merger operations including those between morphemes within a word" (Marantz 2001, 6). A point remains to be clarified, i.e. the role of the little "v, n, a" determining "the syntactic category for roots". As we suggested above, we identify these elements with the verbal or nominal features expressed by morphemes immediately combining with the root.

3.1 Proposals for the Analysis of Clitics

Let us consider the treatment of verbal inflection and clitic insertion in terms of merger operations. Starting from Halle and Marantz (1993, 1994) the interplay between clitics and inflections has induced a unified treatment of them as realizations of φ-features associated with syntactic structure. This solution is confirmed by mesoclisis (Manzini and Savoia 2011b, Baldi and Savoia 2020), presented in (14)–(15), where clitic elements are interpolated within the inflectional string.

We assume that the inflectional content of the verb fulfils the task of satisfying the properties of the sentence. For instance, consider the simple clause in (22) (cf. (10a), Morano):

(22) $[_{OCl}$ a] $\quad$ $[_{T/v}$ vir-ɪrɪ]
$\quad$ her $\quad\quad$ see-3sɢ
$\quad$ '(s)he sees her'

In the light of Chomsky (2015, 2020b), the inflection, identifying the EA of the verb, is merged with R, giving rise to a labeled amalgam, assuming that φ-features of inflection can be identified as the realization of the category *v*, as in (23).

(23) $\quad$ < vir$_R$, ɪrɪ$_φ$ > → $[_{v/3ps}$ vir + iri$_φ$]

If words, here the verb, are phases, we need to think that inflectional head is accessible to operations at vP, where it agrees with the features of v, as suggested in (24).

(24) (a) vP phase[7]: T v word-phase
          u_φ, φ iri+vir-

More to the point, if, in accord with Roberts (2010, 57), Romance OCls have to be considered the head of agreement for v phase, the OCl can be treated as the phase edge, specifically merged with the verb realizing v, as in (25).

(25) < OCl_φ, $viriri_v$ > $\rightarrow$ $[_v$ u [viriri]] …

We can think that inflectional properties of the verb satisfy T by merging to T, in the sense that vP and TP absolve the Agreement criterion invoked in Chomsky (2015, 2020b), yielding (26), where the amalgam *OCl+R* is associated with T.

(26) < T_φ, [u [vir-iri_φ]] > $\rightarrow$ $[_T$ [u vir-ɪrɪ $_{Infl}$]

In imperatives we find the order *verb-OCls*, as generally in Romance languages. What does the order in imperative come from? In generative tradition the inversion of OCls is connected to the movement of the verb to C or to a higher position, as proposed in cartographic models where the illocutionary nature of imperatives is associated with the Speech Act Phrase (Speas and Tenny 2003), implying a directive illocutionary force as a property involved in their interpretation. In semantic literature imperatives are devoid of truth value not making assertions about the current world (Han 2011); in other words, they assign a property to a prominent argument, identified with the addressee, rather than denoting events (Platzack and Rosengren 1998, Portner 2004). In keeping with Portner (2004, 239), we can treat imperatives as predicates resulting from an abstraction operator λ, introducing an argumental variable *x* fixed by the addressee. As suggested in (27), the imperative form *rɔn-a* 'give!' (Morano) includes the verbal root combined with the inflection -*a* of 2nd person specialized for imperative, differing from the usual ending of 2nd person that in this type of dialects is -*ɪsɪ*, e.g. *′rɔn-ɪsɪ* 'you give' (Morano).

(27) *rɔn-a$_{2SG}$* 'give'
 λx, give *(x,y)*, x = Addressee

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7 Chomsky (2001) identifies phases with lexical subarrays, i.e. structures, computed at the SM and C-I interfaces as the result of the operation of Transfer. The procedure is constrained by the Phase Impenetrability Condition (PIC) (Chomsky (2001, 14), whereby in a structure $[_{ZP}$ Z…$[_{HP}$ **α** [H YP]]], where Z and H are heads, the complement YP of H is not accessible to operations at ZP and only H and its *edge* are accessible to such operations (Richards 2011).

As for the enclisis of the clitic string in imperatives, we remind that it reflects a structural possibility independently implemented by the externalization in Italo-Romance varieties, as in the case of some West Piedmont varieties (Manzini and Savoia 2005), that show enclisis also in declarative forms. In Standard Italian enclisis characterizes infinitive/ gerundive and participial sentences, in addition to imperative. We can wonder what is the link between enclisis and non-veridical contexts. The simplest hypothesis is that the left position of the verb realizes the scope of the predicative abstraction on the subject and the other arguments. In this sense, the order *verb-OCls* is the morphological encoding of the imperative reading.

We can treat the OCls string as a complex item formed by merging the dative *ni* to the IA *l-u* yielding the amalgam *ni lu* 'to.her/him/them-it', in (28a); the latter realizes the relation of possession between the possessum, the accusative, and the possessor, the dative (Manzini and Savoia 2011b, Baldi and Savoia 2021). The cluster merges to $[_v$ *rɔn-a*$]$ as the realization of the φ features of v as in (28b). The inverted order and the form of clitics satisfy the requirements of T/C, as in (28c). The conclusion that clusters of OCls are the result of merging of dative and accusative is supported by the evidence provided by many dialects, where dative and accusative assume specialized realizations in clusters. This is the case of Morano, where the dative is *i* in isolation, in (11b'), while it is *ni* in clusters, in (15a). The order dative-accusative reflects the usual order of these clitics also in preverbal position. As noticed in the previous discussion, the linearization possessor-possessum expresses the scope of the relation, where the dative restricts the referential content of the object clitic, as clearly manifested by the use of the partitive/ genitive element *ni*.

(28) (a) $< ni_\varphi, l-u_\varphi > \rightarrow [_\varphi\ ni\ [lu]]$

     (b) $< [_\varphi\ ni\ [\ lu\ ]],\ [_v\ rɔn-a] > \rightarrow [_v\ [_\varphi\ ni\ lu]\ [_\varphi\ rɔna\ ]]]$

     (c) $< T_\varphi,\ [_v\ ni\ lu\ [rɔna\ ]] \rightarrow [_T\ [[rɔna]\ n'ni+lu]]$

Continuing along this line of analysis, if clusters are merged into specialized amalgams, we should conclude that mesoclisis is the result of a similar morphological procedure. In other words, a string as *m'mi-ti*$_{nfl}$*-lu* 'to.me-you-it' in *rɔna-m'mi-ti*$_{nfl}$*-lu* 'give(2pl) me it' from (15b) for Morano, implies that the inflection *–ti*$_{2pl}$ does not have a different status from that of clitics (cf. Halle and Marantz 1994), i.e. a clitic string is formed that includes the inflectional exponent, as in (29a). In (29b) the cluster is merged to the verbal stem and the verbal inflectional element *-ti* is externalized as usually to the left of the OCl, yielding (29b) with the effect of mesoclisis.

(29) (a) $< mmi\ [_\varphi ti],\ l-u > \rightarrow [_\varphi\ [_\varphi\ mmi-[_\varphi ti]]\ l-u\ ]$

     (b) $< [_\varphi\ [_\varphi\ mmi-ti]\ l-u\ ],\ rɔn-a_v > \rightarrow [_v\ [rɔn-a\ ]\ mmi - ti - lu]]$

At least two phenomena support the idea that OCls and the inflectional exponent are combined into a cluster, as in (29a). Firstly, the stem combining with mesoclisis is different from the one in the other contexts as highlighted by the comparison between *fatʃ-i-ti-lu* 'do it!' in (30a) and *fatʃ-a-mi-ti-lu* 'do it to me' in (30b) with different TVs. Moreover, examples of doubling of the inflectional material are frequently realized, as in (30c) for the dialect of Albidona.

(30) (a) fatʃ-i-   ti-   l-u
         do-TV- 2PL-   Def-MSG
         'do it there!'

    (b) fatʃ-a-   mi-   ti-   l-u
         do-TV- me-   2PL-   Def-MSG
         'Do it there!'   Morano

    (c) d-a-   tə-   mə-   ˈtɛ-   llə
         give-TV 2PL- 1PS- 1PL- it
         'Give it to me!'   Albidona

The occurrence of 3rd person clitics of the type *l+u/a/i* satisfies a requirement of definiteness implied by these constructs, that we can relate to the non-veridicality of the imperative contexts. The idea, that we will discuss in reference to (39), is that the complex forms are inserted in order to fix referents that are interpreted independently from the scope of the modality.

The DOM effect whereby only 1st person OCls and dative clitics can occur in mesoclisis but not 3rd person clitics, can be traced back to the general point concerning the order in the clitic string. In fact, we see that pronouns interpreted in relation to the discourse context, i.e. 1st/2nd person clitics and dative, as the possessor or location of the direct object, precede accusatives. We have already concluded that this order expresses the scope of the part-whole relation, from 1st/2nd persons or dative over the accusative. Thus, the accusative/ dative syncretism of the 1st and 2nd person clitics suggests that they are however treated as possessors independently of their thematic role (Manzini and Savoia 2010, 2011b, 2017a). This appears to be excluded for the 3rd person clitics, that however are to be read in relation to the event. In mesoclisis this order is however retained 3rd Person obliging elements in the right position. Forcing the elements of 3rd person to the right position.

3.2 The Alternation *a-* vs ɛ-

As discussed in the previous paragraphs, the meaning of the sentence is projected from morphosyntactic properties of lexical items, inflections/clitics included as associated

with interpretable content.[8] Let us consider the auxiliary. We start from the elementary conjecture – the null hypothesis – that the auxiliary *have* is a full verbal projection, embedding a predicative relation between a noun and a participle selecting it as IA (Manzini and Savoia 2011a). As for the internal structure of the participle, we see that in Romance varieties and, specifically, in Italian dialects, inflectional properties identify the participle with a nominal element. The category-less lexical root R combines with the participial suffix, –*t* in the most verbal classes, and the exponent for φ-features. Between the root and the inflectional elements, the Thematic Vowel is inserted, as in (31) (from (1) for Morano).

(31) $[[[cam_R -\varepsilon_{TV}] t_{Part}] u_{Infl}]$ 'called-MSG'

The participial suffix, -*t*- in (28), has a resultative/stative value (Manzini and Savoia 2005). Thematic Vowel, resuming a proposal of Manzini and Savoia (2005, 2007, 2011a), can be identified with a nominal element, introducing an indefinite variable "x", whose value is fixed by the internal (or external) argument of the sentence. More precisely, thematic vowels are nominal inflections making the verbal root into a nominal form of the verb available to insert in the aspectual/modal head. In the terms of the merger operations, the past-participle *cam-ε-t-u* 'called- MSG' is created by merging the TV with R in (32a), this amalgam with the stative suffix -*t*- in (32b) and the φ-features with its result, in (32c). The participle in v satisfies agreement.

(32) (a) $< cam_R, \varepsilon_x > \rightarrow [_x [_R cam] \varepsilon]$
      (b) $[_v < [_x [cam_R] \varepsilon], t_{stative} > \dots \rightarrow [_v [_{Prt} [t\int am_R] \varepsilon_x] t_{stative}] \dots$
      (c) $[_v < [_{Prt} [t\int am_R] \varepsilon_x] t_{stative}, u_{Infl} >] \rightarrow [_{T/v} [[[t\int am_R] \varepsilon_x] t_{stative}] u_\phi] \dots$

Consider now in this perspective the alternant *a-* of the auxiliary, which is introduced when it agrees with the participle, or, more precisely, when the participle is associated with the 3rd person IA by its φ-features. The stem *a-* is able to introduce referential properties compatible with the 3rd IA specified by the participle, in (32); it works like the corresponding OCl in other contexts. We can, therefore, deal with *aɟɟ-u* 'I have.it'[9] as an internally inflected stem selected in combination with the past participle of which it specifies the IA. The head *a(ɟɟ-u)* is pair-merged with the participle yielding (33a), based on sharing compatible (i.e. non contradictory) φ-features, able to refer to the

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8   This assumption excludes the hypothesis that a morpheme ∅, i.e. a non-readable category, alternates with *l-* in auxiliary contexts where the 3rd person is realized through a specialized form of the auxiliary.

9   For the sake of clarity, we remind that in this dialect the ending –*u* of the first person of auxiliary is the usual verbal inflection corresponding to the subject.

same argument. *aɟɟ-* is merged to T forming the verbal amalgam *aɟɟ-u*, agreeing with the subject, in (33b).

(33) (a) $< a_{\varphi}(ɟɟ\text{-}), cam\varepsilon t\text{-}u_{\varphi} > \rightarrow [a(ɟɟ\text{-})_{R}][cam\varepsilon t\text{-}u_{Prt}]$
     (b) $[_{T} < aɟɟ\text{-}, u_{\varphi} > ... \rightarrow [aɟɟu_{Infl/T}]$

The result is the sequence in (34), where the participle externalizes by the alternant *a-* the φ-properties of v.

(34) $[[a_{3RD}ɟɟu_{\ T/Infl}] [[_{VP} [_{Prt} cam\varepsilon\text{-}t\text{-}u_{MSG,}]$ Morano

The other option, implemented by the dialects of Colobraro (cf. (2b)) and Albidona (cf. (6a, c, d)), is that 3rd person clitics are in enclisis. In this respect, we recall that 1st/2nd person OCls occur in proclisis on the auxiliary, as in (35a) and (35b) for Albidona.

(35) (a) mə   nə   vist-ə
        1SG   have.3PL   seen-INFL
        'they have seen me'

     (b) tə   ddʒ-   u   / a / i   dat-ə
        2SG   have.1SG   MSG / FSG / PL   given-INFL
        'I have given it / them to you'   Albidona

     (b') m   ɛn-   u   / a / i dɛt-ə
        1SG   have.1SG   MSG / FSG / PL given-INFL
        'they have given it / them to you'

     (b'')n   ɛn-   u   / a / i dɛt-ə
        3PS.DAT   have.1SG   MSG / FSG / PL given-INFL
        'they have given it / them to her/him/them'   Colobraro

The proclisis of the 1st/2nd person OCls is what we expect since this is the usual position of OCls in declarative sentences, seen in (24). The issue is the occurrence of the 3rd person OCl in enclisis. Superficially, the distribution is similar to what we saw for imperatives in (28), where the OCl of 1st person precedes the inflectional morpheme of the verb and the 3rd person OCl in final position.

Let us assume that 3rd person OCls are pair-merged in the workspace of v, where they realize the IA agreement of v, as in (36a). In other words, the endings *-u/-a/-i* are to be considered as the objective inflections of the auxiliary in v, in (36a), agreeing with the participle. Then the person clitic is merged to *ddʒ-u* 'I have it' (from (2a)), realizing

the second object (the recipient), in (36b); this amalgam is merged to T where realizes the subject agreement, in (36c). The sequence in (36d) is the result:

(36) (a) $[_v < \text{ddʒ}_{\text{Aux}}, u_{\varphi>}] \rightarrow [\text{ddʒ-}u_{\varphi\,\text{Aux}}]$
 (b) $[_T \text{tə}, [\text{ddʒ-}u_{\varphi\,\text{Aux}}]\ldots \rightarrow [\text{tə}\,[\text{ddʒ-}u]_{\text{Aux}}]$
 (c) $[_T < \varepsilon\text{ddʒ}_{\text{1SG}}\text{-}u_{\varphi}, T_{\text{1SG}} > \ldots \rightarrow [\varepsilon\text{ddʒ}_{\text{1SG}}\text{-}u_{\varphi\,\text{Infl/T}}]$
 (d) $[[\text{tə ddʒ-}u]_{\text{Infl/T}}\,[_{VP}\,v\,[_{VP}\,[_{PRT}\,\text{da-t-ə}]]]$

The morphological link between the enclitics elements and the auxiliary is evidenced by an interesting phenomenon, i.e. the occurrence of *-u/-a/-i* even in the negative contexts where the proclitic realization of the OCl is triggered. Thus, as shown in (37), the OCl is divided into two elements, the definiteness root *l(ə)* in proclisis and the gender/number element in enclisis.

(37) ɔ llə ddʒ- u / u / i vist-ə
  Neg 3PS have.1SG MSG / FSG / PL seen-INFL
  'I have not seen her/ him/ them'   Albidona

Two Phase contexts are realized, i.e. v and T; in the latter OCls are merged to the verb (auxiliary), as suggested in (38):

(38) CP/vP phases: T $v_{\text{Aspectual}}$ word-phase
         lə have-u_{φ},   φ, vistə

Our intuition is that the auxiliary in the aspectual construct realizes the event properties of v, and the enclitic element behaves exactly like an inflection on the IA of 3rd person, typically inserting itself in final position. We have already noticed that 3rd person OCls are anchored to the event, to the effect that they are interpreted with respect to it. On the contrary, 1st/2nd person clitic pronouns are interpreted in reference to the discourse universe, so that they are free to occupy the T work-space. We can extend the idea that the auxiliary realizes the aspectual properties of v, to account for its ability to introduce the reference to the IA. In other words, differently from lexical verbs, auxiliary forms have as their only content the features associated with v, both the aspectual properties and, possibly, the IA agreement features. As a consequence, we see that the auxiliary can, someway, realize the reference to IA by its inflection. The different interpretive mechanism of 3rd person and 1st/2nd person explains why the latter escape this type of agreement, as far as their content is not read in relation to the event but is anchored to the universe of discourse, determining a strong effect of DOM. In other words, they are introduced by independent specialized exponents.

This explanation seems to be supported by deontic periphrasis *have-to-V*, where the auxiliary selects for the infinitive of a lexical verb preceded by the preposition *a* 'to'-. In some dialects, i.e. Colobraro and Albidona, we find the ε- stems preceded by the 3rd person OCl *l*-, in (39a, a'). Other systems do not differentiate the behaviour of *have*, introducing however the stem *a*-, as in Morano, in (39b).

(39) (a) l   ε   dda   ca'm-a
    3PS   have.3SG   PREP   call-TV
    '(s)he has to call him/ her/ them'   Colobraro

  (a') l   ε   dda   ca'm-a
    3PS   have.3SG   PREP   call-TV
    '(s)he has to call him/ her/ them'   Albidona

  (b) a-r   a   f-ε
    have-3PS   PREP   do-TV
    '(s)he has to do it'   Morano

Interestingly, the other auxiliary constructs, as for instance the pluperfect, present a certain degree of variability, in the sense that in some dialects the auxiliary includes the reference to the 3rd person, as in (40a, a, b'), while in others the OCl *l*- is inserted, as in (40c).

(40) (a) avi-jə   cam-ε-t-ə
    (3PS) have-IPF.1SG   call-TV-PTP-INFL
    'I had called her/him/them'

  (a') av-erə   cam-ε-t-ə
    (3PS) have-COND.1SG   call-TV-PTP-INFL
    'I would have called her/him/them'   Colobraro

  (b) avi-a   cam-ε-t-u
    (3PS) ave.IPF.1SG   call-TV-PTP-MSG
    'I had called her/him/them'   Morano

  (c) l   avi-ə   vis-t-ə
    3PS   have.IPF-1SG see-PTP-INFL
    'I had seen her/him'   Albidona

We can expect that a dialect such as the one of Albidona, which alternates enclisis and *l*-proclisis, adopts the latter solution in contexts where enclisis is

non morpho-phonologically admitted, as in the case of the imperfect. This solution appears also in the 2nd plural person of the present perfect where again the dialects vary from inserting *l-* (Albidona), cf. *l avisə camatə* 'you have called her/him', to not inserting *l-* (Colobraro, Morano). After all, the definiteness root *l-* for the 3rd person OCl is the outcome that occurs regularly before lexical verbs beginning in vowel, including *have* of possession, that excludes the *a-/ε-* alternation and behaves like the other lexical verbs, as in (9c).

As regards the inability of the form ε- to register the referential properties of the object, we point out that in these varieties only one auxiliary form is attested, that applies to all verb classes (transitives, unergatives, unaccusatives), save to represent with the stem alternant *a-* the 3rd person IA (Baldi and Savoia 2019). In other words, ε- forms have the typical *Elsewhere* distribution, only registering the usual T agreement and excluding the v argumental properties (perhaps reminiscent of the properties of *be*).

We still have to look at negative and modal (imperative) contexts, where 3rd person OCls manifest a referentially richer alternants including the definiteness root *l-* and the gender/ number inflection, as illustrated in the examples in (12), (13), (14), (15) and (17). Manzini and Savoia (2017b) propose that the introduction of the definiteness root *l-* (and possibly the stress, cf. fn. 1) in non-veridical contexts, such as imperative and negation (Giannakidou 1998, 2011), is required as it provides a complete referential content in contexts where the pronoun is out of the scope of the relevant operator. Combining with a non-veridical state of affairs, 3rd person OCls incorporate also the definiteness morpheme. In other words, this make them able to be interpreted independently of the usual connection with the event, on a par with 2st/2nd person elements. Thus, in negative contexts the pronoun provides the restriction for the variable x introduced by the negation, something like (41) (Baldi and Savoia 2021).

(41) $[^- \exists x \quad [_{\text{Neg}} \text{nu} [x [ll_{\varphi}]]] [_T \varepsilon\textternal\textjju}\dots$ Morano
     'I have not … it/her/him/them'   cf. (5a)

4. Concluding Observations

The data concerning the realization of the 3rd person OCls in auxiliary contexts presented in Manzini and Savoia (2005, § 5.11) can help us to highlight some generalizations. If only by focusing on the data from Southern Italian dialects, we note that the realization of the auxiliary *have* with the simple object clitic drop is very widespread. In that corpus, we find the alternation between ∅ and *l-* in the 2nd singular in Montesano (South Campania) dialect in (42a) and between ∅ and *l-* in 1sg and plural in the dialect of Volturino (North Apulia) in (42b). The systems we have found in Lausberg area are attested in other adjacent varieties: Colobraro's system characterizes also the dialects of the nearby Valsinni and Cersosimo, and the alternation between *a-* and *ε-*forms, as in the dialect of Morano, characterizes other North Calabrian varieties, for instance that of Nocara.

(42) (a) addʒə camatə
l e camatə
a ccamatə …
'I have called him, etc.'   Montesano

(b) l ejə camatə
a camatə
a camatə
l emə camatə
l etə camatə
l ennə camatə
'I have called him/her/them, etc.'   Volturino

The table in (43) schematizes the distribution of the different alternants, where ∅ indicates the simple drop of the 3rd person OCl, *a-* the specialized form of the auxiliary, *l-* the insertion of the prevocalic form of the clitic, enclisis the enclitic occurrence of the OCl.

(43)	Many dialects	Morano	Montesano	Volturino	Colobraro	Albidona
1sg	∅	*a*	∅	l-	encl	encl
2sg	∅	*a*	l-	∅	encl	l-
3sg	∅	*a*	∅	∅	*a*	l-
1pl	∅	*a*	∅	l-	encl	encl
2pl	∅	∅	∅	l-	∅	l-
3pl	∅	*a*	∅	l-	encl	encl

We see that the simple drop is the basic solution. Enclisis is limited to a subset of persons: in particular, enclisis on the second person implies its occurrence on the first, that seems to be the specialized context for it to be implemented. Generally, the third singular person excludes enclisis. 1st singular person and 1st/ 3rd persons apply the same pattern, favouring the realization of the enclitic or *l-* clitic. The 3rd singular generally excludes the independent realization of the pronoun. We note that the realization of the 3rd person OCl can be uniform (∅ or *a-*) along the paradigm or not. In this second case, the overt realization of the 3rd person IA is generally associated with the persons that are discourse-implicated, such as 1st singular, or discourse anchored, 1st, 2nd and 3rd plural. Needless to say, we are speculating on constraints that, on a par with the DOM effects, belong to a more external linguistic knowledge of the speaker and not to the inner grammar (cf. Bobaljik 2002). We can think of them as the result of the ordinary syntactic combinatory procedure of pair-merge and the effect of "third factor" constraints that regulate the interpretation (Chomsky 2005). A plausible hypothesis is that the interpretive work can possibly involve general semantic constraints.

Summing up, we have applied a morphological model based on the idea that there is no specialized morphological component nor a different nature for morphological rules. The hypothesis we have pursued is that morphemes (lexical and functional) are endowed with interpretable properties that determine they occurrence in syntax, thus detaching ourselves from the typical perspective of DM. This approach has in the operation of (pair-)merge its basic mechanism, able to treat the formation of complex words and their relation with syntax.

Works Cited

Baker, Mark. 1988, *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago Press.

Baldi, Benedetta, and Leonardo M. Savoia. 2019. "Auxiliary Selection in Italian Dialects: Person Split, OCls and Raddoppiamento Fonosintattico." *Quaderni di Linguistica e Studi Orientali* QULSO 4: 55–105.

Baldi, Benedetta, and Leonardo M. Savoia. 2020. "Clitics in Imperative: Proclisis, Enclisis and Mesoclisis in Albanian and in Italo-Romance Varieties Of Lausberg Area." *LINGBAW* 6: 17–46.

Baldi, Benedetta, and Leonardo M. Savoia. 2021. "Partitives and Indefinites: Phenomena in Italian Varieties." *Studia Linguistica*: 1–45. https://onlinelibrary.wiley.com/doi/full/ 10.1111/stul.12181.

Belvin, Robert, and Marcel Den Dikken. 1997. "There, happens, to, be, have." *Lingua* 101: 151–183.

Bobaljik, Jonathan D. 2002. "Syncretism without Paradigms: Remarks on Williams 1981, 1994." In *Yearbook of Morphology* 2001, edited by Geert Booij and Jaap van Marle, 53–85. Dordrecht: Springer.

Calabrese, Andrea. 2015. "Irregular Morphology and Athematic Verbs in Italo-Romance." *Isogloss*: 69–102.

Chierchia, Gennaro. 1997. "Partitives, Reference to Kinds and Semantic Variation." In *Proceedings of Semantics and Linguistic Theory* VII, edited by Aaron Lawson, 73–98. Ithaca: CLC Publications.

Chomsky, Noam. 1972. *Studies on Semantics in Generative Grammar*. The Hague: Mouton.

Chomsky, Noam. 2001. "Derivation by Phase." In *Ken Hale: A Life in Language,* edited by Michael Kenstowicz, 1–54. Cambridge, Mas.: The MIT Press.

Chomsky, Noam. 2005. "Three Factors in Language Design." *Linguistic Inquiry* 36 (1): 1–22.

Chomsky, Noam. 2015. "Problems of Projections." In *Structures, Strategies and Beyond. Studies in Honour of Adriana Belletti*, edited by Elisa Di Domenico, Cornelia Hamann, and Simona Matteini, 3–16. Amsterdam: John Benjamins.

Chomsky, Noam. 2020a. *The UCLA Lectures* (April 29 – May 2, 2019). https://ling.auf.net/lingbuzz/005485

Chomsky, Noam 2020b. "Puzzles about Phases." In *Linguistic Variation: Structure and Interpretation: Contributions in Honor of M. Rita Manzini*, edited by Ludovico Franco and Paolo Lorusso, 163–167. Berlin: De Gruyter.

Chomsky, Noam, Ángel Gallego, and Dennis Ott. 2019. "Generative Grammar and the Faculty of Language: Insights, Questions, and Challenges." In *Generative Syntax: Questions, Crossroads, and Challenges*, *Catalan Journal of Linguistics*. *Special Issue*, edited by Ángel Gallego and Dennis Ott, 229–261.

Collins, Chris, and Richard Kayne. 2020. *Towards a Theory of Morphology as Syntax*, online. Accessed 22 June, 2022. http://ordinaryworkinggrammarian.blogspot.com/2020/12/towards-theory-of-morphology-as-syntax.html (13.07.2021).

Embick, David. 2010. *Localism versus Globalism in Morphology and Phonology*. Cambridge, MA: The MIT Press.

Embick, David, and Rolf Noyer, 2001. "Movement Operations after Syntax." *Linguistic Inquiry* 32 (4): 555–595.

Giannakidou, Anastasia. 1998. *Polarity Sensitivity as (Non)Veridical Dependency*. Amsterdam: John Benjamins.

Giannakidou, Anastasia, 2011. "Negative and Positive Polarity Items." In *Semantics: An International Handbook of Natural Language Meaning*, vol. 2, edited by Klaus von Heusinger, Claudia Maienborn, and Paul Portner, 1660–1712. Berlin: Mouton de Gruyter.

Halle, Morris, and Alec Marantz. 1993. "Distributed Morphology and the Pieces of Inflection." In *The View from Building 20*, edited by Kenneth Hale and Samuel Jay Keyser, 111–176. Cambridge, Mass: The MIT Press.

Halle, Morris, and Alec Marantz. 1994. "Some Key Features of Distributed Morphology." In *Papers on Phonology and Morphology*, edited by Andrew Carnie, Heidi Harley, and Tony Bures, 275–288. *MIT Working Papers in Linguistics 21*.

Han, Chung-hye. 2011, "Imperatives." In *Semantics*, vol. 2, edited by Klaus von Heusinger, Claudia Maienborn, and Paul Portyner, 1785–1804. Berlin: De Gruyter Mouton.

Hauser, Marc D., Noam Chomsky, and W. Tecumseh Fitch. 2002. "The Faculty of Language: What Is It, Who Has It, and How Did It Evolve?" *Science* 298: 1569–1579.

Lausberg, Heinrich. 1939. *Die Mundarten Südlukaniens*. Niemeyer: Halle.

Manzini, M. Rita. 2021. "Chomsky's (2020) Links and Linker Phenomena." *Quaderni di Linguistica e Studi Orientali* QULSO online 7: 89–102.

Manzini, M. Rita, and Leonardo M. Savoia. 2005. *I dialetti italiani. Morfosintassi generativa*. 3 vv., Alessandria: dell'Orso.

Manzini, M. Rita, and Leonardo M. Savoia. 2010. "Syncretism and Suppletion in Clitic Systems: Underspecification, Silent Clitics or Neither?" In *Syntactic Variation. The Dialects of Italy*, edited by Roberta D'Alessandro, Adam Ledgeway, and Ian Roberts, 86–101. Cambridge: Cambridge University Press.

Manzini, M. Rita, and Leonardo M. Savoia. 2011a. *Grammatical Categories: Variation in Romance Languages*. Cambridge: Cambridge University Press.

Manzini, M. Rita, and Leonardo M. Savoia. 2011b. "Mesoclisis in the Imperative: Phonology, Morphology or Syntax?" *Lingua* 121: 1101–1120.

Manzini, M. Rita, and Leonardo M. Savoia, 2017a. "Enclisis/Proclisis Alternations in Romance: Allomorphies and (Re)Ordering." *Transactions of The Philological Society* 115: 98–136.

Manzini, M. Rita, and Leonardo M. Savoia. 2017b. "Gender, Number and Inflectional Class in Romance: Feminine/Plural –a." In *Language Use and Linguistic Structure*, edited by Joseph Emonds and Markéta Janebová, 263–282. Olomouc: Palacký University Olomouc.

Manzini, M. Rita, and Leonardo M. Savoia. 2018. *The Morphosyntax of Albanian and Aromanian Varieties*. Berlin: De Gruyter Mouton.

Manzini, M. Rita, Leonardo M. Savoia, and Benedetta Baldi. 2020. "Microvariation and Macrocategories: Differential Plural Marking and Phase Theory." *L'Italia Dialettale* 81: 189–212.

Marantz, Alec. 1997. "No Escape from Syntax: Don't Try Morphological Analysis in the Privacy of Your Own Lexicon." *University of Pennsylvania Working Papers in Linguistics* 4: 201–25.

Marantz, Alec. 2001. *Words*. WCCFL XX Handout, USC, February 2001.

Marantz, Alec. 2007. "Phases and Words." In *Phases in the Theory of Grammar*, edited by Sook-Hee Choe, 191–222. Seoul: Dong-In Publishing.

Platzack, Christer, and Inger Rosengren. 1998. "On the Subject of Imperatives: A Minimalist Account of the Imperative Clause." *The Journal of Comparative Germanic Linguistics* 1: 177–224,

Portner, Paul. 2004. "The Semantics of Imperatives within a Theory of Clause Types." In *SALT* XIV, edited by Robert Young, 235–252. Ithaca, NY: Cornell University.

Richards, M. D. 2011. "Deriving the Edge: What's in a Phase?" *Syntax* 14: 74–95.

Roberts, Ian. 2010. *Agreement and Head Movement*. Cambridge, Mass.: The MIT Press.

Savoia, Leonardo M., and M. Rita Manzini. 2010. "Lexicalization of 3rd Person Object Clitics: Clitic Enclisis and Clitic Drop." In *Syntactic Variation. The Dialects of Italy*, edited by Roberta D'Alessandro, Adam Ledgeway, and Ian Roberts, 102–118, Cambridge: Cambridge University Press.

Savoia, Leonardo M., Benedetta Baldi, and M. Rita Manzini. 2018. "Sigmatic Plurals in Romance Varieties Spoken in Italy and Their Interaction with -i Plurals." *LINGBAW* 4: 141–160.

Speas, Peggy, and Carol Tenny. 2003. "Configurational Properties of Point of View Roles." In *Asymmetry in Grammar*, edited by Anna DiSciullo, 315–344. Amsterdam: John Benjamins.

Williams, Edwin. 1994. "Remarks on Lexical Knowledge." *Lingua* 92: 7–34.

Wood, Jim, and Alec Marantz. 2017. "The Interpretation of External Arguments." In *The Verbal Domain*, edited by Roberta D'Alessandro, Irene Franco, and Ángel J. Gallego, 255–278. Oxford: Oxford University Press.

Part II. Explorations in Syntax

Passivization of Multiple Complement Verbs in English

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Abstract: In the present article I investigate multiple complement verbs in passive constructions in English. I account for the fact that recipients in the dative construction and themes in the double object constructions do not undergo passivization, as sentences like *To John was given water*, *John was given water to* or *Water was given John* are ungrammatical. I am going to approach the issue from a new perspective. The framework that I adopt is Syntax First Alignment (Newson 2010), which assumes no constituent structure and operates with a limited set of constraints.

1. Introduction

It is a generally accepted fact that both the direct and the indirect object can undergo passivization in English. This is illustrated by (1a) and (1b):

(1) (a) Water was given to John.
     (b) John was given water.

The standard assumption is that (1a) is related to the dative construction, while (1b) is related to the double object construction, compare (2a) and (2b), respectively.

(2) (a) Someone gave water to John.
     (b) Someone gave John water.

From a standard point of view, the two constructions are distinct although they share certain common underlying properties. The following questions arise: why is it impossible to passivize the recipient in the dative construction (with or without the preposition) and why is it impossible to passivize the theme in the double object construction? In other words, why are the sentences in (3) ungrammatical?

(3)   (a) *To John was given water.
      (b) *John was given water to.
      (c) *Water was given John.

The main goal of the present paper is to answer these questions. I assume that the two constructions in (1) come from almost identical sources, the only difference between them is that the direct object in (1b) is a focussed element. First of all, I am going to discuss the relevant background assumptions, following Grimshaw (2005) and Ramchand (2008). Secondly, I introduce Syntax First Alignment (SFA), i.e. the framework within which I address the issue of multiple complement verbs. Lastly, I will explain certain word order phenomena and present the analysis itself in detail.

2.   Background Assumptions
2.1 Semantic Decomposition and Event Structure
Following Grimshaw (2005) and using Levin and Rappaport Hovav's (2005) terminology, I assume that verb meanings are composed of root content (idiosyncratic information) and their event structures, i.e. what type of event they denote. In other words, it is proposed that there is a root element ($\sqrt{}$) as well as other elements which add some pieces of event and argument structure related to this root.

Ramchand (2008) – among others – discusses the semantic decomposition of predicates which may contain three subevents: a causing subevent, a process-denoting subevent and a result subevent. She introduces three projections: the causing projection (headed by *init*), the process projection (headed by *proc*) and the result projection (headed by *res*). According to Ramchand*, init* is very similar to *v,* which licenses the external argument. Accordingly*, proc* and *res* have similar functions, they license the internal arguments. The former specifies the nature of the change or process and licenses the subject of the process (i.e. the undergoer/theme), while the latter licenses the subject of the result, e.g. the recipient.

When analysing double object verbs, as *in Alex gave the ball to Ariel*, she proposes the following structure. Note that *to* is inserted under *res*.

(4)   *initP* (causing projection)

Alex

init
gave

procP (process projection)

the ball

proc   *resP* (result projection)

res   XP
to

Ariel
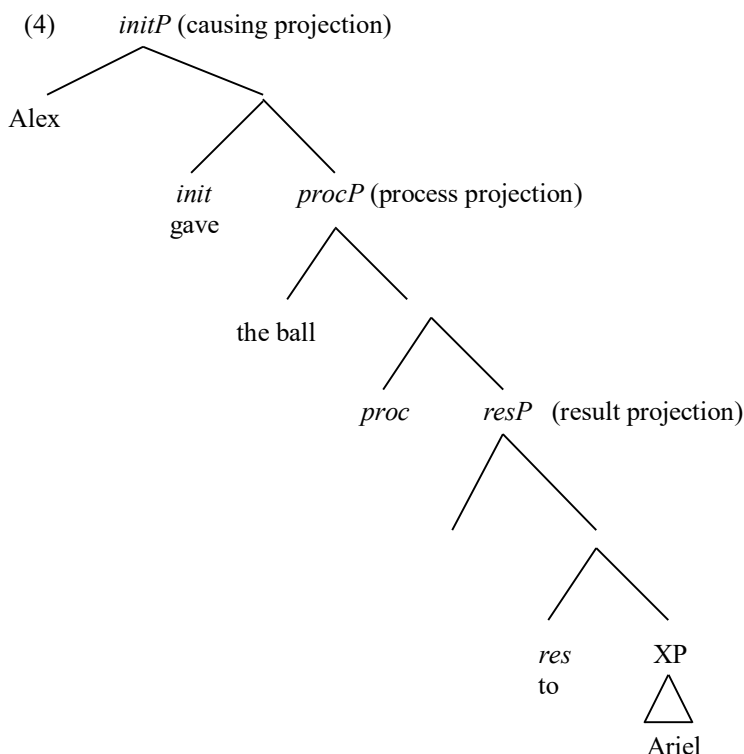
In my analysis, I will refer to *init*, *proc* and *res* as v_1, v_2 and v_3,[1] respectively and as licensors collectively.

2.2. The Rudiments of Syntax First Alignment

The model *Syntax First Alignment* (SFA), which is based on Alignment Syntax, was introduced by Newson (2010). It is an approach that rejects the existence of constituent structure. In this respect, it is similar to other models such as Word Grammar (Hudson 1984) and Dependency Grammar (Debusmann 2006), but differs greatly from these non-constituent structural approaches, as Syntax First Alignment is based on general Optimality Theoretic assumptions (Prince and Smolensky 1993).

Also, it is proposed that the input consists of sub-lexical elements, called Conceptual Units (CUs), i.e. universal stock of basic units –this is an assumption which is shared by Nanosyntax (Starke 2009) as well. According to Newson and Szécsényi (2012),

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1   In this respect, I follow Newson (2014).

two types of CUs can be distinguished: roots that carry descriptive semantic content[2] (represented with the symbol √) and functional units which represent more functional content, e.g. tense, aspect, person and number. There are functional CUs, referred to as markers, which relate arguments to the event structure of a given predicate. In Syntax First Alignment, the input is the basis of semantic interpretation in the same way as it is the basis of the syntactic interpretation. The input itself contains information that is relevant for both aspects of processing.

The generator (GEN) imposes linear orderings on the input elements while it is not allowed to add any element which is not part of the input. This also means that the candidate set is finite[3] – as opposed to Optimality Theory. On the other hand, there may be elements that are present in the input but are absent from the output violating faithfulness constraints – see below.

These orderings constitute the candidate set which will be evaluated by alignment and faithfulness constraints – to be discussed shortly. Only after the optimal candidate has been determined does lexical insertion occur. In other words, vocabulary items are inserted post-syntactically. In SFA, the vocabulary contains phonological forms, the associated ordered sets of conceptual units as well as the context of insertion. For example, the vocabulary entry for the progressive is as follows:

(5)   ing ↔ [prog] / √ - [4]

The notion of late lexical insertion is an integral component of more recent models as well, e.g. Distributed Morphology (Halle and Marantz 1993) or Nanosyntax (Starke 2009). According to Newson and Szécsényi (2012), four principle restrict late lexical insertion.

First, in line with Nanosyntax, they opt for the so-called Superset Principle,[5] which requires that a vocabulary item can be inserted if it is associated with all the CUs which can be found in a given sequence of CUs although it may contain extra CUs as well. For instance, if the sequence to be realized is <x,y,z>, and the possible vocabulary items

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2   The roots constitute what are traditionally referred to as verbs, nouns, or adjectives depending on the context which they are positioned in. For instance, a root aligned to a determiner will be realised as a noun.

3   This makes computing and evaluation much easier, which is another advantage of the present model.

4   The symbol to the left of the arrow can be pronounced as "associated with". It represents the phonological form of the progressive suffix. However, for the sake of convenience I always use the orthographical forms in my paper.

5   Caha (2009) also argues in favour of the Superset Principle instead of the Subset Principle, which Distributed morphology operates with.

that can spell it out are associated with <x,y>, <x,y,z,w> and<x,y,w>, the best fitting match will be <x,y,z,w> even though it is associated with an extra <w> conceptual unit: it contains all the features of the sequence <x,y,z>.

In addition, Newson and Szécsényi (2012) further assume that only contiguous sequences can be realized by a single vocabulary item. Also, they propose that vocabulary insertion is root centric, which means that the process begins with the roots, spelling them out with those contiguous functional units which the vocabulary entry allows for, while the remaining conceptual units will be realized separately. Lastly, the principle of Minimal Vocabulary Access requires that a string of conceptual units be spelled out by the fewest number of vocabulary items possible.

The architecture of Syntax First Alignment is presented below:

(6) input→ GEN→ candidate set→ EVAL→ optimal candidate→ late lexical insertion
        ↓
     semantic interpretation
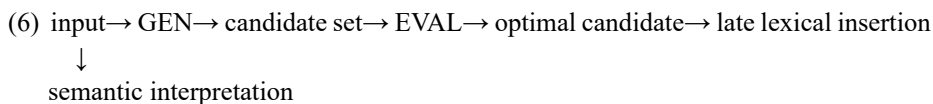
The notion of a domain needs to be introduced, as it also plays a key role in SFA. Newson (2010, 32) defines domains as "sets of input elements which share a given property". For instance, the argument domain consists of arguments related to the same predicate. Importantly, domains are not structural units, and are not necessarily contiguous strings either, as their members can be separated by other elements. The concept of a domain is useful if the position of a given element needs to be determined with regard to two or more elements.

Let us return to the constraints mentioned above. There are only two families of constraints[6] operating in Syntax First Alignment: faithfulness and alignment constraints. Faithfulness constraints are violated if an element which is present in the input is missing from the output. In other words, these constraints guarantee that the input and the output are identical. They are generally ranked high; otherwise, many elements may be deleted from the output, which would prevent the hearer from recovering the intended meaning.

As far as alignment constraints are concerned, three basic relationships can be distinguished: precedence, subsequence and adjacency. These constraints are responsible for the position of target elements with regard to hosts, which can be single elements or domains.

(7)   (a) xPy 'x precedes y'   violated by y...x order
      (b) xFy 'x follows y'   violated by x...y order
      (c) xAy 'x is adjacent to y' violated by every CU which intercedes between
                                     x and y

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6   Actually, these constraints constitute a more limited set of constraints than the ones proposed in Optimality Theory, where nothing restricts what can be a possible constraint.

When the host is a domain, the constraints can be defined in terms of the violation conditions below, following Newson and Szécsényi (2012):

(8) (a) xPDy   'violated by every member of domain y which precedes x'
     (b) xFDy   'violated by every member of domain y which follows x'
     (c) xADy[7]   'violated by every member of domain y which is not adjacent to x'

In addition, there are also anti-alignment constraints with respect to a given domain. For instance, $x*PD_y$ requires that x cannot precede domain y. This anti-alignment constraint is violated if x precedes all the members of domain y or if D_y has no members at all.

In the next sections, I am going to demonstrate that it is possible to explain the phenomena introduced in section 1 within the framework of Syntax First Alignment using only alignment and faithfulness constraints.

3.1 Basic Word Order in English

To account for the word order in passive sentences, it is necessary to briefly introduce the constraints which determine the position of the arguments, licensors, the root and the inflections.

Let us first start with the argument domain (D_A), which is composed of the argument makers related to a given verbal root – following Newson (2013). In English the order of these markers is $[arg_1] > [arg_2] > [arg_3]$, where $[arg_1]$, $[arg_2]$ and $[arg_3]$ are associated with what is traditionally referred to as the external argument and the two internal arguments, respectively. Newson (2013) proposes the following constraints, which are responsible for their order:

(9) $[arg_1]PD_A > [arg_2]PD_A > [arg_3]PD_A$

The first constraint, for instance, is violated by every member of D_A which precedes $[arg_1]$.

In English, the verbal root follows the subject while preceding all the other arguments. In other words, it occupies the second position in the argument domain. This second position phenomenon can be captured by the combination of an anti-precedence and a precedence constraint: the former guarantees that the verbal root does not precede the argument domain while the latter requires the verbal root to precede the argument domain. The result is that the root is not first, but as close to first as it can be (i.e. second).

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7   The constraints in (7c), (8a), (8b) and (8c) are gradient constraints, which means that they can be violated to different degrees. The others are non-gradient constraints as they cannot be violated gradually: they are either violated or not.

(10) $\sqrt{*}PD_A > \sqrt{PD_A}$

The licensor domain (D_L) comprises v_1, v_2 and v_3.[8] The order of these elements is determined by the constraints in (11):

(11) $[v_1]PD_L > [v_2]PD_L > [v_3]PD_L$

Before determining the position of the licensors with respect to the verbal root, it is necessary to take a look at multiple complement verbs, as they are associated with three arguments and consequently with three licensors as well.

(12) Someone gave water to John.

If we assume that it is v_3 that is realized by the preposition, it can be concluded − contrary to what Newson (2014) claims − that v_3 is not necessarily adjacent to v_2, however, I agree with him that v_1 and v_2 are adjacent to the root and are normally spelled out with it. It seems that it is more important for v_3 to be adjacent to $[arg_3]$ than to be as close to the root as possible, i.e. directly follow v_2, c.f. the hierarchy of the relevant constraints − (13c) and (14d) − in the table below. Note that in English the first argument precedes its licensor, while the second and the third argument follow their licensors. This can be achieved by the constraints below:

(13) (a) v_1 A $\sqrt{}$
        (b) v_2 A $\sqrt{}$
        (c) v_3 A $\sqrt{}$

(14) (a) $[arg_1]$ P v_1
        (b) $[arg_2]$ F v_2
        (c) $[arg_3]$ F v_3
        (d) $[arg_3]$ A v_3

Table (1) shows the hierarchy and the interaction of these constraints:

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8   The list of the members of this domain will be slightly modified soon.

		$[arg_3]$ A v_3	$[arg_3]$ F v_3	v_1 A√	v_2 A√	v_3 A√	$[arg_1]$ P v_1	$[arg_2]$ F v_2
→	(15a)	$[arg_1]$ v_1 √ v_2 $[arg_2]v_3[arg_3]$					**		
	(15b)	$[arg_1]$ v_1 √ v_2 $v_3[arg_2][arg_3]$	*(!)				*		
	(15c)	$[arg_1]$ v_1 √ v_2 $[arg_2][arg_3]v_3$		*(!)			***		
	(15d)	v_1 √ $v_2[arg_1][arg_2]$ v_3 $[arg_3]$					***(!)	*	
	(15e)	$[arg_1]v_1$ √ $[arg_2]v_2$ v_3 $[arg_3]$				*(!)	**		*

Table 1. Order of arguments, licensors and the root

As demonstrated above, the winning candidate is (15a), as it best satisfies the given constraints. Candidate (15b) loses on the highest-ranked constraint, as the third argument is not adjacent to v_3, which is a fatal violation – marked with '!'. (15c) and (15e) are also ruled out, because they violate higher-ranked constraints: the former violates the constraint which requires the third argument to follow v_3, whereas the latter violates the constraint which guarantees the adjacency of v_2 and the root. Candidate (15d) loses on the constraint which requires v_3 to be adjacent to the root: this constraint is violated three times, as three CUs intercede between them, while (15a) violates this constraint only twice.

I assume that the vocabulary entry for *give* is as in (16), while *to* is associated with v_3 in its vocabulary entry (c.f. 17):

(16) give ↔ v_1 √ v_2 v_3

(17) to ↔ v_3

Note that the Superset Principle allows the sequence v_1 √ v_2 in (15a) to be spelled out by *give* as well. In this case, v_3 needs to be realized independently by *to*, because only contiguous sequences can be spelled out by a single vocabulary item.

Now let us take a look at (18), where the recipient directly follows the verb.

(18) Someone gave John water.

The only difference between (12) and (18) is the presence of the *focus* CU associated with the direct object in (18) which is responsible for the position of this object, as focussed objects tend to follow the argument domain.[9] This is ensured by a focus constraint:

(19) Foc F D$_A$

This constraint is ranked lower than [arg$_1$]PD$_A$, as focussed subjects are typically fronted, but is ranked higher than [arg$_2$]PD$_A$ and [arg$_3$]PD$_A$:

(20) [arg$_1$]PD$_A$ > Foc F D$_A$ >[arg$_2$]PD$_A$ >[arg$_3$]PD$_A$

Recall that the root takes the second position in the argument domain. The constraints which are responsible for this are in (10). Tableau (2) illustrates how these constraints yield the desired word order[10]:

		√*PD$_A$	√PD$_A$	[arg$_1$]PD$_A$	Foc F D$_A$	[arg$_2$]PD$_A$	[arg$_3$]PD$_A$
(21a)	[arg$_1$] √[foc arg$_2$]^{11} [arg$_3$]		*		*(!)	*	**
→ (21b)	[arg$_1$] √ [arg$_3$] [foc arg$_2$]		*			**	*
(21c)	√ [arg$_1$] [arg$_3$] [foc arg$_2$]	*(!)				**	*
(21d)	[arg$_3$] √ [arg$_1$] [foc arg$_2$]		*	*(!)		**	
(21e)	[foc arg$_2$] √ [arg$_3$] [arg$_1$]		*	**(!)	**		*

Table 2. Order of arguments in double object constructions

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9   This is in line with Rochemont and Culicover (2009), who state that structural foci in English are right-peripheral. (Note that this also accounts for the fact that sentences like *I gave the beautiful girl it* are ungrammatical. Pronouns are not associated with focus, as they typically represent old information. Therefore, the IO>DO order where the indirect object is a DP and the direct object is a pronoun is not motivated.) Secondly, a similar observation is made by Røreng (2011), who investigates the order of arguments in German. She claims that the canonical word order in German is DO>IO (just like in English) which can be modified by the focus factor: focussed direct objects follow indirect objects.

10   The licensors are not included in this table, as my focus is now on the order of the arguments and the root. I will return to this issue in the next section.

11   For the sake of convenience, I use the CU *[foc arg$_2$]* (focussed second argument) as a shorthand for [foc][arg$_2$].

Note that the proposed constraints can also account for the order of arguments and the root in (1b), repeated as (22). Bear in mind that it was assumed that the direct object is a focussed element while the first argument is not present, as it lacks an agent.

(22) John was given water.

		$\sqrt{*}PD_A$	$\sqrt{}PD_A$	$[arg_1]PD_A$	Foc F D_A	$[arg_2]PD_A$	$[arg_3]PD_A$
→ (23a)	$[arg_3]$ $\sqrt{}$ $[foc\ arg_2]$		*			*	
(23b)	$[arg_3]$ $[foc\ arg_2]$ $\sqrt{}$		**(!)			*	
(23c)	$\sqrt{}$ $[arg_3]$ $[foc\ arg_2]$	*(!)				*	
(23d)	$\sqrt{}$ $[foc\ arg_2]$ $[arg_3]$	*(!)			*		*
(23e)	$[foc\ arg_2]$ $\sqrt{}$ $[arg_3]$		*		*(!)		*
(23f)	$[foc\ arg_2]$ $[arg_3]$ $\sqrt{}$		**(!)		*		*

Table 3. Order of arguments in passive constructions with a focussed direct object

The last domain which plays an important role in establishing the word order in English is the inflection domain (D_I), which is made up of the inflectional, the perfect, the progressive and the passive conceptual unit. As the order of these CUs is fixed, the following constraints are introduced (Newson 2013):

(24) $[I]PD_I > [perf]PD_I > [prog]PD_I > [pass]PD_I$

As the examples in (25) demonstrate, the root must precede the last element of the inflectional domain. This can be guaranteed by the constraints in (26).

(25) (a) He   has   been   singing
          [I]   [perf] $\sqrt{}$ [prog]
       (b) It   had   been   being   built
          [I]   [perf]   [prog] $\sqrt{}$ [pass]

(26) $\sqrt{*}FD_I > \sqrt{}FD_I$

Another important issue is the position of the inflections with respect to the licensors. I assume that v_1 and v_2 are adjacent to the root under normal circumstances and thus spelled out with it.

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However, v_3 is less connected to the root, which (12), repeated as (27) below, demonstrates. The inflectional element, i.e. [past] is closer to the root than v_3, realized by *to*:

(27) Someone gave water to John.

The conclusion is that the constraint which requires inflections to be adjacent to the root, i.e. [infl]A√, is ranked lower than v_1 A √ and v_2 A √ but ranked higher than v_3A √:

(28) v_1 A √> v_2 A √ > [infl]A√ > v_3A √

3.2 Passivization and Multiple Complement Verbs

It is often argued that passive sentences contain an implicit agent. In Csontos (2017), I propose that the passive morpheme *–en* spells out two CUs: the implicit general external argument (GEA) and the passive CU ([pass]), which licences it. Therefore, [pass] is a licensor, i.e. a member of D_L. Note, however, that [pass] is a member of the inflection domain as well. The vocabulary for the passive *–en* is as follows.

(29) en ↔ [pass][GEA]

The question is why the preposition is absent in (18) and (22) but present in (27) and in (1a), repeated as (30):

(30) Water was given to John.

Importantly, the CU which the preposition realizes, i.e. v_3, must be present in the inputs: there is no semantic difference between the dative construction (where v_3 is spelled out by *to*) and the double object construction (where *to* is seemingly absent) - apart from the focus on the direct object in the latter. Similarly, there is no semantic difference between (22) and (30) either, besides the fact that the direct object is focussed in the former. So, the question arises as to what happens to v_3 in (18) and (22). My claim is that it gets deleted from the output - violating a faithfulness constraint. More specifically, I identify the presence of the focus on the second argument as the condition on which v_3 is deleted[12]. This can be achieved by the following constraints:

(31) v_3 F [foc arg$_2$] > v_3 P [foc arg$_2$] > Faith (v_3) [13]

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12   If the direct object is not focussed, these constraints are vacuously satisfied, and the order of the relevant CUs will be determined by lower ranked constraints.

13   Both of the two higher ranked constraints are satisfied if v_3 is deleted, as they are not violated by the reverse order of the given elements.

Note that deletion is generally problematic from an interpretability point of view. However, v_3 is an element that does not need an independent realisation for the result to be interpretable. Therefore, licensors are more easily deleted than, for example, arguments themselves, as they are recoverable from the visible argument and the content of the root.

Now let us see how the assumptions and the constraints introduced so far can yield the desired results. Let us start with (22), i.e. *John was given water.*

Candidates 32a. $[arg_3]$ [past] √ $v_2 v_3$ [pass][GEA] [foc arg_2]
32b. $[arg_3]$ [past] √ v_2 [pass][GEA] [foc arg_2]
32c. $[arg_3]$ [past] √ v_2 [pass][GEA] [foc arg_2] v_3
32d. $[arg_3]$ [past] √ v_2 [pass][GEA] v_3 [foc arg_2]
32e. $v_3 [arg_3]$ [past] √ v_2 [pass][GEA] [foc arg_2]

	√*FD₁	√FD₁	v_3 F [foc arg₂]	v_3 P [foc arg₂]	Faith (v_3)	[arg₃] A v_3	[arg₃] F v_3	v_2 A √	[infl] A √	v_3 A √	Foc F D_A	[arg₂]PD_A	[arg₃]PD_A
(32a)		*	*(!)			***	*		**	*		*	
→ (32b)		*		*					*			*	
(32c)		*		*(!)		6*	*		*	****		*	
(32d)		*	*(!)			5*	*		*	***		*	
(32e)		*	*(!)										

Table 4. Order of CUs in passive constructions with multiple complement verbs involving a focussed direct object

The optimal candidate is (32b): $[arg_3]$ and [foc arg_2] are spelled out by the recipient *John* and the theme *water,* respectively, while the root and v_2 are realized by the verb *give* – following the Superset Principle. The [past] CU is spelled out by *was,* whereas [pass][GEA] is realized by the passive morpheme *–en.* Also, this table answers the question of why **John was given water to* (c.f. 32c) and **To John was given water* (cf. 32e) are ungrammatical: (32b) is a more optimal candidate.

As tableau (5) demonstrates, v_3 is realized separately if the theme is not focussed, as in *Water was given to John:*

Candidates   a.   [arg₂] [past] √ v₂ v₃ [pass][GEA] [arg₃]
             b.   [arg₂] [past] √ v₂ [pass][GEA] v₃ [arg₃]
             c.   [arg₂] [past] √ v₂ [pass][GEA] [arg₃]
             d.   [arg₂] [past] √ v₂ [pass][GEA] [arg₃] v₃

	√*FD₁	√FD₁	v₃ F [foc arg₂]	v₃ P [foc arg₂]	Faith (v₃)	[arg₃] A v₃	[arg₃] F v₃	v₂ A√	[infl] A√	v₃ A√	Foc F D_A	[arg₂]PD_A	[arg₃]PD_A
(33a)		*				* * (!)	*		**	*			*
→ (33b)		*							*	***			*
(33c)		*			*(!)				*				*
(33d)							*(!)		*	****			*

Table 5. Order of CUs in passive constructions with multiple complement verbs

The winning candidate is (33b).[14] As the table illustrates, v₃ needs to be realized separately by *to*, as the verb cannot spell it out with the root and v₂ although it is associated with all the licensors in its vocabulary entry, see (16). The reason for this is that these elements do not form a contiguous sequence, as v₂ and v₃ are separated by [pass] and [GEA]. Note also that we can account for the ungrammaticality of **Water was given John* (c.f. (33c): (33b) is more optimal.

4.   Conclusion

In the present paper, I have demonstrated that it is possible to account for the presence and absence of the preposition *to* in passive constructions involving multiple complement verbs in English by using verbal/semantic decomposition, alignment and faithfulness constraints and late lexical insertion. It has been argued that it is the focussed direct object which is responsible for the missing preposition both in active and passive sentences: if the direct object is focussed, the CU which *to* spells out, i.e. v₃, is deleted from the

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14   The examples in table (4) and (5) may suggest that v₃ is never realized by *give*, as this licensor either gets deleted if the theme is focussed or it is spelled out independently. This would also mean that it is unnecessary to include this CU in the vocabulary entry for this verb – as opposed to what is claimed in (16). Note, however, that there are examples, where the verb must realize v₃, e.g. *I gave him it*, as it cannot be deleted: recall that pronouns are not usually focussed elements. Consequently, *give* must be associated with the v₃ in its vocabulary entry.

output – violating a faithfulness constraint. In other cases, v_3 is present in the output and realized separately.

Works Cited

Caha, Pavel. 2009. "The Nanosyntax of Case." PhD diss., University of Tromsø.

Csontos, Tamás. 2017. "Word Order and Passivization in English and German: A Syntax First Alignment Approach." PhD diss., Eötvös Loránd University.

Debusmann, Ralph. 2006. "Extensible Dependency Grammar: A Modular Grammar Formalism Based on Multigraph Description." PhD diss., University of Saarland.

Grimshaw, Jane B. 2005. *Words and Structure*. Stanford: CSLI Publications.

Halle, Morris, and Alec Marantz. 1993. Distributed Morphology and the Pieces of Inflection. In *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, edited by Kenneth L Hale and Samuel Jay Keyser, 111−176. Cambridge, MA: The MIT Press.

Hudson, R. 1984. *Word Grammar*. Oxford: Blackwell.

Levin, Beth, and Malka Rappaport Hovav. 2005. *Argument Realization*. Cambridge: Cambridge University Press.

Newson, Mark. 2010. "Syntax First, Words After: A Possible Consequence of Doing Alignment Syntax without a Lexicon." In *The Even Yearbook* 9, edited by László Varga, 1−46. Budapest: Eötvös Loránd University. Accessed September 14, 2021. http://seas3.elte.hu/delg/publications/even/2010.html#nm.

Newson, Mark. 2013. "What You Can Do with a Domain and Why They Are Not Phrases." In *VLlxx*, edited by Péter Szigetvári, n.p. Budapest: Eötvös Loránd University. Accessed September 14, 2021. http://seas3.elte.hu/tmp/vlfs/newson.html.

Newson, Mark. 2014. "Binding Revisited." In *The Even Yearbook* 11, edited by László Varga, 1−26. Budapest: Eötvös Loránd University. Accessed September 14, 2021. http://seas3.elte.hu/delg/publications/even/2014.html

Newson, Mark, and Krisztina Szécsényi. "2012. Dummy Auxiliaries and Late Vocabulary Insertion. In *The Even Yearbook* 10, edited by László Varga, 1−46. Budapest: Eötvös Loránd University. Accessed September 14, 2021. http://seas3.elte.hu/delg/publications/even/ 2012.html#nm.

Prince, A., and P. Smolensky. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. New Jersey: Rutgers University Center for Cognitive Science.

Ramchand, Gillian Catriona. 2008. *Verb Meaning and the Lexicon: A First-Phase Syntax.* Cambridge: Cambridge University Press.

Rochemont, Michael Shaun, and William Peter Culicover. 2009. *English Focus Constructions and the Theory of Grammar*. Cambridge: Cambridge University Press.

Røreng, Anita. 2011. "Die Deutsche Doppelobjektkonstruktion." PhD diss., University of Tromsø. Accessed September 14, 2021. https://munin.uit.no/bitstream/handle/10037/3377/thesis.pdf?sequence=2&isAllo wed=y.

Starke, Michal. 2009. "Nanosyntax – A Short Primer to a New Approach to Language." In *Nordlyd* 36.1, edited by Peter Svenonius, Gillian Ramchand, Michal Starke and Knut Tarald Taraldsen: 1−6. Tromsø: CASTL. Accessed September 14, 2021. http://www.ub.uit.no/baser/nordlyd/.

Gradients of Reflexivity: Psych Verbs in Causative Alternations

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Abstract: This paper addresses the issue of the syntactic and semantic representation of anticausatives with SE. The "reflexive analysis" extends the reflexive semantics of SE to anticausative constructions (Chierchia 2004), while the "standard view" is that anticausatives are versions of transitive constructions without the external argument (Schäfer and Vivanco 2016). Based on the tests from event modifier licensing (Alexiadou et al. 2014 inter alia), I show that a significant portion of psych verb anticausatives pattern with typical reflexives and transitives in licensing instrumental NPs/DPs introducing the causer argument whereas typical anticausatives license *od*('from')-PPs. I interpret this data as evidence for an intermediary category between reflexives and anticausatives that I label "semi-reflexives". Contrary to the "reflexive account", the analysis presented in the paper (drawing on Sportiche 2014) does not ascribe the same structures and denotations to reflexives and anticausatives, while in contrast to the "standard view", it still maintains a link between these different uses of SE.

Keywords: psych verbs, anticausatives, reflexives, causative alternations, Serbian

1. Introduction

The issue of the correct syntactic and semantic representation of anticausative constructions has received a significant amount of attention in the recent literature. The examples in (1) from Serbian (1a–1a') and English (1b–1b') illustrate two broader types of anticausatives – those involving morphological marking (the morpheme SE in Serbian) and those without any morphological changes of the verbal stem (the English causative alternation). One line of research maintains that anticausatives are akin to reflexives pointing to the fact that many languages employ the same morpheme (SE) to derive reflexives

and anticausatives (Chierchia 2004; Koontz-Garboden 2009, 2012). The opposing view holds that anticausatives are merely structurally impoverished versions of transitive verbs lacking the external argument (Parsons 1990; Schäfer and Vivanco 2016).

Psych verbs (verbs denoting emotional states or events – e.g. *amuse* or *love*) are a class of verbs that exhibit numerous syntactic and semantic peculiarities (Belletti and Rizzi 1988; Pesetsky 1996; Landau 2009). Some of these puzzling behaviors are observed in the domain of reflexives and in the formation of anticausatives. Belletti and Rizzi 1988 note the "reversed binding patterns" with psych verb reflexives. Levin (1993), Alexiadou and Iordăchioaia (2014) and others observe that English psych verbs generally do not participate in causative alternations (2b−2b'), which is not the case in languages such as Greek, Romanian or Serbian, where causative alternations are associated with over morphological marking on the verb (illustrated in 2a−2a' with Serbian examples). In light of these facts, exploring psych verb anticausatives, in languages in which they are available, could yield important insights into the syntax and semantics of anticausatives more generally.

(1) (a) Toma   je   istopio   šećer   *causative transitive*
          Toma.NOM   AUX   melt.PAST   sugar.NOM
          'Toma melted the sugar.'

     (a') Šećer   se   istopio   *anticausative*
          sugar.NOM   SE   melt.PAST
          'The sugar melted.'

     (b) Tom caramelized the sugar.   *causative transitive*

     (b') The sugar caramelized.   *anticausative*

(2) (a) Toma   je   zadivio   Anu   *causative transitive*
          Toma.NOM   AUX   amaze.PAST   Ana.NOM
          'Toma amazed Ana.'

     (a') Ana   se   zadivila   *anticausative*
          Ana.NOM   SE   amaze.PAST
          'Ana got amazed.'

     (b) Tom amazed Ana.   *causative transitive*

     (b') *Ana amazed.   *anticausative*

The aim of this paper is to analyze the internal syntactic structure of psych-verb anticausatives (involving the morpheme SE) in Serbian to determine what (if anything) makes them different from "ordinary/typical" anticausatives. If psych verb SE anticasuatives are syntactically and/or semantically different from "ordinary/typical" anticausatives, then, this difference might tell us something about the lack of these structures in languages such as English. The structural differences between psych verb anticausatives and typical anticausatives will be established by testing for their combinability with various types of event modifiers (Alexiadou and Anagnostopoulou 2009; Alexiadou et al. 2014; Alexiadou et al. 2015; Gehrke 2013, 2015; Gehrke and Marco 2014). It will be shown that psych verb anticausatives can license instrumental case-marked NPs/DPs introducing the causer (3a) while ordinary anticausatives license *od*('from')-PPs instead (3b).

(3) (a) Ana   se   oduševila   **Tominom**   **pesmom.**
         Ana.NOM   AUX   amaze.PAST   Toma.POSS.INST   poem.INST
         'Ana was amazed by Toma's poem.'

     (a') Šećer   se   karamelizovao   **od**   **toplote.**
         Sugar.NOM   SE   caramelize.PAST   from   heat.GEN
         'The sugar caramelized from heat.'

In this respect, psych-verb anticausatives pattern with reflexives, even though they lack the agentivity component which is necessarily present with reflexives. To capture these facts, I will propose a graded or ranked model of reflexivity based on the options supplied by the extended VP structure. Specifically, I will argue that (i) pure reflexives arise when SE combines with full-fledged Voice^0; (ii) "semi-reflexives" arise when SE combines with v^0 with a filled Spec position; and (iii) typical anticausatives arise when SE combines with v^0 without the Spec position. The discrepancy between those psych-verb anticausatives that license instrumental NPs/DPs and typical anticausatives will be attributed to the structural distinction in the higher layers of the extended VP structure. Namely, it will be argued that the presence of an external argument either in Spec vP or Spec Voice P is responsible for licensing instrumental NPs/DPs with reflexives and "semi-reflexive" psych verb anticausatives (as well as agentive transitives). On the other hand, the absence of the external argument with typical anticausatives (and unaccusatives) will be taken as the reason behind the incompatibility between these structures and instrumental NPs/DPs requiring the use of *od*('from')-PPs to introduce the cause participant.

The paper is structured as follows. Section 2 introduces the opposing views regarding the correct structural representations of anticausative structures and points to the potential significance of anticausatives derived from psych verbs in this debate. In Section 3, I introduce the diagnostics of the presence of particular layers of the extended

VP structure based on the combinability with different types of *even* modifiers. These diagnostics will be used to show that psych-verb anticausatives are structural different from typical anticausatives. The structural representations modelling the observed differences are introduced in Section 4. Section 5 concludes the paper.

2. Anticausative SE: Reflexivizer or Pure Anticauzativizer

The literature on the status of SE can (roughly) be divided into two camps. So-called "reflexive accounts" always treat this morpheme as a reflexivity marker (Chierchia 2004; Koontz-Garboden 2009, 2012). A more mainstream line of research, the so-called "standard account" (Schäfer and Vivanco 2016) denies any kind of synchronic syntactic or semantic link between the reflexive SE and the anticausative SE (Parsons 1990; Schäfer and Vivanco 2016). The first two parts of this section will present the arguments of the two approaches to the semantic and syntactic contribution of SE. The third part of this section will briefly illustrate the cross-linguistic variation when it comes to the availability of anticausatives derived from psych-verbs.

2.1. Reflexive Accounts

As is transparent from the label attached to this set of accounts, "reflexive accounts" extend the reflexive semantics of SE to constructions typically labelled anticausative (4b). Chierchia (2004) proposes to interpret (4b) along the lines of "the house toppled/collapsed *itself*" (i.e. as a reflexive). More precisely, following Chierchia's (2004) analysis, one would interpret the sentence in (4b) as entailing that some property of the house was such that it led to its collapse.

(4) (a) Ana   je   srušila   kuću.
         Ana.NOM   AUX   topple.PAST   house.ACC
         'Ana toppled the house.'

     (b) Kuća   se   srušila
         house.NOM   SE   topple.PAST
         'The house collapsed'

The precise semantics that Chierchia (2004) proposes for anticausatives presupposes that the introduction of the morpheme SE builds on the basic semantics of the transitive verb by identifying the external argument with the internal argument as with typical reflexive verbs.

One piece of evidence Chierchia (2004) offers in support of his analysis concerns the distribution of *da se* ('by itself') with anticausative forms. Namely, while this expression is licensed in agentive transitive constructions (5), it is blocked with non-agentive transitives (6), passives and impersonals (6), but it is allowed with anticausatives (7). The

fact that SE anticausatives pattern with agentive transitives is expected and accounted for assuming that the syntax and semantics of the anticausative version contains the semantics of the transitive version.

(5) Gianni   mi   ha   picchiato   da   se   *agentive*
     Gianni   me   has   hit   by   self
     'Gianni hit me by himself.'

(6) (a) *Gianni   conosce   il   latino   da   se   *stative verb*
          Gianni   knows   the   Latin   by   self   *of cognition*
          'Gianni knows Latin by himself'

     (b) *Gianni   ha   sudato   da   se   *verb of physical*
          Gianni   has   sweat   by   self   *function*
          'Gianni sweat by himself.'

     (c) A: Tu   hai   fatto   sudare   Gianni   *contextually improved*
              You   have   made   sweat   Gianni   *verb of physical function*
              'You made Gianni sweat.'

          B: No,   ha   sudato da   se
              No   has   sweat by   self
              'No, he sweat by himself.'

(7) (a) *La   porta   e   stata   aperta   da   se   *passive*
          the   door   is   been   opened   by   self
          'The door was opened by itself.'

     (b) *Questo   libro   si   legge   da   se   *impersonal*
          this   book   one.CL reads   by   self
          'This book reads by itself.'

(8) (a) La   porta   si   e   aperta   da   se   *anticausative*
          the   door   SE   is   opened   by   self
          'The door opened by itself.'

     (b) La   barca   e   affondata da   se
          the   boat   is   sank   by   self
          'The boat sank by itself.'   (Chierchia 2004, 43−44)

One desirable conceptual consequence of this analysis is pointed out by Koontz-Garboden (2009, 2012). According to Koontz-Garboden (2009, 2012), assuming that anticausatives are a sub-type of reflexives avoids violating the Monotonicity Hypothesis (Kiparsky 1982), according to which additional morphological material can only add, but not remove meaning. If the addition of this morpheme simply builds on the basic semantics of the transitive verb, it follows that morphological complexity correlates with semantic complexity as predicted by the Monotonicity Hypothesis. Alternatively, if the role of SE was simply to remove the external argument, the addition of a new morpheme would result in semantic (and syntactic) impoverishment contrary to the predictions of the Monotonicity Hypothesis.

Koontz-Garboden (2009, 2012) also points out that the anticausative construction is not entailed by its transitive causative counterpart, which is what one would expect if the role of the anticausative construction involved only a subset of the denotation of the transitive one. The lack of the entailment relationship between the causative transitive form and the anticausative one is illustrated with the Spanish example in (9). This example is significant because the first portion of the sentence contains the anticausative form of one verb under negation while the second part affirms the causative transitive form of the same verb.

(9) El   vaso   no   se   rompio, lo   rompiste tu
    the   vase   not   SE   broke   it   broke   you
    'The vase didn't break, you broke it.'

According to Koontz-Garboden (2009, 2012), the fact that one can deny the anticausative construction in the first part of the sentence in (9) while affirming the transitive one in the second part without creating a fatal contradiction shows that the anticausative construction is not entailed by the transitive one.

2.2. Standard Account

In contrast to the "reflexive account" of SE, what is sometimes referred to as the "standard account" argues precisely that the anticausative construction is nothing but the version of the transitive construction without the external argument. Schäfer and Vivanco (2016) claim that the semantic representation of anticausative verbs lacks the [CAUSE] component as well as the external argument in contrast to the transitive counterpart. Therefore, the semantics of the transitive construction properly contains the semantics of the anticausative one, the only difference being that the external argument is left unexpressed in the anticausative version.

In response to Koontz-Garboden's (2009, 2012) treatment of sentences like (9), Schäfer and Vivanco (2016) argue that these examples represent instances of *metalinguistic negation* rather than logical negation. In essence, they argue that what is

negated in the first part of the example in (9) is not the entailment of the clause but the conversational implicature enabled by the anticausative construction. According to these authors, by negating the first part of the sentence in (9) the speaker actually denies that it is a sufficiently informative description of the situation at hand (i.e. they are accusing the interlocutor of violating the Gricean Maxim of Quantity).

Countering the "reflexive analysis" of anticausatives, Schäfer and Vivanco (2016) point out that in some anticausative constructions, any kind of reflexive semantics would create non-sensical denotations (10).

(10) A   gap   opened

The argument here is that applying the reflexive analysis of SE to the anticausative construction in (10) would result in a denotation whereby the gap caused itself to come to existence, but, of course, no entity can be the cause of its own existence. In contrast, this issue does not emerge with the "standard account" because the denotation of the sentence in (10) would include just an unexpressed cause rather than identifying the cause with the theme.

2.3. Psych Verbs in Causative Alternations
Psych verbs are particularly interesting in relation to the question of anticausative and reflexive constructions because they exhibit numerous syntactic and semantic peculiarities (Belletti and Rizzi 1988; Pesetsky 1996; Landau 2009). Famously, (the vast majority of) English psych verbs generally fail to derive anticausative constructions (Levin 1993). The verb *annoy* in (11a) is a causative transitive psych verb with the experiencer argument in the object position (a so-called "object experiencer verb") denoting a change of mental state on the part of the experiencer. However, unlike other causative transitive (change-of-state) verbs, psych verbs cannot be used as anticausatives as shown in (11b).

(11) (a) The   movie   annoyed   John
     (b) *John   annoyed

In contrast, languages that allow SE or other anticausativity markers exhibit no such restrictions. Alexiadou and Iordăchioaia (2014) provide examples from Romanian (12a) and Greek (12b). The example (12a) from Romanian shows a pair of object experiencer verbs (i.e. causative transitives), which are used intransitively (i.e. as anticausatives) in combination with the reflexive morpheme SE. The Greek example in (12b) shows one causative transitive psych verb, which is also used intransitively but without the morpheme SE. Instead, a so-called "non-active" morphological marker is added to the verbal stem.

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(12) (a) Ion s-a **supărat/îngrijorat** de la vestea cea nouă în
John RF-has upset/worried of at news the new in
cinci minute/ repede / în parc asta a avut loc ieri
five minutes quickly in part this has had place y.day
'John got upset/worried from the news in the park/quickly/in five minutes.'

(b) O Janis **stenahorithike** *me* ta nea se pende lepta/
the John saddened.NACT with the news in five minutes
grigora sto parko afto sinevi htes
quickly in park this happened yesterday
'John (quickly) got sad from the news in five minutes in the park.
This happened yesterday.' (Alexiadou and Iordăchioaia 2014)

Since anticausative psych verbs are possible in other languages such as Greek, Romanian or Serbian, the question is why English psych verbs do not participate in causative alternations given the existence of equivalent constructions in other languages.

What is also worth noticing in (12) is that Romanian and Greek use formally different expressions to introduce the causer participant. In Romanian (12a), it is a *de*('of/from')-PP while in Greek, the causer is introduced by means of a *me*('with')-PP typical of instruments (12b). This will be significant in Section 3 where it will be shown that the equivalents of these two types of PPs are both possible with SE anticausatives in Serbian, but with different types of verbs.

2.4. Summary

The "reflexive" and "standard" accounts of anticausatives predict different syntactic and semantic behaviors of these constructions. The "standard view" predicts unaccusative properties for anticausatives while the "reflexive view", of course, predicts reflexive properties for anticausatives, presumably that means that they have an external argument. Next, since English psych verbs do not participate in causative alternations, there is a reason to believe that in languages where psych-verb anticausatives exist, they might exhibit behaviors that would help us tease apart the predictions of the two competing approaches to the syntax and semantics of anticausatives, which will be the aim of the remainder of this paper. Specifically, the existing tests for the presence/absence of different layers of verbal structure will be applied to psych-verb anticausatives in Serbian in order to determine whether or not they show signs of the higher portions of verbal structure (vP, VoiceP) predicted to be missing under the 'standard account' but present under the "reflexive account".

3. Diagnosing the Internal Structure of Serbian Psych Verb Anticausatives

One way of diagnosing the presence of the different layers of verbal structures in various derivations comes from the licensing of various types of event modifiers. *By*-phrases are assumed to be licensed by VoiceP (Kratzer 1994; Gehrke 2013, 2015; Alexiadou et al. 2014; Alexiadou et al. 2015) explaining why passives (13a) but not anticausatives (13b) can license these items.

(13) (a) The   car   was   broken   **by   Mary**
     (b) *The   car   broke   (down)   **by   Mary**

Typical anticausatives (14a) and unaccusatives (14b), on the other hand, license *from*-PPs expressing the causer.

(14) (a) The   car   broke   (down)   **from   the   cold   temperature**
     (b) The   patient   died   **from   a   heartattack**

PPs expressing instruments tend to be licensed in active agentive constructions (15a) and with passives (15b) but not with anticausatives (15c).

(15) (a) Mary   opened   the   door   **with   a   key**
     (b) The   door   was   opened   **with   a   key**
     (c) *The   door   opened   **with   a   key**

The Serbian equivalent of the English *by*-phrase is the *od strane* ('from side of')-PP and it is licensed with passives but not with anticausatives (16).

(16) (a) Vrata   su   otvorena   **od   strane   provalnika**
         door.NOM   AUX   open.PASS.PRT   from   side.GEN   burglar.GEN
         'The door was opened by the burglar.'

     (b) *Vrata   su   se   otvorila   **od   strane   provalnika**
         door.NOM   AUX   SE   open.PAST   from   side.GEN   burglar.GEN
         Literally: 'The door opened by the burglar.'

Instrumental case-marked NPs/DPs are licensed with transitive active constructions (17a) and passives (17b) but not anticausatives (17c).

(17) (a) Marija   je   otvorila   vrata   **ključem**
        Marija.NOM   AUX   open.PAST   door   key.INST
        'Marija opened the door with a key'

      (b) Vrata   su   otvorena   **ključem**
        door.NOM   AUX   open.PASS.PRT key.INST
        'The door was opened with a key'

      (c) *Vrata   su   se   otvorila   **ključem**
        door   AUX   SE   open.PAST   key.INST
        Literally: 'The door opened with a key'

Finally, *od*('from')-PPs introducing the causer are licensed with anticausatives (18a) but not with active transitives (18b) and passives (18c).

(18) (a) Vrata   su   se otvorila   **od**   **vetra**
        door.NOM   AUX   SE open.PAST   from   wind.GEN
        'The door opened from the wind.'

      (b) *Marija   je   otvorila vrata   **od**   **vetra**
        Marija.NOM   AUX open.PAST door.ACC   from   wind.GEN
        Literally: 'Marija opened the door from the wind.'

      (c) *Vrata   su   otvorena   **od**   **vetra**
        door.NOM   AUX   open.PASS.PRT from   wind.GEN
        Literally: 'The door was opened from the wind.'

Turning now to the domain of psych-verb anticausatives, we can apply these tests to determine whether these constructions pattern with reflexives or with typical anticausatives and unaccusatives. Here, we encounter a more complex picture. *By*-phrases are always rejected (19).

(19) (a) *Marija   se   ohrabrila   **od**   **strane**   **brata**
        Marija.NOM SE   encourage.PAST   from   side   brother.GEN
        Literally: 'Marija got encouraged by her brother.'

      (b) *Marija   se   iznervirala   **od**   **strane**   **brata**
        Marija.NOM SE   annoy.PAST   from   side   brother.GEN
        Literally: 'Marija got annoyed by her brother.'

(c) *Marija   se   zaprepastila   **od**   **strane**   **brata**
Marija.NOM   SE   shock.PAST   from   side   brother.GEN
Literally: 'Marija got schocked by her brother.'

(d) *Marija   se   razbesnela   **od**   **strane**   **brata**
Marija.NOM   SE   anger.PAST   from   side   brother.GEN
Literally: 'Marija got angry by her brother.'

If the rejection of *by*-phrases were taken as a decisive diagnostic for the lack of VoiceP layer, then, one would have to assume that psych verb anticausatives, like "typical anti-causatives" always lack this portion of the extended VP structure. However, one should be cautions not to jump to this conclusion prematurely since there are agentive structures, which presumably include the VoiceP domain, but systematically reject *by*-phrases. For instance, typical reflexives disallow *by*-phrases; however, they do show signs of the presence of the external argument on other tests such as control into purpose clauses (Gehrke 2013, 2014; Alexiadou at al. 2014).

Indeed, with some psych verbs, SE triggers a purely reflexive reading as evidenced by the availability of control into purpose clauses (20a) and the grammaticality of a full reflexive pronoun *sebe* ('self') (20b).

(20) (a) Marija   se   hrabri   [da   bi   izašla   na   binu]
Marija.NOM   SE   encourage   that   would   GO.OUT   on   stage
'Marija is encouraging herself to go out on stage.'

(b) ?Marija   hrabri   sebe
Marija.NOM   encourage   self
'Marija is encouraging herself.'

Since control into purpose clauses is one of the standard diagnostics for the presence of VoiceP (Gehrke 2013, 2014; Alexiadou at al. 2014), one can assume that VoiceP is present with verbs such as the one in (19a) and (20) despite the fact that they reject *by*-phrases (19a) simply because *by*-phrases are normally rejected with typical reflexives (21), presumably due to the fact that the agent is already expressed by means of the subject DP/NP.

(21) *Marija   se   očešljala   od   strane   majke
Marija.NOM   SE   comb.PAST   from   side   mother.GEN
Literally: 'Marija combed (herself) by her mother.'

When it comes to the licensing of instrumental case-marked DPs/NPs, unlike typical anticausatives, a significant number of psych verb anticausatives allow instrumental case-marked DPs/NPs (22).

(22) (a) Marija   se   zaprepastila   bratovim   ponašanjem
        Marija.NOM   SE   shock.PAST   brother's   behavior.INST
        'Marija got shocked by/with her brother's behavior.'

    (b) Marija   se   iznenadila   njegovim   postupkom
        Marija.NOM   SE   surprise.PAST   his   action.INST
        'Marija got surprised by/with his action.'

    (c) Marija   se   oduševila   svojim   rezultatom
        Marija.NOM   SE   impress.PAST   self's   result.INST
        'Marija got impressed by/with her result on the exam.'

Also, unlike typical anticausatives, these constructions tend to reject *od*('from')-PPs (23).

(23) (a) *Marija   se   zaprepastila   od   bratovog   ponašanja
        Marija.NOM   SE   shock.PAST   from   brother's   behavior.GEN
        'Marija got shocked with her brother's behavior.'

    (b) *Marija   se   iznenadila   od   njegovog   postupka
        Marija.NOM   SE   surprise.PAST   from   his   action.GEN
        'Marija got surprised by his action.'

    (c) *Marija   se   oduševila   od   svog   rezultata
        Marija.NOM   SE   impress.PAST   from   self's   result.GEN
        'Marija got impressed by her result on the exam.'

Still, it is crucial to point out that the category of psych verbs is not homogenous when it comes to the licensing of various types of even modifiers. While there are those that allow instrumental NPs/DPs and reject *od*('from')-PPs, there are also psych-verb anticausatives that exhibit the opposite behavior since they license *od*('from')-PPs while rejecting instrumental case-marked NPs/DPs (24), but these are significantly less numerous.

(24) (a) Marija   se   razbesnela   *bratovim   ponašanjem
          Marija.NOM SE   anger.PAST   brother.INST   behavior.INST
          /od   bratovog ponašanja
          from   brother's behavior.GEN
          'Marija got angry because of her brother's behavior.'

   (b) Marija   se   ražalostila   *tužnom   pesmom
        Marija.NOM SE   sadden.PAST   sad.INST   song.INST
        /od   tužne   pesme
        from   sad.GEN   song.GEN
        'Marija got sad because of a sad song.'

Finally, there are verbs that can basically tolerate both kinds of event modifiers to varying degrees (25) and native speaker judgments tend to vary with these verbs.

(25) (a) Ivan   se   iznervirao   ?bratovim   ponašanjem
          Ivan.NOM   SE   annoy.PAST   brother.INST   behavior.INST
          /?od   bratovog ponašanja
          from   brother's behavior.GEN
          'Ivan got annoyed with/by his brother's behavior.'

   (b) Ivan   se   isprovocirao   ?bratovim   ponašanjem
        Ivan.NOM   SE   provoke   brother's.INST behavior.INST
        /?od   bratovog ponašanja
        from   brother's behavior.GEN
        'Ivan got provoked with/by his brother's behavior.'

None of these verbs, however, pattern with pure reflexives because they do not license full reflexive pronouns or control into purpose clauses. The examples in (26a), (26b), and (26c) demonstrate the lack of control into purpose clauses with these verbs while (26a'), (26b'), and (26c') show that they do not license full reflexive pronouns.

(26) (a) *Marija   se   zaprepastila   da   bi   uplašila   Anu
           Marija.NOM   SE   dazzle.PAST   that   would scare   Ana.ACC
           Literally: 'Marija got dazzled in order to scare Ana.'

   (a') Marija   je   zaprepastila   sebe
         Marija.NOM   AUX   dazzle.PAST   self
         Literally: 'Marija dazzled herself'

(b) *Marija se razbesnela da bi uplašila Anu
Marija.NOM SE anger.PAST that would scare Ana.ACC
Literally: 'Marija got angry in order to scare Ana.'

(b') Marija je razbesnela sebe
Marija.NOM AUX anger.PAST self
Literally: 'Marija angered herself"

(c) *Marija se iznervirala da bi uplašila Anu
Marija.NOM SE annoy.PAST that would scare Ana.ACC
Literally: 'Marija got annoyed in order to scare Ana.'

(c') *Marija je iznervirala sebe
Marija.NOM AUX annoy.past self
Literally: 'Marija annoyed herself.'

In sum, among psych verb constructions with SE in Serbian, we clearly find cases that do not pattern with reflexives in all relevant respects, but they cannot be collapsed with typical anticausatives either given the data from event modifier licensing. The "standard approach" to anticausatives seems to be too rigid to account for these cases. Also, semantically, there are strong reasons to believe that the reflexive semantics that Chierchia (2004) proposes for anticausatives fits the denotations of these borderline cases that licensee instrumental case-marked modifiers. Recall that Chierchia (2004) argues that the reason why anticausatives are reflexive is because they denote eventualities that are caused by some internal property or state of the subject. I would suggest that this is precisely what native speakers intend to communicate when they utter a sentence like (27a), and it is precisely this semantic component that makes the difference between (27a) and the corresponding transitive construction (27b). In other words, the two sentences in (27) do not have identical truth-conditional content.

(27) (a) Marija se zaprepastila bratovim ponašanjem
Marija.NOM SE dazzle.PAST brother's behavior.INST
'Marija got dazzled by/with her brother's behavior.'

(b) Bratovo ponašanje je zaprepastilo Mariju
brother's behavior AUX dazzle.PAST Marija.ACC
'Her brother's behavior dazzled Marija.'

Even though it might be possible to describe the same situation with either of the two forms, the selection of one instead of the other casts the situation in a different light. The

transitive version (27b) entails that the brother's behavior was the direct cause of the change in Marija's emotional state (it was both a necessary and a sufficient condition) whereas the version with SE communicates that the brother's behavior was a necessary but not sufficient condition for the change in Marija's emotional state and some internal (psychological/emotional) property/state on Marija's part was the decisive factor (see Talmy 1988; Croft 1993; Wolf 2003).

It is difficult to find a test that would pin down this truth conditional distinction, but the contrast in (28) points in that direction quite strongly.

(28) (a)
Marija	se	zaprepastila	??ni sa čim	posebno
Marija.NOM	SE	dazzle.PAST	nothing.INST	special
/ni	zbog	čega	posebno	
NEG	because	what	special	

'Marija got dazzled for no apparent reason.'

(b)
*Ništa	posebno	je	zaprepastilo	Mariju
nothing	special	AUX	dazzle.PAST	Marija.ACC

Literally: 'Nothing special dazzled Marija.'

The (partial) acceptability of (28a) suggests that the construction with SE can be used while explicitly negating the external cause which is impossible with the transitive version (28b). While the prepositional instrumental expression in (28a) is quite degraded, the *zbog* ('because')-PP introducing a negated indirect cause/reason is perfectly acceptable. What this tells us is that clauses that contain psych-verb anticausatives can receive a truth value and be grammatically acceptable even when the external cause is explicitly negated. On the other hand, when an NP/DP introducing the causer appears as the subject of a transitive sentence (28b), the outcome is ungrammatical. Note that the ungrammaticality of (28b) cannot simply be ascribed to independent factors such as the lack of sentential negation presumably needed to license the Negative Polarity Item (NPI) *ništa* ('nothing'). If (28b) were ungrammatical because the NPI located in the subject position is not licensed, then, we would expect (28a) to be ungrammatical as well since there is no sentential negation in this example either. Therefore, I assume that the contrast in (28) emerges for semantic reasons. Specifically, the anticausative example (28a) does not entail the existence of an external cause, which is why the external cause can be explicitly negated, but the transitive sentence (28b) includes this entailment, which is why the negation of the existence of the external cause yields a fatal contradiction. It, thus, follows that the two sentences do not have the same truth-conditional content.

4. Modeling the Differences among SE Constructions: Gradients of Reflexivity

To capture the data presented in the previous section, drawing on Sportiche (2014), I propose to treat SE as a variable whose interpretation is structurally determined in two ways: (i) by its merge site, and (ii) the c-commanding NP/DP, which binds it and assigns it interpretation. SE has to be merged with a head within the extended VP domain, which basically means that it can either merge with v^0 or with $Voice^0$ (assuming with Harley 2013 and Merchant 2013 *inter alia* that these two projections are separate). When it is merged with $Voice^0$, it creates typical agentive reflexives (29a). In that case, it is c-commanded by the subject in Spec VoiceP. The agentive component is, of course, supplied by $Voice^0$.

(29) (a) Marija   se   posekla
          Marija.NOM SE   cut.PAST
          'Marija cut herself.'

    (b) Marija   se   zaprepastila
        Marija.NOM SE   dazzle.PAST
        'Marija got dazzled.'

    (c) Stolica   se   polomila
        chair.NOM   SE   break.PAST
        'The chair broke.'

SE can also be merged with v^0 in the absence of VoiceP, and in that case, two things can happen. It can either be merged with a v^0 that projects a Spec position/an external argument or it can merge with a v^0 without the Spec position. When there is an NP/DP in the Spec vP position, this NP/DP will bind the SE variable and assign it reference giving rise to a kind of "semi reflexive" denotation that we can see with psych verb anticausatives (29b). In such cases, the absence of VoiceP will ensure the lack of agentivity and the external argument will be interpreted as a "self-cause" rather than "self-agent" yielding the crucial difference between these constructions and typical reflexives.

Alternatively, SE can merge with a Spec-less v^0, in which case there would be no NP/DP c-commanding it and it would receive arbitrary interpretation as with typical anticausatives (29c). Finally, in order for this analysis to work, the binding domain for SE would have to be restricted to the first-phase or the extended VP because, otherwise, it would be bound by the subject NP/DP once it reaches Spec TP even with typical anticausatives.

To illustrate the proposal more clearly, I submit the following structural representations for pure reflexives, semi-reflexives and pure anticausatives in (30). (30a) illustrates a reflexive structure where SE merges with $Voice^0$ with the agent NP/DP in the

Spec position. (30b), on the other hand, represents the new category of "semi-reflexives" where SE merges with v^0, but the VoiceP layer is not projected. Nevertheless, the Spec vP position is still available for the external argument NP/DP denoting a causer. Finally, the "typical anticausative" construction represented by (30c) does not project the VoiceP layer, and it lacks the Spec vP position for the external argument. Consequently, there is no hierarchically higher NP/DP, within the domain of the "first phase" / extended VP to bind the variable introduced by SE. This lack of binding does not result in ungrammaticality because the variable can receive arbitrary interpretation.

(30) (a) reflexive

```
                VoiceP
              /        \
          NP/DP        Voice'
           /\         /      \
        agent   SE+Voice⁰     vP
                            /     \
                           Ø       v'
                                  /   \
                                 v⁰   VP/√P
                                       Δ
```

(b) semi-reflexive

```
              vP
            /     \
        NP/DP      v'
         /\       /    \
      causer  SE+v   √P/VP
                       Δ
```
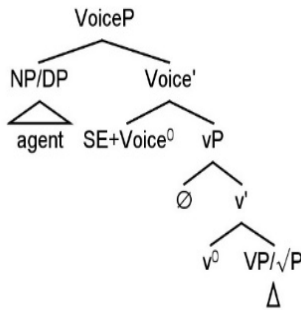
(c) anticausative
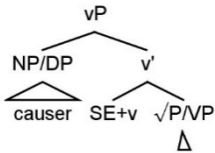
```
             vP
           /     \
        SE+v    √P/VP
               /      \
            √/V⁰     NP/DP
                      /\
                    theme
```
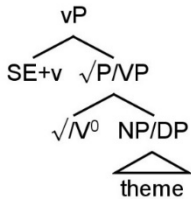
As a side note, the idea that SE is a variable whose interpretation is structurally determined is also desirable with respect to middles and impersonal constructions where it gets arbitrary interpretation. The impersonal construction in (31a) comes with the

SE morpheme and the external argument of the verb (the agent) is left unspecified. Similarly, with middles (31b), the external argument or the agent is also unspecified, and, again, one finds the morpheme SE in these constructions as well.

(31) (a) U   biblioteci   se   čuvaju   knjige
         in   library.LOC   SE   keep   books.NOM
         'The library is where books are kept.'

     (b) Ova   knjiga   se   lako   čita
         this   book.NOM   SE   easily   read
         'This book reads easily.'

However, providing a precise analysis of these constructions goes beyond the scope of this paper.

The different structural representations in (30) now enable us to explain the contrasts in the licensing of different types of event modifiers observed in (22−24). Namely, those psych-verb anticausatives that license instrumental NPs/DPs would correspond to "semi-reflexive" configurations (30b). Assuming that instrumental NPs/DPs are licensed by the presence of an external argument either in Spec vP or Spec VoiceP, we would have an account of the acceptability of these elements with agentive transitives, typical reflexives (30a) and structures we have called "semi-reflexives" (30b). The unacceptability of instrumental NPs/DPs with typical anticausatives (30c) as well as unaccusatives and the use of *od*('from')-PPs would, then, follow from the lack of the external argument in Spec vP.

Finally, I would like to point out that the present approach has the potential to shed some light on the puzzling lack of psych verb anticausatives in English. Namely, because there is no SE in this language, it is impossible to generate the kind of semi-reflexive construction that we find in Serbian (and presumably other languages that have this morpheme). Merging the experiencer DP in Spec vP position as in (30b) in the absence of SE would leave the structure without the internal argument resulting in ungrammaticality.

In terms of broader implications, this account bridges the gap between the "reflexive account" and "standard account" of SE by suggesting that reflexivity is a graded category. Contrary to the "standard account", it avoids the severance of all syntactic or semantic links between the reflexive and anticausative uses of SE. At the same time, in maintaining this link, it does not go so far as to extend the same reflexive semantics to all anticaustive structures. Instead, the present account confines the semantic connection between reflexives and anticausative uses of SE to the fact that SE introduces a variable, which can receive the interpretation from different NPs depending on the structural configuration it finds itself in. With typical reflexives,

SE receives its interpretation from the agent argument in Spec VoiceP; with "semi-reflexives", its interpretation is determined by the cause argument in Spec vP; finally, in typical anticausative constructions (potentially also in middles and impersonals), SE remains unbound receiving arbitrary interpretation.

The account also raises the question of the syntactic and semantic status of SE forms with psych verbs in other languages that have this morpheme. We have seen that these constructions combine with *from*-PPs expressing causers in Romanian, but in Greek they combine with *with*-PPs typical of instruments (Alexiadou and Iordăchioaia 2014). The issue whether these facts signal different syntactic and semantic behaviors of SE forms in these languages is a topic for further research.

5. Conclusion

This paper addressed the broader issue of the status of anticausatives by focusing on the event modifier licensing with Serbian psych verb anticausatives. It was established that like reflexives, but unlike typical anticausatives, psych verb anticausatives in Serbian can license instrumental case-marked expressions of cause and reject *od*('from')-PPs. Still, these constructions are not fully reflexive as they disallow control into purpose clauses and the full reflexive pronoun *sebe* ('self').

This data was interpreted in light of Sportiche's (2014) approach to SE arguing that Chierchia's (2004) "reflexive approach" to anticausatives as well as the so-called 'standard view' (Schäfer and Vivanco 2016), which denies any kind of synchronic link between reflexive and anti-causative SE, are simply too rigid to explain these data. I argued that what is needed is a graded or ranked model of reflexivity constrained by the options provided by the extended VP structure, which allows for a category between pure reflexives and pure anticausatives. I called this category "semi-reflexives".

The observations were modeled by assuming that SE introduces a variable that has to be bound by a c-commanding NP/DP in order to obtain interpretation. With pure reflexives, SE attaches to Voice[0] and gets bound by the agent in Spec VoiceP. With "semi-reflexives", SE combines with v and gets bound by the causer in Spec vP. Finally, with anticausatives, SE is merged with v that does not project a Spec position, which is why it remains unbound and receives arbitrary interpretation. Crucially, the binding domain for SE has to be restricted to the first phase (extended VP). The distribution of instrumental NPs/DPs and *od*('from')-PPs with different types of constructions involving SE was accounted by assuming that instrumental NPs/DPs need to be licensed by the presence of an external argument in Spec vP or Spec VoiceP. This explains why these expressions are licensed with agentives, reflexives and "semi-reflexive" psych-verb anticausatives but banned with typical anticausatives and unaccusatives, where the only option for expressing the cause argument is the *od*('from')-PP.

Works Cited

Alexiadou, Artemis, and Elena Anagnostopoulou. 2009. "Agent, Causer and Instrument PPs in Greek." *MIT Working Papers in Linguistics* 57: 1−16.

Alexiadou, Artemis, and Giannia Iordăchioaia. 2014. "The Psych Causative Alternation." *Lingua* 148: 53−79.

Alexiadou, Artemis, Elena Anagnostopoulou, and Florian Schäfer. 2015. *External Arguments in Transitivity Alternations: A Layering Approach.* Oxford: Oxford University Press.

Alexiadou, Artemis, Berit Gehrke, and Florian Schäfer. 2014. "The Argument Structure of Adjectival Participles Revisited." *Lingua* 149: 118−138.

Alexiadou, Artemis, Gianna Iordăchioaia, Mariangeles Cano, Fabienne Martin, and Florian Schäfer. 2013. "The Realization of External Arguments in Nominalizations." *The Journal of Comparative Germanic Linguistics* 16(2−3): 118−138.

Belletti, Adriana, and Lugi Rizzi. 1988. "Psych-Verbs and θ-Theory." *Natural Language and Linguistic Theory* 6(3), 291−352.

Chierchia, Genaro. 2004. "A Semantics for Unaccusatives and Its Syntactic Consequences." In *The Unaccusativity Puzzle: Exploration of the Syntax-Lexicon Interface,* edited by Artemis Alexiadou, Eelena Anagnostopoulou, and Martin Everaert, 22−59. Oxford: Oxford University Press.

Croft, William. 1993. "Case Marking and the Semantics of Mental Verbs." In *Semantics and the Lexicon,* editted by James Pustejovsky, 55−72. Dordrecht: Springer.

Gehrke, Berit. 2013. "Still Puzzled by Adjectival Passives." In *Syntax and Its Limits,* edited by Raffaella Folli, Christina Sevdali, and Robert Truswell, 175−191. Oxford: Oxford University Press.

Gehrke, Berit. 2015. "Adjectival Participles, Event Kind Modification and Pseudo-Incorporation." *Natural Language & Linguistic Theory* 33: 897−938.

Gehrke, Berit, and Cristina Marco. 2014. "Different *By*-Phrase with Adjectival and Verbal Passives: Evidence from Spanish Corpus Data." *Lingua* 149: 188−214.

Harley, Heidi. 2013. "External Arguments and the Mirror Principle: On the Distinctness of Voice and *v*." *Lingua* 125: 34−57.

Koontz-Garboden, Andrew. 2009. "Anticausativization." *Natural Language and Linguistic Theory* 27: 77−138.

Koontz-Garboden, Andrew. 2012. "The Monotonicity Hypothesis." In *Telicity, Change and State. A Cross−Categorial View of Event Structure* edited by Louise McNally, and Violeta Demonte, 139−161. Oxford: Oxford Univeristy Press.

Kratzer, Angelika. 1994. *The Event Argument and the Semantics of Voice.* Ms., University of Massechusetts.

Landau, Idan. 2009. *The Locative Syntax of Experiencers.* Cambridge: MIT Press.

Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Study.* Chicago: University of Chicago Press.

Merchant, Jason. 2013. "Voice and Ellipsis." *Linguistic Inquiry* 44 (1): 77−108.

Parsons, Terence. 1990. *Events in the Semantics of English.* Cambridge: MIT Press.

Pesetsky, David. 1996. *Zero Syntax: Experiencers and Cascades*. Cambridge: MIT Press.

Schäfer, Florian, and Margot Vivanco. 2016. "Anticausatives Are Weak Scalar Expressions, Not Reflexive Expressions." *Glossa: A Journal of General Linguistics* 1 (1).

Sportiche, Dominique. 2014. "French Reflexive se: Binding and Merge Locality." In *Locality*, edited by Enoch Olade Aboh, Maria Teresa Guasti, and Ian Roberts, 104−138. Oxford: Oxford University Press.

Talmy, Leonard. 1988. "Force Dynamics in Langauge and Cognition." *Cognitive Science* 37 (1): 111−130.

Wolff, Phillip. 2003. "Direct Causation in the Linguistic Coding and Individuation of Causal Events." *Cognition* 88 (1): 1−48.

The Syntax of Locative Inversion in Mandarin Chinese

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Abstract: This paper examines the verbs that can participate in the formation of the Locative Inversion with an obligatory localiser phrase in Mandarin Chinese. We show evidence that runs counter to the previous observation that the Locative Inversion with the perfective aspect *-le* has an implicit Agent, as opposed to the Locative Inversion with the imperfective/durative *-zhe*. We argue that whether there is an implicit Agent is dependent on the verbal argument structure, not directly on the aspectual differences. Based on the interpretive differences induced by the occurrence of the aspectual markers, we provide a non-uniform analysis of the Locative Inversion based on the verb classes identified in this paper.

Keywords: Locative Inversion; Aspect; Syntax; Mandarin Chinese

1. Introduction

This paper investigates the syntax of Locative Inversion (Henceforth, LI) in Mandarin Chinese. This construction has the surface structure "localiser phrase + V + Asp + noun phrases" (Fan 1963; Huang 1987; Nie 1989; Hu 1995; Pan 1998; Yang and Pan 2001; F. Liu 2007; Lin 2008; Paul et al. 2019; Zhang 2019). As shown in (1), the localiser phrase *cūn-lǐ* 'village' precedes the verb *sǐ* 'die', and the post-verbal Theme/Patient is *yí-ge rén* 'one person'. In (2), the localiser phrase *qiáng-shàng* 'wall-on' precedes the verb *guà* 'hang', which can be suffixed by either the perfective marker *-le*, or the durative/imperfective marker *-zhe*. The post-verbal Theme argument can be a definite demonstrative phrase *nà-fú huà* 'that painting', in contrast with the indefinite Theme/patient in (1).

(1) cūn-lǐ   **sǐ**   -le   yí-ge   rén
     village-in   die   -PERF   one-CLFperson
     "In the village died one person."

(2) qiáng-shàng **guà**   -zhe/-le   nà-fú   huà
     wall-on   hang   -DUR/-PERF   that-CLF   painting
     Lit. "On the wall is/was hung that painting."

We will examine the LI based on the verbs like *guà* 'hang'. This paper is organised as follows. Section 2 presents the background of LI in Mandarin Chinese. Section 3 presents the verb classes that can participate in the formation of LI. Section 4 shows the distinction between the LI with the perfective *-le* and the LI with the durative/imperfective *-zhe*. They differ in whether there is an implicit Agent and in the complexity of verbal argument structure. We further show that with *-zhe*, the LI can be interpreted with a state reading, a progressive reading or both, depending on the verbs. In Section 5 we provide a non-uniform analysis. We conclude in Section 6.

2.   Background

This construction has been referred to as existential sentences (Huang 1987), presentative sentences (Hu 1995), existential structure (Yang and Pan 2001) and locative construction (Paul et al. 2019) in the literature. Huang (1987) divided the verbs that can form existential sentences (or LOCATIVE INVERSION in our term) into two classes. Huang regarded (3) based on the verbs like *sǐ* 'die' as Type II existential sentences, and (4) as Type III existential sentences.

(3) (cūn-lǐ)   **sǐ**   -le   yí-ge   rén   TYPE II
     village-in   die   -PERF   one-CLFperson
     "In the village died one person ."

(4) *(qiáng-shàng) **guà**   -zhe/-le   nà-fú   huà   TYPE III
     wall-on   hang   -DUR/-PERF   that-CLF   painting
     Lit. "On the wall is/was hung that painting."

Huang observed that the localiser phrase is optional in Type II, but obligatory in Type III, and that the post-verbal noun phrase must be indefinite in Type II, but does not have to be indefinite in Type III. The obligatory presence of the localiser phase in Type III suggests that it has an argument status. In this paper, we will not analyse the verbs involved in Type II, which are basically unaccusative verbs.

(5)   Localiser phrase   Definiteness Restriction
      Type II   optional   yes
      Type III   obligatory   no

The localiser phrase in Mandarin Chinese has the distribution of DP argument (Huang, Li, Li 2009). As shown in (6), the localiser phrase can occur in subject or object position.

(6)   (a) [tāmende chéngshì]   /[**chéng-wài**]   hěn   měilì.
          their   city   /city-outside   very   beautiful
          "[Their city]/[the outside of the city] is beautiful."

    (b) wǒ qù-guò   [tāmende chéngshì]   /[**chéng-wài**].
          I   go-EXP   their   city   / city-outside
          "I have been to [their city]/[the outside of the city]."

Furthermore, the literature has been particularly interested in the aspectual markings on the LI based on the verbs of Huang's Type III. In (4), the verb *guà* 'hang' can be suffixed by either a perfective aspect *-le* or a durative/imperfective *-zhe*. While some scholars considered these two markers freely interchangeable (Fan 1963, Nie 1989), others claimed that they are not semantically identical (Hu 1995, Yang and Pan 2001, F. Liu 2007), and further observed that the LI with the perfective *-le* has an implicit agent, whereas the LI with the durative *-zhe* does not have an implicit agent (Pan 1996, Paul et al. 2019).

In the next section, we present the verbs that can form the Locative Inversion with an obligatory localiser phrase. Based on the differences among the subclasses, we argue that it is the verbal argument structure that determines the presence of an implicit Agent, not the aspectual markers.

3.   Verbs

We identify five subclasses of verbs that can form the Locative Inversion with an obligatory localiser phrase (7). These verbs include but are limited to the locational verbs of Huang's (1987) Type III existential sentences. We will present them based on (i) whether they can be suffixed by the perfective *-le* or the durative *-zhe* and (ii) the interpretations resulted from the possible aspectual markings.

With the imperfective/durative *-zhe*, the LI based on these verbs can have a state reading, or a progressive reading, or both. The possible readings are related to the two uses of *-zhe,* cf. Smith (1997). In its basic use, *zhe* focuses on the state of position and posture, or the state that results from an event. In its extended use, *-zhe* 'presents internal stages of durative events as static' (Smith 1997; 274).

(7)   **hang**-verbs: *zhàn* 'stand', *zuò* 'sit', *dūn* 'squat on heels', *guì* 'kneel on knees', *tăng* 'lie on back', *pā* 'lie on stomach', *fàng* 'put', *guà* 'hang'; *kào* 'lean', *chuān* 'wear', *wéi* 'surround', *děng* 'wait', *gài* 'cover'

      write-verbs: *xiě* 'write', *huà* 'draw', *kè* 'carve', *liú* 'leave/remain', *lì* 'erect', *shēng* 'raise (a flag)', *jì* 'record, document'

      walk-verbs: *zǒu* 'walk', *pǎo* 'run', *fēi* 'fly', *pá* 'crawl/creep', *yóu* 'swim', *tiào* 'jump', *gǔn* 'roll', *piāo* 'float'

      plant-verbs: *zhòng* 'plant', *jiàn* 'build, construct', *gài* 'build', *pū* 'lay, pave', *tiē* 'stick'

      sing-verbs: *chàng* 'sing', *kāi* 'hold (meetings)', *zhǔ* 'cook', *mào* 'emit', *mài* 'sell'

Hang-verbs correspond to Levin and Rappaport Hovav's (1995) VERBS OF SPATIAL CONFIGURATION and VERBS OF PUTTING OR PUTTING IN A SPATIAL CONFIGURATION (their sec. 6.4.5). As described by the LI based on these verbs, the entity bears a particular spatial configuration with a certain position. As shown in (8), they can be suffixed either by the durative -*zhe* or by the perfective -*le* (Pan 1996; Liu 2007). With -*zhe*, the sentence describes a state. The state reading can be diagnosed by the incompatibility with the progressive *zài*-, which rejects states (9).

(8)   (a)   ménkǒu   zhàn **-zhe/-le**   jǐ-ge   lǎoshī.
           doorway   stand -DUR/-PERF   a few-CLF   teacher
           "At the door stand a few teachers."

      (b)   qiáng-shàng   guà **-zhe/-le**   yì-fú   huà
           wall-on   hang -DUR/-PERF   one-CLF   painting
           Lit. "On the wall was hung one painting."

(9)   (a)   *ménkǒu   **zài**   zhàn   **-zhe**   jǐ-ge   lǎoshī.
           doorway   PROG   stand   -DUR   a few-CLF   teacher
           ("At the door were standing a few teachers.")

      (b)   *qiáng-shàng   **zài**   guà   **-zhe**   yì-fú   huà
           wall-on   PROG   hang   -DUR   one-CLFpainting
           ("On the wall was being hung one painting.")

Write-verbs correspond partially to Levin and Rappaport Hovav's (1995: sec 6.4.5) VERBS OF IMAGE IMPRESSION. They can be suffixed either by the durative -*zhe* or by the perfective -*le*. With -*zhe*, the sentence describes a state, which is incompatible with the progressive *zài*-.

(10) (a) zhuōzi-shàng   xiě   **-zhe/-le**   yí-ge   zì.
      table-on   write   -DUR/-PERF   one-CLF   character
      "On the table was/is written one character."

(b) *zhuōzi-shàng   **zài**   xiě   **-zhe**   yí-ge   zì.
      table-on   PROG   write   -DUR   one-CLF   character
      ("On the table was being written one character.")

Walk-verbs correspond to Levin and Rappaport Hovav's (1995) VERBS OF MANNER OF MOTION. Contrasting with the previous two groups, *walk*-verbs can only be suffixed by the durative *-zhe*, not by the perfective *-le* (11a, cf. Yu 1995). In addition, with *-zhe*, the LI based on *walk*-verbs describes an on-going dynamic event (Nie 1989), and is compatible with the progressive *zài-* (11b). The incompatibility with the perfective *-le* is due to the fact that the LI based on *walk*-verbs describes unbounded activities, which cannot satisfy the bounded requirement imposed by the perfective *-le* (see Xiao and McEnery 2004 on *-le*).

(11) (a) cāochǎng-shàng   zǒu   **-zhe/*-le**   xǔduō   xuéshēng.
      playground-on   walk   -DUR/-PERF   many   student
      Lit. "On the playground are walking many students."
      (NO: "on the playground walked many students.")

(b) cāochǎng-shàng   **zài**   zǒu   **-zhe**   xǔduō   xuéshēng.
      playground-on   PROG   walk   -DUR   many   student
      Lit. "On the playground are walking many students."

Plant-verbs can be suffixed either by the durative *-zhe* or by the perfective *-le*. With the durative *-zhe*, the LI based on *plant*-verbs is ambiguous between a state reading and a progressive reading (12a, cf. Yeh 1993; Smith 1997). The insertion of the progressive *zài-* in (12b) can single out the progressive reading, while excluding the state reading. The LI with the perfective *-le* in (12c) has a resultant state reading.

(12) (a) yuánzi-lǐ   zhòng   **-zhe**   yí-kē   shù.
      yard-in   plant   -DUR   one-CLF   tree
      (i) "In the yard is planted one tree."   —> state reading
      (ii) "In the yard is being planted one tree."   —> progressive reading

(b) yuánzi-lǐ   **zài**   zhòng   **-zhe**   yí-kē   shù.
yard-in   PROG   plant   -DUR   one-CLF   tree
    ~~(i)   "In the yard is planted one tree."~~   —> ~~state reading~~
    (ii) "In the yard is being planted one tree." —> progressive reading

(c) yuánzi-lǐ   zhòng   **-le**   yí-kē   shù.
yard-in   plant   -PERF   one-CLF   tree
"In the yard was planted one tree."

Sing-verbs (cf. Fan 1963) can be suffixed either by the durative *-zhe* or by the perfective *-le*. With the durative *-zhe*, the LI describes an ongoing dynamic event, which is then compatible with the occurrence of the progressive *zài-* (13b). With the perfective *-le,* the LI describes a terminated event without the implication of a resultant state.

(13) (a) tái-shàng   chàng   **-zhe/-le**   gējù.
stage-on   sing   -DUR/-PERF   opera
-zhe: "On the stage is being sung the opera."
-le: "On the stage was sung the opera."

(b) tái-shàng   **zài**   chàng   **-zhe**   gējù.
stage-on   PROG   sing   -DUR   opera
"On the stage is being sung the opera."

We resume the five subclasses in (14). With the durative *-zhe*, the LI based on *hang*-verbs and *write*-verbs describes states, the LI based on *walk*-verbs and *sing*-verbs describes on-going dynamic events, and the LI based on *plant*-verbs is ambiguous between these two readings. With the the perfective *-le*, the LI based on *stand*-verbs, *write*-verbs and *plant*-verbs describes resultant states, while the LI based *sing*-verbs describes a terminated event. The LI based on *walk*-verbs is incompatible with the perfective *-le.*

(14)

		durative *-zhe*		perfective *-le*
		state	progressive	
(a)	*hang*-verbs	yes	no	yes
(b)	*write*-verbs	yes	no	yes
(c)	*walk*-verbs	no	yes	*
(d)	*plant*-verbs	yes	yes	yes
(e)	*sing*-verbs	no	yes	yes

4. Perfective *-le* vs Imperfective *-zhe* in Locative Inversion

The literature on Mandarin LI has paid special attention to the contrast between the perfective and imperfective LI: diagnostics show that the LI with the perfective *-le* has an implicit agent, whereas the LI with the durative *-zhe* does not have an implicit agent.

In section 4.1, we will show evidence that runs counter to this claim. With the perfective *-le*, while the LI based on *guà* 'hang'/*xiě* 'write'-verbs and *zhòng* 'plant'-verbs can be diagnosed with an implicit agent, the LI based on *chàng* 'sing'-verbs cannot. We argue that whether there is an implicit Agent is determined by the verbal argument structure.

In section 4.2, we use the *yòu* 'again'-test to show that, with the perfective *-le*, the LI based on *guà* 'hang'/xiě 'write'-verbs and *zhòng* 'plant'-verbs has an event component and a state component, whereas the LI based *chàng* 'sing'-verbs only has an event component. In addition, with the durative *-zhe*, the LI based on *guà* 'hang'/*xiě* 'write'-verbs has a state reading without event implication, while the LI based on *chàng* 'sing'-verbs and *zǒu* 'walk'-verbs has a progressive reading.

4.1 Implicit Agent

As observed in H. Pan (1996), F. Liu (2007) and Paul et al. (2019), with the perfective *-le*, the LI has an implicit agent, whereas the LI with the durative *-zhe* does not have an implicit agent. These tests, which diagnose the existence of an implicit Agent, include the occurrence of the passive morpheme *bèi* (Pan 1996), the subject-oriented adverbial *gùyì* 'deliberately' (F. Liu 2007) and the purpose clause (see also Paul et al. 2019). As shown in (15), only the LI with *-le* can occur with these elements, whereas the LI with *-zhe* cannot.

(15) (a) With the passive *bèi*

qiáng-shàng	**bèi**	**Zhāngsān**	guà	***-zhe/-le**	yì-fú	huà.
wall-on	PASS	Zhangsan	hang	-DUR/-PERF	one-CLF	painting

Lit. "On the wall was hung one painting by Zhangsan."

(b) With a subject-oriented adverbial 'deliberately'

qiáng-shàng	**gùyì**		guà	***-zhe/-le**	yì-fú	huà.
wall-on	deliberately		hang	-DUR/-PERF	one-CLF	painting

Lit. "On the wall was hung one painting deliberately."

(c) With a purpose clause

wèile	yíngjiē	lǎoshī,	qiáng-shàng	guà
in.order.to	greet	teacher	wall-on	hang
*-zhe/-le	yì-tiáo	huānyíng	biāoyǔ.	
-DUR/-PER	one-CLF	welcome	banner	

"In order to greet the teachers, on the wall is hung one welcome banner."

Why is the presence of implicit Agent in LI dependent on the perfective -*le*? This question has not been answered. However, as shown in (16), the LI based on *chàng* 'sing'-verbs runs counter to the correlation between the presence of an implicit Agent and the perfective -*le*. In contrast with *guà* 'hang'-verbs as in (15), the LI based *chàng* 'sing'-verbs is not compatible with the passive *bèi* or a subject-oriented adverbial, even with the perfective -*le*.

(16) (a)

*tái-shàng	**bèi**	Zhāngsān	**chàng**	-le	gējù.
stage-on	PASS	Zhangsan	sing	-PERF	opera

(Lit. "On the stage was sung the opera by Zhangsan.")

(b)

*tái-shàng	**gùyì**	**chàng**	**-le**	gējù.
stage-on	deliberately	sing	-PERF	opera

(Lit. "On the stage was sung the opera deliberately.")

Furthermore, we cast doubt on the test with the passive morpheme *bèi*. As shown in (17), the passive morpheme *bèi* is in fact obligatory in the formation of canonical passives in Mandarin Chinese. However, the LI in (15a) shows that this morpheme is only optional in the LI with -*le*. The passive morpheme *bèi* is not a counterpart of English passive *by* (Li 1990). Hence, the LI with the perfective -*le* must be distinguished from the canonical passives.

(17) (a)

Zhāngsān	*(**bèi lǐsì**)	dǎ	-le.
Zhangsan	PASS Lisi	hit	-PERF

"Zhangsan was hit by Lisi."

(b)

Zhāngsān	*(**bèi**)	dǎ	-le.
Zhangsan	PASS	hit	-PERF

"Zhangsan was beaten." Huang, Li, and Li (2009, 112, [1], [2])

In this subsection, we have shown evidence that runs counter to the previous observation that the perfective LI has an implicit Agent. As shown in (18), in contrast with *guà* 'hang'/*xiě* 'write'/*zhòng* 'plant'-verbs, the perfective LI based on *chàng* 'sing'-verbs

does not have an implicit Agent. We will argue in section 5.2 that the occurrence of an implicit Agent is determined by the argument structure in which verbs can occur.

(18)   Is there an implicit Agent in LI?

		DURATIVE -ZHE	perfective -le
(a)	*hang*-verbs	no	yes
(b)	*write*-verbs	no	yes
(c)	*walk*-verbs	no	*
(d)	*plant*-verbs	no	yes
(e)	*sing*-verbs	no	no

4.2 Structural Complexity

Based on the *yòu* 'again'-test, we bring about more contrast between the LI with the perfective *-le* and the LI with the durative *-zhe*.

  We begin with the LI with the perfective *-le*. The *yòu* 'again'-test further sets *chàng* 'sing'-verbs apart from other verbs as exemplified by *guà* 'hang'. As shown in (19), with *yòu* 'again', the LI based on *guà* 'hang' is ambiguous. In the reading (i), the sentence presupposes that there was a previous state of one painting hung on the wall. In the reading (ii), the sentence presupposes a previous event of hanging. Von Stechow (1996) has used the German *wieder* 'again' to diagnose the presence of two eventualities in change-of-state predicates: a dynamic event and a state. Similarly, the two readings in (19) can be explained in the same way. In the reading (i), the *yòu* 'again' is associated with the state component of the structure involved in LI, while the *yòu* 'again' scopes over the dynamic event of 'hanging one painting' in the reading (ii).

(19) qiáng-shàng **yòu**   guà   **-le**   yì-fú   huà.
     wall-on   again   hang -PERF   one-CLF   painting
     (i) "On the wall the state of one painting hung occurs again."   − restitutive
     (ii) "On the wall another painting was hung."   − repetitive

By contrast, the LI based on *chàng* 'sing'-verbs does not have a state component. As shown in (20), there is only one dynamic event of 'singing opera' which can be associated with the *yòu* 'again'.

(20) tái-shàng   **yòu**   chàng **-le**   gējù.
     stage-on   again   sing -PERF   opera
      "On the stage the event of singing the opera happened again."

The LI with the durative *-zhe* shows different results than the the LI with the perfective *-le*. As shown in (21), the adverb *yòu* 'again' can only find a state component in the LI with *-zhe* based on *guà* 'hang'. The sentence presupposes a previous state of one painting hung on the wall. Unlike (19), (21) does not have a repetitive reading, suggesting that there is no event implication in the structure.

(21) qiáng-shàng **yòu** guà **-zhe** yì-fú huà.
 wall-on again hang -DUR one-CLF painting
 (i) "On the wall the state of one painting hung occurs again." − restitutive
 (ii) ~~"On the wall another painting was hung."~~ ~~repetitive~~

By contrast, with the durative *-zhe*, the LI based on *chàng* 'sing'-verbs (and *zǒu* 'walk'-verbs) has a progressive reading. The sentence (22) with *yòu* 'again' presupposes a previous on-going event of 'singing the opera'. It indicates that *yòu* 'again' scopes over the dynamic event.

(22) tái-shàng **yòu** chàng **-zhe** gējù.
 stage-on again hang -DUR opera
 "On the stage there is again an event of singing the opera."

Recall that, with the durative *-zhe*, the LI based on *zhòng* 'plant' is ambiguous between a state reading and a progressive reading. When the adverb *yòu* 'again' is inserted as in (23), the sentence can (i) presuppose a previous state of one tree planted in the yard (like 19i), or (ii) presuppose a previous on-going event of planting one tree (like 22).

(23) yuánzi-lǐ **yòu** zhòng **-zhe** yì-kē shù.
 yard-in again plant -DUR one-CLF tree
 (i) "In the yard the state of one tree planted in the yard occurs again."
 (ii) "In the yard there is again an event of planting one tree."

To summarise, we use the *yòu* 'again'-test to show that the LI is not structurally uniform in (24): the LI can have a complex [dynamic event + state] structure with *guà* 'hang'/*xiě* 'write'/*zhòng* 'plant'-verbs, or a dynamic event structure with *chàng* 'sing'/*zǒu* 'walk'-verbs. The state in the complex structure results from the dynamic event, that is, a resultant state. The resultant state in the LI with the perfective *-le* must be distinguished from the state without event implication in the LI with the durative *-zhe*. In the following sections, we will explain why the perfective *-le* can occur with the complex structure, and why the durative *-zhe* somehow 'forces' a simple structure.

(24)   Structural composition

	durative *-zhe*	perfective *-le*
(a) *hang*-verbs	state	dynamic event + state
(b) *write*-verbs	state	dynamic event + state
(c) *walk*-verbs	dynamic event	*
(d) *plant*-verbs	dynamic event or state	dynamic event + state
(e) *sing*-verbs	dynamic event	dynamic event

5.   Analysis

5.1 Base Structure

(25) shows the transitive sentences with an overt Agent. The localiser phrase can either follow the theme argument *yì-kē shù* 'one tree', or precede the verb *zhòng* 'plant'. However, while the perfective *-le* can occur in these two sentences, the durative/imperfective *-zhe* can only occur in (25b) in which the localiser phrase precedes the verb. We take the contrast with respect to the possibility of *-zhe* to indicate that these two sentences have different structures.

(25) (a) Zhāngsān   zhòng   -***zhe**/-le   yí-kē   shù   zài   yuánzi-lǐ.
         Zhangsan   plant   -DUR/-PERF   one-CLF   tree   PREP   yard-in
         "Zhangsan planted one tree in the yard."

     (b) Zhāngsān   **zài**   yuánzi-lǐ   zhòng   **-zhe**/-le   yí-kē   shù.
         Zhangsan   PREP   yard-in   plant   -DUR/-PERF   one-CLF   tree
         perfective *-le*:   "Zhangsan planted one tree in the yard."
         durative *-zhe*:   "Zhangsan is planting one tree in the yard."

Why is the durative *-zhe* unable to occur in (25a)? The structure proposed as in (26) accounts for it. In (26), the sequence following the verb *zhòng* 'plant' has a prepositional structure *p*P in which the localiser phrase *yuánzi-lǐ* 'yard-in' is in complement of P, and the Theme *yì-kē shù* 'one tree' is introduced by little *p*. The *p*P denotes states. The verb *zhòng* 'plant', which is formed by the root being adjoined to the eventive verbaliser *v*, takes the state-denoting *p*P as complement. The vP as a whole has a change-of-state meaning: the event of planting results in the state of one tree being in the yard. Above the vP, an aspectual marker is merged in Asp2 (Tsai 2008, Travis 2004). Since the durative *-zhe* selects an atelic predicate (Jo-wang Lin 2002), the telic change-of-state vP is incompatible with it. Above AspP2, the Agent *Zhangsan* is introduced by Kratzer's (1996) Voice.

(26)

```
                    VoiceP
                   /      \
               Spec        Voice'
              Zhāngsān     /    \
                      Voice      AspP2
                                /     \
                            Asp2       vP        —>   change-of-state
                           *zhe/le    /  \
                          -DUR/-PERF v    pP        —>   state
                                     √zhòng+v°   /  \
                                     'plant'  Spec   p'
                                             yì-kē shù  / \
                                            'one-CLF tree'  p    PP
                                                                /  \
                                                               P    localiser phrase
                                                              zài 'at'  yuánzi-lǐ
                                                                        'yard-in'
```
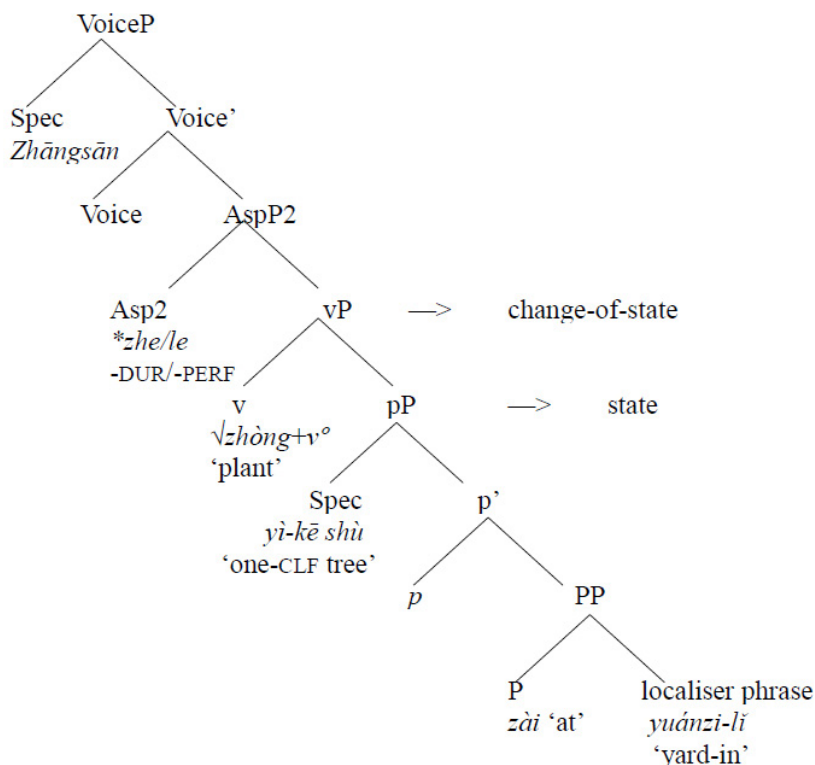
The little *p* can be regarded as the prepositional counterpart of little *v* or Voice. The little *p* introduces the Figure argument *yì-kē shù* 'one tree', and assigns or values the Case of the Ground argument *yuánzi-lǐ* 'yard-in' (Svenonius 2010, Levinson 2011), reminiscent of little *v* or Voice which introduces the external argument and assigns the Accusative Case to the internal argument (Burzio's generalisation). Note that we assume that *zài* 'at' is merged in P (see also A. Williams 2016). Later, we will take (26) as the base structure for the perfective LI based on 'hang/write/plant'-verbs. Since (26) excludes the durative *-zhe*, it explains why *-zhe* cannot occur in this type of complex [dynamic event + state] structure, cf. (24).

5.2 Locative Inversion with an Implicit Agent

Recall that the perfective LI based on *guà* 'hang'-verbs, *xiě* 'write'-verbs and *zhòng* 'plant' verbs is diagnosed with an implicit Agent. This type of LI must be distinguished from the canonical passive structure with *bèi* 'pass'. We extend the [v + pP] structure of (26) to the perfective LI with an implicit Agent in (27a). As shown in (27b), the

localiser phrase *yuánzi-lǐ* 'yard-in' is in complement of the null P, while the Theme *yì-kē shù* 'one tree' is introduced by the little *p*.

(27) (a) yuánzi-lǐ   zhòng   **-le**   yí-kē   shù.
         yard-in   plant   -PERF   one-CLF   tree
         Lit. "In the yard was planted one tree (by someone)."

(b)
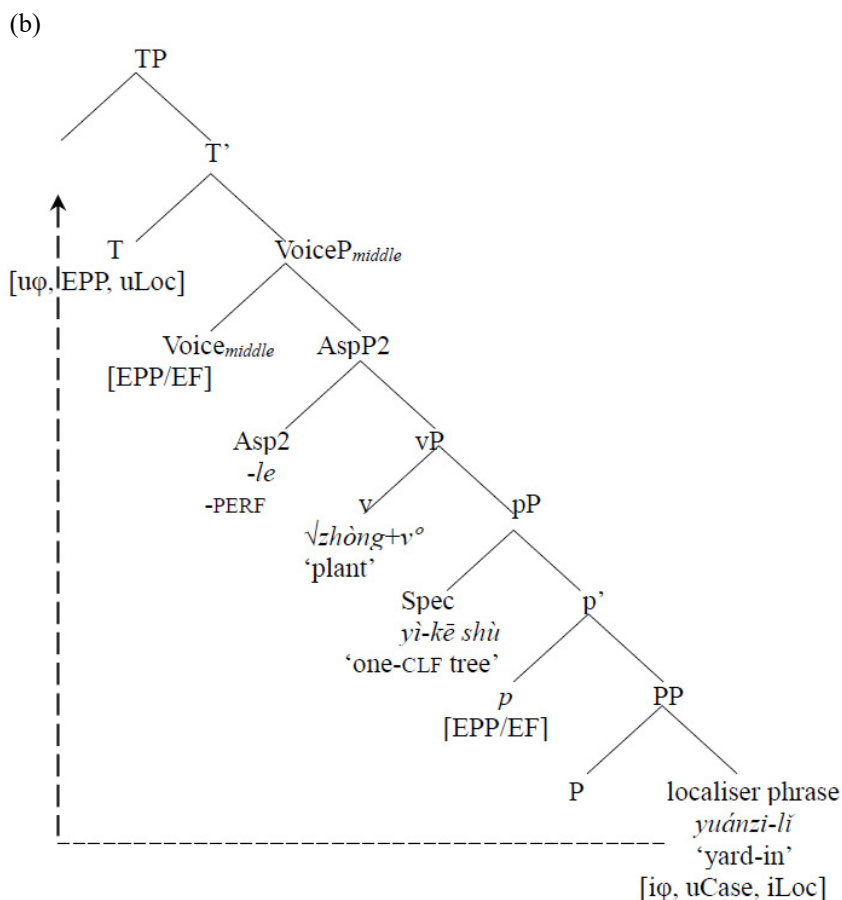
We propose that the implicit Agent is introduced by a different type of Voice, which introduces an external argument variable, not an overt external argument in its specifier. This type of head is similar to the Middle Voice proposed for Greek by Alexiadou, Anagnostopoulou and Schäfer (2015), Alexiadou and Doron (2012).

The localiser phrase originates within vP (*pace* Paul et al. 2019), and moves to Spec,TP (*pace* Yu 1995).[1] We further assume that Voice($_{middle}$) and little *p* are phase heads, and the localiser phrase *yuánzi-lǐ* 'yard-in' moves successive-cyclically through the edge of *p*P and VoiceP to avoid being trapped inside the lower phases, cf. Chomsky's (2000) PHASE IMPENETRABILITY CONDITION. The movement can be triggered by the EPP or Edge feature in *p*P and VoiceP, and the EPP in T.

Note that the movement of the localiser phrase *yuánzi-lǐ* 'yard-in' should have been intervened or blocked by the Theme *yì-kē shù* 'one tree' in Spec,*p*P. Assuming Chomsky's (1995) EQUIDISTANCE, thanks to the movement of P to *p*, the edge of *p*P (Spec,*p*P) and the Theme in Spec,*p*P are equidistant from the localiser phrase in the complement of P, because the edge of *p*P and Spec,*p*P are now in the same minimal domain. Another solution is LEAPFROGGING (Bobaljik 1995, Legate 2014). The head *p* hosting the post-verbal Theme in its specifier attracts the localiser phrase to create an additional specifier of *p*P. The Theme *yì-kē shù* 'one tree' cannot be attracted because it is not in the c-command domain of little *p* (being in its specifier, not in the complement). Hence, there is no locality violation.

5.3 Locative Inversion without an Implicit Agent
5.3.1 Locative Inversion with Durative/Imperfective *-zhe*

With *-zhe*, the LI based on *guà* 'hang'-verbs and *xiě* 'write'-verbs has a state reading, the LI based on *zǒu* 'walk'-verbs has a progressive reading, and the LI based on *zhòng* 'plant'-verbs is ambiguous between a state reading and a progressive reading.

To account for the state reading in (28a), we keep on assuming that the *p*P is the source of the state meaning. The post-verbal Theme *yì-kē shù* 'one tree' is introduced by the little *p*, and the localiser phrase *yuánzi-lǐ* 'yard-in' is merged as the complement of the null P. Given the lack of event implication in this LI (cf. the 'again'-test in the section 4.2), we argue that the verb is formed by the root being merged to a light copular verbaliser *v* (Myler 2016). This verbaliser is stative, and does not introduce an event variable or argument. The result is a semantically beached verb, which behaves like a copula.

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1 We hypothesise that the localiser phrase fails to get its Case assigned or valued by the little *p* due the fact that P is null, in contrast with (26), where the P is filled with an overt *zài* 'at'. The unvalued Case feature on the localiser phrase makes it active for the Probe in T. The movement renders the localiser phrase local to T. This analysis raises the question of why the Case assignment has to care about the overtness of P. Alternatively, the localiser phrase can be introduced by an Applicative head.

(28) (a) yuánzi-lǐ   zhòng   **-zhe**   yí-kē   shù.
        yard-in   plant   -DUR   one-CLF   tree
        Lit. "In the yard is planted one tree."

(b)
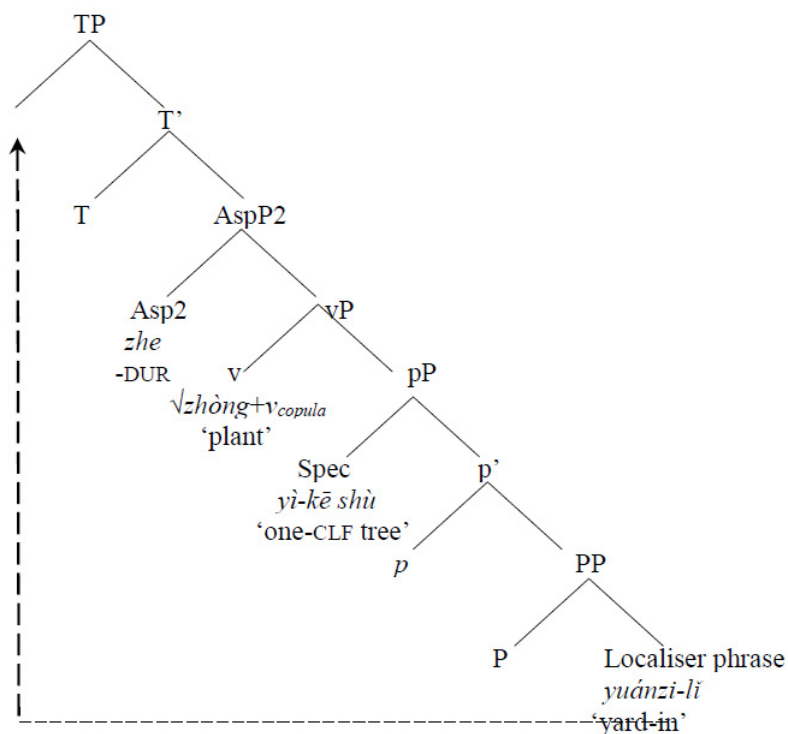
This proposal can provide insights into the following set of data.[2] As shown in (29), the post-verbal Theme arguments are inanimate and only *-zhe* marking is possible. These inanimate themes are particular, because 'stone lions' cannot really 'sit', and the 'moon' cannot be hung by someone in the sky. The LI with *-zhe* describes the spatial configuration of these inanimate themes, and there is no real event of 'sitting' or 'hanging' involved. By contrast, since the LI with *-le* has event implication due to the eventive verbaliser *v*, the oddness is induced by the events of 'sitting' and 'hanging' with these inanimate themes.

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2   See Hu (1995), Xiao and McEnery (2004) and Feng-his Liu (2007) for differing accounts of this set of data.

(29) (a) ménkǒu   zuò   ***-le/-zhe**   yí-duì   shí-shī.
       doorway   sit   -PERF/-DUR   one-CLF   stone-lion
       "At the doorway sits a pair of stone lions."

   (b) tiān-shàng   guà   ***-le/-zhe**   yì-lún   míng-yuè.
       sky-on   hang   -PERF/-DUR   one-CLF   bright-moon
       "In the sky hangs a bright moon."   Feng-hsi Liu (2007, 190, [24])

We turn to the progressive reading in the LI based on *zǒu* 'walk'-verbs and *zhòng* 'plant'-verbs (30a). As shown in (30b), the post-verbal Theme argument *yì-kē shù* 'one tree' is merged at the specifier of the dynamic vP. The complex predicate is made of the verb and the location noun *yuánzi* 'yard'. Note that the complement of the verb is not yet a localiser phrase, and the location noun *yuánzi* 'yard' forms a complex predicate with the verb *zhòng* 'plant' and turns the meaning of verb from 'an event of planting' to 'an event of planting the yard'.

(30) (a) yuánzi-lǐ   zhòng   **-zhe**   yí-kē   shù.
       yard-in   plant   -DUR   one-CLF   tree
       Lit. "In the yard is being planted one tree."

  (b)
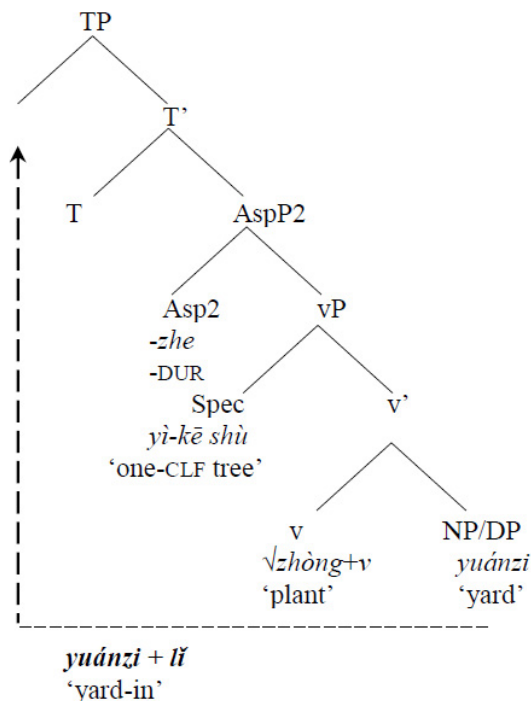
We argue that the localiser phrase *yuánzi-lǐ* 'yard-in' is formed at a later stage of derivation, in a separate syntactic Work Space. The reasons for assuming a complex predicate structure like (30b) come from the observation that the location noun can complement *zǒu* 'walk'/*zhòng* 'plant'-verbs elsewhere in the language (cf. non-canonical objects, Barrie and Li 2015, Zhang 2018). As shown in (31), these verbs can take a location noun as a complement. Like the *zhe*-marking LI based on the same verbs, the occurrence of the durative *-zhe* in (31) yields a progressive reading.

(31) (a) zǒu   -zhe   **shān-lù**
        walk   -DUR   montain-road
        "be walking the mountain road"

    (b) pǎo   -zhe   **cāochǎng**
        run   -DUR   playground
        "be running the playground"

    (c) zhòng -zhe   **huā-yuán**
        plant   -DUR   flower-yard
        Lit. "be planting the garden"

    (d) pū   -zhe   **mǎ-lù**
        pave   -DUR   horse-road
        "be paving the road"

The complex predicate structure proposed in (30b) can give an explanation of why *guà* 'hang'/*xiě* 'write'-verbs do not have the LI with a progressive reading. As shown in (32), contrasting with *zǒu* 'walk'/*zhòng* 'plant'-verbs, *guà* 'hang'-verbs cannot take location nouns as complement. It follows that *guà* 'hang'-verbs cannot form the structure of (30b). In addition, the reason the LI based on *zhòng* 'plant'-verbs is ambiguous between a state reading and a progressive reading is due to the fact that *zhòng* 'plant'-verbs can occur in both of the two structures (28b) and (30b) that yield these readings.

(32) (a) *fàng   (-zhe)   **qiáng**
        put   -DUR   wall

    (b) *xiě   (-zhe)   **běnzi**
        write   -DUR   notebook

    (c) *guà   (-zhe)   **qiáng**
        hang   -DUR   wall

5.3.2   *Sing*-Verbs

In contrast with *zhòng* 'plant'-verbs and *guà* 'hang'-verbs, the LI based on *chàng* 'sing'-verbs is not diagnosed with an implicit Agent (33a). With the perfective *-le*, the sentence describes a terminated event, not a resultant state. With the durative *-zhe*, the sentence describes an on-going event of singing.

As shown in (33b), we propose that the verb *chàng* 'sing' takes as complement the post-verbal noun phrase *gējù* 'opera', which forms a complex predicate with the verb. This nominal predicate enriches the semantics of the verb by turning an event of 'singing' into an event of 'singing the opera'. The localiser phrase is merged in the Spec,vP as an argument. The vP denotes a dynamic event. Above vP, aspectual markers are merged in Asp2 head.

(33) (a) tái-shàng   chàng   **-zhe/-le**   gējù.
       stage-on   sing   -DUR/-PERF   opera
       -zhe: "On the stage is being sung the opera."
       -le: "On the stage was sung the opera."

(b)
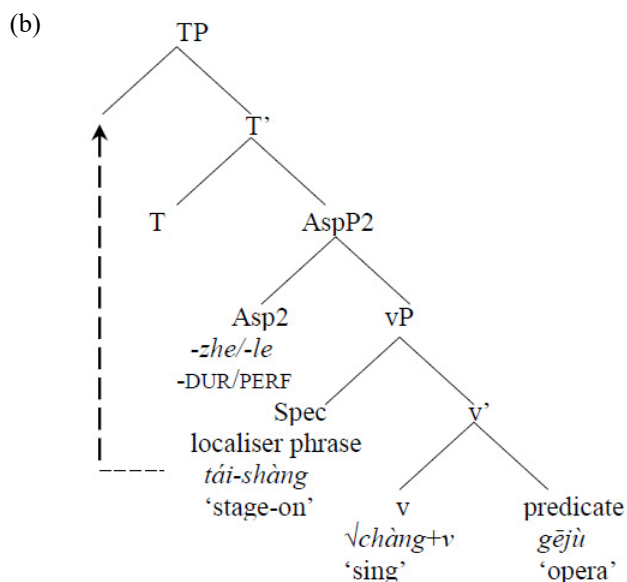
The complex predicate *chàng gējù* 'sing-opera' is predicated of the subject *tái-shàng* 'stage-on'. This predicational relation may shed light on the restriction on the verbs. As shown in (34), unlike *chàng* 'sing' and *mài* 'sell', verbs like *tīng* 'listen to' and *mǎi* 'buy'

are unable to form LI.[3] We speculate that the complex predicate *chàng gējù* 'sing-opera' in (34a) expresses the property characteristic of the subject *tái-shàng* 'stage-on', whereas the complex predicate *tīng gējù* 'listen to-opera' is not a property of the subject *tái-shàng* 'stage-on'. In the *sell/buy* case in (34b), while the the complex predicate *mài chē* 'sell-car' expresses the property characteristic of the subject *huìzhǎn-shàng* 'exposition-on', the complex predicate *mǎi chē* 'buy car' describes the behaviours of the clients. Therefore, verbs that can participate in the complex predicate structure need to describe some properties of the localiser subject.

(34) (a) yīnyuètīng-lǐ   **chàng/*tīng** **-zhe**   gējù.
        music hall-in   sing/listen   -DUR   opera
        "In the music hall is being sung/*listened to the opera."

     (b) huìzhǎn-shàng   **mài/*mǎi**   **-zhe**   zuì-xīn   zhìzào-de   qìchē.
         exposition-on   sell/buy   -DUR   most-new   make-DE   car
         "In the exposition are being sold/*bought the most recently made cars."

5. Concluding Remarks

We have examined the Locative Inversion based on five subclasses of verbs by studying their occurrence with the perfective *-le* and the durative *-zhe*. The interpretive differences and the possibility of an implicit Agent have led us to propose a non-uniform analysis. With the perfective *-le*, the LI based on 'hang'/'write'/'plant'-verbs has an eventive verb embedding the prepositional pP, yielding the change-of-state meaning. In addition, we argue that the implicit Agent is introduced by Middle Voice (Alexiadou, Anagnostopoulou and Schäfer 2015), which should be distinguished from the Mandarin canonical passive with *bèi*. With the durative *-zhe*, the LI based on 'hang'/'write'/'plant'-verbs denotes state. We have argued that the root of the verb is adjoined to the light copular verbaliser *v*. As a result, the verb behaves like a copula, and takes the state-denoting pP as complement. With the durative *-zhe*, the LI based on 'walk'/'plant'-verbs has a dynamic vP, which takes the location noun as complement and the post-verbal theme as argument. The LI based on 'sing'-verbs has an unaccusative structure. The result shows that the Mandarin Locative Inversion can take place when the language has several strategies to produce structures without an overt Agent.

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3   There is a contrast between *sell* and *buy* in the formation of English middle constructions (Fagan 1992).

    (i) a.   The new Saramago **sells** like water in a desert.
         b.   * The new Saramago **buys** with great difficulty, the distribution is so bad.

Works Cited

Alexiadou, Artemis, Elena Anagnostopoulou and Florian Schäfer. 2015. *External Arguments in Transitivity Alternations: A Layering Approach*. Oxford: Oxford University Press.

Alexiadou, Artemis, and Edit Doron. 2012. "The Syntactic Construction of Two Non-Active Voices: Passive and Middle." *Journal of Linguistics* 48: 1–34.

Barrie, Michael, and Yen-Hui Audrey Li. 2015. "Analysis vs. Synthesis: Objects." In *Chinese Syntax in a Cross-Linguistic Perspective*, edited by Yen-Hui Audrey Li, Andrew Simpson, and Wei-Tien Dylan Tsai, 179–206. Oxford: Oxford University Press.

Bobaljik, Jonathan David. 1995. "*Morphosyntax: The Syntax of Verbal Inflection*." Ph.D. diss., MIT.

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

Chomsky, Noam. 2000. "Minimalist Inquiries: The Framework." In *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, edited by R. Martin, D. Michaels and J. Uriagereka, 89–155. Cambridge: MIT Press.

Chomsky, Noam. 2001. "Derivation by Phase." In *Ken Hale: A Life in Language*, edited by M. Kenstowicz, 1–52. Cambridge, MA: The MIT Press.

Fan, Fanglian. 1963. "Existentials." *Studies of Chinese Language* 5: 386−95.

Gu, Yang. 1992. "On the Locative Existential Construction in Chinese." In *Proceedings of the10th West Coast Conference on Formal Linguistics*, edited by Dawn Bates, 183−195. Stanford, CA: The Stanford Linguistics Association.

Hoekstra, Teun, and René Mulder. 1990. "Unergatives as Copular Verbs; Locational and Existential Predication." *Linguistic Review* 7: 1–79.

Hu, Wenze. 1995. "Verbal Semantics of Presentative Sentences." *Yuyan Yanjiu* 2: 100–112.

Huang, Cheng-Teh. James. 1987. "Existential Sentences in Chinese and (In)definiteness." In *The Representation of (In)definiteness*, edited by Eric Reuland and Alice ter Meulen, 226–253. Cambridge, MA: MIT Press.

Huang, Cheng-Teh. James., Yen-Hui Audrey Li and Yafei Li. 2009. *The Syntax of Chinese.* Cambridge: Cambridge University Press.

Kratzer, Angelika. 1996. "Severing the external argument from its verb." In *Phrase Structure and the Lexicon,* edited by J. Rooryck and L. Zaring, 109−137. Dordrecht: Kluwer.

Legate, Julie Anne. 2014. *Voice and v: Lessons from Acehnese*. MIT Press.

Levin, Beth, and Malka Rappaport Hovav. 1995. *Unaccusativity: At the Syntax–Lexical Semantics Interface*. Cambridge, MA: MIT Press.

Levinson, Lisa. 2011. "Possessive WITH in Germanic: HAVE and the Role of P." *Syntax* 14 (4): 355−393.

Li, Yen-hui Audrey. 1990. *Order and Constituency in Mandarin Chinese.* Dordrecht: Kluwer Academic Publishers.

Lin, Jo-Wang. 2002. "Aspectual Selection and Temporal Reference of the Chinese Aspectual Marker -*Zhe*." *The Tsing Hua Journal of Chinese Studies:* 257−295.

Lin, Tzong-Hong. Jonah. 2008. "Locative Subject in Mandarin Chinese." *Nanzan Linguistics* 4: 69–88.

Liu, Feng-hsi. 2007. "Auxiliary selection in Chinese." In *Split Auxiliary Systems: A Cross-Linguistic Perspective*, edited by Raúl Aranovich, 181−205. Amsterdam: John Benjamins.

Myler, Neil. 2016. *Building and Interpreting Possession Sentences*. Cambridge, MA: MIT Press.

Pan, Haihua. 1996. "Imperfective Aspect *zhe*, Agent Deletion, and Locative Inversion in Mandarin Chinese." *Natural Language and Linguistic Theory* 14: 409−432.

Paul, Waltraud, Yaqiao Lu, and Thomas Hun-Tak Lee. 2019. "Existential and Locative Constructions in Mandarin Chinese." *Linguistic Review* 37 (2): 231−267.

Smith, Carlota S. 1997. *The Parameter of Aspect.* Dordrecht: Kluwer.

Svenonius, Peter. 2010. "Spatial P in English." In *Mapping spatial PPs* (The Cartography of Syntactic Structures 6), edited by Guglielmo Cinque and Luigi Rizzi, 127–160. New York: Oxford University Press.

Travis, Lisa. 2010. *Inner Aspect: The Articulation of VP.* Dordrecht: Springer.

Tsai, Wei-Tien Dylan. 2008. "Tense Anchoring in Chinese." *Lingua* 118: 675–686.

von Stechow, Arnim. 1996. "The Different Readings of Wieder 'Again': A Structural Account." *Journal of Semantics* 13(2): 87–138. doi:10.1093/jos/13.2.87.

Williams, Adina. 2016. Modificational and Predicate Adjunct Uses of the Mandarin Locative Preposition zài. Paper presented at ConSOLE XXIV, January 6–8, 2016.

Xiao, Ricard, and McEnery, Tony. 2004. *Aspect in Mandarin Chinese: A Corpus-Based Study*. Amsterdam and Philadelphia: John Benjamins.

Yang, Suying. 1999. "The Unaccusativity Phenomenon: A Study on the Relationships between Semantics and Syntax." *Dangdai yuyanxue* 1: 30–43.

Yang, Suying, and Pan, Haihua. 2001. "A Constructional Analysis of the Existential Structure." In *Studies in Chinese Linguistics* II, edited by H.H. Pan, 189–208. Hong Kong: Linguistic Society of Hong Kong.

Yeh, Meng. 1993. "The Stative Situation and the Imperfective *zhe* in Mandarin." *Journal of the Chinese Language Teachers Association* 28: 69–98.

Yu, Ning. 1995. "Towards a Definition of Unaccusative Verbs in Chinese." In *Proceedings of the 6th North American Conference on Chinese Linguistics*, edited by J. Camacho and L. Choueiri, 339–353. Los Angeles: Univerity of South California.

Yuan, Boping. 1999. "Acquiring the Unaccusative/Unergative Distinction in a Second Language: Evidence from English-Speaking Learners of L2 Chinese." *Linguistics* 37: 275–296.

Zhang, Niina Ning. 2018. "Non-Canonical Objects as Event Kind-Classifying Elements." *Natural Language & Linguistic Theory* 36 (4): 1395–1437.

Zhang, Nina Ning. 2019. "Appearance and Existence in Mandarin Chinese." *Studies in Chinese Linguistics* 40 (2): 101–140.

Case Changing and Case Maintaining Movements in Dependent Case Theory: Dative Extraction in Hungarian

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Abstract: In Hungarian, when a possessor moves from its position within the *np* to a higher position in the DP, it changes its case from nominative to dative. But when it moves from this higher position, it maintains this dative case. This paper seeks to account for why some movements allow case change while others do not. Our account is set within Baker's (2015) Dependent Case Theory, though with modifications which enable us to achieve our goal. We claim that the Invisibility Principle (case assignment makes a DP invisible to the case system) is central to the theory and use it to justify the distinction between Baker's hard and soft domains. A soft domain is defined as one for which its unmarked case is not assigned until a hard domain is evaluated. Thus, DPs in soft domains earmarked for unmarked cases may get a different case if they move.

1. Introduction

The aim of the paper is to provide an explanatory account of the following cross-linguistic observation: occasionally the case of a DP changes after movement. Since existing accounts fail to reliably predict when case change takes place and when it does not, we offer an alternative that argues for a modification of Baker's (2015) Dependent Case Theory.

Our analysis is based on the following empirical facts from Hungarian:

I.   *Movement of a nominative possessor within a DP changes the case of the moved possessor into dative without any change in meaning:*

(1) (a) a   fiú   kalap-ja
          the   boy.NOM   hat-3SG.POSS
          'the boy's hat'

     (b) a   fiú-nak   a   kalap-ja
          the   boy-DAT   the   hat-3SG.POSS
          'the boy's hat'

In the well-known examples in (1) (Szabolcsi 1994, 1984), the position of the definite article is a reliable indicator of the position of the possessor: in sentence (1a) the possessor is behind the article, in (1b) it is before it, suggesting a more external position. Correspondingly, in (1a) the possessor must be nominative, while in (1b) it is obligatorily in dative case.

II.   *Movement of a dative possessor/subject from DPs (2) and TPs (3) leads to no change of the case of the moved DP.*

(2)   [A fiú-n`ak]$_i$ / *[A fiú]   elveszett [t$_i$ a   kalap-ja].
      the boy-DAT   the boy.NOM got.lost   the hat-3SG.POSS
      'The boy's hat got lost.'

(2) shows is that it is possible for the possessor to be extracted in Hungarian, but only if the possessor is dative.

(3)   (Péter-nek)   nem   kell   (Péter-nek)   el-men-ni-e.
      Peter-DAT   not   have.to   away-go-INF-3SG
      'Peter does not have to leave.'

(3) shows that the subject of an inflected infinitive is dative clause internally (cf. Tóth 2000) and can move to the left periphery of the selecting verb. The dative case form remains unchanged.

Having presented the empirical focus of our paper, in section 2 we argue in support of the movement analysis and against an account in terms of base generation. Section 3 presents background information on Baker's (2015) Dependent Case Theory (DCT) highlighting the notion of soft and hard domains and discusses the results of earlier work on a DCT account of Hungarian (Newson and Szécsényi 2020). Section 4 looks more closely at Baker's (2015) stance on the relationship between case and movement and identifies a number of problems in his analysis. In section 5 we present an alternative analysis, which makes the soft vs. hard domain distinction meaningful and accounts for the distribution of case change.

2. Case and Movement in Hungarian

One instance of our claim that movement from a dative position does not change the case of the DP concerns DP external possessors. In arguing that we are dealing with movement (as opposed to base generation) in the relevant structures presented in section (1) we rely on den Dikken (1999) and É. Kiss (2014). These use evidence from the anti-agreement facts of the possessive DP paradigm to distinguish between two possibilities for external possessors. The relevant observation is that in possessive DPs with a third person plural possessor, the possessor and the possessee cannot agree as they do in other cases (see, for example, (1)). When the possessor is pronominal, while the meaning is plural, it can only appear in the singular form *ő*, although the possessee carries the plural agreement (4a). When the possessor is a nominative lexical DP, it appears in its plural form, and the agreement marker on the possessee has to be third person singular (4b):

(4) (a) az ő/*ők kalap-juk
the 3SG/3PL hat-3PL.POSS
'their hat'

(b) a fiúk kalap-ja/*kalap-juk
the boys at-3SG/hat-3PL
'the boys' hat'

Interestingly, when a plural lexical possessor is extracted (and hence realized as a dative DP), the possessee can bear either agreement form (5). In order to account for this, den Dikken (1999), and, following the proposal therein, É. Kiss (2014) argue for different derivations. The pattern showing anti-agreement can only arise if the possessor moves from within the possessive DP (5a). In order to explain (5b), where the possessee has a form it would have if it (anti-)agreed with a pronoun, it is assumed that this is indeed the case: within the possessive DP there is a *pro* with the lexical possessor being base generated as an affected argument of the selecting verb (5b)[1,2].

---

1   Here, the dative case of the base generated external possessor cannot come from within the possessive DP. We assume that is has another source entirely and is an inherent case assigned by the applicative head which introduces it.

2   A reviewer points out that plural possessive DPs can be interpreted as having either collective possessors or distributed ones: in (5a), for example, it could be that there was a different hat for each boy or the boys collectively owned the hat. Moreover, according to their intuition, there is a preference for the distributed reading in the case of (5a). We have nothing to add to these comments at this point.

(5) (a) A fiúk-nak$_i$ elveszett [$_{DP}$ a   [$_{NP}$ t$_i$ kalap-**ja**]]
        the boys-DAT got.lost   the   hat-3SG.POSS
        'The boys' hat got lost.'

    (b) A fiúk-nak$_i$ elveszett [$_{DP}$ a   [$_{NP}$ pro$_i$ kalap-**juk**]]
        the boys-DAT   got.lost   the   hat-3PL.POSS
        'The boys' hat got lost.'

That is, anti-agreement can be used as a diagnostic for movement. It is the data showing anti-agreement like the one in (5a) that are relevant for the purposes of the present paper. The pattern in (5b) will not be discussed further.

    We now take a closer look at whether familiar dichotomies in case and movement can be used to account for the distribution of case-changing and non-case-changing movements. One of the obvious candidates is the distinction between inherent and structural case, as inherent case is known to be maintained under movement and structural case can be acquired by a DP in its landing site. Though Hungarian does have inherent datives, assuming a difference in case type will not explain case-change as the constructions in question involve structural datives only, as indicated by the fact that the relevant DPs are not restricted to a specific interpretation. Furthermore, as argued in Newson and Szécsényi (2020), the fact that the dative subjects of inflected infinitives show clear parallels with the nominative subjects of finite clauses, both cases emerging on subjects in transitive and intransitive contexts ((6) and (7)), demonstrates that these cases are not only structural but specifically unmarked.

(6) (a) Muszá$_j$ [Péter-nek   haza-men-ni-e].
        must   Peter-DAT   home-GO-INF-3SG
        'Peter must go home.'

    (b) Tud-om,   [Péter   haza-men-t.]
        know-1SG   Peter.NOM   home-GO-PST
        'I know that Peter went home.'

(7) (a) Nem szabad [Péter-nek meg-néz-ni-$_e$ ez-t   a   film-et].
        not   allowed   Peter-DAT PV-watch-INF-3SG this-ACC the film-ACC
        'Peter is not allowed to watch this film.'

    (b) Tudom, [hogy Péter   meg-néz-t$_e$ ez-t   a   film-et].
        know-1SG   that Peter.NOM PV-watch-PST this-ACC the film-ACC
        'I know that Peter watched this film.'

We have already seen that in possessive structures the case form of the possessor depends on its position: lower possessors are nominative, higher ones, dative. Both cases are necessarily structural. Still, it is only nominative case that changes; dative does not. In conclusion, the inherent vs. structural case distinction cannot account for when case changes after movement.

Another potential candidate for predicting when case change takes place and when it does not is the A- vs. A-bar movement dichotomy. Under traditional assumptions, A-movement involves moving to a position to which case is assigned while A-bar movement does not. So, a DP undergoing raising or passivisation, for example, will receive a case associated with its landing site while a DP undergoing wh-movement will maintain the case it was assigned before it moved to spec CP. However, much current work questions the legitimacy of this distinction on empirical and conceptual grounds. Conceptually the distinction between argument and non-argument positions is hard to maintain under current assumptions. There are movements which do not cleanly fall into one or the other type: scrambling, for example, resists an account in terms of this distinction (Webelhuth 1992). Specifically concerning the Hungarian data, there is little reason to assume an A/A-bar distinction between the movement from the nominative and dative positions: both are movements from positions to which case is assigned, though both fail to qualify as A-bar movement as none of the features associated with this can be convincingly argued to trigger either movement. If anything, this movement could be identified as one which makes further movement out of the DP possible.

3.   Background

We have seen in the previous section that a movement account of the constructions in question is feasible, but at the same time case change/maintenance does not correlate with either case or movement type. Clearly, there must be something else that accounts for its distribution, but from the standard perspective it is far from obvious what our next candidate should be. The main claim of this paper is that an alternative view of case, Baker's (2015) Dependent Case Theory, fares better, provided that certain modifications are introduced.

In order to proceed, we need to introduce some background information on the core notions of Dependent Case Theory in general, and, more specifically, previous assumptions on the case domains of Hungarian in a DCT framework.

3.1. Dependent Case Theory

One of the core components of DCT is the case hierarchy of Marantz (1991), according to which DPs are assigned case in an order that depends on case type. *Lexical case*, case with a consistent semantic value is assigned first. After this comes *dependent case,* which is assigned to one of two case competitors in a local domain. *Unmarked case* is assigned

to those DPs that have no lexical case or dependent case assigned to them.[3] Importantly, unmarked case is not necessarily morphologically unmarked, and can vary even in the different domains of one and the same language.

In Marantz's system, it was assumed that after a DP is assigned case, it plays no further role in the system; either to receive another case or to provide the conditions for dependent case to be assigned to another DP. Baker, however, marginalizes this idea by making it dependent on a parameter setting. For languages like Icelandic, in which quirky subjects trigger nominative case assignment to objects, the parameter is set so that once the subject is assigned inherent case, it drops out of the competition and the object is then eligible for unmarked case, being the sole remaining contender in the domain. However, for some languages, such as Warlpiri and Burushaski, some predicates which have an inherent dative object also have an ergative subject, suggesting that for these languages the inherent case marked object is still visible to enable the high dependent case to be assigned to the subject.

We will discuss problems for Baker's proposal in section 4.2, but for now we will simply reject it and instead propose to elevate Marantz's original proposal the status of a core principle of the framework. Let us call it the Invisibility Principle:

(8) **The Invisibility Principle**
    Once DPs are assigned case, they play no further role in the case system

Another key component of the theory is the notion of case domains. These have two important functions. First, they limit the DPs competing for an assigned case; only those which appear in the same domain can determine the conditions of dependent and unmarked case assignment. Thus, while the presence or absence of an object can determine which case is assigned to the subject of the object's clause, it will never affect the case of a subject in a different clause. Second, dependent and unmarked cases are specified for specific domains and can vary both cross-linguistically and intra-linguistically, e.g. we often find different cases in nominal vs. verbal projections.

Baker (2015) equates case domains with the spell-out domains of phase theory (Chomsky 2001). We will be in a better position to understand the problems this leads to after a discussion of how unmarked nominative and dative domains work in Hungarian.

3.2. Unmarked Nominative and Dative in Hungarian

This part of the paper builds heavily on the conclusions reached in Newson and Szécsényi (2020), the aim of which is giving a consistent account of the distribution of nominative and structural dative DPs in Hungarian in a DCT framework.

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3   Different case systems emerge depending on whether the structurally higher or lower DP is assigned the dependent case.

The structure we assume for clauses in (9) is standard. For the possessive DP (10), we assume that the possessor is introduced by *n*, similar to how *v* introduces the agent.

(9)

```
            CP
         ╱     ╲
        C       TP
             ╱      ╲
       DP-NOM        T′
                   ╱    ╲
                  T      vP
```

(10)

```
           DP
        ╱     ╲
       D       nP
           ╱      ╲
      DP-NOM       n′
                 ╱   ╲
                n     NP
```
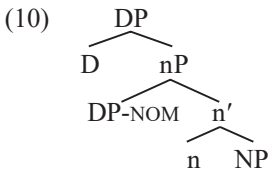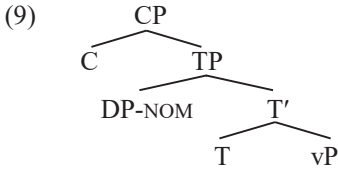
The complements of C and D are therefore domains with unmarked nominative case. CP and DP are the typical extended verbal and nominal projections, in the sense of Grimshaw (2005), and therefore the unmarked nominative domains of Hungarian are the complements of the heads of canonical extended projections. In these domains, the subject/possessor is the highest, if not only, DP and therefore is eligible for unmarked case assignment.

The dative DPs we are concerned with in the present paper are all associated with unmarked dative domains in Newson and Szécsényi (2020). Among others, we systematically find unmarked dative case in the complements AgN, the non-finite agreement head that appears in possessive DPs and inflected infinitives and differs from the finite agreement paradigm.

(11)

```
                  AgNP
               ╱        ╲
              TP         AgN
           ╱      ╲
     DP-DAT_i      T′
                 ╱    ╲
                vP     T
              ╱    ╲
           DP_i  v  VP
```

(12)

```
                          AgNP
                 _____|_____
                DP                  AgN
          _____|_____
      DP-DAT₁          D′
                   ____|____
                  D         nP
                       _____|_____
                      DP          n′
                      △        ___|___
                      t₁       n      NP
```

(12) tree: AgNP branching into DP and AgN; DP branching into DP-$_{DAT_1}$ and D′; D′ branching into D and nP; nP branching into DP (t$_1$) and n′; n′ branching into n and NP.
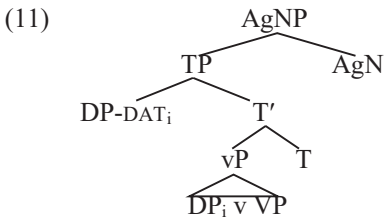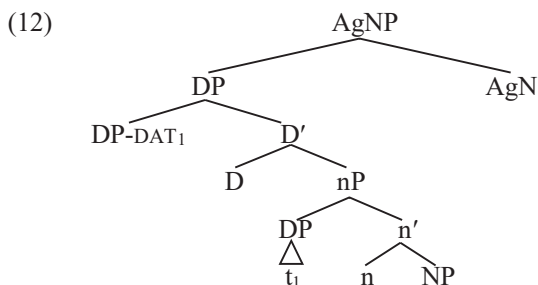
In the inflected infinitive in (11) (see (6a) for an example), the subject sits in a similar position to that of other clauses, the only difference being the presence of AgN. This defines TP as an unmarked dative domain and hence the subject, being eligible for unmarked case, gets dative. In the possessive DP in (12) (see (1b)), the possessor has moved from its position in (10) to the specifier of the DP complement of AgN, where it receives dative for the same reason as the subject of the inflected infinitive[4].

3.3. Hard and Soft Domains

In the previous section we saw how the DPs occupying the specifier position of complements of heads determining unmarked nominative and dative domains end up in their respective case forms. Now we can move on to the problems that emerge for Baker's (2015) approach to case domains.

To recap, for Baker case domains are the spell-out domains of phase theory. This often leads to the right predictions, but, unmoderated it runs into a systematic and rather disturbing problem: VP should be a case domain, as *v* is a phase head universally. This is problematic because in most standard case systems the specifier of VP, when present, interacts with DPs in the clausal domain to determine dependent case assignment: accusative to the object or ergative to the subject. It therefore seems that movement and

---

4   A reviewer points out that dative possessors can also appear postnominally:

i.   a   két   szép   régi   kocsi-ja   a   nagyi-nak
      the   two   nice   old   car-3s.POSS   the   grandmother-DAT
      "the grandmother's two nice old cars"

Given that dative case, once assigned to a possessor does not change on movement, a straightforward account of postnominal datives would be to employ a movement similar to extraposition. Similar phenomena can be found in certain Hungarian PPs where a dative nominal not only can, but must be extraposed.

ii.   Mellett-e   áll-t-am   Péternek.   (vs. Péter   mellett   áll-t-am.)
      beside-3SG.POSS   stand-PAST-1SG   Peter-DAT   Peter-NOM   beside   stand-PAST-1SG
      Both: "I was standing next to Peter."

Space limitations prevent us from going into these observations further in this paper.

case assignment part ways at this point: whereas for movement we have ample evidence for vP being a phase, for case assignment we need a larger local domain, at least in some cases. In other cases, however, as Baker points out, assuming the VP to be a case domain is advantageous. He argues that in some languages we can identify cases, both unmarked and dependent, which are specific to the VP. For example, he claims that Sakha has a high dependent dative and Finnish has an unmarked partitive in the VP. As it is one of the functions of domains to distinguish the different structural cases assigned to DPs in different positions, this is a strong reason to think of VP as a domain in these cases. Therefore, it seems that languages differ in whether VP counts as a domain or not.

To account for this cross-linguistic variation, Baker introduces a distinction between soft and hard case domains. The two differ in their effects on case. Hard domains behave as expected with their contents being spelled out on the merger of the phase head. Therefore, contained DPs have fixed cases and they do not participate in determining the case assignment to DPs in subsequent domains. In soft domains, contained DPs remain active after spell-out, and therefore are available to receive cases assigned at a higher domain and can act to determine dependent case assignment at that higher domain. Thus, if the VP is soft, the object can be assigned accusative at the TP level or determine ergative case assignment to the subject.

While this distinction is necessary for Baker, it remains descriptive, without explanatory content and does not naturally fall out from either case or phase theory. It is an aim of the present paper, in elevating the status of the Visibility Principle, to place soft domains as a proper component of DCT with explanatory power, resulting in an account that is also more in line with minimalist assumptions.

7.   Baker on Case and Movement

Baker sees the relationship between case assignment and movement as a timing issue: which precedes and which follows? Originally standard case theory saw the Case Filter operating at S-structure, allowed the possibility of moving caseless DPs into case positions. Other movements seemed to carry an already assigned case to positions not associated with case assignment. Baker maintains that this distinction is still relevant within Dependent Case Theory, though not necessarily applying to the same phenomena which motivated it under standard assumptions. The question is that if case domains are equated with Spell-Out domains, and case assignment is part of spelling out a DP, how can it be delayed until after movement?

Baker proposes several different mechanisms to deal with various instances related to this issue. For instance, he proposes that adjuncts are spelled out in a second round within each phase, following the spell out of all non-adjuncts. He uses this to account for why both the subject and the extracted possessor in Japanese end up with marked nominative:

(13) John-ga   [– otoosan]-ga   sin-da.
     John-MNOM   father-MNOM   die-PAST
     'It is John whose father died.'

On the assumption that the extracted possessor is in an adjunction position, Baker argues that the subject in (13) is assigned marked nominative case because, at the point it is evaluated, the adjoined possessor is not considered. As there is no DP c-commanding the subject, it is eligible for marked nominative[5]. Subsequently, the extracted possessor is considered and as there is no c-commanding DP for this it also gets marked nominative.

For our paper, however, the most important assumption Baker makes concerns how different cases interact with movement. His claim is that dependent case, once assigned, cannot be altered if a DP is evaluated in another domain. But unmarked case may be overwritten in such circumstances. A DP can be evaluated in more than one domain under two conditions: i) when it is inside a soft domain, and so it remains visible after the domain is spelled out, and ii) when it moves from one domain to another. Thus, dependent case will be maintained, and unmarked case may be changed, under movement.

Evidence that dependent case is maintained under movement comes from raising of ergative subjects (14) and moving internal arguments with structural dative from VP to subject position (15):

(14) (a) 'E   lava   ['o   ako   'e   Pita   'a   e   lea   faka-Tonga].
         AUX possible COMP learn ERG Peter ABS the language Tongan
         'Peter can learn Tongan.'

     (b) 'E   lava   'e   Pita ['o   ako   –   'a   e   lea   faka-Tonga].
         AUX possible ERG Pita COMP learn   ABS the language Tongan
         'Peter can learn Tongan.'

(15) Ucuutal-ga   student-na$_r$ tiij-bet-ter.
     teacher-DAT   student-PL   suffice-NEG.AOR-3PS
     'The teacher doesn't have enough students.'

In (14) we see a Tongan example of subject raising where we observe that the raised subject maintains its ergative case and (15) illustrates a Sakhan diadic unaccusative verb in which the dative DP is moved to subject position maintaining its case[6].

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5   Baker analyses marked nominative languages as involving the following assignment conditions:

            i. Assign a DP marked nominative if it has no c-commanding competitor.

6   Baker maintains that the higher argument in the VP in Sakha receives structural dative, not inherent case, as the dative marked argument is not restricted to a particular semantic interpretation and appears in a number of different constructions.

As for unmarked case being overwritten with movement of the DP to another domain, Baker provides two examples. The first involves his account of differential object marking in Sakha. In this language, definite DPs receive accusative case while indefinite DPs are unmarked. The data below indicate that the definite DP is raised out of the VP, and hence precedes the VP adverb, while the indefinite DP remains inside the VP:

(16) (a) Masha   [VP   türgennik   salamaat   sie-te]
       Masha   quickly   porridge   eat-PAST.3SS
       'Masha ate porridge quickly.'

     (b) Masha   salamaat-y   türgennik [VP sie-te]
       Masha   porridge-ACC quickly   eat-PAST.3SS
       'Masha ate the porridge quickly.'

On the assumption that the VP is a hard domain in Sakha, Baker accounts for the unmarked case on the VP internal indefinite object straightforwardly: when the VP is spelled out, the only DP in the domain is the object and hence it is assigned unmarked case. Remaining inside the VP, this object plays no further role in the case system and hence the unmarked case is fixed. However, the definite object moves out of the VP into the higher TP domain. The unmarked case that it was assigned in its VP internal position is then overwritten by the dependent (accusative) case as in the higher domain the object is in a position to interact with the subject.

The second instance of unmarked case being overwritten after movement concerns the Japanese data given in (13). First Baker argues that, in some languages, genitive case is the unmarked case of the nominal domain. The mark of an unmarked genitive is the possibility of having two genitive DPs within a single possessive DP. As the following shows, Japanese can be taken to have an unmarked genitive:

(17) yuubokumin-no   toshi-n$_o$ hakai
    nomad-GEN   city-GEN   destruction
    'the nomad's destruction of the city'

As we saw in (13), when a possessor is extracted from the possessive DP it loses its genitive case and is overwritten with the case determined for it in the higher domain. The extraction of a possessor with dependent genitive case, however, would not allow this case change to take place. Baker cites Cuzco Quechuan as an example of this.

4.1 Empirical Problems for Baker's Proposal
Although Baker discusses several languages which, by his diagnostic, have unmarked genitive and a number of languages which allow extraction from the possessive DP

accompanied by a case change on the extracted possessor, the only example he discusses in which these properties coincide is Japanese.[7]

However, one might wonder if this is enough data on which to form a generalization. In fact, one can find examples which appear to go against Baker's generalization. For some speakers of Greek, it is possible to have two genitives in a single DP, indicating that, for them, genitive is unmarked:

(18) I   fotografia   tis   Marias   tu   Yann$_i$ en kalit^{h}eri
     the-NOM photograph- NOM the-GEN Maria-GEN the-GEN John-GEN is good

     pu   tu   Kosta
     than   the-GEN Kosta-GEN
     'John's photograph of Maria is better than the one of Kosta.'   Natalia Pavlou p.c.

Moreover, Greek also allows possessor extraction, though without changing the genitive of the possessor:[8]

(19) (a) Tinos   mu   ipes   pos dhiavases   to   vivilo.
         whose-GEN my   said-2ND.S. that read-2ND.s the-NOM book-NOM
         'Whose book did you tell me that you read.'

     (b) Tis   MARIAS   thelo   to   forema.
         the-GEN Maria-GEN   want-1ST.s. the-NOM dress-NOM
         'I want Maria's dress (not Eleni's)   Ntelitheos (2002)

The Hungarian data discussed at the beginning of this paper offers a similar problem. As was demonstrated earlier, a possessor moving from the lower DP internal position to the higher one loses its unmarked nominative case, following Baker's prediction. However, when the possessor is extracted from the higher position it maintains its dative case. As dative is the unmarked case of the higher nominal domain, we would expect it to be visible for further case assignment in domain it is moved into. Yet, as we have seen, a moved dative DP never changes case.

Another empirical problem facing Baker's approach is that universally some movements never involve case change regardless of whether the affected DP has dependent

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7   Perhaps not surprisingly, Korean is a language demonstrating similar facts to Japanese. Korean allows double genitives (An, 2014) and extracted possessors are assigned nominative rather than maintaining their genitive case (Nakamura, 2002).

8   It remains to be discovered whether all those people who accept the double genitive construction also allow possessor extraction without case change.

or unmarked case. For example, DP movement out of the TP into the left periphery of the clause necessarily extracts the DP from a case domain, as TP is a spell out domain universally. A left peripheral DP therefore could in principle be evaluated in the higher domain and, if its original case were unmarked, could be assigned another case. But to our knowledge, movements traditionally associated with spec CP, such as wh-movement or first position topics in V2 languages, never change the case of the extracted DP, regardless of what its original case is. This is an important observation as, given that TP is not only a spell out domain, but also universally a hard domain, we claim that it is not only the type of case a moved DP bears which determines whether the case may be changed, but the type of domain that it moves out of. Specifically, only a DP with unmarked case moving out of a soft domain can change its case. All DPs, whether assigned dependent or unmarked case, moving out of a hard domain, maintain their original cases.

4.2. Conceptual Problems

Besides the empirical problems with Baker's account of case changing movements, there are also a number of conceptual problems that Baker's theory faces. One of these concerns the distinction between hard and soft domains. As we pointed out earlier, this distinction is necessitated by the identification of case domains as spell out domains. However, there is nothing in Dependent Case Theory which would predict either the distinction itself or the particular properties of soft domains. Why should some domains be such that already spelled out DPs within them remain active in higher domains?

Moreover, the necessity to introduce the difference between soft and hard domains was introduced by unifying case and spell out domains. Before this, the distinction was unnecessary as no observations concerning movement motivated it. It therefore seems that the distinction relates solely to case phenomena. Unless we can identify something specifically related to case from which it can be made to follow, this discrepancy is clearly problematic for the assumption that the processes of movement and case assignment are restricted by the same structural conditions.

A second somewhat related problem concerns Baker's claim that DPs with unmarked case can be reassigned another case at some later point. As we mentioned above, Baker claims that what we have referred to as the Invisibility Principle is parameterized across languages. Presumably, then, those languages which allow a further case to be assigned to an already case marked DP should have the parameter set to the value that allows case marked DPs to remain visible. But if this is the way to deal with these observations, one would expect consistency within languages and all case marked DPs should either be visible or invisible in subsequent domains. Baker does not attempt to verify this, but it is easy to show that in fact it does not hold. For example, Japanese extracted possessors must remain visible after they have been assigned unmarked genitive so that they can be reassigned marked nominative. Thus, Japanese sets the parameter to the value that allows case marked DPs to continue to take part in the case system. However, Japanese

also has dative quirky subjects, and these cannot trigger accusative case on an object. Instead, the object must appear in nominative, indicating that the inherent case marked DP is invisible:

(20) John-ni   sore-ga   mie-ta   Kishimoto (2013)
      John-DAT   that-NOM   see-PAST
      "John saw that".

It seems therefore that Japanese adopts the parameter setting which prevents case marked DPs playing a further role in the system, in contradiction to the conclusion just reached.[9]

The Hungarian data is perhaps even more problematic for Baker's parameterized account. Here within a single language movement of the same DP produces different effects, depending on the movement: from the lower DP internal domain to the upper one there is case change and from the upper domain to DP external positions there is no case change. Clearly this could not be accounted for in terms of the kind of macro parameter that Baker suggests[10].

10. Analysis

We want to address both the empirical and conceptual problems identified in the previous section and see a unified way of doing so. Rather than relegating the Invisibility Principle to the parameterised margins, as Baker does, we propose to elevate it to a central position in the theory, using it not only to conceptualise the distinction between soft and hard domains but to account for why some movements change the case of the moved DP while others maintain it.

Our proposal is rather simple:

(21) A soft domain is one in which unmarked case is not assigned.

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9   Baker could claim that Japanese dative subjects are PPs and therefore do not count as competitors. This would seem unlikely, however, as Kishimoto demonstrates that dative subjects behave like nominative subjects and unlike obliques, suggesting a DP status for them.

10   It remains to account for the Warpiri and Burushaski data in which dative objects do not prevent the subject from receiving dependent ergative case. The fact that in both languages this phenomenon is restricted to certain verbs, indicates that ergative might be lexically assigned in these cases. Baker rejects this as these ergative subjects do not have a uniform argument role. However, Woolford (2006) points out that there is a difference between inherent case, restricted to specific arguments, and lexical case which is an idiosyncratic property of certain verbs. Thus, it may be that ergative is lexical for the verbs in question.

By this, we do not intend to claim that soft domains do not have an unmarked case associated with them. Clearly, they do. What we intend is that the assignment of the unmarked case associated with a soft domain is delayed until the spell out of the next hard domain. This will leave some DPs in some domains unvalued for a case feature and therefore, by the Invisibility Principle, still visible in further structural processing. At the level of the hard domain, depending on the structural conditions holding there, visible DPs from the spelled out soft domain can either be assigned the unmarked case defined for that domain or another case associated with the hard domain.

To demonstrate how this works, let us take some examples from the Hungarian data we have been considering. We start with the dative subject of the inflected infinitive. Our story starts at the point when the non-finite agreement is merged with its TP complement in which the subject has already undergone a movement from its vP internal position. According to the analysis given in Newson and Szécsényi (2020), AgN is a phase head and therefore TP is a case domain. Here we add the claim that AgN is a hard phase head and therefore TP is a hard case domain, as indicated by the solid circle around it in the following diagram:

(22)
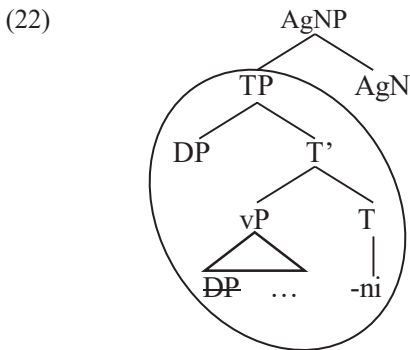
At this point all visible DPs will be assigned case and given that the subject in its TP position has no c-commanding possessor it is determined to receive unmarked case. Moreover, as it sits in the TP domain, the case it will receive will be the one defined for that. As previously argued, the unmarked case for the complement of AgN is dative. Henceforth, as this DP has been assigned case, it can play no further role in the case system by the Invisibility Principle. This means that it cannot itself be assigned another case and hence the extracted dative subject will remain dative.

Compare this to what happens to a DP extracted from the lower possessor position in the DP. We start at the point where the D is merged into the structure, taking the possessive nP as its complement:

(23)

```
            DP
          /    \
         D      nP
              /    \
            DP      n'
                  /    \
                 n      NP
```
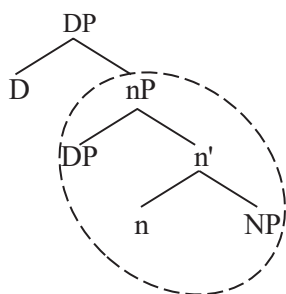
As is standard, we assume that D is a phase head, though we claim that in Hungarian it is a soft one, meaning that the nP is a soft domain, as indicated by the broken circle surrounding it in (23). As the possessor, in the specifier of nP, has no c-commanding competitor it is eligible for unmarked case. This assignment is not carried out at this point, the domain being soft. Instead, it is delayed until we reach the next hard domain. This happens when the AgN is merged with the DP. Being a hard phase head, its DP complement is a hard domain:

(24)

```
              AgNP
             /    \
           DP      AgN
          /   \
         D     nP
             /    \
           DP      n'
                 /    \
                n      NP
```
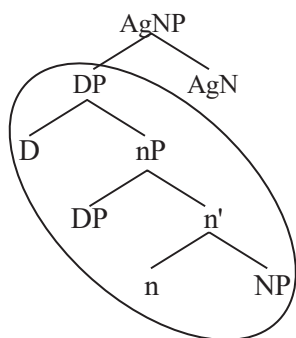
Lacking case at this point, the possessor is still visible and hence will be case assigned. As there is no c-commanding DP added to the structure, the possessor's situation remains unchanged and hence it is eligible for unmarked case assignment. The unmarked case it is assigned is the one defined for the domain that contains it, which is nominative. At this point, given that the nP and the DP have both been spelled out, the possessor is not available for movement and hence the nominative possessor always appears in the lower possessor position.

However, if the possessor had been moved to the specifier of DP before the merger of AgN, the following situation would pertain:

(25)
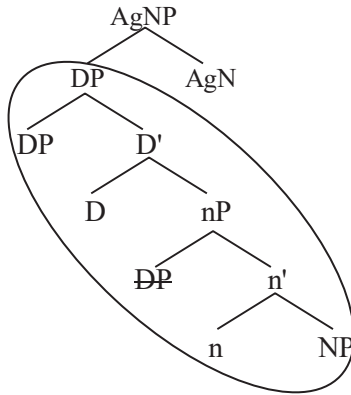
Now the possessor is in the hard DP domain, though it still has no c-commanding competitor and is still eligible for unmarked case, which can now be assigned. But this time the case involved is the one defined for complement of AgN, which as we have seen is dative. After case assignment, the possessor is invisible and therefore can play no further role in the case system. Any further extraction of the dative possessor will therefore not change its case.

11. Conclusion

We have argued that whether the case of a moved DP changes is dependent on both the case involved and the domain which contains it. Only if the case is unmarked and the domain soft can the case 'change'. However, the nature of case 'change' is, in reality, simply a hold on the assignment of unmarked case in a soft domain. Therefore, the relevant DPs remain visible, under the Invisibility Principle, and may be assigned a different case in a subsequent domain.

Having demonstrated that the claim in (21) accurately accounts for the interaction between movement and case in Hungarian possessor and dative subject extraction, we can highlight the conceptual advantages of the proposal. Note that (21) is a definition of a soft domain which is based on how case is assigned within it. The main property of a soft domain, that some of its content remains active after spell-out falls out directly from what we are taking to be a central part of case theory. The Invisibility Principle determines that a DP becomes inactive in the case system as soon as it is assigned case and hence delaying the assignment of unmarked case in some domains allows those DPs to remain active in subsequent domains, though not indefinitely so. Hard domains cause all contained DPs to become inactive because no DP can be left without a case after these are spelled out. The overall picture is more consistent than just a simple statement that certain domains allow spelled out elements to remain active while others do not.

Furthermore, the fact that the distinction between soft and hard domains is defined specifically in terms of case theoretic considerations accounts for why the distinction is

relevant only for case phenomena and not movement. This better supports Baker's original proposal that the same domains are relevant for case and movement phenomena. The claim can be maintained in terms of the identity of the domains, though differences in how these domains limit phenomena follow from properties of the phenomena themselves.

Works Cited

An, Duk-Ho. 2014. "Genitive Case in Korean and Its Implications for Noun Phrase Structure." *Journal of East Asian Linguistics* 23: 361−392. https://doi.org/10.1007/s10831-014-9123-9

Baker, Mark. 2015. *Case: Its Principles and Parameters*. Cambridge: Cambridge University Press.

Chomsky, Noam. 2001. "Derivation by Phase." In *Ken Hale: A Life in Language*, edited by Michael Kenstowicz, 1–52. Cambridge, Mass.: MIT Press.

Dékány, Éva. 2018. "The Position of Case Markers Relative to Possessive Agreement." *Natural Language & Linguistic Theory* 36 (2): 365–400.

Den Dikken, Marcel. 1999. "On The Structural Representation of Possession and Agreement. The Case of (Anti-)Agreement in Hungarian Possessed Nominal Phrases." In *Crossing Boundaries: Theoretical Advances in Central and Eastern European Languages*, edited by István Kenesei, 137–178. Amsterdam: Benjamins.

Grimshaw, Jane. 2005. "Extended Projection." *Words and Structure*: 1–74. Stanford: CSLI.

Kishimoto, Hideki. 2013. "Case, Tense and Subject Raising in Japanese." *Nanzan Linguistics* 9: 21−50.

É. Kiss, Katalin. 2014. "Ways of Licensing External Possessors in Hungarian." *Acta Linguistica Hungarica* 61 (1): 45−68.

Marantz, Alec. 1991. "Case and Licensing." *ESCOL 91: Proceedings of The Eighth Eastern States Conference On Linguistics*, edited by German Westphal, Benjamin Ao, and Hee-Rahk Chae, 234−253. Columbus: Ohio State University.

Nakamura, Hiroaki. 2002. "Double Subject, Double Nominative Object and Double Accusative Object Constructions in Japanese and Korean." *Language, Information and Computation* 16: 358−369.

Newson, Mark, and Szécsényi, Krisztina. 2020. "Dative as the Unmarked Unmarked Case in Hungarian." In *Linguistica Brunensia* 68 (2), edited by Markéta Ziková and Marcin Wągiel, 27−44. Brno: Masaryk University.

Ntelitheos, Dimitris. 2002. "Possessor Extraction in Greek and the Left Periphery of DP." Ms. UCLA.

Szabolcsi, Anna. 1983. "The Possessor That Ran Away from Home." *The Linguistic Review* 3.1: 89–102.

Szabolcsi, Anna. 1994. "The Noun Phrase." In *The Syntactic Structure of Hungarian: Syntax and Semantics*, vol. 27, edited by Ferenc Kiefer and Katalin É. Kiss, 179−27. New York: Academic Press.

Tóth, Ildikó 2000. *Inflected Infinitives in Hungarian*. Phd Diss. Tilburg University.
Webelhuth, Gert. 1992. *Principles and Parameters of Syntactic Saturation*. New York: Oxford University Press.
Woolford, Ellen. 2006. "Lexical Case, Inherent Case, and Argument Structure." *Linguistic Inquiry* 37 (1): 111−130.

Modal Existential Constructions in Hungarian

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Abstract: The paper is devoted to a comprehensive description of the Hungarian modal existential *wh*-construction(s). These constructions consist of three main elements: an existential predicate, a pronoun, and a subordinate verb, which is either an infinitive or a subjunctive. Šimík (2011, 45) sorted languages into three groups based on the possible subordinate verb forms in modal existential *wh*-constructions. Hungarian belongs to the languages which can accept both infinitive and subjunctive verbs. This paper adds to this classification that the subjunctive type is significantly less acceptable in modal existential *wh*-constructions than the infinitival type but Transylvanian Hungarians significantly more readily use the subjunctive type than Hungarians within Hungary do. Then we turn to the theoretical investigation of the pronominal component of the construction, which is formally identical to interrogatives in Hungarian. We point out that it occupies a topic position within a [Topic(s)–Quantifer(s)–Focus] cycle-internal operator domain (É. Kiss 2002). In the final part of the paper, we have positioned the pronominal component of Hungarian modal existential *wh*-constructions, which is ultimately an indefinite, in Haspelmath's (1997) semantic map of indefinites.

Keywords: modal existential *wh*-construction; infinitive; subjunctive; operators; indefinite pronouns

1. Introduction:
1.1 Modal Existential *Wh*-constructions in Hungarian

In this paper we examine Hungarian modal existential (MEC) and other constructions containing pronouns which are formally identical to interrogative *wh*-words in this language. Our main goals are to decide the information-structural status of such

pronouns—pronominal absolute stems—in MECs, and, in general, to present their high degree of multifunctionality in Hungarian, not discussed in Haspelmath's (1997, 291–292, Fig. 4.8.26) seminal typological description.

MECs consist of three main elements: an existential predicate, a pronoun, and a subordinate verb, which is either an infinitive or a subjunctive. Šimík (2011, 45) sorted languages into three groups based on the possible subordinate verb forms that can appear in MECs. The first group of languages only use the infinitive verb form. The second group consists of languages being able to use only the subjunctive in the given construction. Hungarian is in the third group: these languages can accept both infinitive and subjunctive verbs in MECs. Hungarian infinitives can also be inflected, therefore Hungarian MECs can appear in three forms regarding the subordinate verbs: MECs can host a bare/uninflected infinitive (1a); an inflected infinitive (1b), and a subjunctive subordinate verb (1c).

(1)   (a) Van   kit   be-mutat-*ni*   Ilinek.
           is   who.ACC   preV-introduce-*INF*   Ili.DAT
           'There is someone to introduce to Ili.'

      (b) Van   kit   be-mutat-*n-om*   Ilinek.
           is   who. ACC   preV-introduce-*INF-1SG*   Ili.DAT
           'There is someone for me to introduce to Ili.'

      (c) Van   kit   be-mutas-*s*-ak   Ilinek.
           is   who. ACC   pre-V-introduce-*SUBJ*-1SG Ili.DAT
           'There is someone for me to introduce to Ili.'

Constructions hosting an uninflected infinitive for the subordination are used in two ways: they can either stand together with an explicit, "named", subject (2a), or without it (2b). The (2a) type is understood the same way as the type with an inflected infinitive (1b), in that it is clear in both cases whom the statement expressed by the MEC regards. If the explicit subject is left out from the construction, as in (2b), MECs can be understood as universal statements, which are generally true for every possible or relevant person at the situation at hand.

(2)   (a) Neked   van   mit   olvasni.   "named subject"
           you.DAT   is   what.ACC   read.INF
           'There is something for you to read.'

(b) Van   mit   olvasni.   "general subject"
     is   what.ACC   read.INF
     'There is something (for everyone) to read.'

1.2 Other Forms of MECs

There are similar constructions in Hungarian which have been considered as MECs in previous studies (Šimík 2011, Lipták 2003).

 Besides the existential *van* 'be', *tud* 'can' can also take the position of the main predicate (3a), presumably due to its inherently modal character. However, this type of MEC is restricted as it can only take the uninflected infinitive as a subordinate verb, while other verb forms are unacceptable after *tud*.

(3) (a) Tudunk   kit   bemutatni   Ilinek.
          can.1PL   who.ACC   preV.introduce.INF Ili.DAT
          'We can introduce someone to Ili.'

     (b) ⁽?⁾Van,   akit   bemutassunk   Ilinek.
          is   *a*-who.ACC   preV.introduce.SUBJ.1PL Ili.DAT
          'There is someone for us whom we can introduce to Ili.'

MECs can also be formed with relative pronouns instead of interrogatives (3b). Such MECs are also restricted as only the subjunctive verb form can occur in such constructions.

 A common property of the two constructions presented in (3a-b) is that they cannot be used to express universal statements due to the obligatorily appearing verbal inflection (in different components of the MECs in question).

 After this theoretical introduction to the rich world of modal existential constructions in Hungarian, in the following subsection we focus on the interchangeability of the competing subordinate verb forms in MECs, in order to get a more realistic picture on the factual distribution of the alternatives. Since the subordinate verbs cannot be altered in the constructions illustrated in this subsection, these have been left out from the investigation presented in 1.3 (but see Szabó and Prohászka 2021). We have restricted our attention to the construction types presented in 1.1, which are introduced by the existential predicate (some form of *van* 'be') and contain a pronoun that is formally identical to interrogative pronouns in Hungarian.

1.3 The Subjunctive as a Dispreferred Verb Form in MECs

To the best of our knowledge, previous literature – based on introspection – did not discuss any difference in the usage of the alternative subordinate verb forms (1a–c). This subsection is devoted to the verification of a hypothesis according to which the subjunctive version of MEC is dispreferred. We have conducted three experiments in which Google

forms were filled out by (non-linguist) native speakers of Hungarian and statistical analyses were executed by SPSS 23. They had been asked for evaluating potential (written) sentences by means of the six-point scale, presented and defined in Table 1, which is to be regarded as the standard canonical scale of current generative linguistics, given that it has been applied in such seminal series as *Comprehensive Grammar Resources* for different languages (Broekhuis et al. 2012, Alberti and Laczkó 2018).

		CONVERSION TYPES				
JUDGMENT	STANDARD INTERPRETATION IN *CGR*	**v1**	v2	v3	v4	v5
*	unacceptable	**−3**	0	−5	−1	−1
*?	relatively acceptable compared to *	**−2**	1	−4		
??	intermediate or unclear status	**0**	2	0	0	
?	marked: not completely unacceptable, or disfavoured form	**+1**	3	+2		0
(?)	slightly marked, but probably acceptable	**+2**	4	+4	+1	
✓	fully acceptable	**+3**	5	+5		+1

Table 1. The six-point scale of judgments proposed in *CGR* series and their conversion into different numerical scales

The distributions of grammaticality judgments concerning the three MEC minimal pairs provided in (4a–c) are presented in Figure 1. The pie charts clearly show that, relative to the practically fully acceptable infinitival versions, the subjunctive versions are deeply divisive for native speakers.

(4) (a) Van   mit   mondanod/mondj.
          is   what.ACC   say.INF.2SG/say.SUBJ.2SG
          'There is something for you to say.'

    (b) Van   hol   aludnod/aludj.
          is   where   sleep.INF.2SG/sleep.SUBJ.2SG
          'There is a place for you to sleep.'

    (c) Van   kivel   elmennem/elmenjek   a   boltba.
          is   who.ACC   preV.go.INF.1SG/preV.go.SUBJ.1SG   the shop.ILL
          'There is someone for me to go to the shop together with.'
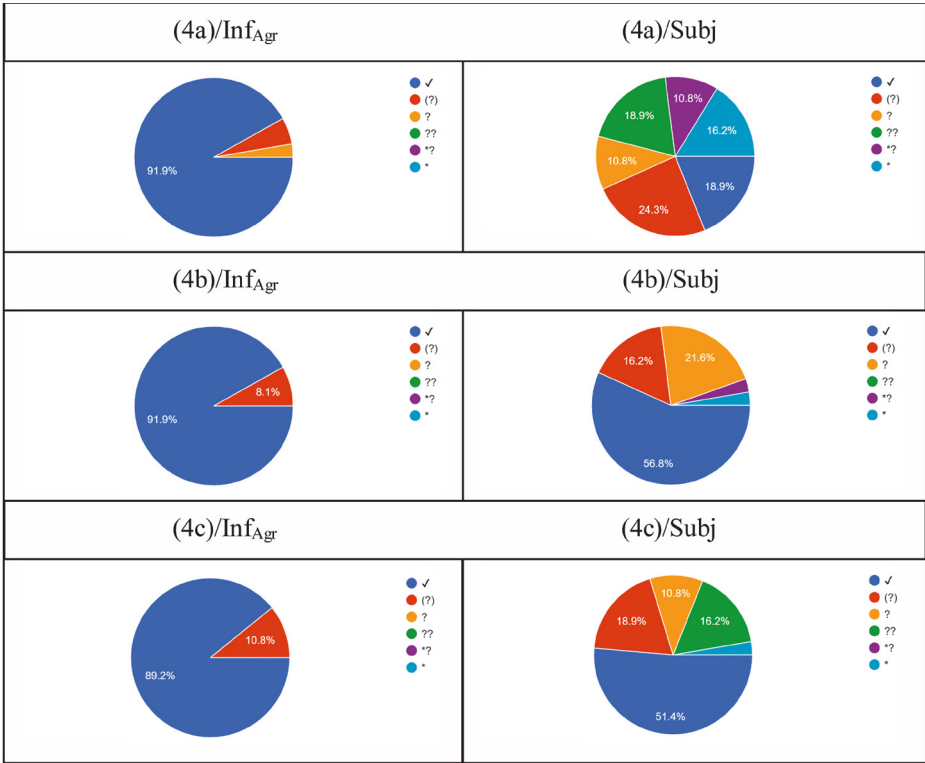
Figure 1. Grammaticality judgments of native speakers on MECs with an infinitive / a subjunctive verb in the first experiment in 2018 (N=37; 8 males and 29 females, all native speakers of Hungarian within Hungary)

As shown in Figure 2 of corresponding MEC versions (where the corresponding confidence intervals do not overlap), the infinitival version is always significantly more acceptable than the subjunctive version. This holds true in spite of the fact that two of the three subjunctive versions are qualified as (not worse than) "slightly marked" on average (see Table 1 above), due to the high speaker-dependent standard variation, visualized by the pie charts in Figure 1.[1]

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1   As for the less acceptable, and most divisive, subjunctive version in (4a), its dispreferred status has presumably to do with the following specialty of Hungarian morphology. The subjunctive /imperative mood in Sg2 can be marked, in addition to the regular way with a Sg2 agreement suffix (*mond-j-ál* 'say-SUBJ-SG2'), without any explicit reference to any person and number (*mond-j* 'say-SUBJ'), as in (4a)). Our conjecture is that there is some "division of labor" according to which a one-syllable variant is "too short" for a subordinate clause but it is preferably to use in the main clause of an imperative sentence.
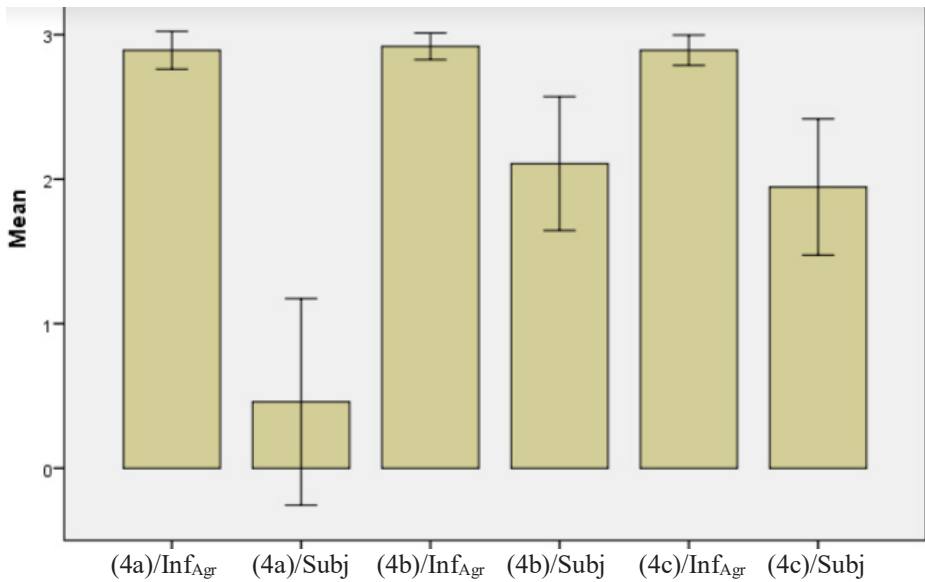
Figure 2. Pairwise significant differences (95%) between members of the minimal pairs presented in Figure 1 according to the numerical scale numbered as v1 in Table 1

Figure 3 below is devoted to illustrating a major methodological question. How can we avoid the loss of information coming from using statistically the system of the six grammatical judgments given in Table 1 merely as an ordinal variable, instead of interpreting it as an interval variable (Field 2013, 8–9), with appropriately chosen distances between the six values? On the basis of our linguistic experiences, we propose that the conversion given in Table 1 labelled as v1 from the ordered six values into numbers. This conversion follows two basic rules: i. the extreme points of the scale of judgments are associated with a positive number and its negative counterpart (namely, +3 and –3), ii. the "intermediate or unclear status" is mapped onto zero, in harmony with this definition. At first glance, it seems to be a disadvantage of conversion v1 that no judgment is mapped onto –1; but this can also be regarded as the true reflection of the linguistic practice according to which we have had more grades for "almost good" than for "almost bad".
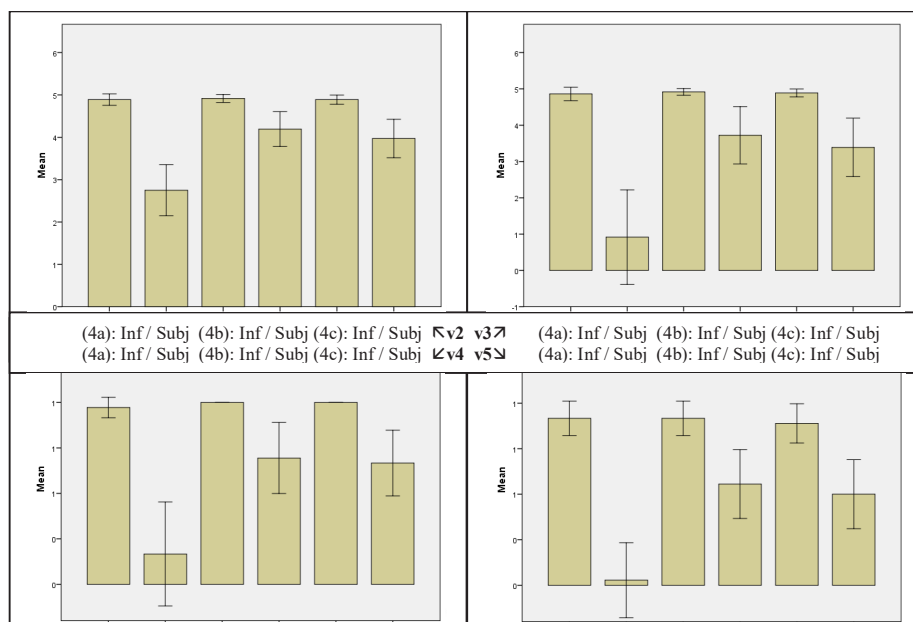
Figure 3. Pairwise significant differences (95%) between members of the minimal pairs presented in Figure 1 according to the numerical scales numbered as v2, v3 (first row), v4 and v5 (second row) in Table 1

By exhibiting the four sets of error bar charts (Field 2013, 106) in Figure 3, calculated based on four alternative ways of "intervalization" of the originally only ordered judgments, we intend to convince the reader that the choice of conversion, as far as it is reasonable from a linguistic point of view, does not radically influence the statistical output. As shown by the pairwise non-overlapping confidence intervals in all four parts of Figure 3, infinitive variants still prove to be significantly more acceptable than the corresponding subjunctive counterparts; even if certain judgments are not distinguished any more during the conversion process, as in the case of v4 and v5.

If the MEC-internal subject is named, as in (2a) and (5), due to ALSO-quantification, for instance, which blocks the otherwise almost obligatory *pro*-drop, infinitival versions are still significantly more acceptable than their subjunctive counterparts in the minimal pairs, see Figure 4.

(5) (a) Nekem   is   van   hova   mennem/menjek.
       For I.DAT   also   is   where   go.INF.1SG/go.SUBJ.1SG
       'There is some place for me, too, to go to.'

(a') Én   is   van   hova   menjek.
      I   also   is   where   go.SUBJ.1SG
      'There is some place for me, too, to go to.'

(a") Mi   is   van   hova   menjünk.
      we   also   is   where   go.SUBJ.1SG
      'There is some place for us, too, to go to.'

(b) Neked   is   van   kivel   beszélned/beszélj.
      For you.DAT   also   is   who.INS   speak.INF.2SG/speak.SUBJ.2SG
      'There is someone for you, too, to speak to.'

(c) Neki   is   van   mitől   tartania/tartson.
      For he.DAT   also   is   what.ABL   fear.INF.3SG/fear.SUBJ.3SG
      'There is something for him, too, to be afraid of.'
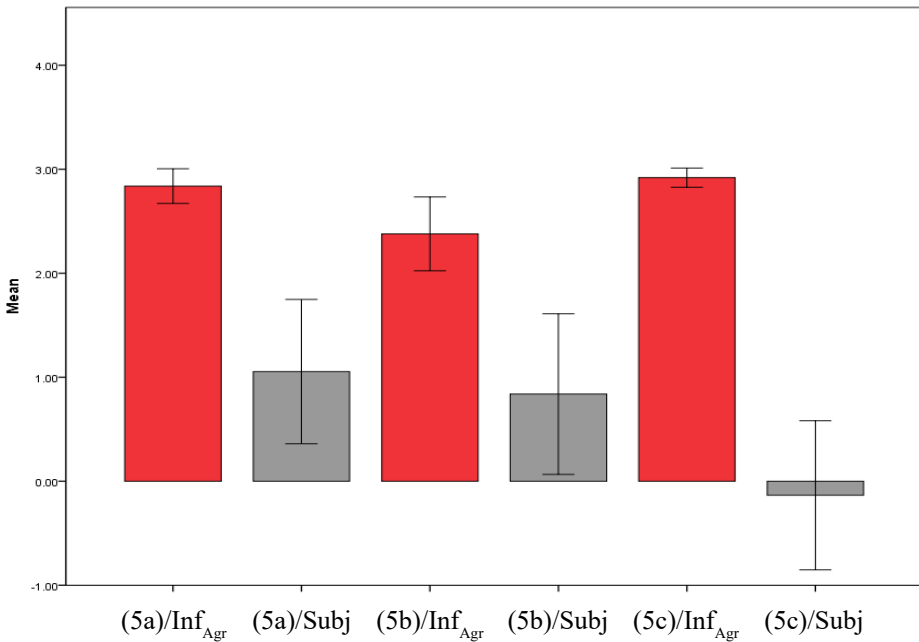
Figure 4. Pairwise significant differences (95%) between members of the minimal pairs presented in (5a, b, c) according to the numerical scale numbered as v1 in Table 1. The experiment was carried out in 2020 (N=37; 4 males and 33 females, all native speakers of Hungarian within Hungary)

Since it is not obvious whether the named subject in subjunctive MEC variants is dative (due to the copular component *van* 'is', cf. the possessive construction *nekem van* 'I have (got)…',) or nominative case marked (as in basic subjunctive clauses in Hungarian), a third experiment addressed this question, see Figure 5. In this experiment our attention has also been extended to a Transylvanian dialect of Hungarian, which is claimed to use the subjunctive mood more frequently than the dialects of Hungarian spoken within the territory of Hungary (É. Kiss 2009, 214).
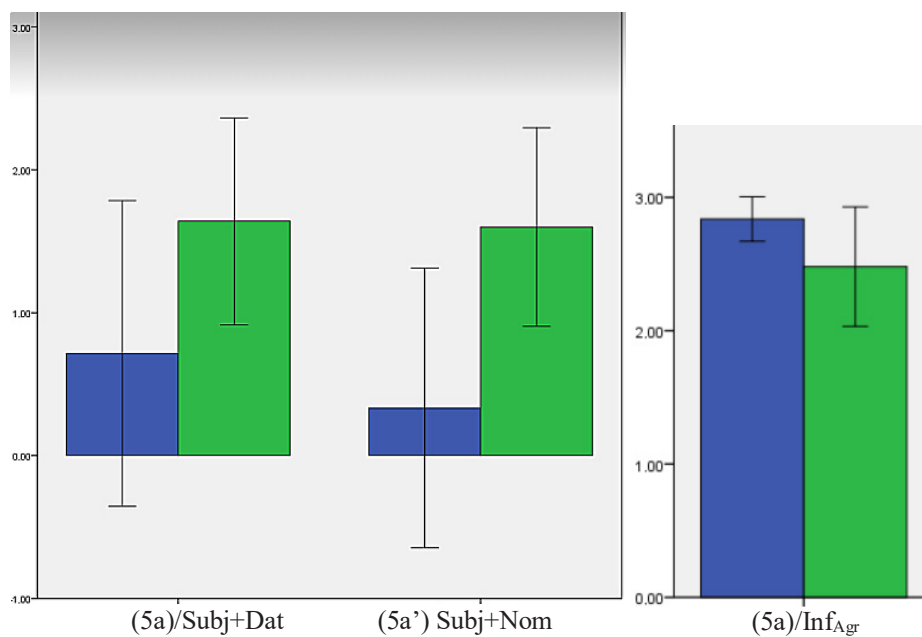
Figure 5. For speakers within Hungary, as shown by the bars on the left-hand side in the attached pairs, there is no significant difference between the subjunctive MEC variants given in (5a–a') while the infinitival variant in (5a) is significantly more acceptable than both subjunctive variants. The experiment was carried out in 2021 (N=46; 21 native speakers of Hungarian within Hungary, 25 native speakers of a Transylvanian dialect of Hungarian).

The two subjunctive variants, with different case marked named subjects, do not show significant difference either within Hungary or in Transylvania. The infinitival counterpart, however, can be claimed to be significantly more acceptable only within Hungary, as shown by the corresponding overlapping confidence intervals for the Transylvanian dialect in Figure 5.

Figure 6 below presents further evidence for the more preferred status of the subjunctive version of MEC in the Transylvanian dialect of Hungarian, relative to the standard version of Hungarian. There are, however, analogous examples in the case of which the difference between the Transylvanian data and the data from Hungary only "almost" reach the level of 95% significance.
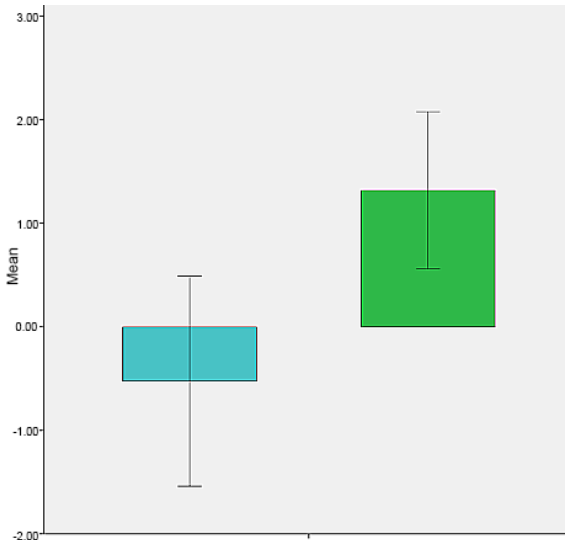
Figure 6. Sentence (5a"), representative of the subjunctive version of MEC with a nominative case marked named subject, is significantly more acceptable in Transylvania (see the bar to the right) than in Hungary, according to the third, 2021 experiment

To summarize, the infinitival version of MEC in Hungarian tends to be significantly more acceptable than the subjunctive version, which we consider to serve as a new contribution to the relevant literature. We have also pointed out that there are dialectal variations in this respect: Transylvanians' bias to subjunctive also manifests itself in the area of modal existential constructions.

2. The Operator Position of the *Wh*-pronoun in the Hungarian [Topic* Quant* Focus] Operator Sequence (É. Kiss 2002) in MEC

2.1 Focus?

The syntactic position of the pronominal component in MECs is debated. The standard generative literature automatically considers the pronominal component in MECs to function as a (narrow) focus, see example (11a-b) in É. Kiss (2002, 202–203). Lipták (2006, 6) also claims that this *wh*-item occupies a (narrow) focus position, despite the preverb-verb order, which can be seen in (1a–c) in 1.1.

The series of examples in (7) provides the background. First, it is a characteristic feature of Hungarian narrow focus that it triggers the verb-preverb order in finite constructions (7a). Second, in *wh*-questions, the *wh*-word occupies the focus position; in these cases, the preverb-verb order is unacceptable either, as illustrated in (7b). In the case of infinitival constructions containing a narrow focus, however, the verb-preverb order is optional (7c); which makes it impossible to immediately refuse Lipták's hypothesis.

(7) (a) Csak   Petit   hívtam be   / *be-hívtam   a megbeszélésre.
         only   Peti.ACC   called.1SG preV preV-called.1SG   the meeting.SUB
         'It is only Peti whom I called into the meeting.'

     (b) Kit   hívtál be   / *be-hívtál   a megbeszélésre?
         who.ACC   called.2SG preV / preV-called.2SG   the meeting.SUB
         'Who did you call into the meeting?'

     (c) Szeretném   Csak Petit   hív-ni be   / be-hívni   az értekezletre.
         like.COND.1SG   Only P.ACC   call-INF PreV   preV-call-INF   the meeting.SUB
         'I would like to invite only Peti to the meeting.'

In an earlier paper (Prohászka et al. 2020), based on statistically analyzed tests we presented that the verb–preverb order immediately following the *wh*-pronoun of MECs is not optional at all but highly refused by native speakers ('*?', see Table 1 in 1.3), as shown in Figure 7 below. This is a strong argument for refusing the hypothesis that the pronominal component of MECs occupies a (narrow) focus position.
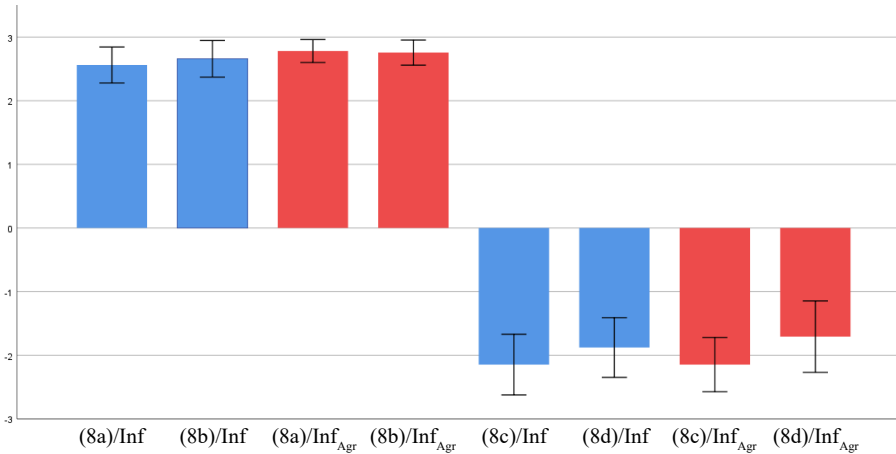
Figure 7. Significant difference between fully acceptable MECs with a preverb-verb order and unacceptable MEC variants with a verb-preverb order (Prohászka *et al.* 2020, 66)

(8)   (a) Ilivel   van   mit   megbeszélni   / megbeszélnem.

            Ili.ɪɴs   is   what.ᴀᴄᴄ   preV.discuss.ɪɴꜰ   preV.discuss.ɪɴꜰ.1ꜱɢ

            'There is something (for me) to discuss with Ili.'

      (b) Van   mit   elmesélni   / elmesélnem   Marinak.

            is   what.ᴀᴄᴄ   preV.tell.ɪɴꜰ   preV.tell.ɪɴꜰ.1ꜱɢ   Mari.ᴅᴀᴛ

            'There is something (for me) to tell Mari.'

      (c) *?Ilivel van   mit   beszélni   / beszélnem   meg.

            Ili.ɪɴs   is   what.ᴀᴄᴄ discuss.ɪɴꜰ   discuss.ɪɴꜰ.1ꜱɢ preV

            Intended meaning: 'There is something (for me) to discuss with Ili.'

      (d) *?Van   mit   mesélni / mesélnem   el   Marinak.

            is   what.ᴀᴄᴄ   tell.ɪɴꜰ tell.ɪɴꜰ.1ꜱɢ   preV Mari.ᴅᴀᴛ

            Intended meaning: 'There is something (for me) to tell Mari.'

Another argument against the *focus*-view is that more than one *wh*-element can be present in Hungarian MECs, as in (9); and the preverb is emphasized, which does not hold, for instance, for the preverb in (7c) in a real narrow-focus construction.

(9)   Van kit   kinek   bemutatnom.

     is   who.ᴀᴄᴄ   who.ᴅᴀᴛ   preV.introduce.ɪɴꜰ.1ꜱɢ

     'There is at least one person whom I can introduce to at least one person.'

2.2 Quantifier or Topic?

In a potential É. Kiss-style (۲۰۰۲) [Topic* Quant* Focus] MEC-internal operator domain, as discussed above, the *wh*-pronoun cannot serve as a (narrow) focus, since it cannot trigger inversion; whereas a real identificational focus does trigger inversion even within a MEC, at least as an option, see Prohászka et al. (2020, 67). The interpretation of the *wh*-pronoun in MECs does not support a hypothesis according to which it is an ALSO-quantifier or an EACH-quantifier, either. The meaning of this element is closer to *valaki* 'someone'. Such pronouns are typically claimed to serve as topics, see É. Kiss (2002, 106, ex. (7a)), for instance (10).

(10) [$_{\text{TopP}}$ Valaki   szerencsére [$_{\text{AspP}}$ meghívta   Jánost]]

      Somebody   luckily   preV.invited.ꜱɢ3   János.ᴀᴄᴄ

      'Somebody luckily invited John.'

We propose thus that the pronoun of MECs is similar to *valaki*-type pronouns in that they both occupy a topic position in the operator sequence. The operator domain of MECs presented in our study is as follows:

(11) (a) Van   kit_Topic   kinek_Topic   bemutatnom   /^?bemutassak.
            is   ki.ACC   ki.DAT   preV.introduce.INF.1SG   preV.introduce.SUBJ.1SG
            'There is at least one person whom I can introduce to at least one person.'

     (b) Van   mit_Topic   csak veled_Focus   ^(?)megbeszélnem   ^?[beszélnem meg].
            is   mi.ACC   only you.INS   preV.talk.INF.1SG   talk.INF.1SG preV
            'There is at least one topic which I can discuss only with you.'

The topic-interpretation of the existentially bound pronoun of MECs thus explains possible word-order variants. However, as the MEC-pronoun is always non-specific, it violates the criterion of topichood proposed by É. Kiss (2002, 11):

> The formal features of topic:
> A topic constituent must be [+referential] and [+specific].

This contradiction can be resolved in two ways. The first solution is to consider the topic of MECs as exceptional: the pronouns in MECs are *exceptional* topics in that they do not need to meet the referentiality criterion, which applies for topics in general.

We propose a more elegant solution. Our claim is that the function of a topic expression consists of pure anchoring to referents in the scope in which the given expression can be found, while additional conditions depend on the character of the scope in question. In this theory, the "scope" of topics that belong to finite verbs is the discourse itself, in which the given sentence is to be interpreted; hence, these topics should be anchored to (salient) discourse referents, as in (10). This anchoring provides a [+referential] and [+specific] interpretation to the given topic.

In MECs, however, the scope in question is an existential stratum. In this environment, the topic is interpreted as an existentially bound expression ($\exists x.P(x)$). Therefore, the topic of MECs is not "exceptional", but is determined by the accommodating scope typical of MECs.

2.3 Commenting on Surányi's (2005) Proposals concerning the Interpretations of Hungarian MEC-Pronouns

Surányi (2005), based on (allegedly ambiguous) sentences like the one presented in (12), claims that the interpretation of a MEC-pronoun can be both existential and universal. This subsection is devoted to arguing against the latter option.

(12) (Most aztán) (Jánosnak) van kinek mit adnia.
     now then János.DAT is ki.DAT what.ACC give.INF.3SG
    (a) 'Now John has something to give to everyone.'
       $\forall y \ (\text{PERSON}(y) \rightarrow \exists x \ (\text{THING}(x) \ \& \ \text{GIVE}(j,y,x)))$
    (b) 'John has things to give to people.'
       $\exists x \exists y \ (\text{THING}(x) \ \& \ \text{PERSON}(y) \ \& \ \text{GIVE}(j,y,x))$

On the basis of the assumed alternative readings, his conclusion is that the *wh*-pronoun of a MEC is quantified either by sitting in DistP (12a), universally, or by being bound by the existential quantifier of the copular MEC-verb (12b). We agree with the latter proposal: we consider this element to be the straightforward MEC-specific existential topic proposed in 2.2.

    As for reading (12a), we claim that the construction in (12) is not ambiguous with alternative meanings (12a) and (12b). Instead, we consider this to be *vague*, with (12a) being a very special case *within* the general meaning given in (12b): 'at least one pair' might mean 'several pairs'. This means that the semantic content given in (12b) is basically the intersection of that presented in (12a) and our world knowledge ('in certain situations one should give some present to each person in a relevant set'), whereas in the case of (11a) in 2.2, for instance, world knowledge does not produce a (12a)-type $\forall\exists$ reading: 'for each relevant person there is someone whom I can introduce him or her'.[2]

3. The Place of MEC-pronouns in the System of Hungarian Indefinites[3]

The fact that MEC-pronouns formally coincide with bare-interrogative pronouns is of great importance in the light of Haspelmath's (1997, 2003) extensive typological research into systems of indefinites. According to Haspelmath (1997, 27), bare-interrogative pronouns play a crucial role in the system of indefinites, whose universal systematization, in the form of semantic maps, belongs to Haspelmath's distinguished aims in his seminal typological book on indefinites across languages of the world:

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2   Thus we argue against the stance that a MEC-pronoun can be associated with the type of universal interpretation which, for instance, the accusative case marked *wh*-word in (17c) in 3.3 can be associated with (in a sequence of *wh*-words). Surányi's proposal obviously comes from the observation that the sentence *Kinek mit adott János?* 'who.DAT what.ACC gave János?' is, indeed, to be interpreted so that the first pronominal element corresponds to a universal quantifier (and not an interrogative pronoun): *The hearer is asked for revealing for each relevant person what János gave to him/her*.

3   Special thanks are due to Hans-Martin Gärtner for raising our attention to Haspelmath's method of constructing semantic maps for pronoun types.

"[I]ndefinites are a marked category relative to interrogatives … (Moravcsik 1969, 77) … there is a universal asymmetric markedness relation such that indefinite pronouns are usually more marked than and derived from interrogative pronouns." "Indefinite pronouns are … derived by conversion from interrogative pronouns."[4]

He proposes a universal semantic map based on data from 40+100 languages (in which linked pragmasemantic functions are expressed by the same phonetic forms in certain languages) with 9 universal functions, see Figure 8. The crucial typological generalization can be formulated as follows: if two functions are associated with the same pronominal forms in a language, the functions between these two along the lines can also be associated with the given pronominal form in the given language.
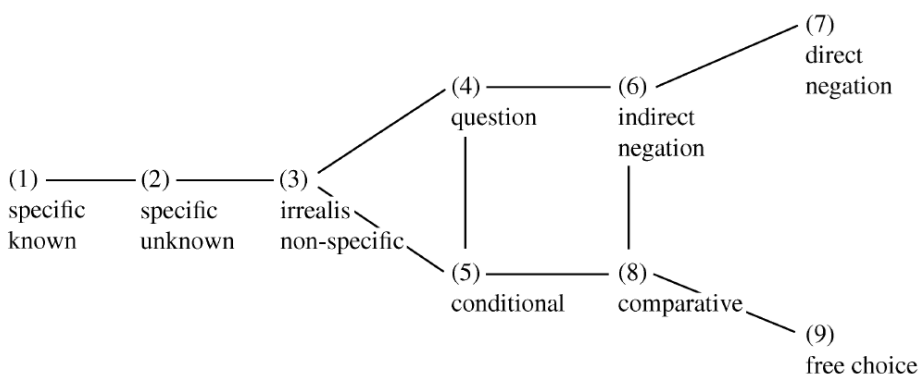
Figure 8. An implicational map for functions of indefiniteness pronoun series as proposed by Haspelmath (1997, 64)

In Hungarian (Haspelmath 1997, 291–292), four series of indefinite pronouns are claimed to cover the universal functional space with the nine functions, as presented in Figure 9. A few examples are *valaki* 'somebody', *bárki/akárki* 'anybody', and *senki* 'nobody'.[5]

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4   It is also emphasized at the end of the book what central a research question bare-interrogative-like indefinites constitute: "Some puzzles that remain are: … What is the mechanism by which bare interrogatives come to be used as indefinites?" (Haspelmath 1997, 238).

5   The partial *né*-series, e.g., *néhány* 'a few', is mentioned in Haspelmath's book (1997, 291– 292) but is not shown on the map. As for the representatives of the four complete sets of indefinite pronouns, the common *ki* component is the [+HUMAN] bare-interrogative form, which can be replaced with other interrogative forms. *Vala* and *akár* are quite transparently derived from *van* 'be' and *akar* 'want', respectively. *Se(n)* is *is+nem* 'also+not' (Szabolcsi 2018, 240) where the *also*-like component has an emphasizing contribution. These three etymological sources of indefinites occur in many languages (Haspelmath 1997). The *bár* component, a systematic alternative to *akár*, coincides with the connective *bár* '(al)though'.
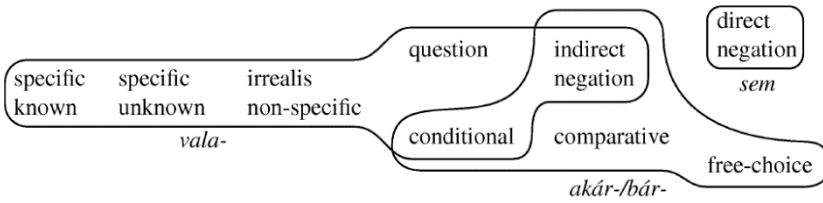
Figure 9. Haspelmath's semantic map for Hungarian indefinites

Due to a potential indefinite interpretation of the German *jeder* 'each (person)', Haspelmath (1997, 155) expands the general semantic map to (non-specific) universals. We claim that in Hungarian we can differentiate altogether 10 different pragmasemantic functions associated with the bare-interrogative indefinite form in a further-expanded version of this map, as presented in Figure 10. The bare-interrogative form thus can be characterized by an outstandingly high level of hidden multifunctionality; and it is also surprising how diversely the functions are associated with different operator characters in the É. Kiss-style (2002) Topic / Quant / Focus trichotomy, discussed in 2.2.
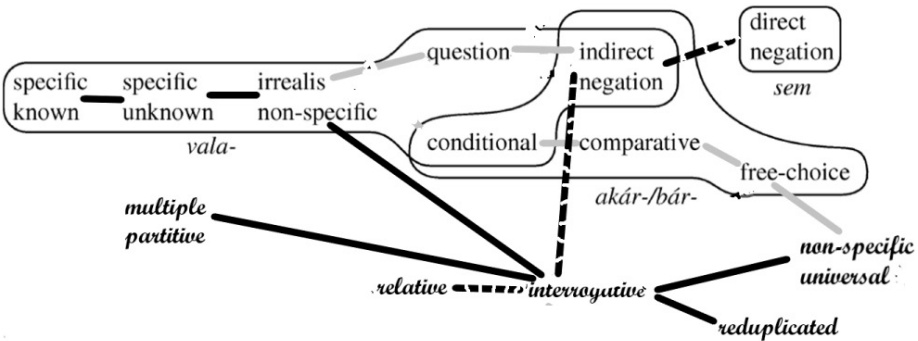
Figure 10. The semantic map we propose for Hungarian indifinites; the ten (!) functions of bare-interrogative pronouns are linked by thick lines

In the final part of the paper, we present the different (Haspelmathian) functions which can be associated with bare-interrogative pronominal forms (such as *ki* 'who', *mi* 'what', *hol* 'where', and their suffixed variants).

3.1 Three Related Functions of MEC-pronouns in Haspelmath's System: *Specific Known | Specific Unknown | Irrealis Nonspecific*

In the case of *specific known*, the speaker knows what (in this case: which place) the indefinite pronoun refers to, as illustrated by the potential continuation.

(13) Van   **hol**   aludnod;   …
       is   HOL   sleep.INF.2SG
       'There is a place for you to sleep; (you will sleep at Donners'.)'

The situation of *specific unknown* is somewhat different from the previous one, as although someone knows what (or here: which place) the indefinite pronoun refers to, it is not necessarily the speaker.

(14) Van   **hol**   aludnod;   …
       is   HOL   sleep.INF.2SG
       'There is a place for you to sleep; (Mari has mentioned the family's name, but I have forgotten).'

In the type of *irrealis nonspecific*, it is not known what the indefinite pronoun refers to.

(15) Van   **hol**   aludnod;   …
       is   HOL   sleep.INF.2SG
       'There is a place for you to sleep; (there are six of you and the local families have offered places for eight).'

To sum up, the constructions discussed in subsection 3.1, three (related) functions of MEC-pronouns have been differentiated from the Haspelmathian perspective, expressed "otherwise" in Hungarian by the *vala*-series of indefinite pronouns (e.g., *valaki* 'someone', *valami* 'something', *valahol* 'somewhere', *valahogy* 'somehow'). As *vala-* is related to *van* 'be', it is a straightforward explanation for the fact that MEC-pronouns "remain" bare interrogatives that in MECs they are typically immediately preceded by the verb *van* itself. The modal existential construction can be regarded as the place of the Hungarian grammar where the source of the *vala*-series of indefinites has preserved. In respect of operator character (É. Kiss 2002), the pronoun types illustrated in (13–15) all function as topics, in the sense elaborated in 2.2 (according to which a topic is not necessarily specific).

3.2 Interrogative

The series of examples in (16) is devoted to the presentation of what is generally held to be the basic use of the absolute pronominal stem, that is, the interrogative use. Haspelmath (1997, 2003) does not classify interrogatives as indefinite pronouns; nevertheless, it is worth considering that in Hungarian an interrogative object *ab ovo* triggers the indefinite conjugation, as shown in (16a), but interrogatives can also be used as definite expressions, witnessed by the conjugation presented in (16b). This may legitimize an approach according to which certain interrogatives belong to indefinites while members of the complementary subtype are definites.

(16) (a) **Kit**　　　　engedtek　　/ *engedték　　be? …
　　　　　　KI.ACC　　let.3PL$_{\text{IndefObj}}$　let.3PL$_{\text{DefObj}}$　　preV
　　　　　　'Who was allowed to go in?'

　　　(b) Kidet　　　　　　engedték　　/ *engedtek　　be?
　　　　　　KI.SG2$_{\text{Poss}}$ACC　　let.3PL$_{\text{DefObj}}$　let.3PL$_{\text{IndefObj}}$　　preV
　　　　　　'Who, of your family members or acquaintances, was allowed to go in?
　　　　　　Your sister or your mother?'

　　　(c) **Ki**　mindenkit　　　engedtetek　　/*engedtétek　be?
　　　　　　KI　everyone.ACC　let.2PL$_{\text{IndefObj}}$　let.2PL$_{\text{DefObj}}$　　preV
　　　　　　'Who (presumably many people) did you$_{\text{pl}}$ allow to come in?'

To make the picture complete, we illustrate in (16c) a complex interrogative construction, obligatorily triggering the indefinite conjugation, in which an interrogative pronoun is combined with a universal pronoun (Bartos 2020). In respect of operator character (É. Kiss 2002), the pronoun type illustrated in (16) functions as a (narrow) focus, witnessed by the "inverse" order between preverbs and verb stems.

3.3 Universal

Two facts are illustrated in (17). First, in Hungarian, there are indefinite/non-specific (17a) as well as definite/specific (17b) universal pronominal constructions. Second, in a list of pronominal absolute stems, only the last member is interpreted as an interrogative pronoun with the preceding ones to be interpreted as universal quantifiers (É. Kiss 2002, 99–104), see the translation in (17c). As shown in (17c'), to use a regular universal pronoun is forbidden in the construction in question. It is also illustrated in (17c) that this kind of bare-interrogative universal quantifier *ab ovo* triggers the indefinite conjugation (while a (16b)-type pronominal variant is also permitted in the construction). In respect of operator character (É. Kiss 2002), thus, the pronoun type illustrated in (17c) functions as a universal quantifier.

(17) (a) Mindenkit　　　　beengedtek　　　　/*beengedték.
　　　　　　every.KI.ACC　　preV.let.3PL$_{\text{IndefObj}}$　preV.let.3PL$_{\text{DefObj}}$
　　　　　　'Who (presumably many people) did you allow to come in?'

　　　(b) Mindegyik　lányt　　beengedték　　　　/*beengedtek.
　　　　　　all　　　　girl.ACC　preV.let.3PL$_{\text{DefObj}}$　preV.let.3PL$_{\text{IndefObj}}$
　　　　　　'Both girls were allowed to go in.'

(c) **Kit**   hova   engedtek   /*engedték   be?

KI.ACC   hova   let.3PL$_{\text{IndefObj}}$ let.3PL$_{\text{DefObj}}$ preV

'Who were allowed to go in where?' [The addressee is expected to give information on each relevant person in the given respect (where were they allowed to go in).]

(c') *Mindenkit   hova   engedtek   /engedték   be?

every.KI.ACC   hova   let.3PL$_{\text{IndefObj}}$ let.3PL$_{\text{DefObj}}$ preV

Intended meaning: (16c)

3.4 Different Ways of Multiplying the Reference of Bare Interrogatives

The first way of multiplying the reference of bare interrogatives yields *multiple partitive* constructions, which can be observed in Hungarian with the bare-interrogative form; (18) illustrates two different realizations of the type.

(18) (a) **Ki**   pénzre   vár,   **ki**   egy   levélre,

KI   money.SUBL   wait.3SG   KI   a   letter.SUBL

ki   újságokra.

KI   newspaper.PL.SUBL

'Some (people) are waiting for money, some for a letter, some for newspapers.'

(b) Elszaladtak,   **ki**   merre   látott.

prev.ran.3PL   KI   MERRE   saw.3SG

'They dispersed, some in some direction, some in other directions (i.e. different people in different directions).'

The bare-interrogative form can also take part in *reduplication*:

(19) Menjen   táncba   **ki-ki**   köztünk   az ő   jegyesével!

go.SUBJ.3SG   dance.ILL   KI-KI   between.1PL   the his/her   fiancé.POSS.3SG.INS

'Everyone among us should go to dance with their own fiancé.'

In respect of operator character (É. Kiss 2002), the pronoun types illustrated in (17–19) function as specific topics.

3.5 Relative Pronoun

The bare-interrogative pronominal form in the place of the standard relative pronoun (e.g. *aki* 'that who') provides archaic flavor (20). As for its potential place in the Hungarian system of indefinites, the relevant piece of information is presented in (20): a relative pronoun (also in its archaic bare-interrogative disguise) in the subordinate clause triggers

the indefinite conjugation while the corresponding pronoun in the main clause the definite conjugation. In respect of operator character, relative pronouns function as another type of operator than Topic, Quantifier or Focus; they function as a subordinating operator (É. Kiss 2002, 243).

(20) archaic**Kit**   beengedtek,   azt   mi is   beengedtük   volna.
      KI.ACC   preV.let.3PL_IndefObj   that.ACC we also   preV.let.1PL_DefObj   be.COND
      'Those who were allowed to go in would have been allowed to come in by us too.'

3.6 *Indirect* and *Direct* Negation

We can meet in Hungarian the type of *indirect negation* in rhetorical questions. The bare-interrogative can practically be interpreted as 'nobody' in the given context; in respect of operator character (É. Kiss 2002), however, it functions as a (narrow) focus.

(21) **Ki** engedne   be   ilyen   gyanús   alakot?!
      KI let.COND.3SG   preV such   suspicious figure.ACC
      'Who would allow to go in someone as suspicious as this person?'

It is also archaic, but quite acceptable in many constructions, to substitute the non-human bare-interrogative pronominal form for the standard negative universal pronoun *semmi* 'nothing', which can be regarded as the direct type of negation. The pronoun type illustrated in (22) functions as a universal quantifier.

(22) archaic**Mit**   sem   ér.
      MI.ACC   neither   be_worth.3SG
      'It is worth nothing.'

4. Conclusion

The paper has been devoted to a comprehensive description of the Hungarian modal existential construction(s).

Section 1 presents the results of three experiments. These have been carefully analyzed by statistical methods after converting the canonical ordinal system of grammaticality judgments applied in modern generative linguistics into an interval variable which is ideal input to pointing out significant differences in different areas. We have verified that the subjunctive type of MEC is significantly less acceptable than the infinitival type but Transylvanian Hungarians use the subjunctive type significantly more readily than Hungarians within Hungary do.

Section 2 is devoted to theoretical argumentation. We claim that the pronoun of modal existential *wh*-constructions, which is formally identical to interrogatives, occupies a topic position, and nothing else (see subsection 2.3). The given topic position

is considered within a [Topic(s)–Quantifer(s)–Focus] MEC-internal operator domain, proposed on the basis of the standard hypotheses concerning the left periphery of the Hungarian sentence structure (É. Kiss 2002). One might say that this is an exceptional topic, considering its non-referential character (cf. É. Kiss 2002, 11). Instead of this view, we have argued that the common characteristic of topics lies in their anchoring feature, and the superordinate scope will specify the cycle-specific nature of different subtypes of topic.

Section 3 discusses MEC-pronouns, which formally coincide with bare interrogatives, from a Haspelmathian (1997, 2003) typological perspective. We have pointed out that this common pronominal form shows an extraordinary multifunctionality in Haspelmath's (1997) universal semantic map of indefinite pronouns with its 8 present-day (+2 archaic) functions. The MEC-pronoun, this hidden indefinite, occupies a much more expanded domain in the Hungarian map (Haspelmath 1997, 291–292) than the well known *vala/né, akár/bár* and *se(n)*series (corresponding to the *some-*, *any* and *no-*series in English, respectively). Its extraordinary multifunctionality is also seen in the fact that the ten functions are associated with Topic, Quantifier, Focus as well as Subordinating character in the É. Kiss-style (2002) operator system.

Acknowledgement

Works Cited

Alberti, Gábor, and Tibor Laczkó, eds. 2018. *Syntax of Hungarian – Nouns and Noun phrases*. Amsterdam: Amsterdam University Press.

Broekhuis, Hans, Evelien Keizer, and Marcel Den Dikken. 2012. *Syntax of Dutch – Nouns and Noun Phrases*. Amsterdam: Amsterdam University Press.

Bartos, Huba. 2020. "Mi mindent tudunk a mi minden-típusú kérdésekről? [What do we know about the 'what everything' type questions?]" In Általános *nyelvészeti tanulmányok* XXXII.: Újabb *eredmények a grammatikaelmélet, nyelvtörténet* és *uralisztika köréből* [New results in grammar theory, history of language and Uralistics], edited by Éva Dékány, Tamás Halm, and Balázs Surányi, 249–264. Budapest: Akadémiai Kiadó.

É. Kiss, Katalin. 1992. "Az egyszerű mondat szerkezete [The structure of the simple clause]" In *Strukturális magyar nyelvtan I* [A Structural Grammar of Hungarian I], edited by Ferenc Kiefer, 79–177. Budapest: Akadémiai Kiadó.

É. Kiss, Katalin. 2002. *The Syntax of Hungarian*. Cambridge: Cambridge University Press.

Field, Andy. 2013. *Introduction to Statistics using IBM SPSS*. London: Sage Publ.

Haspelmath, Martin. 1997. *Indefinite Pronouns*. Oxford: Oxford University Press.

Haspelmath, Martin. 2003. "The Geometry of Grammatical Meaning: Semantic Maps and Cross-linguistic Comparison." In *The New Psychology of Language*, Vol. 2., edited by Michael Tomasello, 211–242. Mahwah, NJ: Lawrence Erlbaum Associates.

Lipták, Anikó. 2003. *Hungarian Modal Existential Wh-constructions*. Manuscript. Leiden: University of Leiden.

Moravcsik, Edith A. 1969. "Determination." *Working Papers in Language Universals* 1, 64–98. Stanford: Stanford University.

Prohászka, Zsolt, Judit Farkas, Gábor Alberti, and Anna Szeteli. 2020. "The Position of Preverbs in Hungarian as an Indicator of Verbalness." In *Exploring Variation in Linguistic Patterns*, edited by Karolina Drabikowska and Anna Prazmovska, 55–77. Lublin: Wydawnictwo KUL.

Šimík, Radek. 2011. *Modal Existential Wh-constructions*. Utrecht: LOT.

Szabó, Veronika and Zsolt Prohászka. 2021. "Hungarian Modal Existential *Wh*-constructions in Written Language Use – Diachronic Perspectives." Paper presented at International Conference on the Structure of Hungarian 15, Pécs, Hungary, 25–26 August 2021.
https://icsh15.netlify.app/icsh15_abstracts/ICSH15_paper_Szabo_Prohaszka.pdf.

Szabolcsi, Anna. 2018. "Strict and Non-Strict Negative Concord in Hungarian: A Unified Analysis." In *Boundaries Crossed, at the Interfaces of Morphosytax, Phonology, Pragmatics and Semantics*, edited by Huba Bartos, Marcel den Dikken, Zoltán Bánréti, and Tamás Váradi. 227–242. Cham: Springer.

Surányi, Balázs. 2005. "Indefinite Wh-pronouns and the Modal Existential Wh-construction in Hungarian." Paper presented at International Conference on the Structure of Hungarian 7, Veszprém, 29–31 May 2005.
Handout: http://www.nytud.hu/icsh7/absz/Indefinite%20wh-pronouns.pdf.

VSO-VOS Alternations in Kaqchikel

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Abstract: In this paper I argue against the uniform head movement analysis for Mayan languages, as proposed by Clemens and Coon (2018). According to their analysis VOS orders with definite objects are predicted not to exist. However, exactly such orders have been attested in at least one variety of Kaqchikel (cf. Broadwell 2000). Furthermore, Kaqchikel exhibits free VSO-VOS alternations with both arguments being indefinite. To account for the VSO-VOS alternations, I argue that the two orders are derived in syntax. I consider two different analyses. In one I employ uniform leftward movement with exclusively specifier-initial orders, while in the other I consider both leftward and rightward movement as well as specifier-initial and specifier-final orders. The second analysis appears to be superior as it adequately accounts for the absence of adverbial intervention as well as for the ungrammaticality of orders in which definite arguments precede the indefinite.

Keywords: syntax; (anti)symmetry; head movement; rightward movement

1. Introduction

In this paper I argue against the uniform head movement analysis for Mayan languages, as proposed by Clemens and Coon (2018) (henceforth, C&C) in which both VSO and VOS orders are derived via a verb movement to the clause-initial position. Their account that the surface VOS orders follow from, (i) postsyntactic reordering of arguments, (ii) right-side subject topicalization and (iii) heavy NP shift do not coherently account for discourse neutral VSO-VOS alternations in Kaqchikel, a Mayan language spoken in Guatemala. Crucially, Kaqchikel exhibits VOS orders with definite objects, which

under C&C's analysis are predicted not to exist, as none of the three conditions are met. To account for the VSO-VOS alternations in Kaqchikel, I argue that the two orders are derived in syntax. I present two different analyses. In one analysis, I employ an anti-symmetric syntax (involving uniform leftward specifiers and leftward movement) in which either the subject DP or the VP move to a spec,TP position, yielding the respective orders. In the other analysis, I employ a symmetric syntax (involving both leftward and rightward movement) in which arguments surface as rightward multiple vP specifiers, which can be freely ordered at PF, yielding VOS or VSO. Either analysis accounts for the basic word order facts in Kaqchikel, as documented in Broadwell (2000), although they make different predictions. In particular, the symmetric (rightward specifier) anal-ysis appears to be superior for Kaqchikel as it accounts for the following two additional facts in the language that cannot be captured with the antisymmetric (uniform leftward movement) analysis.

First, the antisymmetric analysis requires a stipulation that definite arguments cannot precede the indefinite (*<DEF,INDEF>), suggesting that in an analysis where all syntactic objects move to the left, the definite argument cannot be higher than the indefinite (*DEF>INDEF, where '>' stands for 'higher than'). This is unexpected and runs counter to the observation that DEF>INDEF is attested many languages. In contrast, under the symmetric analysis *<DEF,INDEF> naturally follows as DEF moves over INDEF to a higher position on the right side, and thus, DEF>INDEF is the expected hierarchical order.

Second, the antisymmetric analysis inevitably leads to the generation of structures in which the verb surfaces outside of vP. This turns out to be problematic as adverbials that typically adjoin to vP cannot intervene between the verb and its arguments in either VOS or VSO orders. This also runs counter to a crosslinguistic tendency of a number of different adverbials attaching low in the structure, which are typically assumed to be vP-adjoined. In contrast, under the symmetric analysis, both arguments remain vP-internal and therefore *ipso facto* vP-adjoining adverbs are possible, and yet (correctly) cannot intervene.

This paper is structured as follows. In section 2, I discuss C&C's analysis on VSO-VOS alternations in Mayan languages and show that the facts from Kaqchikel chal-lenge the uniform head movement analysis along with the C&C's proposals that seem-ingly violating superficial orders are post-syntactically derived. In section 3, I develop an analysis involving antisymmetric syntax which exclusively involves leftward move-ment, and show that while such an analysis can account for the VSO-VOS alternations, it fails to adequately account for the aforementioned *DEF<INDEF restriction as well the absence of adverbial intervention. To account for these facts, in section 4, I assume that syntax is underlyingly symmetric (as traditionally assumed) allowing rightward specifiers within vP and (short distance) rightward movement. This adequately captures the Kaqchikel facts. Section 5 concludes.

2. VOS in Mayan
2.1 Clemens and Coon (2018)

In many Mayan languages, VOS orders readily occur when objects are bare NPs, but are unavailable with DP objects, as illustrated in (1) and (2).

(1)   (a)   Tyi   y-il-ä   x'ixik   wiñik
             PFV   a3-see-   woman   man
             'The man saw the woman.' (Vázquez Álvarez 2011, 21)

      (b)   Tyi   i-kuch-u   si'   aj-Maria
             PFV   a3-carry-   wood   CLF-Maria
             'Maria carried this wood.' (Coon 2010, 355)

(2)   (a)   *Tyi   y-il-ä   jiñi   x'ixik   wiñik
             PFV   a3-see-   DET   woman   man
             intended: 'The man saw the woman.'

      (b)   *Tyi   i-kuch-u   ili   si'   aj-Maria
             PFV   a3-carry-   DEM   wood   CLF-Maria
             intended: 'Maria carried this wood.' (Coon 2010, 355)

Determiners, demonstratives, and proper names cannot appear as objects in VOS orders. C&C observe that the presence of D^0 layer material on objects correlates with the word order as only objects that lack D^0 material on top of the nominal can appear in VOS orders (Clemens and Coon 2018, 247). if the object is a full DP, the resulting order must be VSO:

(3)   Tyi   i-kuch-u   aj-Maria   ili   si'
       PFV   a3-carry-   CLF-Maria   DEM   wood
       intended: 'Maria carried this wood.'

To account for the VOS-VSO alternations in Mayan, C&C consider a number of potential analyses for this. Right-side specifiers (a la Aissen 1992) are rejected as this presents complications for rigid VSO languages like Qanjob'al and Mam. Although C&C do not elaborate on why this is the case, presumably, this may be due to the fact that subjects appear to the left of the object and therefore the assumption that the subject is in a right-spec position is unlikely. Similarly, *v*P-fronting analysis by Coon (2010) is rejected because such analysis is difficult to extend to languages with rigid VSO orders.

In order to have a uniform account of the verb-initial orders, C&C argue that VOS is derived from VSO in three different ways (i) postsyntactic restructuring of bare NP objects, (ii) 2 heavy-NP shift (iii) right-side topics. Following verb (head) movement to the clause-initial position, objects that lack D^0 layer material postsyntactically move to yield VOS orders in order to maintain prosodic constituency. Evidence for this analysis comes from Cho'l, in which, according to C&C, the prosodic boundaries in VOS and VSO orders differ in that there is no prosodic boundary between the verb and the object in VOS orders. In contrast, in VSO orders, the prosodic boundaries are evident between all elements, as illustrated in (4), where ϕ demarcates the prosodic boundaries.

(4) Prosodic phrasing of VSO and VOS clauses in Ch'ol
    (a) (V)ϕ(S)ϕ(O)ϕ
    (b) (VO)ϕ(S)ϕ

                                   (Clemens and Coon 2018, 252)

Based on the prosodic boundaries and the presence of the D^0 layer material, C&C contend that a nominal with a D^0 layer is a phase, whereas the object that lacks the D^0 layer (i.e. an NP object) is not a phase. As such, NP objects undergo leftward movement and surface adjacent to the verb with which they form a prosodic constituent. This analysis predicts that "naturally occurring examples of VOS in cases where the object is a DP and the subject is neither a topic nor a heavy NP would constitute counterevidence to [C&C's] claims" (Clemens and Coon 2018, 274).

Although in their analysis C&C primarily focus on the facts in Ch'ol, they contend that their analysis holds for all Mayan languages. However, I show below that Kaqchikel has an additional set of data that suggests that the VOS-VSO alternations are already available in syntax.[1] In addition to Kaqchikel, Tz'utujil, Poqomam, and Poqomchii' may also exhibit orders that challenge the notion that the variation arises postsyntactically.[2] In the remainder of this section, I focus on Kaqchikel data that challenge C&C's post-syntactic account. While I draw data primarily from Broadwell (2000) in my analysis, the reader should be made aware that there are distinct varieties of Kaqchikel for which a different set of facts (and therefore the analysis) may hold.

2.2 Kaqchikel
According to Broadwell (2000), transitive clauses in Kaqchikel exhibit VOS, VSO, and SVO orders, as illustrated in (6a), (6b), and (6c) respectively:

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1   See Douglas, Ranero, and Sheehan (2017) who also argue for a syntactic analysis for word order alternations in Mayan.

2   Thanks to Michelle Sheehan (p.c.) for pointing out Poqomam and Poqomochii'.

(6) (a) x-u-b'a   ri   tz'i'   ri   me's
         COMPL-3.SG.ERG-bite   the   dog   the   cat
         'The dog bit the cat.'

     (b) x-u-b'a   ri   me's   ri   tz'i'
         COMPL-3.SG.ERG-bite   the   cat   the   dog
         'The dog bit the cat.'

     (c) ri   tz'i'   x-u-b'a   ri   me's
         the   dog   COMPL-3.SG.ERG-bite   the   cat
         'The dog bit the cat.' (Broadwell 2000)

Verb-initial orders show ambiguity if the subject and the object have "equal degrees of definiteness" (cf. Broadwell 2000). That is, either of the argument DPs following the verb can either be the subject or the object of the verb if both arguments are definite or if both arguments are indefinite (cf. 7):

(7) (a) x-r-oqotaj   ri   tz'i'   ri   me's
         COMPL-3.SG.ERG-chase   the   dog   the   cat
         'The dog chased the cat.'
         'The cat chased the dog.'

     (b) x-r-oqotaj   jun   tz'i'   jun   me's
         COMPL-3.SG.ERG-chase   a   dog   a   cat
         'A dog chased a cat.'
         'A cat chased a dog.'

The ambiguous data in (7) run counter the predictions made by C&C's analysis. Firstly, these cases are ambiguous in their interpretation (p.c. George Aaron Broadwell), suggesting that there cannot be any prosodic differences between the two readings. Secondly, the definite objects do appear in VOS readings. And thirdly, both arguments are light NPs, which per definition means that that these cases cannot involve any instances of heavy NP shift.

In addition to Kaqchikel, these facts may also hold in other Mayan languages. For example, for Tz'utujil, C&C adopt their data from Dayley (1985), who documents that VSO orders are absent. However, Duncan (2003) explicitly points out that, according to his consultants, the VSO orders are available patterning with Kaqchikel. Compare (7) and (8).

(8) x-uu-tz'et   jun   tz'i'   jun   miix
     INC-3.SG.ERG-see   a   dog   a   cat
     'A cat saw a dog.'
     'A dog saw a cat.' (Duncan 2003, 169)

Furthermore, heavy objects in Tz'utujil can appear in either VSO or VOS, suggesting that the obligatory heavy-NP shift is not at play:

(9) (a) x-uu-tz'ub'-aj   derja Aa   Xwaan   ru-chi   Ta   Mari'y
         COMPL-3.ERG-kiss-   the   Mr   Juan   3.ERG-cheek Miss Maria
         'Juan kissed Maria on the cheek.'

     (b) x-uu-tz'ub'-aj   der   ru-chi   Ta   Mari'y   ja   Aa Xwaan
         COMPL-3.ERG-kiss-   3.ERG-cheek Miss Maria   the Mr Juan
         'Juan kissed Maria on the cheek.'

Regarding the contexts in Kaqchikel with different degrees of definiteness in subject and objects, if one of the argument DPs is definite and the other one indefinite, then the definite argument must be the subject and it must follow the object yielding VOS orders. In the following example the definite DP must follow the indefinite DP, and it must be the subject of the verb:

(10) (a) x-r-oqotaj   jun   me's   ri   tz'i'
         COMPL-3.SG.ERG-chase   a   cat   the   dog
         'A dog chased a cat.'
         '*A cat chased a dog.'

     (b) *x-r-oqotaj   ri   tz'i' jun   me's
         COMPL-3.SG.ERG-chase   the   dog   a   cat

If the subject is indefinite and object definite then verb-initial orders are ungrammatical and the surface order must be SVO. In this case, actor focus (AF) morphology appears as a suffix on the verb (cf. 11a), and cannot be left out (cf. 11b).

(11) (a) Jun tz'i' x-b'a'-o   ri   a   Juan
         A   dog   COMPL-bite-AF   the   CL   Juan
         'A dog bit Juan.'
     (b) ?*Jun tz'i' x-u-b'a'   ri   a   Juan
         A   dog   COMPL-3.SG.ERG-bite   the CL   Juan

The summary of possible word orders depending on the definiteness of subject and object is given in the following table:

(12)

Subject-object definiteness and word order		
S_{indef}	O_{indef}	VOS, VSO, SVO
S_{def}	O_{def}	VOS, VSO, SVO
S_{indef}	O_{def}	SVO
S_{def}	O_{indef}	VOS

Given (12) we can make a relevant generalization that the analysis of the clause structure should capture. Namely, the definite arguments in Kaqchikel cannot precede the indefinite. I refer to this as the *<DEF,INDEF> restriction.

Regarding the placement of adverbials, verb-initial and the SVO orders differ in that in verb-initial adverbials cannot intervene between the verb and its arguments (cf. 13). However, the intervention effects are attested in SVO orders (cf. 14).

(13) (a) **iwir**   x-r-oqotaj   ri tz'i' ri   me's   AdvV SO
          yesterday COMPL-3.ERG-chase   the dog   the   cat
     (b) x-r-oqotaj **iwir** ri tz'i' rime's   *VAdvSO
     (c) x-r-oqotaj ri tz'i' **iwir** ri me's   *VSAdvO
     (d) x-r-oqotaj ri tz'i' ri me's **iwir**   ?VSOAdv

(14) (a) **iwir**   ri   tz'i' x-r-oqotaj   ri   me's   AdvSVO
          yesterday the   dog   COMPL-3.ERG-chase   the cat
     (b) ri tz'i' **iwir** x-r-oqotaj ri me's   SAdvVO
     (c) ri tz'i' x-r-oqotaj **iwir** ri me's   SVAdvO
     (d) ri tz'i' x-r-oqotaj ri me's **iwir**   ?SVOAdv

Given (13) and (14) there are (at least) three possible ways of deriving the structures: (i) SVO orders are derived from verb-initial orders, (ii) verb-initial orders are derived from SVO orders, (iii) verb-initial orders and SVO orders are derived independently. Since adverbs are much more flexible in SVO, it stands to reason that SVO orders are more flexible and involve additional movement operations. It is for this reason that in my analysis below, I adopt the option (i) and leave aside the option (ii). The option (iii) is *a priori* undesirable, and I leave it aside (though see Broadwell 2000 who treats them as independent derivations).

In the next section I discuss an analysis that involves antisymmetric syntax and illustrate that such an analysis comes with (ad hoc) stipulations. Subsequently, in section 4, I demonstrate that these stipulations are not required under a symmetric analysis.

3.   Leftward Movement Analysis

Under the assumption that verb-initial orders are default in Kaqchikel, we can surmise that since the verb and the object are not adjacent in VSO orders it follows that under the standard assumptions the displacements must be taking place. It is well understood that verbs combine with objects first before they combine with subjects, a generalization which Baker (2010) dubs as Verb-Object Constraint (VOC). Since the verb and object are not adjacent in VSO, it follows that either the verb or the XP containing the verb moves over the subject to the left. Alternatively, the object may move to the right, over the subject in the rightward specifier position. However, since antisymmetric syntax requires uniform leftward movement as well as specifiers on the left side, this option cannot be considered here, but I return to it in section 4.

Given the prerequisites of antisymmetric syntax, both VSO and VOS orders must be derived. Two potential approaches exist in the literature that can derive the orders, namely, head movement analysis and VP- (and VP-remnant) movement analysis. Under head movement analysis the verb moves over the subject deriving VSO from SVO. However, to derive VOS orders, we must stipulate an object shift crossing the subject. This would require a postulation of a strong feature that optionally triggers object shift (recall that verb-initial orders with arguments of equal degree of definiteness can optionally read as VSO or VOS). This rules out a uniform head movement analysis.

Under a VP-movement analysis, the VP containing the verb and its object move to a position in front of the subject, which derives VOS orders. However, in order to derive VSO orders, we run into the same problem (as with the head movement analysis) of having to postulate a strong feature that optionally triggers object shift out of VP, before the VP fronts. Consequently, we are left with the option of having both VP-movement and verb movement. That is, either VP moves to the front along with the direct object yielding VOS or verb alone moves to the front yielding VSO, as illustrated in (15a) and (15b), respectively.[3]

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3   A reviewer suggests that a there may be some effects of information structure that lead to the two structures in (15). However, it seems that such effects are unlikely as VSO and VOS readings are ambiguous (Aaron Broadwell p.c.). If correct then the option of deriving either order likely exists in narrow syntax, rather then as an effect that takes place post-syntactically. A feature that triggers either v^0 or VP movement should then be syntactic rather than a discourse feature, as the reviewer proposes.

(15) (a)

```
              TP
          ╱      ╲
       VP          T'
                 ╱    ╲
                T      vP
                     ╱    ╲
                  DP_sub    v'
                          ╱    ╲
                        v⁰      VP
                              ╱    ╲
                           spec     V'
                                  ╱    ╲
                                V⁰      DP_obj
```

(b)

```
              TP
            ╱    ╲
                  T'
                ╱    ╲
               T      vP
                    ╱    ╲
                 DP_sub    v'
                         ╱    ╲
                       v⁰      VP
                             ╱    ╲
                          spec     V'
                                 ╱    ╲
                               V⁰      DP_obj
```
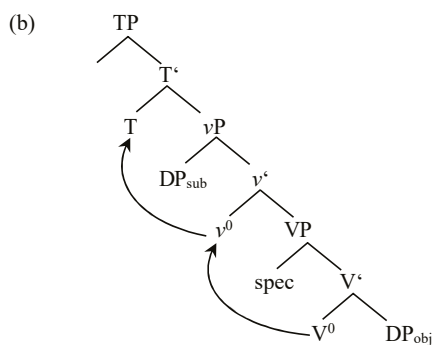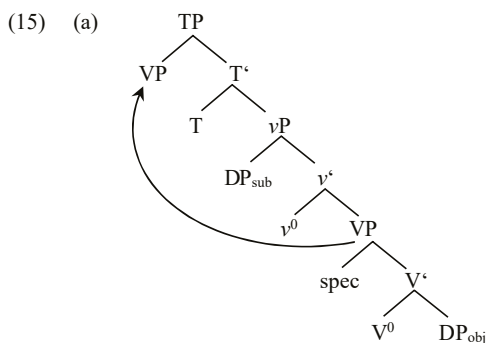
In (15), I assume that the projection to which either VP or the verb moves is TP. Furthermore, I assume that the TP projection bears an EPP feature that must be checked either by VP, or in the case of verb movement by the subject which raises to spec,TP in (15b) yielding the structure in (16).

(16)

```
              TP
          ╱      ╲
      DP_sub      T'
                ╱    ╲
               T      vP
                    ╱    ╲
              <DP_sub>    v'
                        ╱    ╲
                      v⁰      VP
                            ╱    ╲
                         spec     V'
                                ╱    ╲
                              V⁰      DP_obj
```
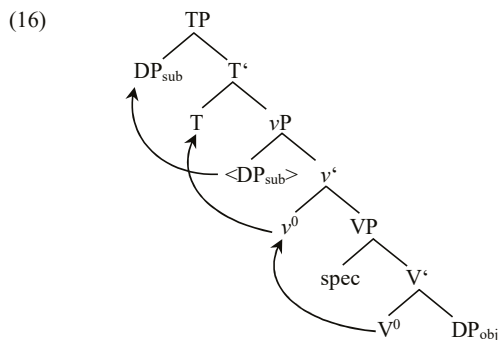
Subsequently, the verb raises to Agr⁰ (cf. 17) deriving the correct word order. Since Kaqchikel is morphologically rich involving aspectual morphology as well as agreement

morphology that appear on the verbal stem, verb movement to the higher position can be triggered by any of these higher inflectional morphemes. For example, there is a long-standing view that head movement is often triggered by affixal requirements of higher functional heads, such as agreement morphology (cf. Bobaljik and Thráinsson 1998; Rohrbacher 1994, 1999; Koeneman 2000; Koeneman and Zeijlstra 2014; Tvica 2017). Thus, (15a-b) are derived to yield the following two structures, respectively:

(17) (a)

```
AgrP
   Agr'
Agr0   TP
     VP      T'
         T     vP
             DPsub   v'
                   v0   VP
                     spec   V'
                          V0   DPobj
```

(b)

```
AgrP
    Agr
 Agr   TP
    DPsub   T'
        T     vP
           <DPsub>   v'
                   v0   VP
                     spec   V'
                          V0   DPobj
```
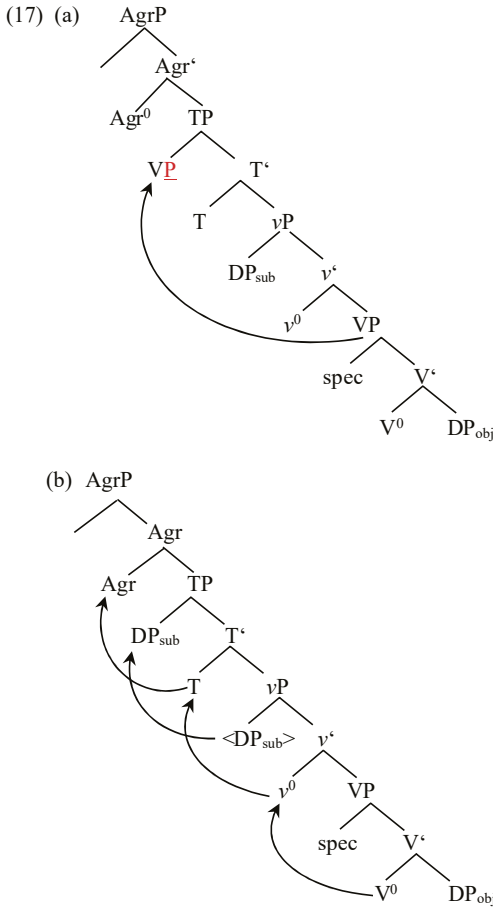
In (17a) where the VP containing the verb raises to spec,TP, the verb and the affix in the Agr^0 position appear adjacent at PF which allows the affix to appear on the verb, whereas in (17b) the verb raises to Agr^0 where the affix attaches to the verb. Importantly, when arguments are of equal degree of definiteness the syntax generates either (17a) or (17b), allowing for ambiguous interpretation of verb-initial orders, i.e. either VOS or VSO, respectively.

However, when subjects are definite and object indefinite, only (17a) is possible. In contrast, when subjects are indefinite and objects definite, the order must be SVO which requires subject movement to a clause initial position (spec,AgrP or higher). Importantly, the subject movement to spec,AgrP must be available in both (17a) and (17b), as SVO orders allow adverbial intervention in all positions. Concretely, if the subject movement to spec,AgrP is available only in (17a) then we cannot derive SVAdvO orders, which are attested. If, however, subject to spec,AgrP is available only in (17b) then we cannot derive SAdvVO orders.

Nevertheless, even with both structures employed to generate all possible adverb placements in SVO orders, problems still arise. The generation of SAdvVO orders with the subject movement to spec,AgrP, requires that adverbs must be adjoined to TP. If this is correct, then it is not clear why adverbs cannot intervene between the verb and the subject in VSO orders, as generated with the structures in (17b). More generally, there is an additional problem for (17), namely, why can't adverbs adjoin to *v*P in Kaqchikel? This certainly comes as a surprise as low adjunction of certain types of adverbs is common in many other languages.

Although the analysis correctly accounts for the VOS-VSO alternations, (17) must involve the *DEF<INDEF restriction, suggesting that in the antisymmetric syntax the indefinite arguments must be higher than the definite. This is an obligatory stipulation, which is *a priori* undesirable. More importantly, it runs counter to crosslinguistic findings, according to which it is typically the case that the definite arguments raise to a higher position, as in many Germanic languages.

In the next section, I develop a symmetric analysis that accounts for both the lack of adverbial intervention and for the surprising restriction on the linear order of arguments with unequal degree of definiteness (i.e. *<DEF,INDEF>).

4. Rightward Movement Analysis
4.1 Spec-Final Orders
In order to mitigate the ordering constraint *DEF<INDEF let us suppose that the *v*P specifiers are adjoined to the right. In Kaqchikel, there is some independent evidence for this assumption from possessive phrases. Standardly the possessor and the possessee, e.g. in English, are assumed to occupy specifier and complement positions, respectively. This corresponds to the left-right <possessor, possessee> linear order. In Kaqchikel, however, the linear order is opposite (cf. 18), already superficially suggesting the right-wardness of specifiers.

(18) n-u-kanoj   r-ixjayil   a   Manuel   rija'
      CON-3.SG.ERG-look:for   3.SG.ERG-wife   Manuel   s/he
      'Manuel's wife is looking for him.'

Furthermore, to allow the optionality of the postverbal argument orders in (7), let us assume that subjects and objects of equal degrees of definiteness surface as specifiers of a single head. There is substantial literature on multiple specifiers in which it has often been observed that in certain cases the order of specifiers can alternate (cf. Chomsky 1995; Richards 1999; Bošković 2002; Jiménez and İşsever 2010; Jiménez-Fernández 2011; Jiménez-Fernández and Issever 2012). For example, this has been noted in the free order of wh-words in multiple-*wh*-fronting languages, such as Serbo-Croatian and Russian where they can appear as multiple specifiers of CP (cf. Bošković 2002). This idea can be extended to *v*P, which would project multiple specifiers that can host both arguments of a transitive verb in Kaqchikel. With the assumption that multiple specifiers are on the right (as has been proposed by Aissen 1992), we can postulate that the Kaqchikel *v*P projects the surface structure in (19).

(19)
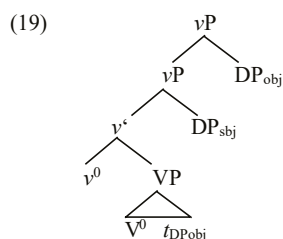
Here, the object DP appears at the outer specifier, while the subject at the inner specifier of *v*P. Crucially, given the VOC, the object DP must be base-generated as the sister of V, suggesting that it must undergo movement to the outer specifier of *v*P.

4.2 Rightward Movement

The structure in (19) involves a critical deviation from what has standardly been observed, namely that movement is predominantly to the left. Contrary to this, the object DP in (19) moves to the right. Here I take a position that movement to the right is possible, and although it is rare, I assume that there are no syntax-internal principles that forbid it (contra Kayne 1994). Rather, the apparent scarcity of rightward movement may follow from grammar-external factors such as parsing, as argued for by Ackema and Neeleman (2002) and Abels and Neeleman (2012), and even modality, as rightward movement has been observed in sign language (cf. Cecchetto et al. 2009).

4.3 Basic Clause Structure in Kaqchikel

With the assumption that syntax is symmetric, involving instances of rightward movement, as given in (19), there are (at least) two hypotheses with respect to the order of postverbal arguments (of equal degrees of definiteness) that yield either VOS or VSO orders in Kaqchikel.

    A. Objects must raise to the outer spec,*v*P, which allows for a free linearization of subjects and objects at spec,*v*P.

    B. Objects optionally raise to the outer spec,*v*P, which yields either order derivationally.[4]

Let us consider both hypotheses. Under hypothesis A, object shift is uniform in all derivations. (20a) derives both VO$_{def}$ S$_{def}$ and VS$_{def}$ O$_{def}$ orders, while (20b) derives the indefinite counterparts. Structurally in both cases the object is syntactically higher, however, since both arguments are multiple specifiers of the same head (i.e. v^0) they can be linearized in either order. This patterns with the free ordering of *wh*-words in multiple-*wh*-fronting languages, as well as in multiple-topic-fronting languages, where the multiple specifiers of C can appear in either order (cf. Bošković 2002), as well as with multiple specifiers of TP, as proposed by Jiménez-Fernández and Issever (2012).

Regarding the clauses with arguments of different degrees of definiteness, (20c) derives VO$_{indef}$S$_{def}$. Here, the indefinite object surfaces *in situ* and cannot move higher over the definite subject, in accordance with the *<DEF,INDEF> restriction. Lastly, the VS$_{indef}$O$_{def}$ orders can in principle be derived as (20d) illustrates. However, this configuration is ungrammatical, as only SVO orders are available when subjects are indefinite and objects definite; In such configurations, the subject must escape to the clause-initial position (cf. 21).

(20)   (a)

    (b)

---
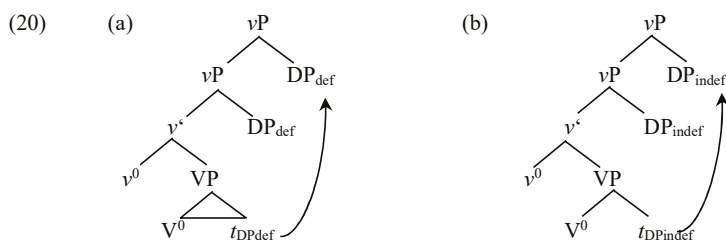
4   A reviewer suggests that there should be some mechanisms that allow for rightward movements. Under this account the linearization algorithm would have to restrict that specifiers must follow heads in Kaqchikel *v*Ps, as opposed to for example the LCA, which cannot linearize specifiers to the right.

(c)

vP
  vP   DP_indef
    v'   DP_def
      v⁰ VP
        V⁰ t_DPindef

(d)

vP
  vP   DP_def
    v'   DP_indef
      v⁰ VP
        V⁰ t_DPdef

XP
  DP_indef   X'
                X⁰   vP
                        vP   DP_def
                          v'   t_DPindef
                            v⁰ VP
                              V⁰ t_DPdef
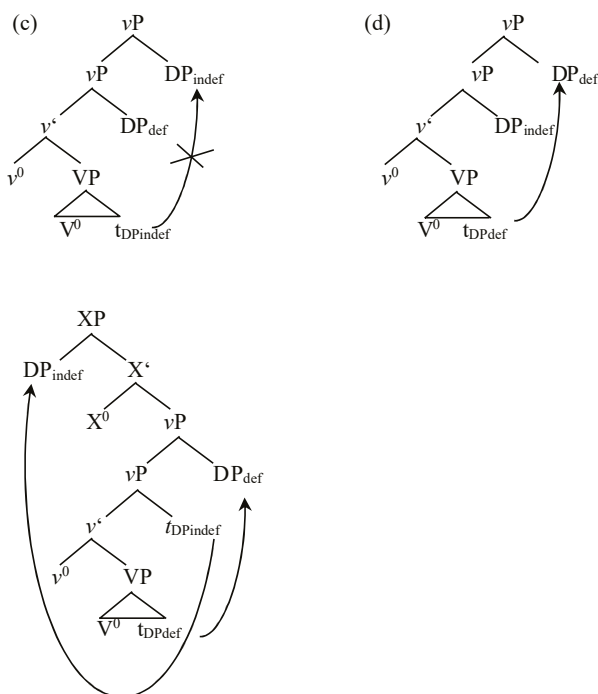
Under hypothesis B, object optionally raises to the outer spec of *v*P in both (20a) and (20b), yielding both VOS and VSO, where both arguments are definite in (20a) and both indefinite in (20b). In (20c) object cannot raise to the outer spec,*v*P as this violates the *<DEF,INDEF> restriction. (20d) can in principle be derived, however configurations with indefinite subjects and definite objects must yield SVO orders, so the subject must escape to the clause initial position.

For both hypotheses A and B scenarios, it seems to be the case that multiple specifiers of v^0 cannot be occupied by arguments of different degrees of definiteness, as object shift cannot take place in (20c). However, in (20d) it might take place, but we cannot detect it as, in this context, the indefinite subject must appear before the verb.

The crucial difference between the A and B scenarios is that under A, object always moves to the outer spec,*v*P, whereas under B, object movement is largely optional and it seems to have the same problem that I have shown for the antisymmetric analysis in section 3, where we would have to stipulate an optional strong feature that triggers object shift. In addition, the B scenario employs optional movement of definite objects, which raises the question of why (20d) is not possible? For A, which I adopt and contend to be superior, it can be argued that it is precisely because the object obligatorily raises over the subject to the outer spec,*v*P that the indefinite subject must escape to the clause-initial position in (21). In addition, the idea that definite objects optionally raise is challenged

by some empirical evidence pertaining to the Principle C effects, which I discuss next, suggesting that definite objects must move to a position from which they c-command the subject, such as the outer spec,*v*P.

4.4 Principle C

In Kaqchikel verb-initial orders, a pronoun in the object position can bind an R-expression inside the subject. According to Broadwell (2000) when the possessor of the subject is antecedent to a following pronoun as in (22a), SVO order is obligatory (cf. 22b).

(22) (a) n-u-kanoj   r-ixjayil   a   Manuel   rija'
          CON-3.SG.ERG-look:for   3.SG.ERG-wife   CL   Manuel   s/he
          *'Manuel's$_i$ wife is looking for him$_i$.'
          'Manuel's$_i$ wife is looking for him$_j$.'

      (b) r-ixjayil   a   Manuel   n-u-kanoj   rija'
          3.SG.ERG-wife   CL   Manuel   CON-3.SG.ERG-look:for   s/he
          'Manuel's$_i$ wife is looking for him$_i$.'

In addition to SVO orders in which subjects are indefinite and objects definite (cf. 12), in (22b) both subject and object are definite. If definite objects optionally raise over the subject, as is the case under scenario B, then the object could remain *in situ*, a position from which it cannot c-command the subject at spec,*v*P. In other words, a VOS order should be available, but this according to Broadwell (2000) is not possible.

Since both arguments wind up in multiple specifiers the question arises how the c-command relations are established between the two specifiers of the same head. Note that Abels and Neeleman (2012) abstractly show that asymmetric c-command can hold between two specifiers of the same phrase, which suggests that if both arguments are specifiers of the same head, then there can be a c-command relation between the two, which could lead to binding effects (see also Guimarães 2008). This suggests that under the analysis in (20) the object in the outer specifier of *v*P must c-command the subject in the inner specifier of *v*P. In terms of geometric relations this indeed is this case. However, under Kayne's (1994) notion of c-command as given in (31) the two specifiers symmetrically c-command each other.

(23) X *c-commands* Y iff X and Y are categories and X excludes Y and every category that dominates X dominates Y. (Kayne 1994, 16)
      X *excludes* Y if no segment of X dominates Y. (Chomsky 1986, 9)

Abstractly, (23) stipulates that in the following multiple-specifier structures, neither YP nor XP asymmetrically c-command each other:

(24) (a)
```
            ZP
          /    \
        YP      Z'
        |      /  \
        y    XP    Z'
             |    /  \
             x   Z    WP
                 |
                 z
```

(b)
```
            ZP
          /    \
        Z'      YP
       /  \     |
      Z'   XP   y
     /  \   |
    Z    WP  x
    |
    z
```
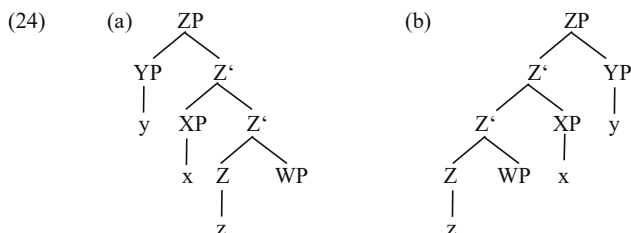
But, in (25a) YP asymmetrically c-commands XP, and in (25b) XP asymmetrically c-commands YP.

(25) (a)
```
              ZP
            /    \
          Z'      YP
         /  \     |
       Z'    MP   y
      /  \   / \
     Z   WP M   XP
     |      |
     z      m
```

(b)
```
              ZP
            /    \
          Z'      MP
         /  \    /  \
       Z'    XP M    YP
      /  \   |  |
     Z   WP  x  m
     |
     z
```
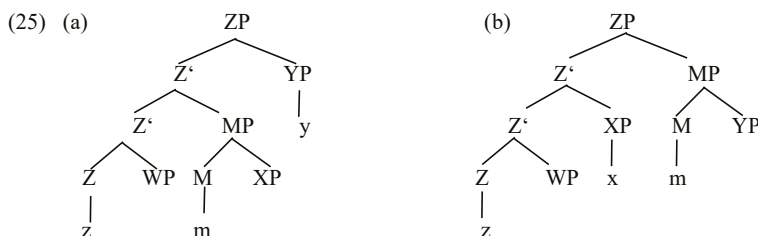
(25a) is exactly the structure of (22a), which is represented in (26), where the object pronoun (DP1) in the clause-final position asymmetrically c-commands the subject (DP2):

(26)
```
                              vP
                          /        \
                        vP          DP₁
                      /    \         |
                    v'      DP      himᵢ
                   /  \    /   \
                 v⁰   VP  D'    DP₂
                 |   /\  / \     |
               look V⁰ t_DP1 D⁰ NP  Manuelᵢ
```
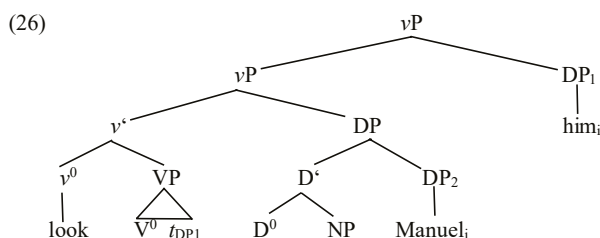
Since (22a) is ungrammatical under a bound reading, the apparent principle C violation in (26) is mitigated by the subject movement to the clause-initial position as represented in (27). Here, the subject moves to a projection XP, the nature of which is not relevant for the purposes here. However, as Kaqchikel productively uses actor focus morphology in SVO orders. The AF morpheme, typically appearing as a suffix on the verb, could be hosted by X^0, X^0 triggering verb movement.

(27)

```
                         XP
             ┌───────────┴───────────┐
            DP                        X'
        ┌────┴────┐            ┌───────┴───────┐
       D'         DP₂         X⁰              vP
     ┌──┴──┐     Manuelᵢ              ┌────────┴────────┐
    D⁰    NP                         vP               DP₁
          │                    ┌─────┴─────┐         himᵢ
        wife                  v'          t_DP
                         ┌─────┴─────┐
                        v⁰          VP
                       look      ┌──┴──┐
                                V⁰   t_DP1
```
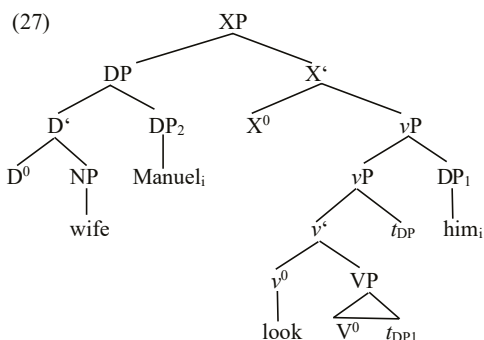
DP movement to the left (rather than to the right) can potentially be attributed to processing limitations (cf. Ackema and Neeleman 2002). The movement of the subject in (27) is likely a long-distance movement, due to potentially other projections between vP and XP (such as TP and AspP). Hence, it is not surprising that it is to the left as crosslinguistically there is practically no evidence of long-distance rightward movement. Ackema and Neeleman (2002) suggest that the absence of long-distance rightward movement is due to processing limitations.

Since binding relations hold between arguments occupying multiple specifiers, it is reasonable to expect that this is something that we find in multiple specifiers elsewhere. Indeed, this is precisely what has been observed in the order of the multiply-fronted topics in Romance, but then from the higher position on the left side (cf. López 2009), a mirror image of what we see in Kaqchikel. A pronoun in the leftmost fronted topic in Spanish binds into the nominal within the subsequent fronted topic, violating Principle C. This is demonstrated in (28c) which is ungrammatical under the relevant reading.

(28) (a) Cadaᵢ niño puso suᵢ chaqueta en el armario
         Each child put-3.SG self's coat in the closet
         'Each child put his/her coat in the closet.'

   (b) Cadaᵢ niño suᵢ chaqueta la puso en el armario

   (c) */??Suᵢ chaqueta cadaᵢ niño la puso en el armario

Under this analysis the attested placement of adverbs is straightforwardly accounted for. If both arguments remain vP-internal with multiple specifiers being available in vP, then it is expected that adverbs (standardly assumed to be vP-adjoined) cannot intervene between the verb and its arguments in VOS and VSO orders. The relevant assumption here is that the multiple specifiers of $v⁰$ are freely ordered at PF (under hypothesis A), allowing both VOS and VSO. The crucial part of the assumption is that the free ordering

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holds only between the elements in the specifiers content of v^0, without the inclusion of adjuncts, or else the system would incorrectly generate VSAdVO and VOAdvO orders.

The added benefit of the analysis is that the much greater freedom of adverbs in SVO orders follows straightforwardly. As discussed above, SVO orders are assumed to be derived from verb-initial orders and involve subsequent subject movement to the clause initial position as well as verb movement to the head of the projection that hosts the AF morphology, which appears as a suffix on the verb. The extraction of the subject and the verb to a vP-external position yields adverbial intervention effects that are not attested in verb-initial orders.

5. Concluding Remarks

In this paper I have argued that a uniform head movement analysis as proposed by Clemens and Coon (2018) does not straightforwardly account for verb-initial orders in Kaqchikel, as the VSO-VOS alternation appears to be syntactic, rather than post-syntactic. I have therefore discussed two potential ways of deriving the VSO-VOS alternation, involving antisymmetric (with uniform leftward movement) and symmetric analyses. There appear to be two empirical hurdles for the antisymmetric analysis: (i) it is unclear why adverbial intervention is blocked in verb-initial orders, and (ii) the ad hoc stipulation that definite arguments cannot precede the indefinite runs counter to crosslinguistic findings, as definite-before-indefinite orders *are* widely attested. Neither of these issues arise under the symmetric analysis, suggesting that traditional syntactic theories that allow for mirror-image structures might be on the right track.

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Works Cited

Abels, Klaus, and Ad Neeleman. 2012. "Linear Asymmetries and the LCA." *Syntax* 15 (1): 25–74.

Ackema, Peter, and Ad Neeleman. 2002. "Effects of Short-Term Storage in Processing Rightward Movement." In *Storage and Computation in the Language Faculty*, edited by Sieb Nooteboom, Fred Weerman and Frank Wijnen, 219–256. Springer, Dordrecht.

Aissen, J. 1992. "Topic and Focus in Mayan." *Language* 68: 43–80.

Baker, Mark C. 2010. "Formal Generative Typology." In *The Oxford Handbook of Linguistic Analysis*, 2nd ed., edited by Bernd Heine and Heiko Narrog, 285–312. Oxford: Oxford University Press.

Bobaljik, Jonathan David, and Höskuldur Thráinsson. 1998. "Two Heads Aren't Always Better than One." *Syntax* 1 (1): 37–71.

Bošković, Željko. 2002. "On Multiple Wh-Fronting." *Linguistic Inquiry* 33 (3): 351–383.

Broadwell, George Aaron. 2000. "Word Order and Markedness in Kaqchikel." In *Proceedings of the LFG '00 Conference*, edited by Miriam Butt and Tracy Holloway King, 44–62. Stanford University: CSLI Publications.

Cecchetto, Carlo, Carlo Geraci and Sandro Zucchi. 2009. "Another Way to Mark Syntactic Dependencies: The Case for Right-Peripheral Specifiers in Sign Languages." *Language* 85 (2): 278–320.

Chomsky, Noam. 1986. *Barriers*. Vol. 13. Cambridge, MA, MIT Press.

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

Clemens, Lauren, and Jessica Coon. 2018. "Deriving Verb-Initial Word Order in Mayan." *Language* 94 (2): 237–280.

Coon, Jessica. 2010. "VOS as Predicate Fronting in Chol." *Lingua* 120 (2): 345–378.

Dayley, Jon Philip. 1985. *Tz'utujil Grammar*. Vol. 107. Berkeley: University of California Press.

Douglas, Jamie, Rodrigo Ranero, and Michelle Sheehan. 2017. "Two Kinds of Syntactic Ergativity in Mayan." *Proceedings of GLOW in Asia XI* 2, edited by Michael Yoshitaka Erlewine, 41–56. Cambridge, MA: MIT Press.

Duncan, Lachlan. 2003. "The Syntactic Structure of Tz'utujil Maya." In *Proceedings of the LFG '03 Conference*, edited by Miriam Butt and Tracy Holloway King, 164–183. Stanford University: CSLI Publications.

Guimarães, Maximiliano. 2008. "A Note on the Strong Generative Capacity of Standard Antisymmetry Theory." *Snippets* 18: 5–7.

Jiménez-Fernández, Ángel L. 2011. "On the Order of Multiple Topics and Discourse-Feature Inheritance." *Dilbilim Araştirmalari Dergisi* (Journal of Linguistic Research) 2011 (1): 5–32.

Jiménez, A, and S. İşsever. 2010. "Multiple Topic Fronting, Multiple Specifiers and Feature Inheritance." Paper presented at the Mediterranean Syntax Meeting 3, 8–10 October 2010, University of Athens.

Jiménez-Fernández, Ángel L., and Selçuk İşsever. 2012. "Deriving A/A'-effects in Topic Tronting: Intervention of Focus and Binding". In *Current Issues in Generative Linguistics: Syntax, Semantics and Phonology* edited by Joanna Błaszczak et al., 8–25. Wroclaw: Center for General and Comparative Linguistics (CGCL).

Kayne, Richard S. 1994. *The Antisymmetry of Syntax*. Cambridge, MA: MIT Press.

Koeneman, Olaf. 2000. "The Flexible Nature of Verb Movement." PhD diss., Utrecht University.

Koeneman, Olaf, and Hedde Zeijlstra. 2014. "The Rich Agreement Hypothesis Rehabilitated." *Linguistic Inquiry* 45 (4): 571–615.

López, Luis. 2009. "Ranking the Linear Correspondence Axiom." *Linguistic Inquiry* 40 (2): 239–276.

Neeleman, Ad, and Amanda Payne. 2020. "PP-Extraposition and the Order of Adverbials in English." *Linguistic Inquiry*: 1–50.

Richards, Norvin. 1999. "Featural Cyclicity and the Ordering of Multiple Specifiers." *Current Studies in Linguistics Series* 32:127–158.

Rohrbacher, Bernhard Wolfgang. 1994. "The Germanic Languages and the Full Paradigm." PhD diss., University of Massachusetts.

Rohrbacher, Bernhard Wolfgang. 1999. *Morphology-Driven Syntax: A Theory of V to I Raising and Pro-Drop*. Amsterdam: John Benjamins.

Tvica, Seid. 2017. "Agreement and Verb Movement: The Rich Agreement Hypothesis from a Typological Perspective." PhD diss., University of Amsterdam.

Vázquez Álvarez, Juan Jesús. 2011. "A Grammar of Chol, a Mayan Language." PhD diss. University of Texas, Austin.

Part III. Explorations in Language Use across Modalities

Nonword Repetition in Czech-English Bilingual Children. Parallels with Developmental Language Disorder

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Abstract: Bilingual children may display language difficulties that are, at times, misunderstood as a language impairment. Previous work has suggested that nonword repetition tasks may be used to disentangle difficulties related to bilingualism from difficulties related to developmental language disorder (DLD), since the patterns observed in these two groups may be different: specifically, DLD children were shown to be more prone to errors related to nonword length and to be more sensitive to the presence of phonological clusters.

This study offers some preliminary data on a new sample of children, Czech-English sequential bilinguals, and it compares their performance to that of English DLD children (both groups were assessed with an English task). Contrary to previous studies, in this sample, groups did not differ in performance: both bilinguals and children with DLD in fact displayed a main effect of length (long nonwords were repeated less accurately), and a main effect of cluster (nonwords containing clusters were repeated less accurately). These findings suggest that the use of nonword repetition to disentangle bilinguals from children with DLD shall be exerted with caution and may not extend to all language pairs.

Keywords: bilingualism; nonwords; phonology; developmental language disorder

1. Theoretical Background
1.1 Nonword Repetition as a Clinical Tool

Nonword repetition is one of the most reliable systems to assess language difficulties in children and nonword repetition tasks are usually part of the assessment batteries used to diagnose a language disorder in a child. Classic research shows that deficits in

nonword repetition tasks correspond to deficits in working memory (Gathercole et al. 1994) and/or phonological processing (Snowling, Chiat, and Hulme 1991). Since both working memory and phonological processing appear to be impaired in children with language disorders, nonword repetition tasks have been shown to have an excellent diagnostic accuracy, and they are adopted across a wide variety of languages, such as English, German, Dutch, Italian, French, Russian, Czech, Vietnamese (Chiat 2015).

As Gathercole et al. (1994) explain, children, with or without a disorder, are sensitive to the length of the nonword they are asked to repeat, and longer nonwords cause more problems and tend to be repeated less accurately. This finding is described as a working memory effect (Baddeley, 2003): When we listen to speech, the sequence of sounds perceived is rehearsed for a very short time in our mind, and then it is rapidly lost from memory. If the sequence of sounds has a meaning, its perception may lead to the activation of specific representations in the lexicon. If, as it is the case with nonwords, it has no meaning, the only representational component that will be active is working memory, and specifically the so-called phonological loop. Nonword repetition offers thus primarily a measure of the phonological loop (Baddeley 2003). While it is true that increased nonword length represents a challenge for all children (Gathercole et al. 1994), several studies show that these effects are larger in children with a developmental language disorder (Chiat 2015). Thus, difficulties associated with increased nonword length are considered a useful parameter to differentiate typically developing (TD) children from children with DLD.

As further research has shown, the number of segments or the length in milliseconds are not, however, the only parameters that predict difficulty in nonword repetition. Archibald and Gathercole (2006), for instance, showed that nonwords matched in length may still lead to different results when they differ in their phonological complexity. Nonwords that contain phonological clusters (sequences of at least two consonants) are repeated significantly less accurately than nonwords that do not contain phonological clusters, and, again, this is particularly evident in children who received a diagnosis of language impairment. Thus, deficits occurring with increased nonword length are regarded as working memory deficits, while deficits occurring in nonwords containing clusters of consonants are regarded as phonological deficits, and these deficits may be used to assess a developmental language disorder (Chiat 2015; Sileo and Tyčová 2019; Archibald and Gathercole 2007).

1.2 Nonword Repetition in Bilingual Children

Studies on the performance of bilingual children in the repetition of nonwords have given very mixed results. In principle, nonword repetition shall not be heavily affected by the domain that tends to be more problematic for bilingual children, lexical access (Bialystok, Craik and Luk 2008), since nonword are by definition items that do not belong to the lexicon. However, several studies have shown that TD monolingual children

outperform TD bilingual children in nonword repetition accuracy, and TD bilinguals may match monolingual children with DLD in their overall score with nonwords (Chiat 2015). This overlap is problematic, as it reduces the applicability of nonword repetition as a diagnostic tool. Due to this pattern in overall performance, several researchers have turned to a more fine-grained analysis of the features of the nonwords as predictors of accuracy, rather than looking at overall performance, when comparing monolingual and bilingual children.

The parameters presented in the previous section (length and phonological complexity) are important and may offer a tool to disentangle the difficulties observed in bilinguals and those observed in children with a language impairment. A study by Thordardottir and Brandeker (2013) is particularly relevant to explain this concept. In this study, the authors investigated nonword repetition scores in a large sample of French-English bilingual children and compared their performance to that of French monolingual children with a diagnosis of language impairment. In this experiment, the authors investigated how different nonword properties may affect performance, given that both bilinguals and DLD children may perform, in terms of overall accuracy, below the monolingual norm. The study showed that while DLD children were highly sensitive to nonword length, bilingual children were not affected by this property of the nonwords. Longer nonwords were problematic for children with DLD, but were not problematic for bilingual children. This difference may be regarded as a tool for language assessment. As the authors suggested, while the performance in terms of overall score may be lower in both bilinguals and children with DLD, differences of this kind may be used to understand whether a bilingual child has a disorder.

Another study that is promising in this regard is that of Dos Santos and Ferré (2018). In this experiment, the authors compared monolingual and bilingual children, with and without language impairment, in their nonword repetition scores. Children were assessed with a French nonword repetition task, and the bilinguals' sample consisted of children speaking French as L2 and a variety of languages as L1. Interestingly, the study in first instance displays a discrepancy with Thordardottir and Brandeker (2013): the length effect was observed not only in the DLD groups (both monolingual and bilingual), but also in the bilingual TD group. The only group that did not show a length effect was the monolingual TD group. As a second step, the authors compared the roles of phonological clusters (specifically comparing nonwords with one vs two clusters) in predicting performance. Their results show that this property was able to differentiate bilingual TD children from bilingual children with DLD. In this sample, both monolingual and bilingual DLD children displayed a sharp drop in performance when two clusters were present. On the contrary, the TD groups (both monolingual and bilingual) did not show a significant drop in performance. According to the authors, thus, phonological complexity may be used to disentangle difficulties related to bilingualism from difficulties related to a disorder: while overall scores may be lower in

both bilinguals and DLD children, only DLD children may show significant effects related to clusters.

This complex and mixed bundle of data offers ideas for further research and contributes to the quest for parameters that could help separate difficulties related to bilingualism from difficulties related to DLD. The final aim is finding a reliable system to assess DLD in bilinguals, with the rationale that if TD bilinguals and DLD children display qualitative differences in nonword repetition, when bilinguals show traits of DLD children in their performance one may suspect that they have a disorder. This concept was well summarized by Chiat (2015), in a thorough review of the potential role of nonwords in the assessment of language disorders in bilinguals. As she states (Chiat 2015, 14): "If bilingual children are less affected by length and/or syllable complexity than those with language impairment, these factors may help with clinical diagnosis in bilingual children when their overall scores fall below those of monolingual children."

As Chiat (2015) further explains, despite the promise of this idea, evidence is currently very limited, and further studies contributing to this research agenda are warranted. The current study contributes to this agenda with data from a previously unexplored group, Czech-English sequential bilingual children.

2. Methods

2.1 Ethical Concerns

This study is part of the Primus project "Core syntax in bilingual children with varying levels of input" (www.csbc.ff.cuni.cz), directed by the first author of this article. The project was reviewed by Charles University Ethics Committee, and it received ethical approval. This study contains testing involving human participants. All procedures performed involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Informed consent was obtained from at least one parent for all individual participants involved in this study.

2.2 Participants

The study involved two groups of children: one group of sequential bilingual children (Czech-English), and one group of monolingual English children with developmental language disorder (DLD).

The bilingual group consisted of 23 children (age 9–11), recruited in three international schools in Prague. Participants were all bilingual speakers of English and Czech, having Czech as L1, and they have started acquiring English from the ages of 1 to 4 and are thus classified as early sequential bilinguals (Meisel 2009; Tsimpli 2014). The data for this group were collected by Brabcová, as part of background testing for her MA project (Brabcová 2018). A questionnaire distributed to the parents of the participants specified their age of onset to English and thus provided the inclusion criteria for this article. Brabcová

tested a larger sample of children, but we decided to exclude simultaneous bilinguals because they were only 11, and the subsample was thus too small for us to reach meaningful conclusions. A parental consent for the testing was also provided from each participant. All children were Czech-English bilinguals, using mainly English in their education and both English and Czech in their everyday life (as assessed with a questionnaire).

The DLD group consisted of 18 children, aged 5 to 14, whose data was provided by the Department of Clinical Language Sciences at Reading University. These children attended the clinic because they were experiencing language difficulties, and they received a diagnosis of language impairment because they performed at least one standard deviation below the mean in at least one other language test. The tests used were the Test for the Reception of Grammar-2 (Bishop 1989), the Clinical Evaluation of Language Fundamentals-4 (Semel, Wiig, and Secord 2004) and the Test of Word Finding (German 1989). Children in this sample were assessed with a battery of tests, and since these assessments were completed for clinical reasons and not for research reasons, each child did not necessarily complete the whole battery. Despite these differences, all children were assessed with the Children's test of Nonword Repetition (CNRep, Gathercole et al. 1994), which is also the nonword repetition task that was adopted by Brabcová (2018) in her background assessment of bilingual children, and at least one of the other language tests.

2.3 Nonword Test

The CNRep is one of the most widely used nonword repetition task in the United Kingdom (Archibald and Gathercole 2006). The task is comprised of 40 items of different length (10 two-syllable nonwords, 10 three-syllable nonwords, 10 four-syllable nonwords, 10 five-syllable nonwords). Example of nonwords used in this task are: "glastow" (2 syllables), "dopelate" (3 syllables), "woogalamic" (4 syllables), "sepretennial" (5 syllables). Normative data suggests that children of all ages tend to perform more poorly with nonwords of increasing length (Gathercole et al. 1994).

Our approach to the data follows Cilibrasi et al. (2018) and Archibald and Gathercole (2006), as it compares performance in nonwords with clusters against nonwords without clusters. Following Cilibrasi et al. (2018), we focus on noninitial clusters in medium and long nonwords (4 and 5 syllable), since initial clusters in short nonwords are shown to behave idiosyncratically and are a less reliable measure of phonological processing. Noninitial clusters are a more reliable measure of phonological processing, and in CNRep these clusters only appear in 4 and 5 syllable nonwords. Table 1 summarizes how this approach compares to the previous studies mentioned in the introduction. The three studies led to rather different results, but since both languages and methods differ, we may not reliably suggest what is causing these different outcomes. This summary may serve for further investigations in which a smaller number of conditions could be changed, and it may be possible in the future to establish whether differences between these three studies are related to methodological differences or to language differences (or both).

	Thordardottir and Brandeker (2013)	Dos Santos and Ferré (2018)	Cilibrasi et al. (2022)
Language	French	French	English
Target group	French-English bilinguals	French L2 speakers with and without DLD; mix of L1s	Czech-English bilinguals
Control group	French monolinguals with DLD	French monolinguals, with and without DLD	English monolinguals with DLD
Task characteristics	French nonwords of varying length (clusters not controlled)	French nonwords of varying length, with 0, 1 or 2 clusters	English nonwords of 4 or 5 syllables, with or without a cluster
Results	Length effect only in DLD children	Length effect in both DLD and TD children. Cluster effect only in DLD	Both groups show cluster and length effects

Table 1. Comparison of the current study with Thordardottir and Brandeker (2013) and Dos Santos and Ferré (2018).

2.4 Scoring

Bilingual children were asked to perform this task in their L2. Phonologies of L1 and L2 are shown to interact in bilingual speakers, and the phonology of L1 may be dominant over the other phonology, affecting the realization of phonemes in L2 production (Paradis 2001; Babatsouli and Ingram 2015). As such, scoring in this sample consisted in measuring whether the child was attempting at the correct target, rather than measuring whether the child was articulating with a standard British accent the phonemes they heard in the nonword. CNRep has a binary type of scoring: correct vs incorrect. In this study, deviations from the target were counted as mistakes, but not mispronunciations. For instance, the reduction of a cluster was counted as an incorrect repetition (i.e. "sepetennial" in place of "sepretennial"). In the meantime, the use of a trill /r/, typical of Czech, in the place of a voiced postalveolar approximant /ɹ/, typical of British English, or similar phonemic variations, were not considered errors.

2.5 Hypothesis

Based on the previous work of Thordardottir and Brandeker (2013) and Dos Santos and Ferré (2018), our hypothesis is that bilingual children's performance will be less dependent on phonological complexity and length than DLD children's performance. Our prediction is that DLD children will be showing large length and cluster effects, while bilinguals will be showing small or nonsignificant effects for the same variables.

3. Results

Accuracy was measured as a binary variable (accurate vs inaccurate), and for each participant it was then coded as proportion of correct responses in each of the 4 given conditions (4-syllable with cluster, 4-syllable without cluster, 5-syllable with cluster, 5-syllable without cluster). Thus, for each condition, and each participant, accuracy was a value between 0 and 1. Descriptive statistics for both groups are presented in Table 2.

	Four syllables	Five syllables	Without cluster	With cluster
Bilinguals	0.79 (0.18)	0.69 (0.19)	0.78 (0.18)	0.7 (0.19)
DLD	0.53 (0.34)	0.41 (0.32)	0.53 (0.31)	0.41 (0.34)

Table 2. Descriptive statistics. Mean values for the variables investigated (standard deviation in parenthesis).

The full dataset was analysed with linear mixed models (Bates 2005). The chosen model included accuracy as the dependant variable, and length, cluster, and group as fixed effects (main predictors). The fixed effect of length consisted of two categories, 4 and 5 syllable nonwords (as noninitial clusters are only present in 4 and 5 syllable nonwords in the CNRep test). The fixed effect of cluster also consisted of two categories, presence vs absence of a non-initial cluster. Both length and cluster were re-leveled using the sliding contrast function (MASS library). The random effect of item could not be included because, for the clinical group, the data we had available were already summarised by condition (we did not have access to performance on each specific item), so the only random effect included was participant. The random structure was chosen comparing several possible random structures (using an Anova) and picking the model with the smallest AIC (see Baayen et al. 2008 for a description of this procedure). For a full list of the models compared see the Appendix. The chosen model was thus:

M2 <- lmer(acc ~ length*cluster*group + (length|part), na.action=na.omit)

The full model revealed a main effect of length, a main effect of cluster, and a main effect of group (Table 3). None of the interactions reached significance. Based on the signs of the estimates, these results indicate that long nonwords were repeated less accurately than shorter nonwords, nonwords without clusters were repeated more accurately than nonwords with clusters, and bilingual children outperformed in overall score the children with DLD. The lack of significant interactions indicate that the patterns observed are similar in the two groups: even though overall proficiency is lower in DLD children, both groups are similarly sensitive to length and cluster effects.

	Estimate	Std Err	T value	P value
Length	-0.11	0.02	-3.79	<.001 *
Cluster	-0.10	0.02	-3.88	<.001 *
Group	0.26	0.06	3.96	<.001 *
Length:Cluster	-0.05	0.05	-0.94	0.4
Length:Group	0.01	0.05	0.21	0.8
Cluster:Group	0.04	0.05	0.73	0.4
Length:Cluster:Group	0.13	0.11	1.26	0.2

Table 3. Fixed effects from the full model

To further explore the dataset, the two groups were also analysed separately, and age was added in each separate model. These models included accuracy as the dependant variable, length, cluster, and age as fixed effects (main predictors), and participant as a random effect. Age was centred, following directions of Kraemer and Blasey (2004).

The next section presents results obtained from these models, separately for the bilingual group and the DLD group.

For the Sequential Bilingual group, the model showed a significant main effect of length, $t(63) = -2.81$, $p = 0.006$, and a significant main effect of cluster, $t(63) = -2.34$, $p = 0.02$. No other main effect or interaction reached significance in the analysis. The two main effects are represented visually in Figures 1 and 2.
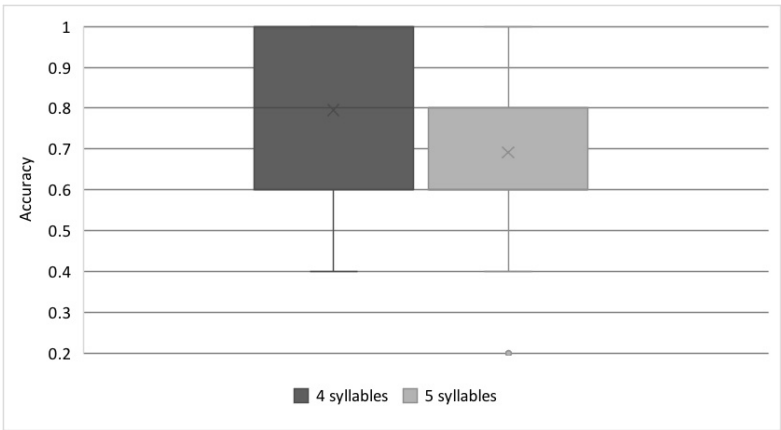
Fig 1: Proportion of correct repetitions in nonwords with 4 and 5 syllables in Sequential Bilinguals. This figure represents the main effect of length. Accuracy was obtained dividing the number of correct responses by the number of items repeated. Overall, nonwords with 4 syllables were repeated more accurately than nonwords with 5 syllables.
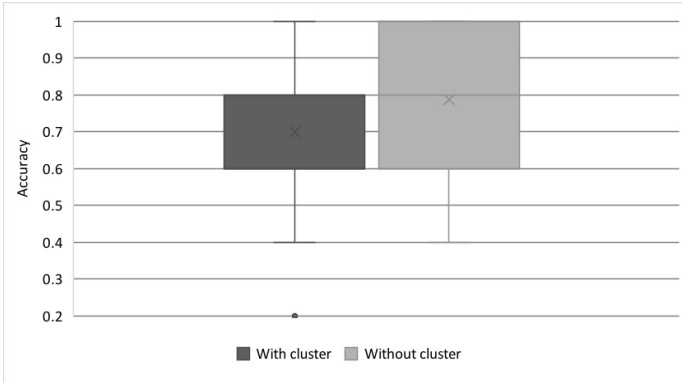
Fig 2: Proportion of correct repetitions in nonwords with either the presence or the absence of a noninitial cluster in Sequential Bilinguals. This figure represents the main effect of cluster. Accuracy was obtained dividing the number of correct responses by the number of items repeated. Overall, nonwords containing a cluster were repeated less accurately than nonwords which did not contain a cluster.

The second part of the analysis focused on the DLD participants. The model showed a significant main effect of length, $t(48)= -2.7$, $p = 0.009$, a significant main effect of cluster $t(48)= -2.96$, $p = 0.004$, and a marginal main effect of age, $t(16)=2.02$, $p = 0,059$. No other main effect or interaction reached significance in the analysis. The two significant main effects are presented visually in Figures 3 and 4. The marginal main effect of age is not surprising in this sample, since the age range was considerably larger in the DLD group than it was in the bilingual group. The general tendency, as expected, was towards an improvement of performance with growing age.
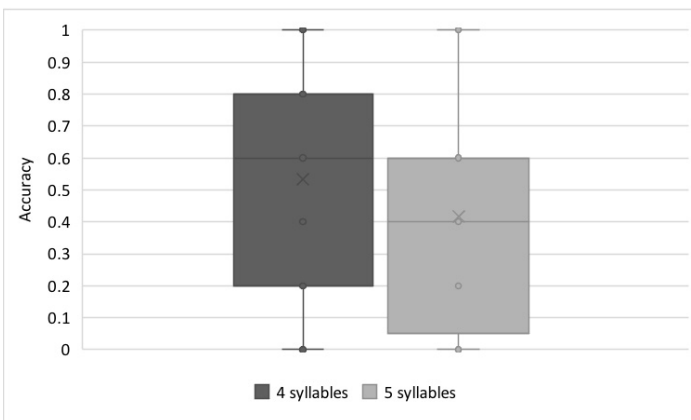
Fig 3: Proportion of correct repetitions in nonwords with 4 and 5 syllables in DLD children. This figure represents the main effect of length. Accuracy was obtained dividing

the number of correct responses by the number of items repeated. Overall, nonwords with 4 syllables were repeated more accurately than nonwords with 5 syllables.
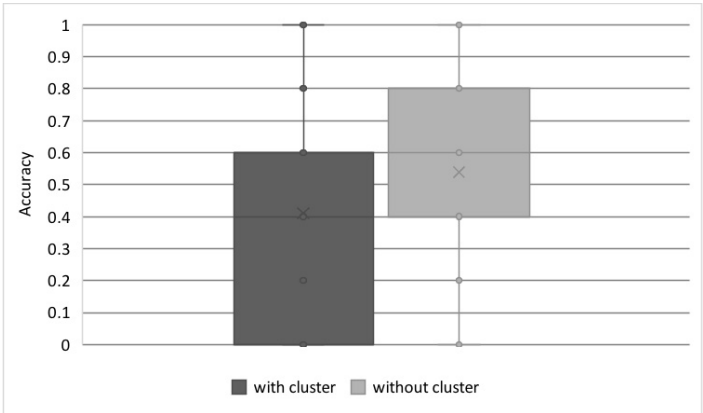
Fig 4: Proportion of correct repetitions in nonwords with either the presence or the absence of a noninitial cluster in DLD children. This figure represents the main effect of cluster. Accuracy was obtained dividing the number of correct responses by the number of items repeated. Overall, nonwords containing a cluster were repeated less accurately than nonwords which did not contain a cluster.

4.   Discussion

This study investigated the roles of length and phonological complexity in predicting nonword repetition accuracy in a group of Czech-English sequential bilingual children, and it compared their performance to the performance of a group of monolingual English children with developmental language disorder (DLD). The results showed that children (in both groups) were sensitive to nonword length and nonword phonological complexity, with longer nonwords being repeated less accurately, and nonwords containing clusters being repeated less accurately. Bilingual children outperformed DLD children in overall score. Additionally, the DLD group displayed a marginal main effect of age, probably due to the larger age variability in that sample, with performance improving together with growth in age.

These findings contribute to the ongoing discussion on the potential role of nonwords in assessing DLD in bilingual children (Chiat 2015). In previous work, Thordardottir and Brandeker (2013) have shown that French-English bilingual children are less prone to length effects in nonwords than French monolingual children with a diagnosis of language impairment. This finding led to the proposal that length effects may be a good candidate for the recognition of qualitative differences in the performance of bilinguals when compared to children with DLD: the proposal of Thordardottir and Brandeker (2013)

is that, even though both groups may perform below monolingual norms, bilinguals may be differentiated because they are not sensitive to length effects. When a bilingual displays a length effect, one may suggest that this could be a flag of a potential language difficulty (a DLD symptom).

Our findings go against these claims and suggest that this approach may potentially be problematic. In our sample, both groups showed a main effect of length.

A second relevant comparison may be made with the study of Dos Santos and Ferré (2018). In their study, the authors found that phonological complexity was efficient in disentangling TD bilinguals from DLD monolinguals. In their sample, while monolinguals with DLD showed a sharp decline in performance when presented with nonwords that contain two phonological clusters, no significant decline in performance was observed in the bilingual sample. Importantly, a significant decline was instead observed in a group of bilingual children with DLD: this pattern was taken to justify the use of phonological complexity as a parameter to disentangle difficulties related to bilingualism from difficulties related to DLD. As a consequence, this discrepancy leads to the suggestion that phonological complexity may be used as a system to diagnose DLD in bilingual samples.

Also in this case, our findings are not consistent with previous work, and suggest thus that phonological complexity may not necessarily succeed in disentangling bilinguals and DLD children. Contrary to Dos Santos and Ferré, we did find that both groups, DLD and bilinguals, behaved in the same way with nonwords of varying phonological complexity: In both cases, we observed a main effect of cluster, with performance declining significantly when nonwords contained a cluster.

In summary, in the current study, bilinguals and DLD children were shown to be sensitive in nearly identical ways to the two parameters manipulated (length and phonological complexity). Thus, none of these two variables would have been efficient in separating these two groups, if deemed necessary.

The consequence is that (if such results were replicated) nonword length and nonword phonological complexity may not be safely used to recognize a language impairment in a bilingual child, at least in those with Czech L1 assessed in English L2. There is nothing in our bilingual sample that could make us suspect a language impairment in these children, and it appears rather that nonword length and nonword phonological complexity are affecting bilinguals' performance similarly to what is observed in DLD children. Following the reflections of Chiat (2015), we stress that further data is necessary to fully understand the extent to which nonword length and phonological complexity may be used to disentangle bilinguals from children with DLD, and ultimately whether some nonword properties may be used to assess a DLD in bilingual children. Our study is smaller in size than the studies completed by Thordardottir and Brandeker (2013) and Dos Santos and Ferré (2018), and it relies on a different pair of languages.

Further work with larger samples and with a wider variety of languages may offer a clearer picture as to whether there are variables that can be used to disentangle between these two groups, and thus help in the assessment of DLD in bilinguals.

Funding Acknowledgement

Appendix

Models compared:

M1 <- lmer(acc ~ length*cluster*group + (1|part), na.action=na.omit)
M2 <- lmer(acc ~ length*cluster*group + (length|part), na.action=na.omit)
M3 <- lmer(acc ~ length*cluster*group + (cluster|part), na.action=na.omit)
M4 <- lmer(acc ~ length*cluster*group + (group|part), na.action=na.omit)
M5 <- lmer(acc ~ length*cluster*group + (length*cluster|part), na.action=na.omit)
M6 <- lmer(acc ~ length*cluster*group + (length*group|part), na.action=na.omit)
M7 <- lmer(acc ~ length*cluster*group + (cluster*group|part), na.action=na.omit)

Models 5, 6 and 7 did not converge.

List of Stimuli:

	4 syllable	5 syllable
With a noninitial cluster	Contramponist, Perplisteronk, Stopograttic, Empliforvent, Blonterstaping	Sepretennial, Detratapillic, Confrantually, Underbrantuand, Versatrationist
Without a noninitial cluster	Woogalamic Fenneriser Commecitate Loddernapish Penneriful	Defermication, Reutterpation, Altupatory, Pristoractional, Voltularity

Works Cited

Archibald, Lisa M., and Susan E. Gathercole. 2006. "Nonword Repetition: A Comparison of Tests." *Journal of Speech, Language, and Hearing Research: JSLHR* 49 (5): 970−983.

Archibald, Lisa M., and Susan E. Gathercole. 2007. "Nonword Repetition in Specific Language Impairment: More Than a Phonological Short-Term Memory Deficit." *Psychonomic Bulletin & Review* 14 (5): 919−924.

Baayen, Rolf Harald, Davidson, Douglas J., and Douglas M. Bates. 2008. "Mixed-Effects Modeling with Crossed Random Effects for Subjects and Items." *Journal of Memory and Language* 59: 390–412. Doi: 10.1016/J.Jml.2007.12.005

Babatsouli, Elena, and David Ingram. 2015. "What Bilingualism Tells Us about Phonological Acquisition." In *Routledge Handbook of Communication Disorders*, edited by Ruth Huntley Bahr and Elaine R. Silliman, 197−206. London: Routledge.

Baddeley, Alan. 2003. "Working Memory and Language: An Overview." *Journal of Communication Disorders* 36 (3): 189−208.

Bates, Douglas. 2005. "Fitting Linear Mixed Models in R." *R News* 5 (1): 27−30.

Brabcová, Alžběta. 2018. "Effect of Time of Exposure to L2 on the Comprehension of Relative Clauses in Primary School Children*."* MA Thesis, Charles University in Prague.

Bishop, Dorothy V. 1989. *Test for The Reception of Grammar (TROG)*. London: Medical Research Council.

Bialystok, Ellen, Fergus Craik, and Gigi Luk. 2008. "Cognitive Control and Lexical Access in Younger and Older Bilinguals." *Journal of Experimental Psychology: Learning, Memory, and Cognition* 34 (4): 859.

Chiat, Shula. 2015. "Non-Word Repetition." In *Assessing Multilingual Children,* edited by Sharon Armon-Lotem, John H.A.L de Jong, and Natalia Meir 125−150. Bristol: Multilingual Matters.

Cilibrasi, Luca, Vesna Stojanovik, Tom Loucas, and Patricia Riddell. 2018. "The Role of Noninitial Clusters in The Children's Test of Nonword Repetition: Evidence from Children with Language Impairment and Typically Developing Children." *Dyslexia* 24 (4): 322−335.

Dos Santos, Christophe, and Sandrine Ferré. 2018. "A Nonword Repetition Task to Assess Bilingual Children's Phonology." *Language Acquisition* 25 (1): 58−71.

Gathercole, Susan E., Catherine S. Willis, Alan D. Baddeley, and Hazel Emslie. 1994. "The Children's Test of Nonword Repetition: A Test of Phonological Working Memory." *Memory* 2 (2): 103−127.

German, Diane J. 1989. *Test of Word Finding (TWF)*. Dallas, TX: DLM.

Kraemer, Helena Chmura, and Christine M. Blasey. 2004. "Centring in Regression Analyses: A Strategy to Prevent Errors in Statistical Inference." *International Journal of Methods in Psychiatric Research* 13 (3): 141−151.

Meisel, Jürgen M. 2009. "Second Language Acquisition in Early Childhood." *Zeitschrift für Sprachwissenschaft* 28 (1): 5−34.

Paradis, Johanne. 2001. "Do Bilingual Two-Year-Olds Have Separate Phonological Systems?" *International Journal of Bilingualism* 5 (1): 19−38.

Semel, Eleanor M., Elisabeth H. Wiig, and Wayne Secord. 2004. *CELF 4: Clinical Evaluation of Language Fundamentals 4 Screening Test*. London: Pearson Clinical.

Sileo, Roberto, and Dana Tyčová. 2019. "Czeck-Rep: Introducing A Nonword Repetition Task for Czech." *Studies in Applied Linguistics* 10 (2): 101−107.

Snowling, Margaret, Shula Chiat, and Charles Hulme. 1991. "Words, Nonwords, and Phonological Processes: Some Comments on Gathercole, Willis, Emslie, and Baddeley." *Applied Psycholinguistics* 12 (3): 369−373.

Thordardottir, Elin, and Myrto Brandeker. 2013. "The Effect of Bilingual Exposure Versus Language Impairment on Nonword Repetition and Sentence Imitation Scores." *Journal of Communication Disorders* 46 (1): 1−16.

Tsimpli, Ianthi-Maria. 2014. "Early, Late or Very Late? Timing Acquisition and Bilingualism." *Linguistic Approaches to Bilingualism* 4 (3): 283−313.

Eyebrow Raises as Facial Gestures: A Study Based on American Late Night Show Interviews

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Abstract: This study provides an exploratory analysis of eyebrow raises in a corpus of TV interviews. The central hypothesis is that brow raises, besides their prosodic, emotive and social functions, often have a metaphorical dimension, signalling 'openness'. This metaphorical function modulates aspects of meaning at various levels of linguistic interpretation. The multi-modal corpus data was biometrically annotated with facial landmarks. The audio signal was analysed in terms of pitch and intensity. The study combines high-resolution analyses of six speakers with analyses of the whole corpus. The hypothesis that brow raises metaphorically signal openness receives some support from the data, especially with respect to their occurrence in the context of epistemic modality and additivity. A statistical association with polar questions cannot be observed. The study also demonstrates that more data, observational as well as experimental, is needed to gain a more complete understanding of the function of facial gestures in spoken conversation.

Keywords: facial gestures; multimodal corpus; eyebrow raises; metaphor

1. Introduction

While there is a substantial body of literature on facial gestures from a psychological point of view, mostly with a focus on the expression and processing of emotions (e.g. Ekman 2003), the "semantics of facial expressions" (Wierzbicka 2000, 15) is more poorly understood. In their *Integrated Message Model of Language*, J. Bavelas, N. Chovil and colleagues have proposed treating *Conversational Facial Gestures* as a component of the gesture-speech ensemble (Bavelas and Chovil 1997, 2000, 2006; Bavelas and Gerwing 2007; Bavelas et al. 2014a,b; Bavelas and Chovil 2018). It is in this spirit that the present article proposes an analysis of eyebrow movement, drawing

on research on hand gestures in spoken language (McNeill 1992, Kendon 2004) as well as non-manuals in sign languages (e.g. Pfau and Quer 2010, Herrmann and Steinbach 2013 across languages, and Bross 2020, Pendzich 2020 on DGS).

The study addresses the following question:

(1)   Under what circumstances do speakers raise their eyebrows?

Wierzbicka (2000), referring to earlier work by other authors, associates raised eyebrows with "attentional activity", "an effort to recall", an "act of empathy", "novelty", "surprise", "doubt", "incredulity", "disbelief", and "interest" (cf. Wierzbicka 2000, 164ff. for references). She proposes the following Natural Semantics Metalanguage representation:

(2)   I know something now.
       I want to know more (about this).
       I'm thinking now.

                                                    (Wierzbicka 2000, 168)

An empirical study of eyebrow movement was carried out by Flecha-García (2006, 2010). Using the framework of Conversational Game Analysis (Carletta et al. 1997), she found that raised eyebrows can be observed in "Instruct" moves (though not in "Query" moves), and at the beginning of higher-level turn-constructional units ("Transactions"). Flecha-García (2006) also identifies correlations between eyebrow movement and pitch contour (see also Guaïtella et al. 2009 and earlier work cited there, and Kim et al. 2014).

The present approach is located in between the more general description of Wierzbicka (2000) on the one hand, and the more specific analysis of Flecha-García (2006, 2010), on the other. I intend to provide an abstract, general meaning of (specific types of) brow raises, deriving their particular communicative effects from a combination of that general meaning with properties of the context.

The central hypothesis of this study is that eyebrow movement is metaphorically associated with openness in some of its uses. Openness is regarded as a relative notion. It is defined in (3).

(3)   A category A is more open than a category B iff the instances of B form a real subset of the instances of A.

I assume that facial gestures – like hand gesticulations – modulate the information conveyed through the acoustic signal. Brow raises may indicate a higher degree of openness in comparison to the default category. For instance, a phonetically encoded proposition comes with a specific amount of epistemic commitment. By using (default) indicative mood, making an epistemically unmodified statement, a speaker signals that

they fully commit to the information in question (e.g. *The road is blocked*). Epistemic commitment can be reduced by using a modal (*The road may be blocked*). The indicative sentence reduces the possible worlds to those where the road is blocked, whereas the modal *may* leaves all possibilities open (the road may or may not be blocked). As modulators of modality, eyebrow raises thus typically accompany expressions of uncertainty, rather than certainty.

I use an annotated multi-modal corpus of TV late night show interviews to address the question in (1). This corpus is described in Section 2. In Section 3, some prosodic, emotive and social functions of eyebrow movement are briefly addressed. Section 4 deals with the central topic of this study, the metaphorical function of brow raises. Section 5 contains the conclusions.

2.   Corpus and Methods

The corpus consists of video material with interviews conducted in the *Late Show with David Letterman* between 1980 and 2014, collected on a fan page, where the videos can be accessed.[1] It comprises 160 video files (episodes) with an overall duration of ~ 160 hrs, with automatically generated subtitles. The files were processed as follows:

Figure 1: *Facial landmark detection*

- The audio signal was extracted (with ffmpeg[2]) and intensity and pitch contours were measured with Praat (Boersma and Weenink 2018).
- Rectangles with faces were identified using the 'dlib'-package for Python.[3]
- For rectangles with a size of at least 10,000 pixels, 3D facial landmark detection was applied (see Figure 1), using the 'face_alignment' package for Python.[4]
- The facial landmark coordinates were normalized to the width of the eyes, the height of the nose and the width of the nose.
- The position of the eyebrows was measured as the distance between the centroid of the ten facial landmarks of the eyebrows, and the centroid of the five facial landmarks of the nose.
- The sagittal and vertical head angles were determined (this was possible because the 'face_alignment' package delivers a three-dimensional model of the head).

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1   https://donzblog.home.blog/

2   https://www.ffmpeg.org/

3   https://pypi.org/project/dlib/

4   https://github.com/1adrianb/face-alignment

The basic unit of observation was the frame. As the video data was processed at a rate of 30 frames per second, each second is associated with 30 (sequential) frames. Each frame is associated with five measurements: (i) intensity and (ii) pitch of the audio signal, (iii) height of the eyebrows, and (iv) sagittal as well as (v) vertical angle of the head. The resulting dataframe was reduced to those observations that were part of an uninterrupted sequence of at least 90 frames (3 seconds) showing the same speaker, filmed from the same angle. The audio-visual data was aligned with the subtitle units as represented in the subtitle files. Subtitle units have a mean duration of 2.28 secs (σ=1.08) and contain 7.75 tokens on average (σ=1.81). All measurements of a subtitle unit were aggregated over those units, determining mean values, maximum values and minimum values for eyebrow height and pitch. Sequences of frames of this type will be called 'segments'.

The multimodal corpus can be represented using the ANVIL software (Kipp 2001) as shown in Figure 2. As the top-right box in Figure 2 illustrates, segments are not (necessarily) meaningful units of speech (here, *what the story was in fact Miss Wyman*, corresponding to segment 0250 of episode 0188, from 00:11:32,100 to 00:11:35,130).

Given that the subtitle units (segments) are relatively short, I created an additional data frame that contains the measurements aggregated over each segment as well as the following segment. The reason is that some effects can be expected to show with a certain time lag. For example, focus particles and other scope-bearing elements may be associated with eyebrow activity later in the signal if we assume that it is not (necessarily) the particle itself, but the focus, that triggers eyebrow movement. The second data frame taking into account the potential temporal delay of eyebrow movement in relation to the verbal material will be called the 'lag data'.[5]
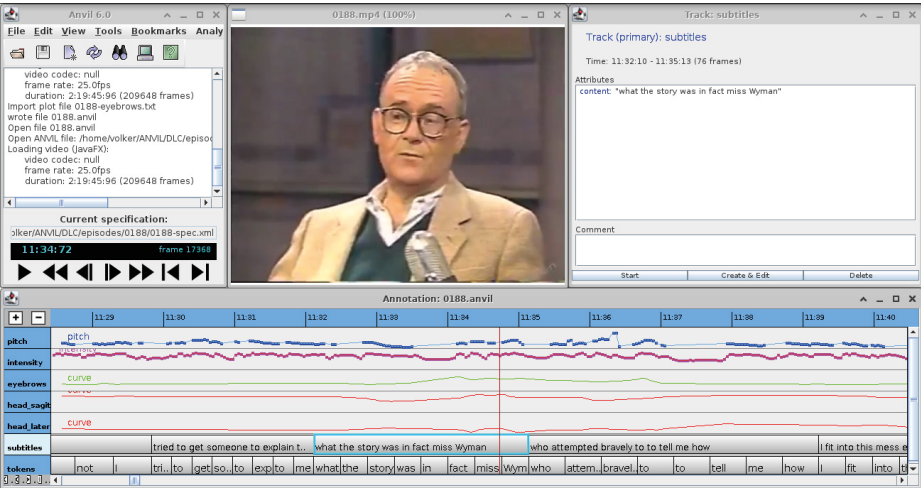
Figure 2: Segment of the corpus, represented using ANVIL

5   The data is available in the following OSF repository: https://osf.io/y5s2u/.

As eyebrow movement varies considerably across speakers, I have combined analyses of the entire corpus with a more fine-grained approach, inspecting six individual speakers, who will be identified with their initials in the following: Eddie Murphy (EM), Teri Garr (TG), Art Donovan (AD), Buck Henry (BH), Quentin Crisp (QC) and Norman Macdonald (NM). David Letterman (DL) mostly figures as a host, but there are also interviews conducted by Tom Snyder (TS).

3. Non-Metaphorical Functions of Eyebrow Raises

The hypothesis of brow raises being associated with openness applies to descriptive meaning only (see Sect. 4). Non-metaphorical occurrences of brow raises can be motivated by prosody (Sect. 3.1), emotions (Sect. 3.2) and the negotiation of social relations during conversation (Sect. 3.3).

3.1 The Prosodic Function of Brow Raises

Like hand gestures (esp. beats), facial gestures may convey prominence. Eyebrow raises are often used as "emphasizers" (Ekman 1979), "which [occur] synchronously with a stressed (e.g., prosodically marked) word" (Bavelas et al. 2014a, 124). In (4), the brow raise is precisely aligned with the focal accent. (Here and in the following, brow raises are indicated by a line over the relevant material, like this. Prosody is approximately annotated with small caps indicating prominent syllables and diacritics showing the type of tone in terms of Wells 2006, e.g. FÀLL, RÍSE. The examples can be inspected by clicking on the annotated material [in blue]).

(4) DL: ... you've handed me a little gift here a little pamphlet it says mental game,
        and this is a little uh brochure, a little pamphlet what is it it's from ...
    TG: JaPÀN.
    DL: ... from Japan, yeah what doe- what does this mean …

(5) is a textbook example of topicalization in the sense of Birner and Ward (1998). *Brick work* has been previously mentioned, and it stands in a paradigmatic contrast to other types of manual labour potentially filling the gap in the open proposition λx[I did x type of labor].

(5) NM: I did a lot of manual labor, did all manual labor.
    TS: Really?
    NM: Yeah.
    DL: Like brick work?
    NM: BRÍCK work I DÌD, yeah!

As mentioned above, speakers differ considerably in terms of their individual eyebrow movement patterns. Globally, there is a clear positive correlation between the maximum values of eyebrow height and the maximum values of pitch per segment ($p<0.001$, according to a linear regression model with a random intercept for 'speaker').[6] However, a linear model mapping maximum pitch to maximum eyebrow height is probably not an appropriate way of capturing the relationship between the two variables. While one speaker shows a rather linear pattern (AD, cf. the left plot in Figure 3), other speakers exhibit a positive correlation only in the lower areas of pitch (e.g. TG, cf. the right plot in Figure 3).
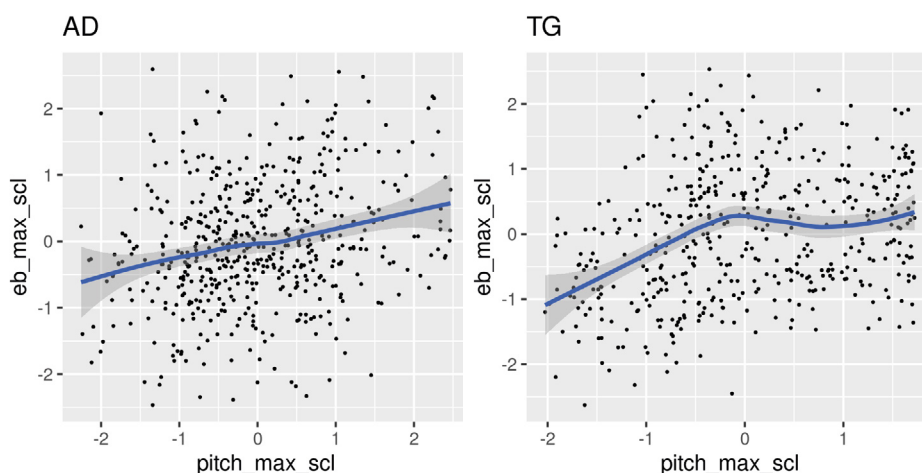
Figure 3: Relationship between maximum pitch (*x*-axis) and maximum eyebrow height (*y*-axis) per segment for two speakers, with a LOESS line (in blue); all values are centered and scaled per speaker.[7]

Obviously, the prosodic function of brow raises is not always easy to keep apart from other functions. For instance, if a speaker stresses a modal (*The road MÀY be blocked*), an accompanying brow raise could reflect either the pitch accent as such (and the focus marked by it), or the modal qualification (or both).

In Section 4, the prosodic function of brow raises will be taken into account by including 'pitch' as a control variable in the regression models predicting eyebrow height on the basis of variables reflecting semantic properties of the context (modality, sentence type, additive operators).

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6   The model was fitted with the function lmer() of the R-package 'lme4' (Bates et al. 2015).

7   The plots were generated with the R-package 'ggplot2' (Wickham 2016).

3.2 Emotive Functions of Eyebrow Raises

The archetypical trigger of raised eyebrows, it is often assumed, is the mental state of attention (e.g. Darwin 1872, Eibl-Eibesfeldt 1972). Attention, in turn, is often associated with the emotions of surprise and astonishment. An example where a brow raise is most probably motivated by surprise is given in (6). The speaker learns during the interview that Sophia Loren will be attending an event that he will also be attending. The (surprised) questions *Is she gonna be there?* and *Sophia Loren?* are accompanied by brow raises. The "attentional activity" (Wierzbicka 2010) is also reflected in a forward lean during *Sophia Loren?*.

(6) DL: Sophia Loren is gonna be there?
     EM: Is she gonna be there?
     DL: Ritchie?
     Ritchie: Yes.
     EM: Sòphia Lorén?

In (7), the speaker expresses astonishment and admiration for the acting skills of a colleague. As can be seen when the material is inspected, the main gesture is probably a lid raise (indicated by the dotted line on top of *very very*), with the speaker opening his eyes wide.

(7) EM: ... and I'm in a movie with an actor called Michael Wincott,
           who's a vĒry vĒry good àctor,
           and Michael Rapaport, directed by Thomas Carter,
           I can't wait till you see this one, you know ...

Emotions such as surprise and astonishment cannot easily be operationalized in a corpus based study. One may think of specific linguistic markers such as *Really?* as indicators of surprise. While the corpus contains 95 occurrences of this adverb, they are often uttered by the host (D. Letterman) in reaction to something a guest has said, and the host is typically not in the picture. I can therefore not offer any quantitative data concerning a correlation between surprise and brow raises on the basis of my corpus. In order to study the position of eyebrows relative to specific emotions, controlled experiments will be needed (cf. also Sect. 5).

3.3 Social Functions of Eyebrow Raises

As a resource for 'rapport management', used to negotiate social relations between interlocutors, raised eyebrows may signal a positive attitude towards the conversational contribution made by the interlocutor. Consider the dialogue in (12). When giving a negative answer (*Do you own a dog? – No.*), the speaker does not raise her eyebrows. She

does so when she provides an affirmative answer though (*Have you ever owned a dog? Yes!*). Her response to the host's statement *Dogs are great, I think – Hm hm, yeah, that's right* – is also accompanied by a noticeable brow raise.

(8) DL: ... and, uhm, a guy named Jim Buck will be here. Jim makes his living walking
           dogs in the city of New York. Do you have a dog?
     TG: No.
     DL: Have you ever owned a dog?
     TG: Yᴇ̀s!
     DL: Dogs are great, I think.
     TG: Hm-hm, ʏᴇ̀ᴀʜ, that's ʀɪ̀ɢʜᴛ.

A positive stance cannot only be expressed towards a conversational contribution but also towards the interlocutor themself. In this case, brow raises can establish or enhance rapport in a more general way. In (9), the speaker raises her eyebrows in a brief, pronounced gesture, reflecting the rapport established in the conversation. Such uses often have a 'conspirational' effect, pointing to shared private knowledge.

(9) DL: ... I was surprised to learn this afternoon that you attended an event here in
           New York City that we've covered about four three or four times ...
     TG: Small world, isn't it?
          That we ʙᴏ̀ᴛʜ were ɪ̀ɴterested in this.
     DL: Yeah, the inventors' exhibition ...

Rapport management can probably be studied systematically on the basis of observational data. However, it would require filming both interlocutors, ideally from various angles, and such analyses would probably require comprehensive manual annotations. The social function of brow raises can therefore not be taken into consideration in the present (quantitative) study. I assume, however, that brow raises reflecting rapport as in (9) are in principle independent of the variables investigated in Sect. 4 and therefore do not have to be controlled for.

4. Eyebrow Raises Modulating Descriptive Meaning

The argument made in this section was already laid out above: I argue that brow raises often – not always – metaphorically convey openness as defined in (3). They typically modulate an existing element of sentence semantics. This modulation may happen at various levels of (non-emotive and non-social) interpretation. My approach has been inspired by F. Bross's and D. Hole's work on German Sign Language (DGS). Bross and Hole (2017) argue for an isomorphism between the position of non-manual articulators in the human body and their scope (the "Bodily Mapping Hypothesis"). The hypothesis

pursued in the present study is different from the Bodily Mapping Hypothesis, however. I assume that eyebrow movement may interact with different levels of meaning, and that its specific effect will be different in each case.

To structure the presentation of the data I use the metafunctions distinguished in Systemic Functional Grammar (e.g. Halliday 1994) (rather than the generative framework used by Bross and Hole 2017). At the highest level of the taxonomy Halliday (1994) distinguishes three functions, (i) the ideational function of language (Sect. 4.1), (ii) the interpersonal function (Sect. 4.2), and (iii) the textual function (Sect. 4.3). Since brow raises seem to operate primarily at the interpersonal and textual levels, Sect. 4.1 is considerable shorter than the other two sections. As will be seen, it is doubtful whether brow raises have a function at an ideational level at all.

4.1 The Ideational Level

Hand gestures are often used metaphorically, e.g. if a temporal development is accompanied by horizontal movement of a hand (see for instance Cienki and Müller 2008). Facial gestures do not commonly seem to be used in this way. We may expect them to accompany expressions denoting the higher region or end of a scale, e.g. indicating large quantities or – in accordance with the main hypothesis of the present study – openness of some container. However, I have not found any striking examples of this type in my corpus. A candidate for a scalar context was given in (7) above. The speaker (EM) emphasises the high quality of a referent's acting (*a very, very good actor*), and raises his eyebrows while uttering *very.* But then, as has been pointed out, the main gesture is a lid raise, which is probably motivated by the emotion of admiration.

In order to test whether the expression of a high degree (at a propositional level) is associated with brow raises I determined the distribution of eyebrow height relative to the (non-)occurrence of the scalar adverb *very*. The data of my corpus do not show any statistical association of *very* with high eyebrow positions (controlling for pitch). For none of the three ways of aggregating over the data per segment – mean values, maximum values or minimum values – can a significant correlation be observed.[8] Figure 4 shows the distribution of mean values for segments with and without *very,* centered and scaled per speaker. The violin plots show that the two distributions – segments with and without *very* – are virtually indistinguishable.

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8 The dataset contains 88 segments with *very* and 5,113 without *very* (after removing outliers). Linear regression models with 'pitch' and 'very' as main effects and 'speaker' as a random effect do not reveal any significant effect of the presence of *very* in a segment on the eyebrow height (mean values: $p=0.58$, max values: $p=0.86$, min values: $p=0.67$).
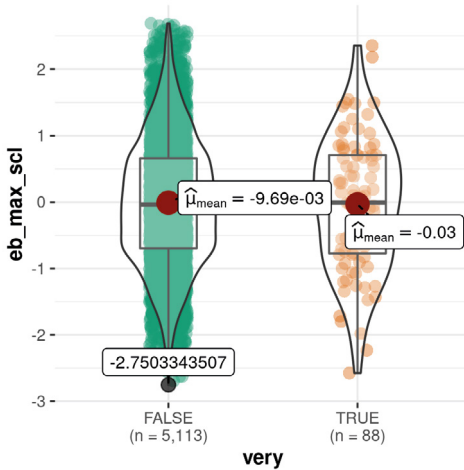
Figure 4: Maximum eyebrow heights for segments without (left) and with *very* (right); values have been centered and scaled by speaker. Outliers (values of 1.5 × the interquantile range) have been removed. The horizontal line shows the median, the red dot shows the mean value.[9]

4.2 The Interpersonal Level

The interpersonal function covers the domains of modality, mood/illocutionary force and polarity, according to Halliday (1994). Polarity will not play a central role in the following discussion, even though it may interact with other categories, e.g. insofar as uncertainty is often expressed using negation (e.g. *I don't know*). The discussion focuses on epistemic modality (Sect. 4.2.1) and sentence type (Sect. 4.2.2).

4.2.1 Epistemic Modality: Expression of Uncertainty

A common context for brow raises is the expression of uncertainty. A relevant example is given in (10), where uncertainty is made explicit (*I'm not sure*). The peak of the raise is here aligned with the negation marker *not*.

(10) DL: ... now let's talk about your association with Falcon Crest, you explained to me that you're not necessarily joining the cast.

BH: I'm actually not a member of the cast, I uh, I joined it as a cameo performer for either three or four shows,

I'm NÒT SÙRE.

I actually haven't ever seen Falcon Crest.

Uncertainty or, in fact, ignorance, is systematically encoded in an emblem in which the eyebrows take part, the "facial shrug" (see for instance Bavelas et al. 2014a, Bavelas and Chovil 2018). The facial shrug at the same time often conveys indifference. An example is given in (11) (the dashed line over *I guess so* indicates the facial shrug).

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9   The plots were generate with the R-package 'ggstatsplot' (Patil 2021).

(11) DL: Was it a success, New Year's Eve?

AD: I GUÉSS SÒ! They all got drunk, uh, my wife ...

The distribution of eyebrow height in segments with and without markers of epistemic modality is shown in Figure 5. The category of 'epistemic modal' here comprises the modals *may* (*n*=15) and *might* (*n*=19) as well as the adverbs *maybe* (*n*=24), *perhaps* (*n*=2) and *probably* (*n*=19). The three plots show the distributions of mean values, maximum values and minimum values, from left to right and top to bottom.
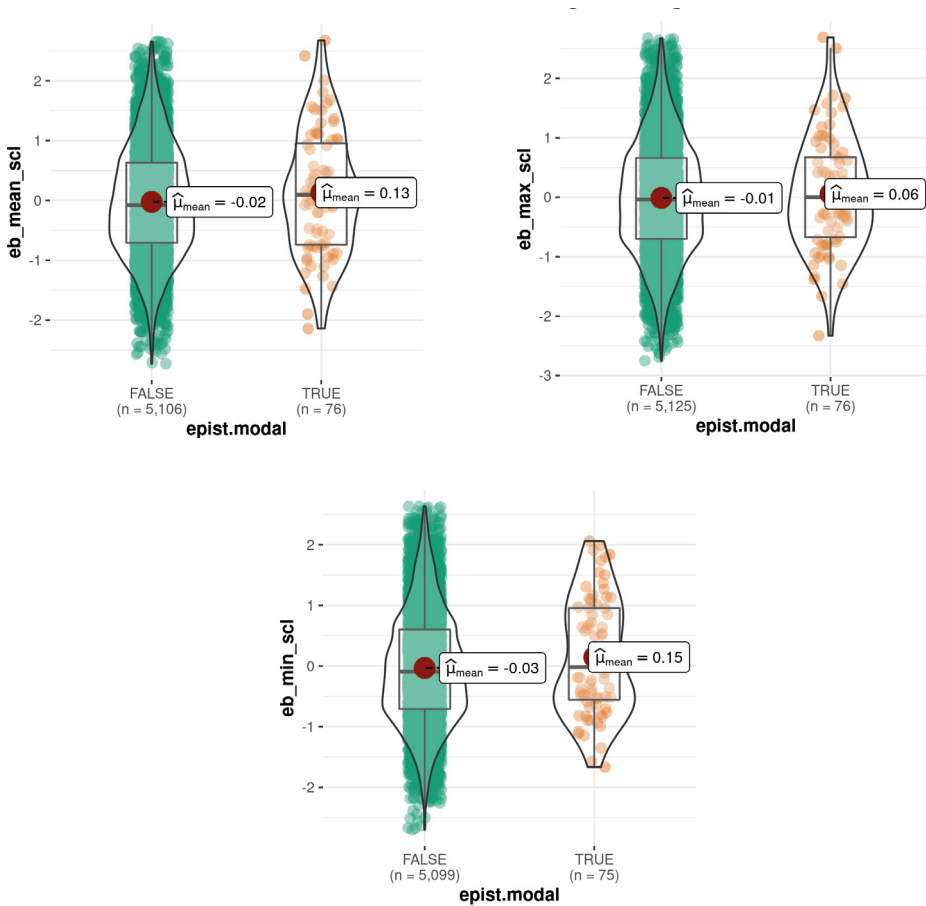
Figure 5: Distribution of values for segments with and without an expression of epistemic modality, for mean, maximum and minimum values, from left to right and top to bottom; all values have been centered and scaled by speaker. Outliers (values of 1.5 × the interquantile range) have been removed. The horizontal line shows the median, the red dot shows the mean value.

Linear regression models with the occurrence of an epistemic modal and the pitch measurements as main effects and random intercepts for 'speaker' show that a significant difference can only be observed for minimum values per segment (p=0.035), but not for mean values (p=0.16) or maximum values (p=0.79). The data contain 75 segments with an epistemic modal and 5,099 segments without one (after removing outliers).

The results suggest that epistemic modality is not necessarily associated with individual, marked eyebrow raises, but rather with the absence of particularly low eyebrow positions. Note also that the plot showing the minimum values for pitch and eyebrow height at the bottom of Figure 5 actually suggests a bimodal distribution. I am unable to interpret these findings on the basis of my corpus data. There may be additional variables at play which my current dataset does not capture. I do assume, however, that the statistical association of epistemic modals with the absence of particularly low eyebrow positions is robust.

Expressions of epistemic modality satisfy the criterion of (relative) openness, in comparison to indicative modality, because the propositions (sets of worlds) that they denote form supersets of the worlds denoted by the latter category (see for instance Kratzer 1978 for a treatment of modality in terms of possible world semantics).

4.2.2 Sentence Type: Polar Questions

In Halliday's (1994) terms, the category of 'mood' covers illocutionary force, sentence type and polarity. This section focuses on sentence type. The most important sentence type in the context of brow raises is the one of 'polar question'. Brow raises have been claimed to be associated with polar questions in sign languages (e.g. Zeshan 2004, Cecchetto 2012) as well as in spoken language (e.g. Ekman 1979, Chovil 1991a, Chovil 1991b, Kim et al. 2014). Flecha-García (2006) found no evidence for brow raises as concomitants of questions, however. In fact, Kimmelmann et al. (2020) also found that raised eyebrows in Kazakh Sign Language primarily signal surprise, not illocutionary force.

The use of brow raises in the context of questions would be compatible with the hypothesis of this study, i.e. that brow raises may metaphorically signal openness. Questions have been analysed as denoting sets of propositions, more specifically, sets of possible answers (Hamblin 1973). The superset condition specified in (3) is therefore met, as the denotation of a question is a superset of the denotation of the corresponding declarative sentence. Note also that, while 'question' is primarily an illocutionary category, it is associated with a modal attitude of uncertainty or ignorance.

Before we look into polar questions specifically note that it is hard to separate the sentence type of 'polar question' from the emotion of 'surprise', as questions often come with surprise (specifically in the genre used for this study, TV interviews). For instance, example (6) above (*Is she gonna be there? … Sophia Loren?*) is a surprised question, and it is hard to tell whether the raised eyebrows modulate the illocutionary force 'question' or the emotion 'surprise', or both. (12) is an example where an eyebrow raise signals

a question without at the same time indicating surprise. The facial gesture is actually aligned with a pause and precedes the explicit question (*Do you?*).

(12)   BH: ... but, but uh, I do what normal people do, when I'm uh, when I'm not doing whatever abnormal people do. Uhm, I, I go to films, I go to plays – just like you do.
<u><pause></u>
Do you?
         DL: Yeah.

(13) is a similar example, insofar as the speaker raises his eyebrows before asking a question. In this case, however, there is probably surprise involved.

(13)   DL: Uh, now, I understand uh from, uh, looking over some information this afternoon – documents, heretofore classified – uh, that you, you go for periods of of uh, insomnia – relentless insomnia ...
         BH: <u><pause></u> Is thàt in the dòcuments?
         DL: Yes, it is.

In order to test whether polar questions are associated with raised eyebrows I identified clauses whose subject was immediately preceded by an auxiliary, and the auxiliary was not preceded by a *wh*-pronoun, as an approximate operationalization of polar questions. Such segments do not show higher eyebrow positions than other segments.[10] The distributions are shown in Figure 6.

The operationalization of polar question used in this study (subject preceded by auxiliary not preceded by *wh*-pronoun) may be a bit coarse-grained, but it is certainly not entirely off the mark. Given the complete absence of any kind of discernible asymmetry in the data (with *p*-values of 0.9, 0.57 and 0.34 for mean, max and min-values), it seems unlikely that polar questions should show any association with eyebrow position. Still, more precise measurements will be needed before the assumption that brow raises reflect polar questions can be discarded.

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10   The annotated dataset contains 363 segments with a polar question and 5,211 segments without a polar question (after removing outliers). Linear regression models with 'polar question' as a main effect and 'speaker' as a random effect do not reveal any significant effect of the presence of a polar question in a segment on eyebrow height (mean: $p=0.9$, max: $p=0.57$, min: $p=0.34$).
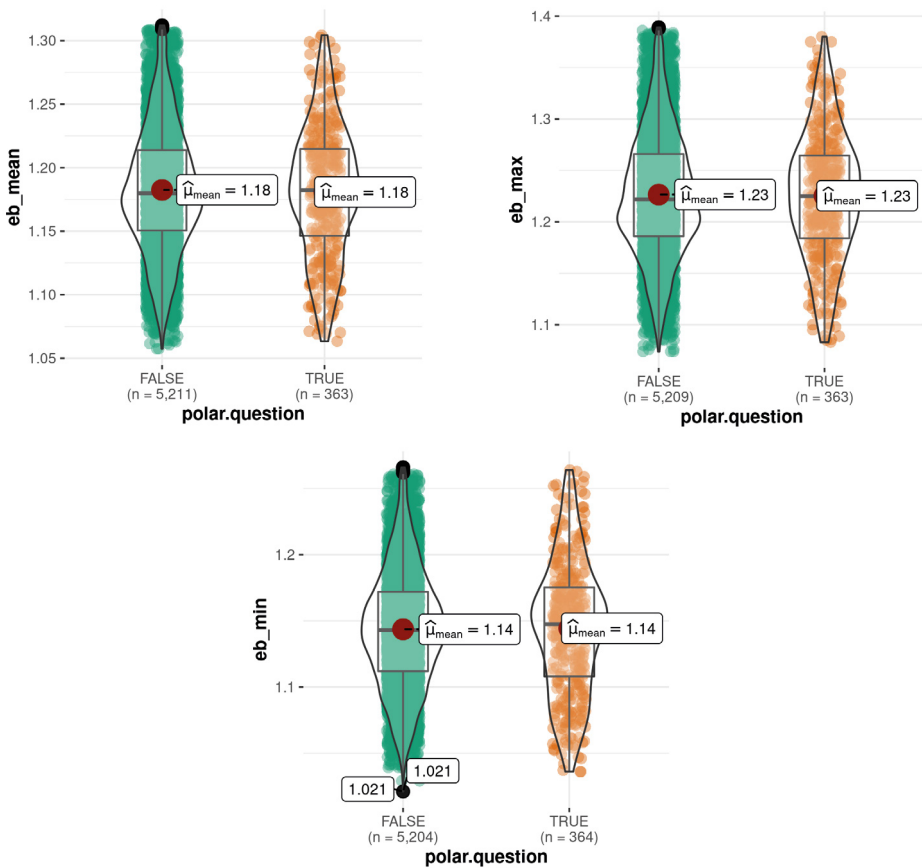
Figure 6: Distribution of aggregated eyebrow height values for segments with and without subject-auxiliary inversion (without a preceding *wh*-pronoun), for mean, maximum and minimum values per segment, from left to right and top to bottom; all values have been centered and scaled by speaker. Outliers (values of 1.5 × the interquantile range) have been removed. The horizontal line shows the median, the red dot shows the mean value.

4.3 The Textual Function: Additivity

In their textual function, brow raises are typically forward-looking, and they can often be observed at the beginning of turns (Flecha-García 2006, Guaïtella et al. 2009). A typical context of this type is provided by the discourse marker *well*. A relevant example is given in (14). Note that *well* is also accompanied by a slight backward thrust of the head in this example. Ample context is provided for the reader to get a better understanding of the conversational embedding.

(14) DL: What was the motivation for you personally to take the gig as we say?

　　HB: An enormous amount of money. It was only like three or four days and I said, "Will you give me almost everything in the world?", and they said "Sure", so I did id.

　　DL: Why not, exactly!

　　HB: And it was fun. They were extremely nice people. They fed me; and they, uh, offered to drive me to the studio, an offer I didn't accept. I know better than that.

　　DL: Yeah. Now, why do you know better than that?

　　HB: WÈLL, ÒNE I live in a PLÀCE where NÒbody can FÌND me.
　　　　So I know that they can never get a car there. And two, people have disappeared on those trips.

An example where a brow raise occurs at the beginning of a turn-internal episode, though not at the beginning of a turn, is given in (15).

(15) NM: ... the people that I worked with, man, they loved lifts and furniture.
　　　　ÒNE time, òne time, THÈRE's an interesting stòry time, it's PRÒbably too LÒNG but ...

The projecting function of eyebrow raises can also be observed at a lower level, in lists. Consider (16), where the speaker provides a two-items list of examples as an answer to the question *What constitutes a good model?* On the first element (*You could be handsome*), he raises his eyebrows, along with a rise-fall tone. After a brief pause, he mentions *a magnificent physique* as a second quality. The brow raise on the first item seems to indicate that the list is not yet complete. A similar effect can be observed on the second item (*magnificent physique*), showing that the list is still not exhaustive.

(16) DL: And what constitutes being a good model?

　　QR: Well, I suppose you could have various things to offer.
　　　　You could be HÁNDSòme
　　　　or you could have a magnificent physique ...

The type of list illustrated in (16) points to the more general function of 'conjunction' or 'additivity' as a context for brow raises. This hypothesis can be tested by determining the distribution of eyebrow heights relative to the conjunction *and*. A mixed linear model taking into account all occurrences of *and* (n_{and}=1,058, $n_{NOT\text{-}and}$=4,133 after removing outliers), with 'pitch' and 'and' as main effects, and 'speaker' as a random effect, shows a clear association of this conjunction with values for maximum eyebrow height within segments ($p<0.001$), though not for mean values ($p=0.078$) or minimum values ($p=0.66$).

Inspection of the data shows, however, that the raises are rarely, if ever, aligned with *and* itself; rather, it seems to be the forward-looking function and, hence, the often unit-initial position of brow raises that associates them with *and*. In any case, brow raises seem to be associated with the function of 'additivity' at a textual (syntagmatic) level.

The function of additivity also seems to play a role at an information structural level. Specifically, additive focus particles and similar expressions seem to be associated with raised eyebrows (see for instance Herrmann 2013 on the role of brow raises in three sign languages). If we pool the additive focus particles *even* (scalar, *n*=43) and *also* (non-scalar, *n*=23) with additive occurrences of *either* (*n*=1) and *in addition to* (*n*=2), a linear mixed effects model with the measurements for 'pitch' and 'eyebrow height' as main effects, and 'speaker' as a random effect, shows a significant association between the occurrence of additive operators and mean as well as minimum eyebrow height (mean values: *p*=0.037, min values: *p*<0.01), in the lag data (where measurements from the current segment as well as the next segment are taken into account). This correlation cannot be observed for maximum eyebrow height though (*p*=0.38). Figure 7 shows the distributions.

An example of a brow raise in combination with a scalar particle (*even*) is given in (17).

(17) BH: Uh, i͞'͞m͞ even at a LÒSS SÒMEtimes to EXPLÀIN to mySÈLF
           what I do when I'm not doing whatever it is I do that you know about.

An important question in the study of brow raises in the context of focus particles is to what extent this connection is sensitive to (esp. information structural) factors other than additivity. In particular, focus alternatives are often ordered, obligatorily so in the case of (scalar) operators such as *even*, optionally in the scope of other operators such as *also* (cf. Gast and van der Auwera 2011). Brow raises may thus also be triggered by modal attitudes coming with scalar orderings, e.g. of (un)likelihood. Once again, more fine-grained annotations and controlled experiments will be needed to address this question on an empirically solid basis.

I take it that the function of additivity instantiates openness as defined in (3), as it implies the broadening of a set of alternatives and the addition of propositions sharing a background to the Common Ground. In the case of turn- or episode-initial occurrences, the raises seem to be forward-projecting, scoping over the following discourse unit as it were.
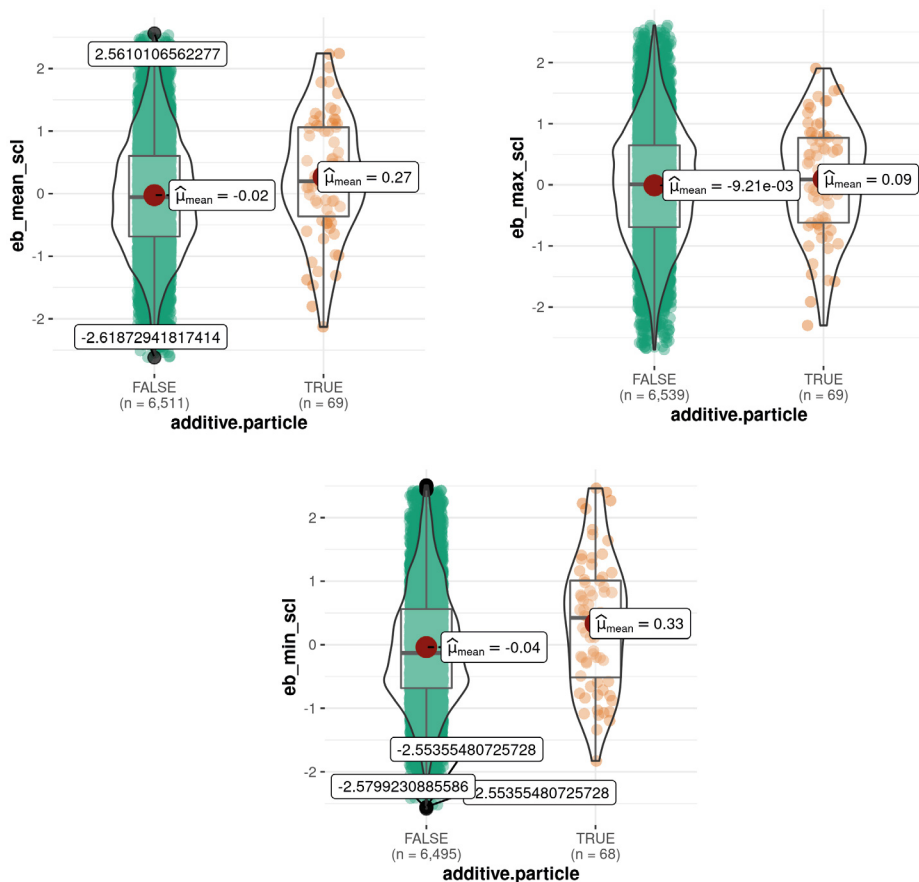
Figure 7: Distributions of values for segments with and without an additive operator, for mean, maximum and minimum values, from left to right and top to bottom; all values have been centered and scaled by speaker. Outliers (values of 1.5 × the interquantile range) have been removed. The horizontal line shows the median, the red dot shows the mean value.

5.   Conclusions

The starting point of the present study was the hypothesis that in specific uses, brow raises are motivated metaphorically as signals of openness. This hypothesis does not imply that brow raises have no other functions, of course. Examples of prosodic, emotive and social functions were discussed in Section 3. While the corpus data presented in this article, as I hope, lends some plausibility to the 'openness hypothesis', it has certainly become clear that a sound empirical study of the conditions under which speakers move

their eyebrows requires more data – both more comprehensive and more richly anno-tated corpus data, and data from controlled experiments. Nevertheless, I feel that the following results obtained in this exploratory study seem to be more or less robust and can therefore be taken as a point of departure for future investigations:

- The expression of epistemic modality seems to correlate with eyebrow movement. While my data only show the minimum values per segment to be significantly higher in the presence of an epistemic modal (*may, might*) or adverb (*maybe*, *perhaps*, *probably*), not for mean or maximum values, that result merits further investigation.
- No significant association of brow raises with polar questions could be found. Before drawing any definite conclusions in this respect, more thorough investigations, based on more precisely annotated data, will be needed, however.
- Raised eyebrows seem to correlate with the textual or information structural func-tion of 'additivity'.

In the text itself as well as in the summary given above, a few desiderata have been pointed out. The most important ones are:

- More multimodal corpus data is needed, ideally with cameras filming all interloc-utors separately, to capture any interactional features.
- More fine-grained annotations are required, both automatic (at a higher resolution) and manual (capturing, for instance, emotions, social interaction and specific types of semantic or pragmatics contexts).
- Controlled experiments will be needed to answer specific questions relating to the movement of eyebrows.

As far as additional multi-modal corpus material is concerned, more data is needed simply because some of the contexts of interest (e.g. epistemic modals) are not partic-ularly frequent, at least in the genre analysed for this study (TV interviews). Conver-sational games and similar elicitation tasks could be used to generate data with a high number of occurrences of specific linguistic categories, with a certain amount of control (e.g. eliciting polar questions, modals and focus particles). Also, textual data will have to be aligned more precisely with the audio signal, using forced alignment. This would help us to get a better understanding of the timing of brow raises. More precise syntactic, semantic and ideally also pragmatic annotations would make it possible to address some more specific questions, e.g. where exactly brow raises are located relative to focus particles (e.g. on the particle itself, in its scope, or on the focus). As for experimental data, it will be instructive to differentiate systematically between specific triggers of eyebrow movement, such as questions and surprise (see also Kimmelmann et al. 2020 on Kazakh Sign Language).

The main challenges in the study of facial gestures at the current state of knowledge are thus methodological ones; but the development of methodology must be accompanied by theoretical considerations like the ones made in this study. I hope that the proposal of eyebrow movement metaphorically modulating linguistic meaning at different levels is a useful contribution to this agenda.

Works Cited

Aikhenvald, Alexandra Y. 2004. *Evidentiality*. Oxford: Oxford University Press.

Aikhenvald, Alexandra Y. 2012. "The Essence of Mirativity." *Linguistic Typology* 16 (3): 435–485. https://doi.org/10.1515/lity-2012-0017.

Bates, Douglas, Martin Maechler, Ben Bolker, and Steve Walker. 2015. Fitting Linear Mixed-Effects Models Using lme4. *Journal of Statistical Software* 67(1): 1–48. doi:10.18637/jss.v067.i01.

Bavelas, Janet B., and Nicole Chovil. 1997. "Faces in Dialogue." In *The Psychology of Facial Expression*, edited by J. Russell and J. Fernandez-Dols, 334–346. Cambridge: Cambridge University Press.

Bavelas, Janet B., and Nicole Chovil. 2000. "Visible Acts of Meaning: An Integrated Message Model for Language in Face-to-Face Dialogue." *Journal of Language and Social Psychology* 19 (2): 163–194.

Bavelas, Janet B., and Nicole Chovil. 2006. "Hand Gestures and Facial Displays as Part of Language Use in Face-to-Face Dialogue." In *The Sage Handbook of Nonverbal Communication*, edited by V. Manusov and M. L. Patterson, 97–115. Thousand Oaks: Sage Publications.

Bavelas, Janet B., and Nicole Chovil. 2018. "Some Pragmatic Functions of Conversational Facial Gestures." *Gesture* 17 (1): 98–127.

Bavelas, Janet B., and Jennifer Gerwing. 2007. "Conversational Hand Gestures and Facial Displays in Face-to-Face Dialogue". In *Social Communication*, edited by K. Fiedler, 283–308. New York: Psychology Press.

Bavelas, Janet B., Jennifer Gerwing, and Sara Healing. 2014a. "Hand gestures and facial displays in conversational interaction". *Oxford Handbook of Language and Social Psychology*, edited by T. Holtgraves, 111–130. New York: Oxford University Press.

Bavelas, Janet B., Jennifer Gerwing, and Sara Healing. 2014b. "Including Facial Gestures in Gesture-Speech Ensembles." *From Gesture in Conversation to Visible Action as Utterances*, edited by M. Seyfeddinipur and M. Gullberg, 15–34. Amsterdam: John Benjamins.

Birner, Betty J., and Gregory Ward. 1998. *Information Status and Noncanonical Word Order in English*. Amsterdam/Philadelphia: John Benjamins.

Boersma, Paul, and David Weenink. 2018. Praat: Doing Phonetics by Computer [Computer program]. Version 6.0.37, retrieved 14 March 2018 from http://www.praat.org/.

Bross, Fabian. 2020. *The Clausal Syntax of German Sign Language. A Cartographic Approach*. Berlin: Language Science Press.

Bross, Fabian, and Daniel Hole. 2017. "Scope-Taking Strategies and the Order of Clausal Categories in German Sign Language." *Glossa: A Journal of General Linguistics* 2 (1): 1–10. doi: https://doi.org/10.5334/gjgl.106.

Carletta, Jean, Amy Isard, Stephen Isard, Jacqueline C. Kowtko, Gwyneth Doherty-Sneddon, and Anne H. Anderson. 1997. "The Reliability of a Dialogue Structure Coding Scheme." *Computational Linguistics* 23: 13–31.

Cecchetto, Carlo. 2012. "Sentence Types." *Sign Language. An International Handbook*, edited by R. Pfau, M. Steinbach, and B. Woll, 292–315. Berlin: De Gruyter Mouton.

Chovil, Nicole. 1991a. "Discourse-Oriented Facial Displays in Conversation." *Research on Language and Social Interaction* 25: 163–194.

Chovil, Nicole. 1991b. "Social Determinants of Facial Displays." *Journal of Nonverbal Behaviour* 15: 141–154.

Cienki, Alan, and Cornelia Müller (eds.). 2008. *Metaphor and Gesture*. Amsterdam: John Benjamins.

Darwin, Charles. 1872. *The Expression of Emotion in Man and Animals*. London: John Murray.

Eibl-Eibesfeldt, Irenäus. 1972. "Ritual and Ritualization from a Biological Perspective." *Non-verbal Communication*, edited by R.A. Hinde, 297–312. Cambridge: Cambridge University Press.

Ekman, Paul. 2003. *Emotions Revealed: Recognizing Faces and Feelings to Improve Communication and Emotional Life.* Times Books/Henry Holt and Co.

Flecha-García, María Luisa 2006. Eyebrow Raising in Dialogue: Discourse Structure, Utterance Function, and Pitch Accents." *PhD thesis*. University of Edinburgh.

Flecha-García, María Luisa. 2010. "Eyebrow Raises in Dialogue and Their Relation to Discourse Structure, Utterance Function and Pitch Accents in English." *Speech Communication* 52(6): 542–554.

Gast, Volker, and Johan van der Auwera. 2011. "Scalar Additive Operators in the Languages of Europe." *Language* 87(1): 2–54.

Guaïtella, Isabelle, Benoît Lagrue, and Chistian Cavé. 2009. "Are Eyebrow Movements Linked to Voice Variations and Turn-Taking in Dialogue"? *Lang. Speech* 52: 207–222.

Halliday, M.A.K. 1994. *An Introduction to Functional Grammar*. London: Edward Arnold.

Hamblin, Charles L. 1973 "Questions in Montague English." *Foundations of Language* 10 (1): 41–53. http://www.jstor.org/stable/25000703.

Herrmann, Annika. 2013. *Modal and Focus Particles in Sign Languages. A Cross-Linguistic Study*. Berlin: De Gruyter Mouton.

Herrmann, Annika, and Markus Steinbach, eds. 2013. *Nonmanuals in Sign Languages*. Amsterdam: John Benjamins.

Kim, Jeesun, Erin Cvejic, and Chris Davis. 2014. "Tracking Eyebrows and Head Gestures Associated with Spoken Prosody". *Speech Communication* 57: 317–330.

Kimmelmann, Vadim, Alfarabi Imashev, Medet Mukushev, and Anara Sandygulova. 2020. "Eyebrow Position in Grammatical and Emotional Expressions in Kazakh-Russian Sign Language: A Quantitative Study." *PlosOne*. DOI: https://doi.org/10.1371/journal.pone.0233731.

Kipp, Michael. 2001. "Anvil – A Generic Annotation Tool for Multimodal Dialogue." *Proceedings of the 7th European Conference on Speech Communication and Technology (Eurospeech)*: 1367–1370.

Kratzer, Angelika. 1978. *Semantik der Rede. Kontexttheorie, Modalwörter, Konditionalsätze*. Königstein: Scriptor.

McNeill, David. 1992. *Hand and Mind. What Gestures Reveal about Thought*. Chicago: University of Chicago Press.

Patil, Indrajeet 2021. Visualizations with Statistical Details: The 'ggstatsplot' Approach. *Journal of Open Source Software* 6 (61): 3167, doi:10.21105/joss.03167.

Pendzich, Nina-Kristin. 2020. *Lexical Nonmanuals in German Sign Language*. Berlin: de Gruyter Mouton.

Pfau, Roland, and Josep Quer. 2010. "Nonmanuals: Their Grammatical and Prosodic Roles." *Sign Languages*, edited by D. Brentari, 381–402. Cambridge: Cambridge University Press.

Sauter, Disa A. 2017. "The Nonverbal Communication of Positive Emotions: An Emotion Family Approach." *Emotion Review* 9 (3): 222–234.

Wells, John C. 2006. *English Intonation PB and Audio CD: An Introduction*. Cambridge University Press.

Wickham, Hadley (2016). ggplot2: Elegant Graphics for Data Analysis. New York: Springer Verlag.

Wierzbicka, Anna. 2000. "The Semantics of Human Facial Expression." *Pragmatics & Cognition* 8 (1): 147–183.

Zeshan, Ulrike. 2004. "Interrogative Constructions in Signed Languages." *Language* 80: 7–39.

Absolutely and *Totally* in Present-Day Spoken British English

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Abstract: The paper explores the various functions of the adverbs *absolutely* and *totally* in present-day informal spoken British English. It shows that the adverbs, which were originally semantically close, differ markedly across the three dimensions that the analysis focuses on – sociolinguistic (gender and age distribution), syntactic, and semantic/pragmatic. While the adverbs function most frequently as degree modifiers, they both appear to be following the same trajectory of change from an intensifier, via a stance adverbial to a discourse (response) marker; however, they are currently at different stages of the process of grammaticalization.

1.   Introduction

In spoken British English, intensification rate has increased during the last two decades: "Male and female speakers across all age groups and all social classes" have been found to use "significantly more intensifiers in 2014 than in 1994" (Fuchs 2017, 355). Underlying the increase in use of individual intensifiers, however, there may be different patterns of use, in sociolinguistic as well as lexico-grammatical terms. The present study focuses on two semantically close intensifiers, whose frequency of use has almost doubled in spoken British English over the last twenty years – *absolutely* and *totally* (see Table 1). At the same time, the difference in frequency between the two intensifiers remains statistically significant,[1] with *totally* being the less frequent one.

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1   The difference is statistically significant on the 0.0001 level of significance (Chi2 test). Significance was calculated using the CALC tool (Cvrček 2020).

The increase in frequency of *absolutely* may be accounted for by its having under-gone a development along "a trajectory from degree modifier to emphasizer and to discourse marker" (Aijmer 2020, 143), accompanied by an increase in subjectivity. Given the similar rise in frequency of both adverbs, and the overall lower frequency of *totally*, our main research question is whether *totally*, originally also a degree modifier, has come to perform the same range of functions as *absolutely* in present day spoken British English. To compare the current patterns of use of the two adverbs, we will explore their "syntagmatic contexts", since "constructions (elements in context) and not individual lexical items are the proper domain of grammaticalization" (Himmelmann 2004, 31), focussing on their collocations and syntactic functions.

The distribution of the two adverbs across gender and age groups will also be discussed briefly. Contrary to general sociolinguistic variationist predictions, *absolutely* is used more often by older speakers than by younger ones, and "it was first used by male speakers and only later spread to female speakers" (Aijmer 2020, 163). We are interested in whether *totally* follows the same unusual pattern, which could account for its relatively low frequency in present day British English, with the younger speakers preferring "other more fashionable intensifiers" (ibid., see also Núñez Pertejo and Palacios Martínez 2014, 218).

	BNC1994 (demographic spoken component: 5,014,655 words)			Spoken BNC2014 (11,422,617 words)		
	N	per million words	Chi2 Sig Level	N	per million words	Chi2 Sig Level
absolutely	671	133.8	213.4423 < .0001	2,875	251.7	995.6747 < .0001
totally	232	46.3		929	81.3	

Table 1. The frequency of *absolutely* and *totally* in the demographically sampled spoken component of the BNC1994[2] and in the Spoken BNC2014.

The paper is organized in the following way. Section 2 gives an overview of previous research into intensifiers, and *absolutely* and *totally* in particular. Section 3 describes the corpus used, and outlines the methodology. The following sections discuss and compare the demographic, syntactic and semantic characteristics of *absolutely* and *totally*. The results are summarized and commented on in the concluding section.

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2   Using similar demographic parameters to sample the population of British English speakers in the United Kingdom, the demographic spoken component of the British National Corpus (1994) is close in its composition to the Spoken BNC (2014).

2. Previous Research

As observed by Bolinger (1972, 18), "[d]egree words afford a picture of fevered invention and competition that would be hard to come by elsewhere, for in their nature they are unsettled." These properties have granted intensifiers substantial attention (for an overview, see Schweinberger 2021, 232−233): they have been explored from the point of view of age, gender and social class distribution (e.g. Aijmer 2020; Beltrama and Staum Casasanto 2017; Fuchs 2017; Núñez Pertejo and Palacios Martínez 2014; Xiao and Tao 2007), geographical variation (e.g. Schweinberger 2021; Wagner 2017), semantic preference and pragmatic functions (e.g. Beltrama 2018; Partington 2004), or their use in specific settings, such as the dialogue in television series (Aijmer 2016; Quaglio 2009; Tagliamonte and Roberts 2005). Moreover, "[the] continuous waxing and waning of forms in this domain is particularly intriguing as their changing nature predestines intensifier systems to be an ideal case for testing mechanisms of change" (Schweinberger 2021, 233; see also Aijmer 2011, 2018; Bordet 2017; Breban and Davidse 2016; Hessner and Gawlitzek 2017; Macaulay 2006; Partington 1993; Tao 2007). Several studies have been devoted specifically to *absolutely* and/or *totally* (e.g. Aijmer 2020, 2016, 2011; Beltrama 2018; Bordet 2017; Carretero 2010; Hessner and Gawlitzek 2017; Núñez Pertejo and Palacios Martínez 2014; Tao 2007; Wagner 2017).

Absolutely and *totally* are "amplifiers", i.e. intensifiers which "scale upwards from an assumed norm" (Quirk et al. 1985, 445), namely "maximizers", "which can denote the upper extreme of the scale" (ibid., 590). They can modify adjectives, verbs (including participles), prepositional phrases, and nouns (Aijmer 2011, 161; 2020, 150, Biber et al. 1999, 544−9, Dušková et al. 2009, 7; 13.41) (1).

(1)   (a) and thi- this counsellor she was **absolutely** brilliant (S28F 1457)[3]
      (b) you see again I'd **totally** forgotten (S28F 2664)

When used as a modifier, *absolutely* expresses its original, intensifying meaning "to the fullest degree, entirely, wholly, utterly".[4] As far as the collocates of *absolutely* are concerned, there is not a clear consensus on the semantic prosody of the adverb. Some studies (Partington 2004, 146; Núñez Pertejo and Palacios Martínez 2014, 224) conclude that the adverb does not display a marked preference for either positive or negative collocates. The results of other studies (Tao 2007, 12) show that the positive collocates significantly outnumber the negative ones. The usual collocates of *absolutely* are of hyperbolic or superlative nature, e.g. *enchanting, splendid* (Partington 2004, 146).

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3   The examples were excerpted from the Spoken BNC2014; the brackets following each example give the text ID code and the utterance number (The British National Corpus 2014: User manual and reference guide 2018, 48)

4   *Oxford English Dictionary*. Accessed June 28, 2021. http://www.oed.com/.

Totally is defined by the Oxford English Dictionary as: "in a total manner; wholly, completely, entirely, altogether".[5] The previous studies dealing with *totally* agree on the fact that it usually collocates with negative items expressing "absence" or "lack of", such as, *bald*, *ignored*, *uneducated*, and also with items expressing "change of state" and "transformation", e.g. *different*, *failed* (Partington 2004, 147). According to Bordet (2017, 11), the adjectival collocates are often colloquial (e.g. *cool*, *awesome*, *lame*, *psyched*), and the adverb is generally used in informal contexts.

When modifying verbs, *absolutely* and *totally* function as maximal degree adjuncts which are used to intensify the scalar quality of verbs such as *hate* or *love*. This use of *absolutely* is what Aijmer (2016, 83) calls "correct" use. Modifying other verbs, whose meaning does not imply any scale, such as *promise* or *understand*, by the adverb *absolutely* (and by extension *totally*) is considered "incorrect" by Aijmer (ibid.), as these verbs cannot appear in hyperbolic or exaggerated meanings. By using intensifying adverbs with non-scalar verbs, speakers emphasize the verb and their own viewpoint (ibid., 84−85).

Both adverbs "seem to be spreading gradually to new syntactic environments by performing new functions which are more discourse-oriented" (Núñez Pertejo and Palacios Martínez 2014, 210). They were observed to function as epistemic content disjuncts (Quirk et al. 1985, 620) or discourse markers, peripheral to the syntactic structure (Aijmer 2020, 157), commenting on the truth value of the utterance and indicating emphasis ("certainly, definitely; without a doubt"[6]) or attitude (2). As "clause-oriented" adverbs, *absolutely* and *totally* "can be said to convey stronger subjectivity" (Carretero 2010, 213).

(2)   S0688:[7] he was older than me wasn't he?
       S0687: >>he was older than you **absolutely** yeah he looked like he was in his sixties (SJM7 1311)

Absolutely and *totally* were shown to have evolved to function as freestanding "response markers" (Núñez Pertejo 2013, 212), whose "maximizing or totality meaning is carried over to the response and to the hearer to indicate involvement" (Aijmer 2011, 168; see also Tao 2007, 21−22) (3).

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5   *Oxford English Dictionary*. Accessed June 28, 2021. http://www.oed.com/.

6   *Oxford English Dictionary*. Accessed June 28, 2021. http://www.oed.com/.

7   In the Spoken BNC2014 transcripts, the codes starting with S refer to the individual speakers.

(3)   S0068: well it does it does
       S0150: yeah
       S0068: I mean
       S0075: yeah
       S0150: I know it does (.)[8]
       S0068: yeah **absolutely** (S2PS 141)

According to Biber et al. (1999, 551), such adverbs which "stand alone as structurally unconnected elements, and even as complete utterances," can either represent a case of ellipsis, when the adverb is related to an omitted element of the previous utterance and is used to avoid unnecessary repetition, e.g. *The kitten's gone crazy. No, totally I mean it. Totally and utterly.* <i.e. *The kitten has gone totally and utterly crazy.*> (ibid.), or as "reaction signals", expressing agreement or an emphatic response to previous utterances. Tao (2007, 19) notes that in these cases *absolutely* also serves as a turn-taking device. This change in function, together with a semantic shift towards the epistemic meanings of "certainly, definitely, without a doubt", appears to be connected with an ongoing grammaticalization process (ibid., 9). Tao's study of the adverb *absolutely* shows that the strong tendency to collocate with positive items strengthens the ability of the adverb to carry the positive and affirmative meaning by itself. "Over repeated encounters and as the combinatorial unit of '*absolutely* + X' gains positive semantic strength" to the effect that our mental representation of the adverb changes and the need for the X to co-occur with *absolutely* disappears (ibid., 16). Consequently, *absolutely* is capable of expressing agreement by itself as a response signal.

Although the two adverbs seem to have evolved in similar ways, there are likely to be differences between them since "similar semantic propensities alone do not guarantee an identical grammaticalization trajectory" (Tao 2007, 15).

Regarding sociolinguistic variation in the use of intensifiers, earlier studies (for a review, see Hessner and Gawlitzek 2017) have shown that *absolutely* is more commonly used by women and by adults in comparison to teenagers, who often use different means of intensification, such as swear or taboo words (Pertejo and Martinez 2014, 218). The distribution of *totally*, on the other hand, appears to be balanced among genders and age groups.

3.   Material and Method

The material was drawn from the Spoken British National Corpus 2014 (Love et al. 2017). The corpus consists of transcripts of recordings gathered between the years 2012 and 2016, and therefore provides the most up-to-date data of spoken British English. It contains 11.5 million words and consists of 1,251 casual informal conversations usually

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8   The symbol (.) marks a short pause (up to 5 seconds) in the transcripts.

among family and friends, with the total number of 668 speakers (Spoken BNC2014 Manual 2018, 1). The corpus was accessed online, via the CQP web platform.

The use of *absolutely* and *totally* was studied from three points of view: a socio-linguistic and a syntactic perspective, and the collocational profile point of view. In the sociolinguistic part of research, the use of the adverbs in the whole Spoken BNC2014 corpus was correlated with the gender and age of the speaker. Since the gender and age sub-corpora are not of equal sizes, the relative frequencies are reported (see Figure 1).

For the study of the syntactic functions of *absolutely* and *totally*, 400 random examples of each adverb were extracted from the Spoken BNC2014. The concordance lines were then analysed manually and a syntactic function was ascribed to each adverb. Three primary syntactic functions were distinguished: a modifier, a stance adverbial, and a response marker. The uses of *absolutely* and *totally* classified as modifiers were intensifiers of adjectives, adverbs, verbs, noun phrases or prepositional phrases (cf. Aijmer 2020, 150), whose scope is limited to the adjacent phrase (4). Stance adverbials are not syntactically integrated into the clause structure; their scope extends over the whole clause, and they provide "a comment on the content or style of the entire proposition" (Biber et al. 1999, 764) (5). *Absolutely* and *totally* can be regarded as response markers when they function "as a response to previous discourse" (Aijmer 2020, 158). In this function, they may be used to express strong agreement, or as backchannels "together with other elements to signal understanding, commitment and involvement" (ibid.) (6).

(4)　(a)　yeah I know she's she's brilliant **absolutely brilliant** (S28F 1166)
　　　(b)　then they w- swung **totally the other way** (S28F 2340)

(5)　Asterix and Obelix you've never read them but they were my that was all I read when I was your age (.) I should **totally** get one

(6)　S0068: yeah (.) yeah
　　　S0075: but it would get in the way of what I would want to use Facebook for
　　　S0068: **absolutely (.) yeah (.) yeah** (S2PS 229)

The collocational patterns of the adverbs are based on the whole Spoken BNC2014. The list of collocates was calculated using the log-likelihood statistics (with the cut-off point set at 6.63)[9]; the span was restricted to one position to the right of the adverb. The collocations were manually checked and wrong hits were removed. The semantic prosody of adjectival and verbal collocates was determined by examining the individual

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9　For a 2x2 table, the log-likelihood value of 6.63 or higher is significant at the level of $p < 0.01$ (cf. Brezina 2018, 114).

lexemes in isolation. In indeterminate cases, a broader context of the respective concordances was considered.

4.   The Frequency and Sociolinguistic Variables

In the Spoken BNC2014, *absolutely* was found to be almost three times as frequent as *totally*, with 2,875 and 929 occurrences, respectively (see Table 1 above).

Each of the adverbs shows a different distribution with respect to gender and age (see Figure 1). While the distribution of *absolutely* varies considerably with regard to gender and age, the use of *totally* is more evenly distributed. *Absolutely* is used significantly more often by women than by men ($p < .0001$).[10] In contrast, there is no significant difference in the use of *totally* between women and men. Among women, the use of *absolutely* rises significantly with age in the age groups of 35–44, 45–59 and 60+. In the case of men, the only significant rise in use of *absolutely* appears between the age groups 0–24 and 25–34. The age distribution of *totally* is different; women's use of *totally* shows a significant rise only between the first two age groups. Men, on the other hand, show a significant rise in use in the age group of 60+.

The adverbs *absolutely* and *totally* are least commonly used by speakers aged 0–24. These results correspond with those of Núñez Pertejo and Palacios Martínez (2014, 218), who point out the differences in the use of *-ly* adverb intensifiers between adults and teenagers:

> *-ly* adverbs tend to be more common in formal language and hence do not sit comfortably with the spontaneity of youth interactions; […] teenagers resort more often than adults to taboo and swear words as intensifiers, on many occasions these functioning as markers of in-group solidarity and identity, and possibly also as a sign of rebellion against the adult world and the establishment.

By far the most active users of *absolutely* are women over the age of 60, which corresponds with the findings of Aijmer (2020, 148).

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10   The Bonferroni correction was employed in order to prevent the occurrence of false positive. The significance threshold was thus set at 0.0045.

	ABSOLUTELY		TOTALLY	
	Female	Male	Female	Male
0-24	157,548	141,123	50,218	54,934
25-34	200,897	210,741	112,303	63,344
35-44	205,523	183,088	99,253	52,311
45-59	332,068	198,497	80,857	80,095
60+	585,291	267,458	63,745	114,254

■ 0-24   ■ 25-34   ■ 35-44   ■ 45-59   □ 60+
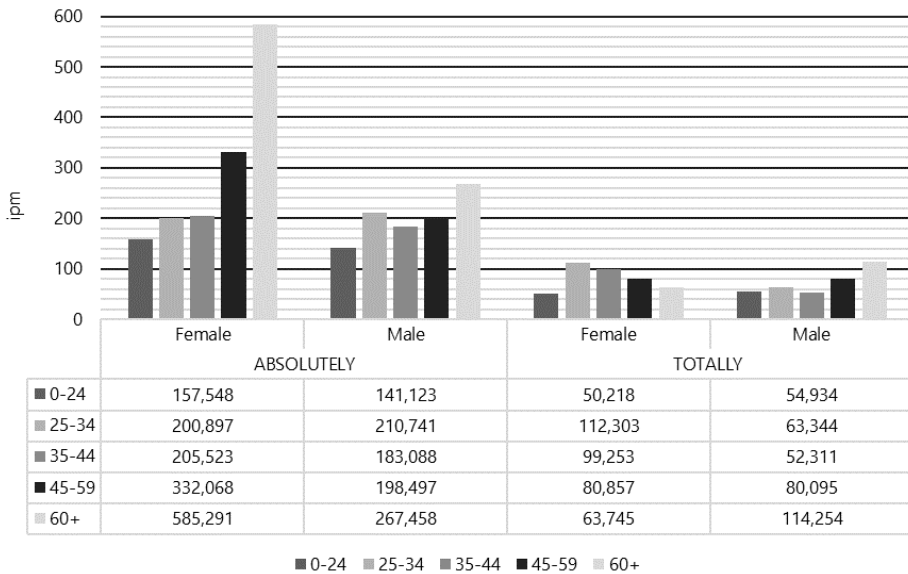
Figure 1. Distribution of *absolutely* and *totally* with regard to gender and age (ipm = items per million words).

5. Syntactic Functions and Colligations

Both *absolutely* and *totally* function most frequently as modifiers, as shown in Figure 2. *Absolutely* was found to perform the function of a modifier in more than half of all its instances (56%). Most prominently, the adverb colligated with adjectives (7 a), including participial adjectives (7 b), and took on the well-established role of an intensifier, indicating "an endpoint on a scale" (Biber et al. 1999, 555).

(7) (a) and understanding the realities of it all she was **absolutely fantastic** (SRD5 405)
     (b) I'd been at work all week and I was **absolutely knackered** (SK8T 358)

In several cases *absolutely* appeared as a modifier of verbs (8). The modified verbs always imply a scale and thus allow for intensification.

(8) I'd hate it I'd **absolutely hate** it but I think it's probably good for me (S5HT 251)
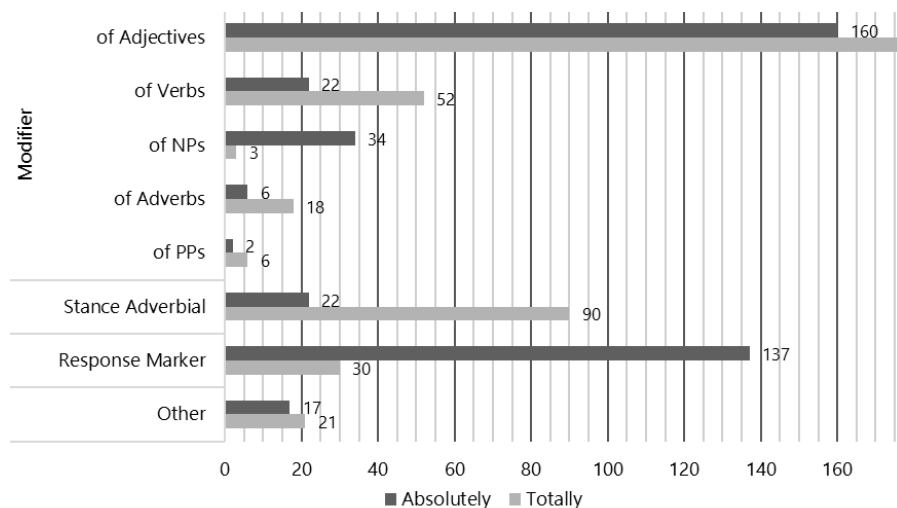
Figure 2. Distribution of *absolutely* and *totally* across syntactic functions (raw frequencies).

Absolutely frequently modified noun phrases. It preceded either the determiner *no* (9 a), the pronouns *nothing*, *nobody*, *anything*, or *all* (9 b, c), or a noun expressing amount, such as *plenty*, *loads*, or *tonnes* (9 d). Generally, the directly modified item referred to quantity.

(9) (a) well I have **absolutely no intention** of erm switching (S8BQ 278)
   (b) and there was nothing left **absolutely nothing** to show for it (SRVR 106)
   (c) well your first year's like you spend a whole year doing **absolutely** fuck **all** (SY2Z 351)
   (d) which should have been **absolutely plenty** of time (S3LE 2999)

Modification of adverbs (10 a) and prepositional phrases (10 b) by *absolutely* proved rare.

(10) (a) she said doctor that worked **absolutely wonderfully** (SHLT 64)
   (b) but the Church is **absolutely against** it (SQWC 1067)

The adverb *totally* appeared as a modifier in 259 cases out of 400 (64.75%). Its most frequent function was that of a modifier of adjectives, as was the case of *absolutely*. It was also found to colligate with participial adjectives (11).

(11) (a) it's like **totally ridiculous** (SES6 975)
   (b) I remember just getting **totally slaughtered** (S8LS 1216)

Totally was more frequent than *absolutely* as a modifier of verbs (12 a), adverbs (12 b), and prepositional phrases (12 c). All the modified verbs imply a scale, and can therefore be intensified. The numbers of adverbs and prepositional phrases are too low to allow any generalization.

(12) (a) they've **totally changed** the form (SABT 27)
      (b) well he **totally falsely** accused me of being absolutist (SP2X 1287)
      (c) I'm **totally into that** (S23A 2428)

In comparison to *absolutely*, *totally* very rarely modified noun phrases; in the present data set, it colligated with the determiner *all*, the pronoun *some*, and the noun phrase *the other way*.

In the role of a stance adverbial, the adverb *totally* was markedly more frequent than *absolutely* (90 and 22 instances, respectively). For *totally*, a stance adverbial was its second most frequent syntactic function, appearing in 22.5% of instances, while stance adverbials made up only 5.5% of all uses of *absolutely*, being the least common syntactic role of the adverb. When used as stance adverbials, both *absolutely* and *totally* express high levels of conviction or emphasis. In this function the adverbs may be replaced by *definitely* or *certainly*, or may be paraphrased as "it is definitely the case that".[11] In the present data, both adverbs appeared as stance adverbials in initial (13 a), medial (13b, c), as well as final position (13d).

(13) (a) S0015: and I ended up with some vouchers left at the end
          S0566: **totally totally** a waste of money (S94Z 523)
      (b) it's **totally** recording right now (SXEV 877)
      (c) well it's my guarantee and I **absolutely** can't lose that because
      (d) and it is a scam like **totally** (SHKF 512)

The role of a response marker was the second most prominent function of *absolutely* (34.25% of its instances). *Totally* only appeared as a response marker in 30 cases (7.5%). Both adverbs were used more frequently as backchannels (14) than answers to direct questions (15). *Absolutely* and *totally* were used predominantly to express agreement or an affirmative answer, often in combination with other response tokens, such as *yeah*, *yes*,

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11   The stance adverbial uses of *totally* and *absolutely* may be hard to distinguish from the adverbs used as modifiers of verbs in clause-medial position. In such instances, we opted for the stance interpretation where the paraphrases "it is definitely the case that" or "there is no doubt that" signalling epistemic meaning could be applied (see Tao 2007, 15), e.g. *yeah I **totally** can (.) I get that* (S6JL 911). The same paraphrases were used to distinguish turn-initial stance adverbials from response markers.

or *oh*. In a few cases, however, the adverbs were found to be followed by the adverb *not* and thus serve as emphatic rejections (16). *Absolutely* appeared in such use in 4 instances, *totally* appeared with *not* only once.

(14) S0515: oh I think it's very important to be very helpful
    S0511: **absolutely** yeah (SKX6 665)

(15) S0561: has yours and –ANONnameF's cycles synced?
    S0544: oh yeah **totally** (SVHN 1405)

(16) S0266: are you gonna climb Mount Everest?
    S0270: on a no **absolutely not** I've looked at it (S7KK 34)

The frequent use of *absolutely* as a response marker supports the previous findings about its undergoing a process of grammaticalization (Tao 2007). The original meaning of wholeness or completeness is disappearing, and the adverb comes to mean "yes", "certainly", "sure". The underlying sense of maximization, originally associated with intensification of adjectives and verbs. is now being used to express agreement or strong speaker involvement. *Totally* can also be used in this manner; it comes to bear the same affirmative meanings as *absolutely*. This signals that it is undergoing grammaticalization as well. Yet the use of *totally* as a response marker is rather infrequent, while the adverb performs the function of a stance adverbial more frequently, which suggests that in the case of *totally* the process of grammaticalization is less advanced.

The category of "other" in Figure 2 refers to those instances in our data set that could not be classified due to incompleteness of the utterances.

6.   Collocational Patterns

The most common collocates of the adverb *absolutely* were adjectives, verbs, noun phrases, and interjections. Table 2 shows the distribution of the types and tokens of the adjectives and verbs modified by *absolutely* with regard to their semantic prosody.

Semantic Prosody	Adjectival collocates		Verbal collocates	
	Types	Tokens	Types	Tokens
Favourable	33	460	4	86
Unfavourable	62	328	13	59
Neutral	24	131	9	52
TOTAL	**119**	**919**	**26**	**197**

Table 2. Collocates of *absolutely* (based on the whole Spoken BNC2014).

Among the significant adjectival collocates of the adverb *absolutely*, there were more favourable tokens but at the same time more unfavourable types of adjectives. Thus, there is less variation among the positive adjectives but their association with *absolutely* is arguably more well-established. On the other hand, the adjectives with negative semantic prosody are diverse, but clearly the collocations are not as widespread, and their individual frequencies are overall lower.

The most frequent adjectival collocates of *absolutely* are the words *fine*, *brilliant*, and *amazing* which appear with the absolute frequency of 97, 58 and 49, respectively. The typical adjectival collocate of *absolutely* bears the meaning of an extreme or superlative quality (17 a), for example, *gorgeous*, *fantastic*, *stunning*. The majority of the adjectival collocates (64 out of the 119 types) in our data expressed subjective evaluation and carried a high emotional load (17 b), e.g. *ridiculous*, *delicious*, *amazing*, *awful*.

(17) (a) cos we were looking at flowers in an **absolutely enormous** pot (SLMB 312)
    (b) Hitchhiker's Guide to Galaxy which was **absolutely terrible** (SPML 225)

Another prominent semantic group of adjectives intensified by *absolutely* comprises adjectives describing some internal or external characteristic or an emotional state: *violent*, *adamant*, *horrified*, *appalled*. There also appears a homogenous semantic group of adjectival collocates of *absolutely* referring to a physical state – all are participial adjectives which refer either to someone being drunk (*smashed*, *fucked*, *slaughtered*, *battered*) (18 a) or tired (*exhausted*, *knackered*) (18 b).

(18) (a) his partner she was like **absolutely blottoed** (S6A5 335)
    (b) I just had no energy I was just like **absolutely shattered** (SMZV 304)

Absolutely functions as a modifier of verbs less frequently than as a modifier of adjectives, and thus the number of its significant verbal collocates is lower – 26 types. The two verbs most prominently collocating with *absolutely* are *love* and *hate*, which appear with the absolute frequency of 75 and 26, respectively. The synonyms of these verbs, *adore* and *loathe*, also appear among the ten most common verbal collocates. As in the case of adjectives, the verbs modified by *absolutely* are expressive and often colloquial, e.g. *chuck down*, *piss down*, *reek*, *ruin*, *howl*. The verbs may describe both physical actions (19 a) and cognitive processes (19 b).

(19) (a) when we got there it was **absolutely pouring** from rain (SWRQ 168)
    (b) but yeah I **absolutely agree** with you (SVXP 424)

Table 2 demonstrates that verbal collocates of *absolutely* display the same pattern of semantic prosody as the adjectival collocates: there are fewer types of favourable verbal collocates but they outnumber the negative verbal collocates in terms of tokens. Notably, 75 out of

the total 86 favourable tokens are instances of the verb *love*. The rest of the favourable collocates are therefore much less frequent. As in the case of the adjectives, there exists a greater variety of the unfavourable or neutral verbs modified by the adverb. The collocation *absolutely* + verb thus seems to be prone to be unfavourable or neutral rather than favourable – in which case there is a strong preference for the collocation *absolutely love*.

As shown in Section 5, when modifying noun phrases, *absolutely* may be followed by a pronoun (*nothing*, *everything*, *anything*, *none*, *nobody*, *all*), a determiner (*no*) or a noun. There are in total 5 significant nominal collocates, all expressing some quantity: *ages*, *loads*, *tonnes*, *hours*, *years*, which further supports clear semantic preference of *absolutely* to collocate with noun phrases that express quantity or extent.

As noted in the previous section, *absolutely* in the role of a response marker is commonly accompanied by other non-clausal units, such as interjections (*mhm*, *oh*), fillers (*er*, *erm*), and response forms (*yeah*, *no*). In the majority of cases, the adverb is used to express agreement, and is therefore combined with *yeah, yes,* or functionally congruent interjections, such as *aye, mhm, uhu*. Even when *absolutely* collocates with *no*, the overall meaning of the utterance is actually agreement with the previous utterance (20).

(20) S0262: just goes to show how political education is isn't it?
　　　 S0301: yeah absolutely **no absolutely** that's absolutely right (SA6K 214)

The overall semantic prosody of the adverb *absolutely* cannot be determined unequivocally due to the uneven distribution of favourable and unfavourable types and tokens. There is a common pattern of the adjectival and verbal collocates of *absolutely*, where the favourable items are more frequent as tokens but fewer as types. This suggests that while there is less variation of the favourable items, they are more strongly established in the speakers' lexicons and appear more frequently in speech. On the other hand, it seems that *absolutely* also lends itself easily to be used with an array of unfavourably or neutrally evaluative items.

The word classes most frequently collocating with the adverb *totally* are adjectives, verbs, prepositional phrases, and interjections. Table 3 summarizes the distribution of the adjectival and verbal collocates with regard to semantic prosody.

Semantic Prosody	Adjectival collocates		Verbal collocates	
	Types	Tokens	Types	Tokens
Favourable	8	27	2	24
Unfavourable	25	81	9	60
Neutral	17	135	13	93
TOTAL	**50**	**243**	**24**	**177**

Table 3. Collocates of *totally* (based on the whole Spoken BNC2014).

In the case of *totally* most of the adjectival collocates were either unfavourable or neutral in nature – favourable items were the least frequent both by type and token. By far the most frequent collocate is the adjective *different*, which appears with the absolute frequency of 93. The adjectives modified by *totally* were overall less expressive and hyperbolic than in the case of *absolutely* (21).[12] Most of the adjectives referred either to an internal or an external characteristic of a thing or a person (*refined*, *committed*, *opposite*, *honest*) or expressed evaluation (*wrong*, *normal*, *insane*, *awesome*). There can also be identified a semantic group of adjectives expressing "a lack of something": *empty*, *bald*, *nonsensical*, *devoid*, *insane*.

(21) It means that what they're doing is **totally wrong** (S7KK 698)

The neutral or negative semantic prosody of *totally* is retained when the adverb modifies verbs. There are only two verbs collocating with *totally* – *agree* and *understand* – which can be classified as favourable. In general, the collocates of *totally* are common neutral verbs, which can hardly be considered expressive or exaggerated (22). The only semantic group identified in the list of collocates are verbs relating to cognitive processes: *forget*, *agree*, *know*, *ignore*, *focus*, *imagine*. With the absolute frequency of 29, *forget* is the most frequent verbal collocate of *totally*.

(22) I'd **totally forgotten** that we're still recording (SB4D 1871)

Totally is quite frequently followed by a prepositional phrase, most prominently *out of*, e.g. *totally out of the blue*, *totally out of proportion*, *totally out of control*, *totally out of line*.

When functioning as a response marker, *totally* behaves in the same manner as *absolutely*, as it usually collocates with positive interjections and with fillers, such as *aye*, *yep*, *yes*, *mm*, and *oh*. By far the most frequent response form collocating with *totally* is *yeah*.

The semantic prosody associated with *totally* is much clearer than that of *absolutely* as it displays a general preference for collocates with unfavourable or neutral meanings, unless it appears as a response signal, in which case it bears the positive semantic prosody of an agreement.

7. Discussion and Conclusions

Quoting Tao's (2007, 23) observation that "degree adverbs are among the most active classes of words in terms of undergoing change", Aijmer (2020, 161) asks "whether grammaticalization can explain the semantic and pragmatic developments of *absolutely*".

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12   This is in contrast with the findings of Bordet (2017).

Our results support her conclusions about the expansion of *absolutely* related to the three stages of grammaticalization (cf. Himmelmann 2004, 32−33), namely the increase in frequency over time, new syntactic functions (34.3% of instances of *absolutely* function as response markers, and 5.5% as stance adverbials), and "semantic-pragmatic expansion", i.e. the expression of stance and emphasis.

The comparison of syntactic functions performed by *absolutely* and *totally* has shown that both adverbs appear most frequently as modifiers of adjectives, which is their original degree-indicating role, but their distribution across other syntactic functions differs markedly. Like *absolutely*, the adverb *totally* can express agreement and be used as a response marker, but this function is rather rare (7.5% of occurrences of *totally*). *Totally* is used more frequently as an epistemic marker, indicating the speaker's certainty ("definitely" or "without a doubt"). The difference in the extent of expansion into new syntactic domains suggests that while the two adverbs appear to be following the same trajectory of change from a degree modifier, via a stance adverbial to a discourse (response) marker, they are at different stages of the process of grammaticalization. In comparison with *absolutely*, *totally* has also increased in frequency, but has been more restricted in its spread into new syntactic functions, and neither has it fully undergone the semantic-pragmatic expansion that can be observed in the case of *absolutely*. Its ability to serve as a stand-alone discourse marker emphasizing full agreement is limited.

The differences between the two adverbs may be related to some factors suggested by the analysis of the sociolinguistic variables of age and gender, and of the collocational patterns. Each of the adverbs displays a different pattern of distribution with respect to gender and age. While *absolutely* is used more commonly by women, in the case of *totally* there is virtually no gender difference, and the use of the adverb is more balanced throughout the age groups as well. *Absolutely*, on the other hand, has a tendency to increase in frequency with the age of the speaker, particularly among female speakers. Aijmer (2020, 163) concludes that "older (female) speakers may use *absolutely* consciously and with higher frequency because of its expressive and hyperbolic qualities".[13] The role of expressiveness as a factor contributing to the spread of the adverb appears to be borne out by the collocational analysis.

The analysis of collocations has shown that the two adverbs differ in their semantic prosody and preference. There has not been a clear consensus on the semantic prosody of *absolutely*. The present findings support those of Partington (2004) and Núñez Pertejo and Palacios Martínez (2014), namely that *absolutely* does not show a clear preference for either favourable or unfavourable items. It has been shown that while the favourable collocations

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13   On the association between linguistic expression of emotion and gender, see e.g. Coates (2015) or Fuchs (2017); Tagliamonte and Roberts (2005: 289) suggest that "[the] correlation of women with intensifiers may also be the result of the fact that women use more emotional language than men".

seem to be more well-established and more frequently used by speakers, there is a greater variety of the unfavourable items that may collocate with the adverb. The collocations of *absolutely* were also found to be of hyperbolic and superlative nature, e.g. *absolutely brilliant*, *absolutely hate*. The semantic prosody of *totally* is easier to determine as the adverb frequently collocates with either unfavourable or neutral items. It seems likely that the high frequency of *absolutely* (compared to *totally*) may be related to the general "tendency for use of intensifiers with emotional language" (Tagliamonte and Roberts 2005, 290). In contrast, across various word classes, the collocates of *totally* are usually neutral, inexpressive terms. There is little overlap between the collocates of both adverbs in the functions of a modifier and stance adverbial. For instance, there are only 13 adjectives that can collocate with both *absolutely* and *totally*, e.g. *honest*, *ridiculous*, *sure*, *fine*, *normal*.

In this paper, we hope to have provided a comprehensive comparison of the present-day uses of the adverbs *absolutely* and *totally* in spoken British English. It has been shown that the adverbs, which were originally semantically close (meaning "entirely" or "wholly"), differ markedly across the three dimensions that were the focus of the present analysis – sociolinguistic, syntactic, and semantic. The semantic prosody of *absolutely* is more equivocal than that of *totally*, whose collocates are generally negative or neutral. *Absolutely*, on the other hand, displays a semantic preference for expressive, hyperbolic and colloquial collocates, while the collocates of *totally* tend to be stylistically unmarked and inexpressive. These differences may have impact on the overall higher frequency of *absolutely* and its association with particular groups of speakers (older female speakers), who may be using it consciously due to its expressiveness. This contrasts with the neutral collocates and more balanced gender and age distribution of *totally*. Both adverbs appear to be following the same grammaticalization path, but while *absolutely* has expanded not only in terms of frequency, but also syntactically, semantically and pragmatically (as attested by its widespread use as a response discourse marker), *totally* seems to be at a lower stage of the process of grammaticalization, being used predominantly as a modifier and a stance adverbial.

With the intensification rate recently increasing "across the board" in British English (Fuchs 2017, 346), it would be interesting to explore the potential of individual intensifiers, such as *completely* or *definitely*, to acquire new syntactic functions and expand into new semantic-pragmatic domains, perhaps following a grammaticalization trajectory similar to that of *absolutely* and *totally*.

Works Cited

Aijmer, Karin. 2011. "Are You Totally Spy? A New Intensifier in Present-Day American English." In *Marqueurs Discursifs Et Subjectivité*, edited by Sylvie Hancil, 155–172. Rouen: Universités De Rouen and Havre.

Aijmer, Karin. 2016. "'You're Absolutely Welcome, Thanks for the Ear': The Use of Absolutely in American Soap Operas." *Nordic Journal of English Studies* 15 (2): 78–94.

Aijmer, Karin. 2018. "That's Well Bad. Some New Intensifiers in Spoken British English." In *Corpus Approaches to Contemporary British English*, edited by Vaclav Brezina, Robbie Love, and Karin Aijmer, 60–95. New York and London: Routledge.

Aijmer, Karin. 2020. "That's Absolutely Fine. An Investigation of *Absolutely* in the Spoken BNC2014." In *Corpora and the Changing Society: Studies in the Evolution of English*, edited by Paula Rautionaho, Arja Nurmi, and Juhani Klemola, 143–167. Amsterdam and Philadelphia: John Benjamins.

Beltrama, Andrea. 2018. "*Totally* Between Subjectivity and Discourse. Exploring the Pragmatic Side of Intensification." *Journal of Semantics* 35: 219–261.

Beltrama, Andrea and Laura Staum Casasanto. 2017. "Totally Tall Sounds Totally Younger: Intensification at the Socio-Semantics Interface." *Journal of Sociolinguistics* 21 (2): 154–182.

Biber, Douglas, Stig Johansson, Geoffrey Leech, Susan Conrad, and Edward Finegan. 1999. *Longman Grammar of Spoken and Written English*. Harlow: Longman.

Bolinger, Dwight. 1972. *Degree Words*. The Hague: Mouton.

Bordet, Lucile. 2017. "From Vogue Words to Lexicalized Intensifying Words: The Renewal and Recycling of Intensifiers in English. A Case-Study of *Very*, *Really*, *So* and *Totally*." *Lexis* (Online) 10. Accessed July 19, 2019. http://journals.openedition.org/lexis/1125.

Brezina, Vaclav. 2018. *Statistics in Corpus Linguistics: A Practical Guide*. Cambridge: Cambridge University Press.

Carretero, Marta. 2010. "You're Absolutely Right! A Corpus-Based Contrastive Analysis of Absolutely in British English and Absolutamente in Peninsular Spanish, With Special Emphasis On the Relationship Between Degree and Certainty." *Languages in Contrast* 10 (2): 194–222.

Coates, Jennifer. 2015. *Women, Men and Language: A Sociolinguistic Account of Gender Differences in Language*. London: Routledge.

Dušková, Libuše Et Al. 2009. *Mluvnice současné angličtiny na pozadí češtiny*. Electronic Edition. Accessed January 28, 2020. Praha: Ústav anglického jazyka a didaktiky, FF UK. http://www.mluvniceanglictiny.cz

Fuchs, Robert. 2017. "Do Women (Still) Use More Intensifiers Than Men? Recent Change in the Sociolinguistics of Intensifiers in British English." *International Journal of Corpus Linguistics* 22 (3): 345–374.

Hessner, Tanja, and Ira Gawlitzek. 2017. "'Totally or Slightly Different?' A Spoken BNC2014-Based Investigation of Female and Male Usage of Intensifiers." *International Journal of Corpus Linguistics* 22 (3): 403–428.

Himmelmann, Nikolaus P. 2004. "Lexicalization and Grammaticalization: Opposite or Orthogonal?" In *What Makes Grammaticalization? A Look Form Its Fringes and Its Components*, edited by Walter Bisang, Nikolaus P. Himmelmann, and Björn Wiemer, 21–42. Berlin and New York: Mouton De Gruyter.

Love, Robbie, Claire Dembry, Andrew Hardie, Vaclav Brezina, and Tony Mcenery. 2017. "The Spoken BNC2014: Designing and Building a Spoken Corpus of Everyday Conversations." *International Journal of Corpus Linguistics* 22 (3): 319–344.

Macaulay, Ronald. 2006. "Pure Grammaticalization: The Development of a Teenage Intensifier." *Language Variation and Change* 18 (3): 267–283.

Núñez Pertejo, Paloma. 2013. "From Degree Adverb to Response Token: 'Absolutely' in Late Modern and Contemporary British and American English." *Neuphilologische Mitteilungen* 114 (2): 207–235.

Núñez Pertejo, Paloma and Ignacio M. Palacios Martínez. 2014. "That's Absolutely Crap, Totally Rubbish: The Use of the Intensifiers Absolutely and Totally in the Spoken Language of British Adults and Teenagers." *Functions of Language* 21 (2): 210–237.

Oxford English Dictionary. 2019. Oxford: Oxford University Press. Accessed June 28, 2021. Available online at http://www.oed.com/.

Partington, Alan. 1993. "Corpus Evidence of Language Change: The Case of Intensifiers." In *Text and Technology: In Honour of John Sinclair*, edited by Mona Baker, Gill Francis, and Elena Tognini-Bonelli, 177–192. Amsterdam and Philadelphia: John Benjamins.

Partington, Alan. 2004. "Utterly Content in Each Other's Company. Semantic Prosody and Semantic Preference." *International Journal of Corpus Linguistics* 9 (1): 131–156.

Quaglio, Paulo. 2009. *Television Dialogue. The Sitcom Friends vs. Natural Conversation*. Amsterdam and Philadelphia: John Benjamins.

Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech, and Jan Svartvik. 1985. *A Comprehensive Grammar of the English Language*. London: Longman.

Schweinberger, Martin. 2021. "Using Intensifier-Adjective Collocations to Investigate Mechanisms of Change." In *Variation in Time and Space*, edited by Anna Čermáková and Markéta Malá, 231–255. Berlin: De Gruyter.

Tagliamonte, Sali, and Chris Roberts. 2005. "So Weird; So Cool; So Innovative: The Use of Intensifiers in the Television Series Friends." *American Speech* 80 (3): 280–300.

Tao, Hongyin. 2007. "A Corpus-Based Investigation of *Absolutely* and Related Phenomena in Spoken American English." *Journal of English Linguistics* 35 (1): 5–29.

The British National Corpus 2014: User Manual and Reference Guide. Version 1.1. 2018. Accessed June 8, 2021. Available online at http://corpora.lancs.ac.uk/bnc2014/doc/bnc2014manual.pdf.

Wagner, Susanne. 2017. "Totally New and Pretty Awesome: Amplifier-Adjective Bigrams in Glowbe." *Lingua* 200: 63–83.

Xiao, Richard, and Hongyin Tao. 2007. "A Corpus-Based Sociolinguistic Study of Amplifiers in British English." *Sociolinguistic Studies* 1 (2): 241–273.

Sources and Tools

Spoken BNC2014: The Spoken British National Corpus 2014. Accessed June 8, 2021. Available online at https://cqpweb.lancs.ac.uk/.

Cvrček, Václav. 2020. *Calc: Corpus Calculator*. Praha: FF UK. Accessed June 8, 2021. Available online at https://www.korpus.cz/calc/.

CQP Web. Accessed June 8, 2021. Available online at https://cqpweb.lancs.ac.uk/.

Perception and Production of Geminate Timing in Hungarian Voiceless Stops

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Abstract: Hungarian is a language that expresses semantic differences using contrastive consonant length. Previous research in many languages confirmed that duration is the most important acoustic correlate of the singleton-geminate contrast. The present study aims to examine the acoustic and perceptual correlates which distinguish single stops from their geminate counterparts in Hungarian. The main question is how closure duration contributes to the perception and production of the length contrast of voiceless stops? Results confirmed that closure duration is the main acoustic attribute that distinguishes between singletons and geminate stops in Hungarian, and it is a sufficient cue for discriminating them in perception as well. Analysis of the relationship between consonant and preceding vowel duration did not support the strategy of temporal compensation. Findings are supposed to explore the relationship between the acoustic and perceptual domains and shed light on the primary/secondary acoustic features of consonant length opposition in Hungarian.

Keywords: geminate; stop consonant; duration; perception; Hungarian

1. Introduction

Gemination has been widely investigated in many languages. Production studies confirmed that the primary acoustic cue for the singleton-geminate (S-G) contrast is the duration (e.g., Ham 2001; Ridouane 2010). Moreover, it was suggested that in the case of complex speech sounds, such as stops or affricates, a detailed examination is needed to find out which portions of the internal structure (closure duration [CD], voice onset time [VOT], etc.) are targeted by phonological lengthening (Pycha 2009). In the case

of stops, CD proved to be the most important acoustic attribute of the S-G contrast; however, in several languages the duration of the previous vowel (V1) also seemed to contribute to the opposition (Ridouane 2010).

In many languages, V1 is realized longer before singletons (e.g. Italian: Esposito and Di Benedetto 1999; Swedish: Hassan 2003). This can be explained by temporal compensation at the segmental level. This means that each VC or CV sequence is time-balanced: a shorter duration of one segment leads to a longer duration of an adjacent segment, and the increased duration of a segment is compensated by a shortening of another segment (Hassan 2003; Khattab 2007; Issa 2015). However, such an inverse relationship between V1 and G duration is not clearly supported in all languages (e.g., Iraqi Arabic; Hassan 2003; Lebanese Arabic: Khattab and Al-Tamimi 2008), and there is even research that has found the opposite trend, increasing V1 duration in the geminate environment (e.g., Persian: Hansen 2004; Japanese: Idemaru and Guion 2008; Fujimoto et al. 2015; Finnish: O'Dell and Malisz 2016; Hungarian: Deme et al. 2019). In addition, some studies did not find any difference in these terms (e.g., Polish: Rojczyk and Porzuczek 2019). The various kinds of relationship between V1 and G duration might be traced back to language typological reasons (e.g., differences between mora-timed and syllable-timed languages; see Ham 2001; Idemaru and Guion 2008).

Perception studies investigated the role of durational parameters, such as CD, the ratio of consonant duration to vowel/mora/word duration in length categorization (e.g., Hankamer et al. 1989; Amano and Hirata 2010; Idemaru and Guion-Anderson 2010). They found that not only absolute but also relative durations proved to be adequate perceptual cues in the distinction of single and geminate stops, especially when speech/articulation rate is taken into account.

2.   Gemination in Hungarian

Length is a phonologically relevant feature in the consonant system of Hungarian, i.e., geminate and singleton consonants are contrastive, e.g., *ép* [eːp] 'healthy': *épp* [eːpː] 'right now'. All consonants in Hungarian can be geminated. Vowel length is also phonemic, and both short and long vowels can occur before or after geminate consonants, e.g., *hallani* [hɒlːɒni] 'to hear', *hallás* [hɒlːaːʃ] 'hearing', *állam* [aːlːɒm] 'state'/'my chin', *állás* [aːlːaːʃ] 'job'.

The distribution of geminates is restricted in Hungarian: geminates cannot stand word-initially or next to another consonant. "In other words, the occurrence of geminates is only possible (i) intervocalically (e.g. *állat* 'animal', *áll-at* 'chin-acc', *áll Attila* 'Attila stands') and (ii) utterance finally (i.e., before a pause) if preceded by a vowel (e.g. *áll* 'stand'/'chin')" (Siptár and Gráczi 2014, 444).

According to the traditional view, it is assumed that geminates must surface as short if they are flanked by another consonant on either side, (this process is called degemination: Siptár and Gráczi 2014; Deme et al. 2019). Recent findings showed that

degeminated stop duration was a mere 88% of singletons, i.e., they were even shorter than singletons, and degeminated stops patterned with singletons in two-term clusters (Deme et al. 2019).

Three types of geminates can be distinguished based on their abstract phonological representation:

- Underlying/lexical geminate: part of the phonemic inventory of the language, for instance: *sok* [ʃok] 'many' : *sokk* [ʃokː] 'shock';
- Derived true geminate: results from some assimilation processes (e.g., voicing assimilation, v-assimilation), for instance: *kalap* + -*val* (INSTR) > *kalappal* [kɒlɒpːɒl] 'with hat';
- Fake geminate: merged sequences of identical consonants arising through morpheme concatenation, for instance: *zseb* + -*ben* (INE) > *zsebben* [ʒɛbːɛn] 'in pocket'.

The comparison between the three types of geminates revealed that the acoustic correlates of fake geminates differed from underlying or derived true geminates to some extent (Neuberger 2015).

Geminates in Hungarian have a relatively low functional load. Consonant length as a phonological feature most often distinguishes minimal pairs whose one or both members are loanwords (e.g., *kasza* [kɒsɒ] 'scythe' : *kassza* [kɒsːɒ] 'cash'), proper names, or contain derived geminates (not underlying ones, e.g., *vasal* [vɒʃɒl] 'he is ironing' : *vassal* [vɒʃːɒl] 'with iron' < *vas* + -*val* (INSTR)).

3.   Aims of the Present Study

The aim of the present study is to examine the acoustic and perceptual correlates which distinguish single /p, t, k/ stops from their geminate counterparts in Hungarian. We hypothesized that closure duration plays the most important role in the distinction between singletons and geminate stops in Hungarian, and it is a sufficient cue for discriminating them in perception as well. It is also assumed that secondary cues for the distinction might be manifested in vocalic context duration. A comparison of production data and perception test results is made to explore the relationship between the acoustic and perceptual domains.

4.   Acoustic Study

Firstly, in order to examine the role of temporal cues in the distinction between singletons and geminates in Hungarian, we conducted an acoustic analysis of intervocalic stops produced in spontaneous speech. The main questions here were: how do Hungarian speakers distinguish singleton stops from geminates acoustically in everyday speech? More precisely, how much durational difference can be found between voiceless singleton and geminate stops (based on closure duration, voice onset time)? How does vowel

duration contribute to the consonant length distinction? We investigated several durational parameters related to the target consonant and surrounding vowels.

4.1 Method

Ten adult males (ages 21–29, mean = 24.7 years) with normal voice quality and no reported history of speaking or hearing disability participated in this study. All participants are monolingual, native speakers of standard Hungarian. Data were drawn from the BEA database (Neuberger et al. 2014). While previous studies have generally examined the phonetic realization of consonant length in controlled material (e.g., Pycha 2009; Deme et al. 2019), the present research investigates spontaneous speech. In this speech type, the durational overlap is expected to be more significant, with a lower singleton-geminate ratio than in read word or sentence list (see Khattab 2007). Recordings were obtained in the same sound-proof room, with AT4040 microphones, using GoldWave sound editing software (sampling at 44.1 kHz, storage: 16 bits, 86 KBytes/s, mono). Participants talked about their job and free-time activities.

The data set contained 590 manually segmented stop consonants (260 Ss and 330 Gs) in intervocalic positions. Underlying and derived true geminates were selected, but fake geminates were excluded from the analysis. The following parameters were measured in Praat 6.1 (Boersma and Weenink 2020): CD, VOT, total C-duration (CD+VOT). In the next step, for examining relative consonant duration related to adjacent vowel duration, only the most common vowels in the material, [ɔ] and [o], were analysed. Their number in the present research material: [ɒ] = 301, [o] = 180 occurrences, in a proportion almost balanced according to the position (preceding or following). The measurement was extended to the duration of 244 V1 and 237 V2. We measured C/V1 and C/V2 ratios, i.e., the ratios of total consonant duration to the preceding and following vowel duration, as well as G/S ratios, i.e., mean geminate to singleton ratios per speaker.

Statistical analysis was made in R (R Development Core Team 2019) using *lmerTest* package (Kuznetsova et al. 2017). The mean and standard deviation of the raw data are indicated in the text. For the purposes of the statistical analysis, all absolute durational measurements were log-transformed. Using linear mixed models, we examined the effect of 'quantity' and 'place of articulation' (fixed factors) on durations (dependent variables), and 'speakers' were defined as random effects. In the contextual analysis, 'vowel quality' (in our case: [ɔ] or [o]) was examined as an independent variable. *F*-values and corresponding *p*-values were computed using the Satterthwaite method.

4.2 Results

First, we analysed the data pooled over all consonants. Singletons were realized with an average duration of 96.62 (SD: 19.57) ms, while geminates were realized with an average duration of 140.66 (SD: 28.38) ms. G/S ratio was 1.4, on average (ranging between 1.2–1.6 across speakers). Statistical analysis confirmed that single and geminate stops differed

significantly in terms of total consonant duration: $F(1, 584) = 419.07$, $p < 0.001$. Moreover, place of articulation also had a main effect on consonant duration: $F(2, 584) = 3.903$, $p = 0.021$, but the interaction between the two factors was not significant.

CD also differed significantly between singletons and geminates (Fig. 1): $F(1, 548) = 470.10$, $p < 0.001$. The overlap between the two categories was large, typically in the duration range between 50 and 120 ms. POA had a main effect on CD: $F(2, 548) = 13.89$, $p < 0.001$. Pairwise comparison showed significant differences between /p/ and /k/, and /p/ and /t/ ($p < 0.001$ in both cases). However, VOT (Fig. 1) did not show such differences between singletons and geminates ($p > 0.05$).
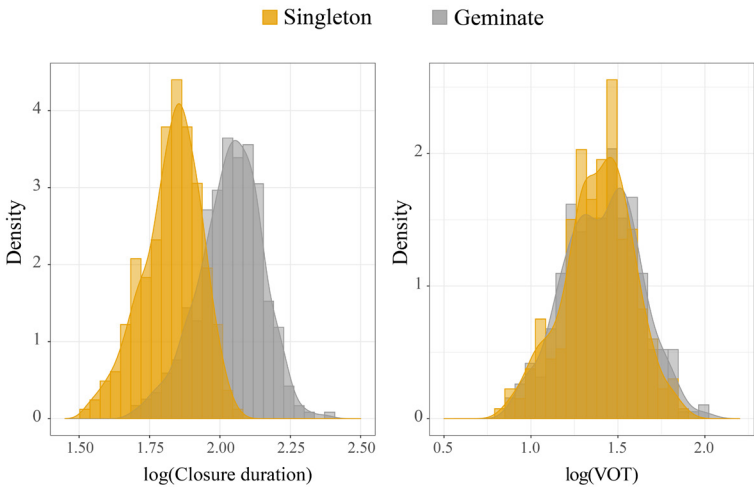
Figure 1. Distribution of log-transformed closure duration (left) and VOT (right) of singleton and geminate stops.

The mean and standard deviation of total C duration, CD and VOT are shown in Table 1 according to the place of articulation (POA). We could observe a shortening tendency of CD moving more posterior in POA, while VOT values described a reverse tendency. Both singletons and geminates showed this trend. The geminate CD was 157% of the singleton CD in bilabial, 177% in alveolar and 170% in velar stops.

	Total C duration		CD		VOT	
	S	G	S	G	S	G
[p]	97 (15)	139 (27)	76 (13)	119 (27)	21 (9)	20 (11)
[t]	91 (17)	137 (29)	65 (15)	115 (30)	26 (8)	22 (8)
[k]	98 (26)	147 (38)	63 (15)	107 (35)	35 (14)	40 (14)

Table 1. Mean and SD of total C duration, CD and VOT by POA.

Concerning the duration of the adjacent vowels (Fig. 2), V1 was found to be longer before geminates than before singletons. Consonant quantity had a significant effect on the duration of the preceding vowel: $F(1, 240) = 7.184, p = 0.008$. We also examined the effect of vowel quality on durations, but no significant difference was shown. V2 duration also differed significantly by adjacent consonant quantity: $F(1, 233) = 18.89, p < 0.001$. After geminates, it was realized with a shorter duration than after singletons. According to the quality of the vowel, as in the case of V1, we did not find any difference in the results for V2.
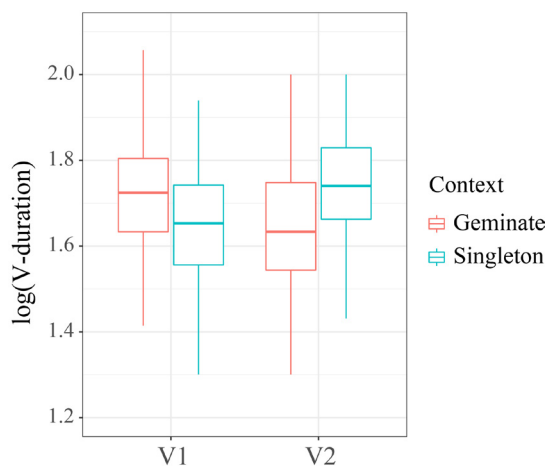
Figure 2. Duration of preceding and following vowels in singleton vs. geminate context.

We analysed the ratio of total consonant (C) duration to V1 and V2 duration, respectively. The difference in the C/V1 ratio was not found to be significant between singletons and geminates ($p > 0.05$). In contrast, consonant quantity had a main effect on C/V2 durational ratio: $F(1, 584) = 155.27, p < 0.001$. This parameter seemed to be a good distinction between singletons and geminates (Fig 3). Note: Since our research material is from spontaneous speech, it is uncontrolled; hence the V1 was a nucleus of a syllable that was either stressed or unstressed. One of the acoustic cues that may contribute to stress in Hungarian is duration (fixed stress on the first syllable of lexical units). Further studies on the effect of syllable structure are needed.
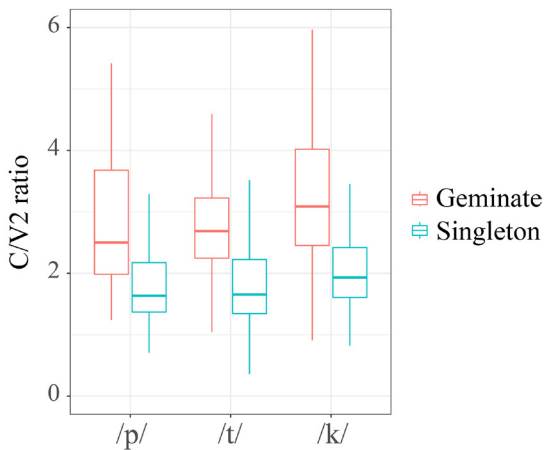
Figure 3. C/V2 ratio in singletons vs. geminates.

5. Perception Study

The acoustic analysis indicated that CD is the most important attribute in the distinction between Hungarian singleton and geminate stops. The present perception experiment thus primarily addressed the question of the role of this parameter in stop length categorization. Given the large overlap between singletons and geminates in production, it is assumed that listeners may face difficulty in discriminating the two categories along the continuous scale of CD around the threshold value. The present examination aimed to analyse the perceptual shift from single to geminate stop.

5.1 Method

Non-words that consist of VC(:)V sequences (V = [i], C = [p, t, k]) were used as stimuli in this experiment. Six tokens with intervocalic stops (2 quantity × 3 place of articulation) were read by a 27-year-old, Hungarian native female in a sound-proof booth, maintaining fundamental frequency and sound pressure relatively constant in each token. Identification accuracy of single and geminate stimuli was tested in a previous study, which found a 100% accuracy rate and relatively short reaction time (< 1.2 s) in each item (Neuberger 2016). For the present study, we manipulated the stop closure duration of the sequences using Praat 6.1 (Boersma and Weenink 2020): the closure duration of original singletons was artificially lengthened by PSOLA analysis-resynthesis method in 10 ms steps up to the closure duration of the matched geminates. The CD of the original geminates was shortened likewise in 10 ms steps. We constituted two continua, whose members had consonant length values covering gradually the full range between the singleton and the geminate value (CD ranging between 94 and 214 ms). Altogether, 78 tokens were created. Only stop closure duration was changed, i.e., the silent interval became shorter or longer, and temporal and spectral properties of the adjacent vowels, the voice onset

time of voiceless stops, and the burst releases remained unaltered. V1 durations were realized between 104–119 ms and C/V1 ratios ranged between 0.94–2.34 among the stimuli. V2 durations were realized between 132–169 ms and C/V2 ratios ranged between 0.76–1.78 among the stimuli.

Thirty participants (15 females: ages 22–57, mean = 38.2 years; 15 males: ages 22–48, mean = 34.9 years) took part in this research. All of them were monolingual, standard Hungarian-speaking adults. No participant reported being diagnosed with a speech or hearing disorder.

They took part in a two-alternative task. Data collection of the perception test was made on an online platform named GMS provided by The Level up Production (https://gms.hu/). Participants completed the test in their own homes using headphones. The task of the listeners was to listen to audio samples and make a binary decision about whether the heard consonant was long or short. If it was heard as long, they chose the 'LONG' response on the screen, whereas when the presented consonant seemed to be short, they had to click the button with the 'SHORT' text on the screen. They all had meta-linguistic knowledge of the short and long categories, as it is a compulsory subject in the Hungarian school system. Items were played in random order. Once a choice was made, the listeners were unable to change their decision and the next token was presented automatically.

Listeners' responses to each item were summarized. The percentage of geminate responses at each closure duration was computed. Response curves (fitted logistic function) were plotted and the perceptual boundaries between singletons and geminates as well as boundary width were computed using R (R Development Core Team 2019). Response curves represent the percentage of 'long' responses (y-axis) at different closure durations (x-axis) for each stop. The perceptual boundary (cross-over point) was defined as the closure duration at 50% of 'long' responses (see van Heuven and Kirsner [2004] for a summary of response curves). At this point half of the participants judged the consonant as 'short', other half of them judged it as 'long'. It was measured in the overall data and for individual listeners as well. Boundary width (uncertainty margin) was defined as the distance along the CD axis between the 25 and 75% identification scores. The wider this region, the shallower the slope in the sigmoid cross-over, which gives information about the well-definedness of the singleton-geminate contrast. Logistic regression was used for statistical analysis (generalized linear model with binomial(link="logit")), we set 'responses' (0 or 1) as the target (or dependent) variable, 'closure duration', 'place of articulation' (bilabial, alveolar, velar) and 'original stimuli' (originally singleton, originally geminate) as fixed effects, and 'speaker' (N = 30) as a random effect.

5.2 Results

As the response curves illustrate (Fig. 4), listeners judged consonants with relatively long closure durations as 'long' and they hardly judged consonants with relatively short

closure durations as 'long'. It is also worth noting that approximately 100 ms closure duration induced a total agreement of 'short' response among the 30 participants. In contrast, closure durations approaching 200 ms triggered unanimous 'long' decisions. CD had a main effect on listeners' responses: $Z = 10.472$; $p < 0.001$.

50% of 'long' responses at cross-over points represent the most ambiguous responses, in which case half of the participants judged the stimulus as short and another half of them judged it as long. The closure duration value at 50% boundary points indicates the perceptual boundary between singletons and geminates in our study. Since production data confirmed that stops proved to be produced with shorter closure durations by moving more posterior in place of articulation, we expected this tendency in the case of closure durations at cross-over points as well. It was the shortest in velar stops (145 ms), while boundary CD attributed to labial and alveolar stops were longer than that of velar stops (both were 157 ms). Responses to /k/ stimuli differed from the responses to /b/ ($Z = 5.782$; $p < 0.001$) and /t/ stimuli ($Z = 6.082$; $p < 0.001$). For the stimulus at which the listeners provided the most uncertain responses, the C/V1 ratios were 1.56–1.75 and the C/V2 ratios were 1.17–1.40.
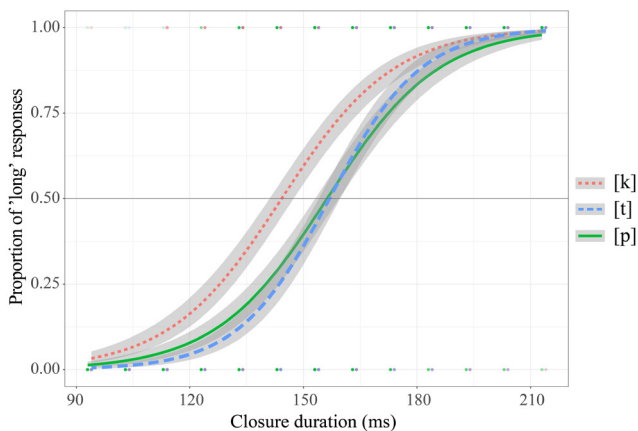
Figure 4. Response curves for discriminating singleton and geminate stops.

Boundary width was computed by measuring the distance along the CD axis between the 25% and 75% cross-over points. Larger width indicates less unanimity in listeners' judgement in these ambiguous regions of closure duration. Boundary width was the smallest in alveolar stops (26 ms, between 144–170 ms). There was less consensus about the responses to bilabial stops in the region between 140 and 173 ms of CD and in velar stops between 128–161 ms (width: 33 ms).

Finally, the effect of the base stimulus (whether the original token was a singleton or a geminate) was analysed. In the case of the bilabial and alveolar stops, the response

curves of the two conditions were similar to each other. However, a comparison of the response curves of originally short and originally long velar stops revealed the possible presence of secondary cues in the discrimination which was not manipulated in this experiment (Fig 5). We assumed, following Hankamer et al. (1989), that when the closure duration cue is ambiguous, listeners may rely on secondary cues when making a forced categorization. The displacement of 50% boundary closure durations was 20 ms between [k:] and [k]. The difference proved to be significant: $Z = 7.207$; $p < 0.001$. Participants tended to consider the original geminate stimulus to be 'long' even at relatively shorter closure durations.
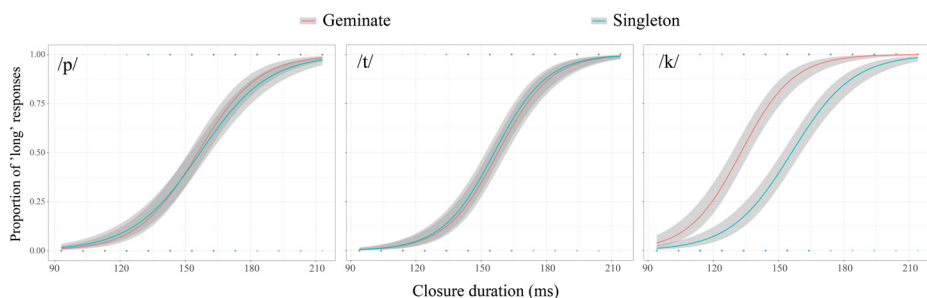
Figure 5. Response curves based on the original token (singleton vs. geminate) in bilabial (left), alveolar (middle) and velar stops (right).

6. Discussion and Conclusion

Results of this study confirmed our hypothesis that closure duration is the main acoustic attribute that distinguishes between singletons and geminate stops in Hungarian, and it is a sufficient cue for discriminating them in perception as well.

In production, singletons and geminates showed a remarkable durational overlap across speakers (due to the contextual and speaker-specific variability of timing); however, they could be well distinguished based on the ratio of consonant duration relative to following vowel duration. CD ranging between 50 and 120 ms seemed to be the most overlapping interval in the production of voiceless stops in spontaneous speech. We found that the duration of preceding and following vowels also contributed to the distinction in production.

Analysis of the relationship between consonant and preceding vowel duration did not support the strategy of temporal compensation: no reciprocal relationship was found between vowel and following consonant duration. Moreover, gemination had an opposite effect on V1 duration, which showed lengthening before geminates. Similar results were found for Japanese (Idemaru and Guion 2008; Fujimoto et al. 2015) and Hungarian read speech (Deme et al. 2019). There is yet no consensus on the explanation for this. Examining tongue movements of geminates and their

relation to V1, Fujimoto et al. (2015) found interpersonal variation, based on which they tentatively concluded that the later occurrence of peak timing did not directly affect the V1 duration, which may thus have been affected by other factors. However, Deme et al. (2019) found a strong correlation between tongue rise and V1 duration, suggesting that V1 duration may be considered a mere side effect of the slower tongue movement in geminates. In our material, V1 duration was significantly longer before geminates than singletons in nine of the ten male speakers. To find the answer to the question of why the preceding vowel tends to be longer before geminates than singletons in certain languages, although in other languages the opposite trend occurs, further articulatory and acoustic investigations are necessary. Nevertheless, we can conclude that duration is the universal attribute of geminates, whereas the temporal compensation of the preceding vowel appears to be a language-specific phenomenon, as suggested by previous studies (see Issa 2015).

According to Ham (2001) and Idemaru and Guion (2008), typological regularity may be behind the relationship between V1 and gemination. They observed that the durational difference between singleton and geminate is generally greater in mora-timed languages (higher S:G ratio; e.g., Japanese 1:3), which do not show the inverse relationship (i.e., shortened vowel before long consonants). In contrast, languages in which the singleton-geminate difference is less robust (such as syllable-timed Italian, 1:1.85), are characterized by the inverse time relationship between V1 and geminate, thus providing a more striking perceptual difference (salience). Our results do not support this explanation, because, in addition to the lengthened V1 before the geminates, we can find a relatively small singleton-to-geminate ratio in Hungarian spontaneous speech (according to the present data, the mean ratio is 1:1.4). In world languages, long consonants have an average duration of 1.5–3 times longer than short consonants (Ladefoged and Maddieson 1996). Comparing[1] our data with other languages (and with previous results in Hungarian), it can be said that in Hungarian the length opposition is realized with a relatively low G/S ratio (Table 2).

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1   Investigations have not been consistent regarding whether VOT of voiceless stops is included as part of the duration of the consonant or only closure duration is measured in G/S ratio, but the proportions are illustrative and comparable across languages. Speech material used in the studies – unless otherwise indicated – was words read in isolation or embedded in carrier phrases.

Language	G/S ratio	Source
Buginese	1.7	Cohn et al. 1999
Finnish	2.28	Dunn 1993
Icelandic	1.72	Pind 1999
Italian	2.11	Pickett et al. 1999
Japanese	2.88–3.36	Hirata and Whiton 2005
	3	Idemaru and Guion 2008
Lebanese Arabic	1.82	Khattab 2007 (spontaneous speech)
	2.5	Khattab 2007
Madurese	1.5	Cohn et al. 1999
Maltese	1.6	Galea et al. 2014
Persian	2.21	Hansen 2004
Polish	2.48	Rojczyk and Porzuczek 2019
Toba Batak	2.0	Cohn et al. 1999
Hungarian	2.1	Pycha 2009
	1.65	Deme et al. 2019
	1.2–1.6	Present study (spontaneous speech)

Table 2. A review of the geminate-singleton ratio in various languages.

Perception results revealed that CD ranging between 128 and 173 ms was the most ambiguous region for discriminating singleton and geminate voiceless stops in our experiment. These durations would rather fall into the 'geminate' category in production according to our acoustic data. At the cross-over points C/V1 and C/V2 ratios were relatively low (< 2.0), which, in turn, is characteristic of singletons in production. However, we need to emphasise that the perceptual stimuli consisted of read speech with a given (normal) tempo, on the one hand, and isolated VCV sequences without meaning. In everyday speech, the classification of individual speech sounds into phoneme classes is processed usually in larger units, sometimes after the identification of an entire word. In this case, the judgment of the length is supported not only by the acoustic characteristics but also by the semantic content of the word. Due to its peripheral nature (low functional load, few occurrences of underlying minimal pairs), quantity does not necessarily need to be supported by a high G/S ratio in production. The boundary width turned out to be 26–33 ms of CD, on average, which shows that at such a time difference there is already a high probability that the sounds will be classified into different categories (S or G).

50% boundary closure duration showed correspondence with the position of the tongue in the mouth during articulation of stop. In the case of voiceless stops produced with shorter closure duration (which seems to be more common in posterior stops than in bilabial ones, as confirmed both for singletons and geminates by the present acoustic

analysis, Table 1; see also Gráczi 2011), the perceptual boundary between singletons and geminates is situated at lower values. This seems to be a universal feature of stop consonants having different places of articulation, which is determined by the properties of the articulatory system, and it is reflected in perception as well.

Comparing the originally geminate and originally singleton stimuli, we found a displacement of the two response curves along the time axis in velar stops. Original geminate response curves were arranged at shorter closure durations than singleton stimuli. It suggests that besides closure duration, secondary cues for the distinction may be manifested in the samples. These may be encoded either in vocalic context or in release burst (e.g., geminates are generally produced with higher release amplitude than singletons, Ridouane 2010). Acoustic data drew attention to the possibility that vowel duration may play a role in consonant length discrimination. Furthermore, the ratio of the consonant to following vowel duration seemed to be a powerful cue as well. Further investigation is needed to find out how these additional cues would affect listeners' responses.

The findings of the present study may help to provide a better picture of the temporal structure of the segmental level of speech and shed light on the primary and secondary acoustic features of consonant length opposition in Hungarian.

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Works Cited
Amano, Shigeaki, and Yukari Hirata. 2010. "Perception and Production Boundaries between Single and Geminate Stops in Japanese." *The Journal of the Acoustical Society of America* 128 (4): 2049–2058.

Boersma, Paul, and David Weenink. 2020. *Praat: Doing Phonetics by Computer* 6.1.38. Accessed November 10, 2020. http://www.praat.org/

Cohn, Abigail, William H. Ham, and Robert J. Podesva. 1999. "The Phonetic Realization of Singleton-Geminate Contrasts in Three Languages of Indonesia." In *Proceedings of the Xivth International Congress of Phonetic Sciences*, edited by John Ohala, Yoko Hasegawa, Manjari Ohala, Daniel Granville, and Ashlee C. Bailey, 587–590. Berkeley: University of California.

Deme, Andrea, Márton Bartók, Tekla Etelka Gráczi, Tamás Gábor Csapó, and Alexandra Markó. 2019. "Articulatory Organization of Geminates in Hungarian." In *Proceedings of the 19th International Congress of Phonetic Sciences*, edited by Sasha Calhoun, Paola Escudero, Marija Tabain, and Paul Warren, 1739–1743. Canberra, Australia: Australasian Speech Science and Technology Association Inc.

Dunn, Margaret Hall 1993. "The Phonetics and Phonology of Geminate Consonants: A Production Study." Ph.D. diss., Yale University.

Esposito, Anna, and Maria Gabriella Di Benedetto. 1999. "Acoustical and Perceptual Study of Gemination in Italian Stops." *The Journal of the Acoustical Society of America* 106 (4): 2051–2062.

Fujimoto, Masako, Seiya Funatsu, and Philip Hoole. 2015. "Articulation of Single and Geminate Consonants and Its Relation to the Duration of the Preceding Vowel in Japanese." In *Proceedings of the 18th International Congress of Phonetic Sciences*, edited by the Scottish Consortium for ICPhS 2015. Glasgow: University of Glasgow.

Galea, Luke, Martine Grice, Anne Hermes, and Doris Mücke. 2014. "Lexical and Surface Geminates in Maltese." In *Proceedings of the 10th ISSP*, edited by Susanne Fuchs, Martine Grice, Anne Hermes, Leonardo Lancia, and Doris Mücke, 128–133. Cologne: University of Cologne.

Gráczi, Tekla Etelka 2011. "Voicing Contrast of Intervocalic Plosives in Hungarian." In *Proceedings of the 17th International Congress of Phonetic Sciences*, edited by Wai Sum Lee, and Eric Zee, 759–762. Hong Kong: City University of Hong Kong.

Ham, William. 2001. *Phonetic and Phonological Aspects of Geminate Timing.* New York: Routledge.

Hankamer, Jorge, Aditi Lahiri, and Jacques Koreman. 1989. "Perception of Consonant Length: Voiceless Stops in Turkish and Bengali." *Journal of Phonetics* 17 (4): 283–298.

Hansen, Benjamin B. 2004. "Production of Persian Geminate Stops: Effects of Varying Speaking Rate." In *Proceedings of the 2003 Texas Linguistics Society Conference.* edited by Augustine Agwuele, Willis Warren, and Sang-Hoon Park, 86–95. Somerville, MA: Cascadilla Proceedings Project.

Hassan, Zeki Majeed 2003. "Temporal Compensation between Vowel and Consonant in Swedish & Arabic in Sequences of CV:C & CVC: and the Word Overall Duration." *PHONUM* 9: 45–48.

Van Heuven, Vincent J., and Robert S. Kirsner. 2004. "Phonetic or Phonological Contrasts in Dutch Boundary Tones?" *Linguistics in the Netherlands* 21 (1): 102–113.

Hirata, Yukari, and Jacob Whiton. 2005. "Relational Acoustic Invariance in the Single/ Geminate Stop Distinction in Japanese." *The Journal of the Acoustical Society of America* 117(4): 2569–2569.

Idemaru, Kaori, and Susan G. Guion 2008. "Acoustic Covariants of Length Contrast in Japanese Stops." *The Journal of the International Phonetic Association* 38 (2): 167–186.

Idemaru, Kaori, and Susan Guion-Anderson. 2010. "Relational Timing in the Production and Perception of Japanese Singleton and Geminate Stops." *Phonetica* 67 (1–2): 25–46.

Issa, Amel 2015. "On the Phonetic Variation of Intervocalic Geminates in Libyan Arabic." In *Proceedings of the 18th International Congress of Phonetic Sciences*, edited by the Scottish Consortium for ICPhS 2015. Glasgow: University of Glasgow.

Khattab, Ghada. 2007. "A Phonetic Study of Gemination in Lebanese Arabic." In *Proceedings of the 16th International Congress of Phonetic Sciences*, edited by Trouvain, Jürgen, and William John Barry, 153–158. Saarbrücken: Saarland University.

Khattab, G., and J. Al-Tamimi. 2008. "Durational Cues for Gemination in Lebanese Arabic." *Language and Linguistics* 22: 39–55.

Kuznetsova, Alexandra, Per B. Brockhoff, and Rune H. B. Christensen 2017. "LmerTest Package: Tests in Linear Mixed Effects Models." *Journal of Statistical Software* 82 (13): 1–26.

Ladefoged, P., and I. Maddieson. 1996. *The Sounds of the World's Languages.* Oxford: Blackwell.

Neuberger, Tilda. 2015. "Durational Correlates of Singleton-Geminate Contrast in Hungarian Voiceless Stops." In *Proceedings of the 18th International Congress of Phonetic Sciences*, edited by the Scottish Consortium for ICPhS 2015. Glasgow: University of Glasgow.

Neuberger, Tilda. 2016. "Perception of Consonant Length Opposition in Hungarian Stop Consonants." *The Phonetician* 113: 6–23.

Neuberger, Tilda, Dorottya Gyarmathy, Tekla Etelka Gráczi, Viktória Horváth, Mária Gósy, and András Beke. 2014. "Development of a Large Spontaneous Speech Database of Agglutinative Hungarian Language." In *International Conference on Text, Speech, and Dialogue*, edited by Petr Sojka, Aleš Horák, Ivan Kopeček, and Karel Pala, 424–431. Cham: Springer.

O'Dell, M., and Zofia Malisz. 2016. "Perception of Geminates in Finnish and Polish." In *Proceedings of Speech Prosody 8.* 1109–1113. Boston.

Pickett, Emily R., Sheila E. Blumstein, and Martha W. Burton. 1999. "Effects of Speaking Rate on the Singleton/Geminate Consonant Contrast in Italian." *Phonetica* 56 (3–4): 135–157.

Pind, Jörgen 1999. "Speech Segment Durations and Quantity in Icelandic." *The Journal of the International Phonetic Association* 106 (2): 1045–1053.

Pycha, Anne. 2009. "Lengthened Affricates as a Test Case for the Phonetics-Phonology Interface." *Journal of the International Phonetic Association* 39(1): 1–31.

R Development Core Team 2019. *R: A Language and Environment for Statistical Computing.* Accessed November 10, 2021. https://www.r-project.org/

Ridouane, Rachid. 2010. "Geminates at the Junction of Phonetics and Phonology." *Laboratory Phonology* 10: 61–90.

Rojczyk, Arkadiusz, and Andrzej Poruczek. 2019. "Durational Properties of Polish Geminate Consonants." *The Journal of the Acoustical Society of America* 146 (6): 4171–4182.

Siptár, Péter, and Tekla Etelka Gráczi. 2014. "Degemination in Hungarian: Phonology or Phonetics?" *Acta Linguistica Hungarica* 61 (4): 443–471.

Oblique Relative Clauses in Italian Students with Developmental Dyslexia: Language Assessment and Syntactic Training

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Abstract: This study investigates the linguistic competence of 6 Italian-speaking high-school students with Developmental Dyslexia (DD) in comparison to a group of typically developing age peers. Language assessment was carried out using a sentence repetition task that included different types of complex movement-derived structures (left dislocation sentences with clitic pronouns, long-distance *wh*-questions, cleft sentences, and oblique relative clauses). Results showed that the group of DD participants performed lower than controls. All DD students were below the mean of the controls in more than one sentence type. In order to improve their linguistic competence, they were administered a syntactic training consisting in teaching explicitly the syntactic rules involved in the derivation of complex sentences, namely relative clauses. Replicating results of previous studies, training proved effective, and the participants showed improvement in the trained relative clauses and in untrained structures (clefts and *wh*-questions). Improvement was maintained over time.

Keywords: dyslexia; sentence repetition; syntactic training; relative clauses; complex syntax

1. Introduction

Dyslexia is a reading disorder. Children with Developmental Dyslexia (DD) fail to acquire age-appropriate reading skills despite normal intelligence, good instruction, and adequate learning opportunities. Individuals with dyslexia typically experience difficulties in reading, word recognition, spelling, writing, and pronouncing words. It is well-grounded that spoken language may be impaired as well. Indeed, as for lexicon and

vocabulary, individuals with dyslexia may struggle with accessing lexical information and rapid automatized naming speed (Jones et al. 2016), and they may have difficulties in mastering spoken vocabulary; as for the syntactic domain, children with dyslexia may manifest difficulties in oral comprehension and production of complex syntactic structures, in particular movement-derived constructions such as sentences containing clitic pronouns (Arosio et al. 2016; Vender et al. 2018), *wh*-questions (Guasti et al. 2015), cleft sentences (Pivi et al. 2016), and subject and object relative clauses (Arosio et al. 2017; Cardinaletti 2014; Pivi et al. 2016). In all these cases, an argument of the verb occupies a position different from the position in which it is interpreted. We exemplify this property here with an object relative clause:

(1) Il bambino   che   la mamma   sta baciando   <il bambino>
     the child   that   the mother   is kissing   <the child>

In individuals with dyslexia, the difficulties with relative clauses persist in adolescence and adulthood. Italian-speaking university students differ from their age-matched peers and are as accurate as younger typically developing adolescents in the oral comprehension of subject and object relatives (Cardinaletti and Volpato 2011, 2015). Adolescent high-school students make more errors than typically developing age-matched peers in the repetition and the production of oblique relative clauses (Piccoli 2018; Cardinaletti et al. 2022).

Through a spoken sentence repetition task, this study aims to investigate the knowledge of oblique relatives in comparison to other different types of syntactically complex structures containing long-distance dependencies (cleft sentences, long-distance *wh*-questions, left-dislocated sentences with resumptive clitic pronouns) in a larger group of Italian high-school students with and without DD, to determine whether adolescent students with dyslexia perform differently from age-matched peers without dyslexia. Then syntactic training was proposed to the participants with dyslexia to improve their language competence.

The paper is organised as follows: section 2 introduces the type of structures that were investigated in the repetition task, sections 3 and 4 present data on the acquisition of complex sentences, based on generative and usage-based approaches. Section 5 offers an overview on previous research on syntactic training. Section 6 presents the methodology and the test results at the group and the individual levels before training. In section 7, the training activities are described, and section 8 shows the post-training results. All results are discussed in section 9.

2.   The Investigated Structures

Different types of complex syntactic structures were investigated using a sentence repetition task: sentences with a left-dislocated object and a resumptive clitic pronoun (2),

long-distance *wh*-questions (3), contrastive cleft sentences (4), prepositional (5a) and genitive (5b) relative clauses.

(2) *La bambina,*   il signore   la   saluta   spesso   *<la bambina>*
     the child.FEM   the man   her.CL   greets often   <the child.FEM>
     "The child, the man greets her often."

(3) *Quale gallina* hai detto   che   *<quale gallina>* sgrida le papere?
     which hen   did you say that *<which hen>*   scolds the ducks

(4) È   *IL PINGUINO*   che le mucche fermano *<il pinguino>*
     it is   *THE PENGUIN*   that the cows   stop   *<the penguin>*

(5) (a) La bambina   lava   *il cane*   a cui/al quale *<cane>*
        the girl   washes   the dog   to whom <dog>
        il padrone   dà   i biscotti   *<a cui/al quale cane>*
        the owner   gives   the cookies   *<to the dog>*

     (b) Il maestro pettina la signora la cui *<signora>* figlia
        the teacher combs   the lady   whose <lady> daughter
        lavora
        works

All constructions are derived through the displacement of a sentence constituent to a position at the beginning of the sentence, namely the left-periphery (Rizzi 1997). A relationship is established between the displaced element and the thematic position in which it is interpreted.

In sentences with left dislocation (2), the object is pronounced at the beginning of the sentence, and a resumptive clitic pronoun is placed before the finite verb. The object and the clitic pronoun share same gender and number features.

Long *wh*-questions (3) involve long-distance movement of the *wh*-element out of embedded clauses (*quale gallina* in the example) to the left periphery of the sentence.

Cleft sentences (4) include a copular verb, a fronted discourse prominent phrase (the clefted (focused) constituent), and the embedded, cleft clause introduced by the complementizer *che* ('that'). Oblique relative clauses are formed through movement of the head of the relative (Kayne 1994) and 'pied-piping', namely the dative preposition (5a) or the whole noun phrase (5b) is displaced together with the relative pronoun.

A complexity hierarchy exists between the different structures with relative clauses being the most difficult. Relative clauses are then followed by clefts. *Wh*-questions and left dislocations are the simplest, with a comparable difficulty

degree. This hierarchy was suggested by Thompson et al. (2003) who proposed to participants with agrammatic aphasia a treatment approach aimed at training and improving the use of object *wh*-questions, object clefts, and relative clauses. Some participants were trained on *wh*-questions, and the other participants were trained on relative clauses. When relative clauses were treated, improvement was also observed in clefts and *wh*-questions. The reverse did not occur: clefts and relative clauses did not improve when *wh*-questions were trained. Thompson et al. (2003) proposed the Complexity Account of syntactic Treatment Efficacy in aphasia (CATE), namely, syntactic intervention focused on the most difficult structures (relative clauses) contributes to improving less complex sentences obtained by the same linguistic processes (clefts and *wh*-questions).

Complexity is also measured in terms of length of syntactic dependencies and/or number of displacements of an element from the position in which it is initially interpreted to the final position in which it is pronounced.

3. Acquisition and Development of Italian Complex Structures

In Italian, most structures are almost fully acquired when children enter primary school. However, some constructions may be acquired later.

Sentences containing clitic left dislocation are comprehended at the rate of 70% at around 5;7 years (Manetti et al. 2016). However, children are already able to produce clitic left dislocations at around 5 years (Manetti and Belletti 2017). In repetition tasks, accuracy in individuals between 11 and 14 years is above 90% (Del Puppo et al. 2018).

For long *wh*-questions, repetition accuracy is 95% for subject questions and 91% for object questions between 7;6 and 8;7 years. Between 11 and 14 years, it is very close to 100% (Del Puppo et al. 2018).

Cleft sentences are hardly produced by children when elicitation tasks are used. Indeed, at the age of 9;6, the rate of cleft sentences is very low (3%) (Del Puppo 2016). However, at the age of 7;5, the percentage noticeably increases in sentence repetition tasks, reaching a level of accuracy of 95%. Ceiling effects are observed between 11 and 14 years (Del Puppo et al. 2018).

Oblique relative clauses are acquired late by typically developing children. They are complex structures typical of the formal register and are acquired during school years through formal teaching and exposure to written texts (Guasti and Cardinaletti 2003; Piccoli 2018; Cardinaletti et al. 2022) addressed the issue of the acquisition of these constructions in Italian. Using an elicitation task, the authors assessed a group of children aged 5;2–10;1 and found that oblique relatives are acquired not earlier than 10 years of age. At this age, children have not yet learnt the complex system of relative pronouns and their syntax. In repetition tasks, accuracy is around 60% at the age of 13–14 years (Del Puppo et al. 2018). Both children and adults prefer more colloquial alternatives (Guasti and Cardinaletti 2003; Piccoli 2018) in which the relative clause

is introduced by the complementizer *che* 'that', and the goal argument is expressed by the clitic pronoun *gli* 'to-him' (6), or, more rarely, sentences typical of sloppy registers, where the goal argument is missing altogether (7).

(6) il bambino   che   il papà   gli   dà   un bacio
     the child   that the dad   him   gives   a kiss
     "the child that the dad gives him a kiss"

(7) il bambino   che   il papà   dà   un bacio
     the child   that the dad   gives   a kiss

In our study, we expect that relative clauses will be the most difficult structure compared to all the other structures, given the number of steps involved in their derivation and the late age at which they are acquired. Moreover, DD participants are expected to show more difficulties with sentences that are learnt through exposure to written texts.

4. The Acquisition of Complex Structures: A Usage-Based Approach

In addition to the analyses developed in the generative framework and presented above, the acquisition of complex sentences was analysed by Diessel and Tomasello (2005) by adopting a usage-based approach. In this study, English-speaking and German-speaking children (age: 4;3–4;9 years) were assessed in the repetition of different types of relative clauses: subject relatives (*The man who saw the farmer*), direct object relatives (*The cat that the dog chased*), indirect object relatives (*The girl who the boy gave his ball to*), oblique relatives (*the boy who the girl played with*), and genitive relatives (*the man whose cat caught a mouse*). Overall, subject relatives were the most accurate structures. When non-subject relatives were targeted, the participants turned the target sentence into a subject construction in most cases.

To account for their findings, the authors suggested that the acquisition of relative clauses is enabled by the frequency with which they occur in the language environment. Hence, frequent sentences, such as subject relatives, are learnt earlier than less frequent structures (non-subject relatives). Subject relatives are also more similar to simple non-embedded sentences and to some forms found in early child speech, like *That's doggy turn around*.

In sum, frequency, processing phenomena, and similarities among various structures contribute to explain the acquisition process. Subject relatives are more frequent and more similar to simple (non-embedded) sentences than object, oblique, and genitive relatives. The most complex relative clauses are less frequent in the language environment, are dissimilar to simple constructions, and involve a higher computational load, so that they are avoided even by adult speakers.

If this approach is correct, structures that conform to distributional patterns that are more frequent in the input will be more accurate than those for which exposure is lower.

5.   Explicit Syntactic Training

Syntactic training consists in explicitly teaching the syntactic rules involved in the derivation of some linguistic constructions. Over the years, these approaches proved to be effective with different populations, such as patients with agrammatic aphasia (Thompson et al. 1994, 2003, 2007), children with developmental language disorders (Ebbels and Van der Lely 2001; Levy and Friedmann 2009), deaf individuals (children with cochlear implants: D'Ortenzio et al. 2017; Benedetti 2018; D'Ortenzio 2019; D'Ortenzio et al. 2020; adult signers: Segala 2017), adolescent students with dyslexia (Piccoli 2018, Cardinaletti et al. 2022), and typically developing individuals with Italian as a second language (Bozzolan 2016; De Nichilo 2017; Volpato and Bozzolan 2017; Piccoli 2018; Volpato and De Nichilo 2020).

The above-mentioned studies were based on the teaching of verb argument structure, Theta Criterion (Chomsky 1981), and syntactic movement. The first step consisted in explaining verb argument structure, namely the fact that a verb requires a certain number of arguments to complete its meaning (e.g., the verb *break* requires two arguments). The second step consisted in explaining Thematic theory and the Theta Criterion, which requires that all and only the selected arguments are realised in the sentences. The thematic grid determines the semantic relationship between the verb and its arguments (e.g., the verb *break* assigns Agent and Theme roles, and therefore it must assign both roles in each sentence it appears in). The third step consisted in teaching syntactic movement, by explaining that in some sentences, an element may be pronounced in a position different from the one in which it is interpreted (< >). A chain (shown by the arrow in example (8) is created between the two positions.

(8)   Sto aggiustando   *il bicchiere*   che   mio fratello   ha rotto   *<il bicchiere>*
      I am repairing   *the glass*   that   my brother   broke   *<the glass>*

In addition to improved scores in the trained structures, the teaching of syntactic rules also provides generalisation effects to untrained structures derived by the same linguistic process (a.o., Thompson et al. 2003; Levy and Friedmann 2009; D'Ortenzio et al. 2020). Generalisation occurs to untrained structures that are less complex than the trained ones. For example, teaching activities focused on relative clauses can also improve the use of cleft sentences and *wh*-questions, but cleft sentences cannot improve after training *wh*-questions (see section 2).

6. Language Assessment
6.1 Participants
Sixty-seven Italian-speaking students attending a high school in the province of Verona (Italy) participated in this study. Sixty-one participants (age range: 14-20, mean age: 17;2; SD: 0.31) showed typical language development (TD) and 6 students (age range: 14-20, mean age:15;11; SD: 0.56) had a diagnosis of Developmental Dyslexia. No Developmental Language Disorder was diagnosed.

6.2 Materials and Methods
To assess language proficiency, the sentence repetition task developed by Del Puppo et al. (2016) was administered orally to all participants. The sentence repetition task consisted of 33 experimental sentences and 16 control sentences. The experimental sentences included: 6 left dislocations, 12 long-distance subject and object *wh*-questions, 6 clefts, 9 oblique relative clauses (including dative relatives with *cui* or *quale*[1], genitive relatives, and prepositional genitive relatives). The control sentences were simple sentences and were matched to the experimental ones by length (12 to 21 syllables).

The repetition task makes it possible to investigate different syntactic structures by using one and the same task (e.g., Szterman and Friedmann 2015), and it is effective to detect deficits in the syntactic language component. It involves a process of decoding, interpretation, and subsequent reproduction of the target sentence. Only those syntactic structures that are part of the language competence of an individual may be correctly repeated. Control sentences are useful to detect errors due to memory or attention (Szterman and Friedmann 2015). If experimental and control sentences of the same length are repeated inaccurately, the error would be ascribed to memory. Conversely, if the repetition of control sentences is accurate and the repetition of experimental sentences is not, the problem would lie in the syntactic complexity of the sentence.

The participants' productions were audio-recorded, transcribed, and double-checked by the first author and a colleague of hers.

6.3 Results
6.3.1 Group Analysis
In the sentence repetition task, only trials that were repeated verbatim were considered target sentences. Table 1 shows proportion (Mean) and standard deviation (SD) of target responses at the group level in the sentence repetition task.

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1 *Cui* is the non-agreeing relative pronoun, while *quale* agrees in number and gender with the antecedent.

	DD		TD	
	Mean	SD	Mean	SD
Left dislocations	0.89	0.17	1	0.06
wh-questions	0.89	0.09	0.97	0.07
Clefts	0.36	0.16	0.90	0.29
Oblique relative clauses	0.37	0.13	0.62	0.17
Control sentences	0.91	0.08	1	0

Table 1: proportion, and standard deviation (SD) of sentences that DD and TD group repeated verbatim

Following Dixon (2008) and Jaeger (2008), a repeated logistic regression analysis was carried out to analyse accuracy, using the statistical software R (R Development Core Team, 2018, R Version 4.0.1). Control sentences were at ceiling for typically developing students and almost at ceiling for the participants with dyslexia. Typically developing participants were at ceiling in left dislocations and almost at ceiling in long *wh*-questions. DD participants were less accurate than controls in these sentence types. Clefts and oblique relatives were the most problematic structures for both groups, especially for the DD participants. Within-group analyses showed that experimental sentences were significantly less accurate than control sentences (Wald Z=1.564, p<.001). This result suggests that the difficulties observed in the groups are not due to limited memory resources, but to the derivation of this type of structures. Clefts and oblique relative clauses were significantly less accurate than all the other structures for both groups, as shown in Table 2.

	DD		TD	
	Wald Z	p value	Wald Z	p value
Control sent.-Clefts	1.224	<.001	1.882	<.001
Control sent.-RCs	0.225	<.001	1.476	<.001
Left disl.-Clefts	2.930	<.001	1.347	<.001
Left disl.-RCs	5.497	<.001	6.823	<.001
WhQ-Clefts	2.800	.002	3.467	.003
WhQ-RCs	6.823	<.001	2.598	.01

Table 2: Z-values and p-values for the Sentence Type factor

The DD group performed significantly lower than the TD group, especially in the repetition of clefts and oblique relative clauses (Wald Z=1.456, Wald Z=1.788, p<.001 in both cases).

Table 3 shows the proportion and SD of target responses on oblique relatives.

	DD		TD	
	Mean	SD	Mean	SD
Dative relative clause with *cui*	0.50	0.55	0.75	0.45
Dative relative clause with *quale*	0.46	0.19	0.56	0.24
Genitive relative clause	0.42	0.20	0.88	0.23
Prepositional genitive relative clause	0.08	0.20	0.42	0.36

Table 3: Proportion (Mean) and standard deviation (SD) of oblique relative clauses that DD and TD group repeated verbatim

By analysing separately the different types of oblique relative clauses, it comes to light that for both groups, the most difficult structures were prepositional genitive relatives. This structure is particularly taxing for DD participants. TD participants were more accurate in the repetition of genitive relative clauses than dative relative clauses (p=.03). TD students showed higher percentages than the DD individuals in all oblique sentences. The level of accuracy of the DD group was much lower in genitive relatives and in prepositional genitive relatives (p<.001 in both cases).

6.3.2 Error Analysis
This section shows the most frequent errors in the repetition of the different structures.

When left dislocations were targeted (9a), some participants produced sentences with the clitic pronoun agreeing with the embedded subject (9b).

(9) (a) I leoni,   il pinguino   li   colpisce   forte
        the lions,   the penguin   them   hits   heavily
        "The lions, the penguin hits them heavily"

    (b) I leoni,   il pinguino   lo   colpisce   forte
        the lions,   the penguin   it   hits   heavily
        "The lions, the penguin hits it heavily"

The most frequent error in the repetition of target subject (10a) and object (11a) *wh-* questions was the production of object questions in place of subject questions (10b) and subject questions instead of object questions (11b).

(10) (a) Quale persona   hai detto   che   saluta   i ragazzi?
         which person   did you say   that   greets   the boys

     (b) Quale persona   hai detto   che   salutano   i ragazzi?
         which person   did you say   that   greet   the boys
         "Which person did you say that the boys greet?"

(11) (a) Quale gallina   hai detto   che   sgridano   le papere?
       which hen   did you say   that   scold   the ducks
       "Which hen did you say that the ducks scold?"

     (b) Quale gallina   hai detto   che   sgrida   le papere?
       which hen   did you say   that   scolds   the ducks

When contrastive clefts were targeted (12a), the only error consisted in the production of the incorrect prosody (lack of focus on the dislocated argument) (12b).

(12) (a) è   IL PINGUINO   che   le mucche   fermano
       it is   THE PENGUIN   that   the cows   stop

     (b) è   il pinguino   che   le mucche   fermano
       it is   the penguin   that   the cows   stop

When dative relatives with *cui* were targeted (13a), some participants produced ungrammatical genitive relatives (13b).

(13) (a) La bambina   lava   il cane   a cui   il padrone   dà
       the girl   washes   the dog   to whom   the master   gives
       i biscotti
       the biscuits

     (b) La bambina   lava   il cane   il cui padrone   dà   i biscotti

       the girl   washes   the dog   the whose master   gives   the biscuits
       "The girl washes the dog whose master gives the biscuits"

When dative relatives with *quale* were required (14a), some students produced sentences with incorrect number agreement on the determiner and the relative pronoun (14b).

(14) (a) Il cane   morde   i ragazzi   ai quali   il nonno
       the dog   bites   the boys   to.the whom.PL   the granddad
       compra   il gelato
       buys   the ice cream
       "The dog bites the boys to whom the granddad buys the ice cream."

(b) Il cane   morde   i ragazzi   al quale   il nonno
    the dog   bites   the boys   to.the whom.sg   the granddad
    compra   il gelato
    buys   the ice cream

When genitive relative clauses were targeted (15a), the participants produced ungrammatical sentences by substituting the pronoun *quale* for *cui* (15b).

(15) (a) Il postino   saluta   la signora   il cui figlio   disegna
         the postman   greets   the lady   the whose son   draws
         "The postman greets the lady whose son draws."

     (b) Il postino   saluta   la signora   il quale figlio   disegna
         the postman   greets   the lady   the which son   draws

When prepositional genitive relatives were targeted (16a), some participants produced ungrammatical dative relatives with *cui* (16b).

(16) (a) La mamma   bacia   la bambina   al cui fratello   piacciono
         the mother   kisses   the girl   to.the whose brother   "please"
         le tigri
         the tigers
         "The mother kisses the girl whose brother like the tigers"

     (b) La mamma   bacia   la bambina   a cui   il fratello   piacciono
         the mother   kisses   the girl   to whom   the brother   "please"
         le tigri
         the tigers

6.3.3 Individual Analysis

Individual performance was also examined calculating how many standard deviations each participant was away from the mean of the group of TD students. Table 4 shows the z-scores for each DD student for each structure.

	DD1	DD2	DD3	DD4	DD5	DD6
Left dislocations	-	**-5.75**	**-5.75**	-	-	-
wh-questions	**-1.56**	0.28	**-3.68**	-0.28	**-3.68**	**-3.68**
Clefts	**-4.38**	**-3.39**	**-3.39**	**-3.39**	-1.40	-1.40
Oblique relative clauses	-0.79	-0.79	-0.30	**-1.78**	**-1.78**	**-1.78**

Table 4. Individual performance (z-scores) of students with DD compared to TD peers

Four DD participants were below the mean of TD peers in the repetition of *wh*-questions, four of them were below in clefts, and two were below in left dislocation sentences. Although the TD group showed low accuracy in the repetition of oblique relatives, three students with DD performed below them also in this sentence structure.

7. Syntactic Training

In this study, the training given to six participants with DD focused on (complex) relative clauses and was inspired by previous research. The aim was to investigate whether explicit teaching of the syntactic rules involved in the derivation of relative clauses is effective in improving syntactic skills in adolescents with DD. Only relative clauses were trained in order to investigate whether untrained structures would also improve after training.

Syntactic training consisted in explicitly teaching verb argument structure, thematic theory, and syntactic movement, in order to turn implicit knowledge into explicit knowledge. To explain verb argument structure, the students were shown three pictures and asked to describe them with a sentence, and to discuss the link between each verb and its arguments. These syntactic rules were explained using the metaphor of a film cast: the verb is like a film director, while its arguments are represented by his staff: make-up artists, film makers, actors, and dancers. The director is the person who decides the number of people who are part of the cast and their role in the production of the film. In the same way, the verb selects the number and the type of arguments needed to derive a grammatical sentence.

Movement was taught using coloured cards on which the different elements of the sentence were reported (Figure 1). Cards were used to show participants that movement-derived sentences are created by the movement of elements from one position to another in the sentence.

Figure 1 illustrates the derivation of an object relative. Before movement, the agent is in its canonical position before the verb, and the theme occurs after the verb.

Figure 1: Derivation of an object relative

Then, the object moves to a position to the left leaving a trace behind (marked by T). The trace is connected to the moved phrase through a "chain", represented here by the phone charger. The same procedure was used for oblique relatives (Figure 2).

Figure 2: Derivation of a prepositional relative

Different types of relative clauses were trained (subject, object, and oblique relatives).

The syntactic training lasted less than two months and consisted of 11 to 13 sessions each lasting 90 minutes. All students were also assessed during follow-up sessions: two students after 6 months, three after 9 months, and one after 12 months.

8. Comparison of Pre- and Post-Training Results

Table 5 shows accuracy at the group level for DD before and after training in the different sentence types. After training, repetition was assessed twice, immediately after the end of the training and some months later in follow-up sessions.

	Before training		After training		Follow-up	
	Mean	SD	Mean	SD	Mean	SD
Left dislocations	0.89	0.17	0.97	0.07	1	0
wh-questions	0.89	0.09	1	0	0.97	0.07
Clefts	0.36	0.16	0.83	0.11	0.89	0.09
Oblique relative clauses	0.37	0.13	0.87	0.05	0.88	0.07

Table 5. Group performance (proportion of target responses and SD) of DD students before, after training, and in the follow-up sessions.

Immediately after the training, the six students with dyslexia showed improved performance in all structures. Improvement was maintained over time several months after the intervention was finished.

Table 6 shows individual performance. We compare the z-scores of the participants before and after syntactic training.

	Before training	After training	Follow-up
DD1	-4.16	1.86	0.84
DD2	-4.47	-0.64	0.43
DD3	-4.21	1.02	1.24
DD4	-4.21	-0.41	0.84
DD5	-3.50	0.20	0.84
DD6	-3.22	0.61	0.84

Table 6. Individual performance (z-scores) of students with DD before and after training

Before training, all participants with dyslexia were more than 3 standard deviations below the mean of the controls. Immediately after the training and in the follow-up sessions, the scores of all participants were within the normal range.

9. Discussion

In this study, we assessed the linguistic competence of a group of high-school students with dyslexia using a sentence repetition task to determine whether they display difficulties with complex syntactic structures. The difficulties were not found with all sentence types, most students with dyslexia behaved comparably to their age-matched peers in left dislocations, where a constituent of the clause occupies a sentence-initial position and a resumptive clitic pronoun is placed before the verb. Students with dyslexia repeated fewer long *wh*-questions than their peers. Still, long *wh*-questions are repeated more accurately than clefts and oblique relative clauses.

Diessel and Tomasello (2005) explained the difficulties of young children with relative clauses, claiming that frequency in the input shapes children's early linguistic knowledge. Oblique relatives are less frequent and, for this reason, they are avoided. Although (Italian) oblique relatives are typical of formal (written) registers and are less frequent in colloquial speech, low frequency of a structure cannot be the (only) reason for the difficulties that the participants in our study display. The level of accuracy of cleft sentences, which are frequent in the colloquial speech, was also low. Some errors were also found in the repetition of subject *wh*-question, which are more frequent than object *wh*-questions, and are fully acquired at adolescence age. A usage-based approach cannot explain our data also when considering the participants' errors. The children in Diessel and Tomasello's study were claimed to simplify the structure producing sentences that adhere to frequent patterns in which the first NP is the agent. In our study, the main error in oblique relatives consisted in replacing the non-agreeing relative pronoun *cui* with the agreeing (less frequent and more complex) relative pronoun *quale*, without modifying word order. The only error in the repetition of clefts was the incorrect prosody, regardless of the type of clefts investigated (subject or object).

We investigated whether DD participants' difficulties can be attributed to memory deficits. Individuals with learning difficulties may have reduced memory skills

(Stanford et al. 2019, Stanford and Delage 2019). We did not assess memory directly, but we used control sentences to disentangle difficulties with syntax and deficits in memory skills, as control sentences have the same number of syllables as experimental sentences. Since control sentences were not problematic for students with dyslexia, we conclude that the (complex) syntactic properties of the experimental constructions caused the low-level accuracy in the task. Oblique relatives were taxing for both groups, and the most difficult structure for both groups was prepositional genitive relative clauses (8% for DD and 42% for TD). The difficulty depends on the syntactic complexity of this sentence type, namely the presence of a larger number of syntactic derivational steps than in the other structures, in addition to pied piping of the relative pronoun together with both a preposition and a DP. Once again, frequency cannot be the reason for the errors found, as all types of oblique relatives included in the task are typical of the formal register and rarely used in colloquial speech.

In addition to the language assessment, we proposed syntactic training activities to the group of adolescent students with dyslexia, following previous studies on the enhancement of language skills in populations with typical and atypical language development. Before training, the participants showed difficulties with some complex structures derived by syntactic movement. All participants were below the mean of the controls in more than one construction. After training, the level of accuracy noticeably improved.

The explicit syntactic training consisted in teaching verb argument structure, the Theta Criterion and syntactic movement involved in the derivation of relative clauses. Only relative clauses were trained. After training, performance also improved in structures that were not trained, namely clefts and *wh*-questions. The DD students were below the mean of the TD group before training; after training, their performance was within normal range. These results are expected since relative clauses are more complex than clefts and *wh*-questions and are derived by the same type of movement. The effectiveness of syntactic training is further confirmed by the fact that improvement was maintained some months after the end of the training.

10. Conclusion

In this paper, we investigated the repetition of movement-derived constructions in Italian high-school students with and without dyslexia.

Results showed that the acquisition of oblique relatives is still in progress during school years for all students. Results also showed that a complexity hierarchy exists in the use of the different complex structures, among which oblique relatives were the most demanding. This is probably due to the fact that they are constructions of the formal register which are acquired very late, at school and via reading. However, the type of register alone cannot explain our results since cleft sentences, which are also used in colloquial speech, proved demanding especially for DD participants. Prepositional genitive relatives are the most demanding constructions because of complex pied

piping and a high number of steps involved in their derivation. The six DD participants were administered syntactic training activities focusing on the most complex structures, namely relative clauses. Their accuracy scores in the repetition of this construction increased noticeably after training. Furthermore, their performance also improved in untrained structures, namely clefts and *wh*-questions. These generalisation effects were observed in similar syntactic treatments administered to other populations and show that training of the most complex structures generalises over less complex structures of the same syntactic type.

Works Cited

Arosio, Fabrizio, Elena Pagliarini, Maria Perugini, Lina Barbieri, and Maria Teresa Guasti. 2016. "Morphosyntax and Logical Abilities in Italian Poor Readers: The Problem of SLI Under-Identification." *First Language* 36 (3): 295–315.

Arosio, Fabrizio, Francesca Panzeri, Bruna Molteni, Santina Magazù, and Maria Teresa Guasti. 2017. "The Comprehension of Italian Relative Clauses in Poor Readers and in Children with Specific Language Impairment." *Glossa* 2(1): 1–25.

Benedetti, Viola. 2018. "Tentativo di Riabilitazione di un Soggetto Affetto da Ipoacusia Neurosensoriale Portatore di Impianto Cocleare Bilaterale. Proposta di Insegnamento Esplicito del Sistema Pronominale Italiano." Unpublished MA Thesis, Ca' Foscari University of Venice.

Bozzolan, Giulia. 2016. "Explicit Syntactic Treatment of Relative and Passive Constructions: A Case Study on a Sequential Bilingual Romanian- and Italian-speaking Child." Unpublished MA Thesis, Ca' Foscari University of Venice.

Cardinaletti, Anna. 2014. "La Linguistica per la Comprensione della Dislessia: alcuni Test di Produzione Orale." In *Dislessia e Apprendimento delle Lingue: Aspetti Linguistici, Clinici e Normativi*, edited by A. Cardinaletti, E. Ghidoni, E. Genovese, G. Guaraldi, and F. Santulli, 51–68. Trento: Edizioni Centro Studi Erickson.

Cardinaletti, Anna, Elisa Piccoli, and Francesca Volpato. 2022. "Dyslexia and Syntactic Deficits: Overview and a Case Study of Language Training of Relative Clauses." In *A Linguistic Approach to the Study of Dyslexia*, edited by Giorgia Cappelli and Sabrina Noccetti. Bristol: Multilingual Matters.

Cardinaletti, Anna, and Francesca Volpato. 2011. "L'Analisi Linguistica per la Comprensione dei DSA." In *Quaderni di Scienze del Linguaggio*, edited by F. Santulli, 65–87. Milano: Arcipelago Edizioni.

Cardinaletti, Anna, and Francesca Volpato. 2015. "On the Comprehension and Production of Passive Sentences and Relative Clauses by Italian University Students with Dyslexia." In *Structures, Strategies and Beyond: Studies in Honour of Adriana Belletti*, edited by E. Di Domenico, C. Hamann, and S. Matteini, 223–279. Amsterdam: John Benjamins.

Chomsky, Noam. 1981. "Knowledge of Language: Its Elements and Origins." *Philosophical Transactions of the Royal Society B: Biological Sciences* 295: 223–234.

Del Puppo, Giorgia. 2016. "On the Acquisition of Focus: Elicited Production of Cleft Sentences and *Wh*-Questions by School-Aged, Italian-Speaking Children." Unpublished Ph.D. Thesis, Ca' Foscari University of Venice.

Del Puppo, Giorgia, Selene Grasso, and Francesca Volpato. 2018. "Exploring Some Morphosyntactic Abilities in Children and Adolescents with Dyslexia: Evidence from a Repetition Task." Talk Given at the Conference on Developmental Language Disorders, Madrid, September 26–28.

Del Puppo, Giorgia, Francesca Volpato, Roberto Padovani, Paola Zavattiero, and Anita Lusuardi. 2016. "Valutare la Competenza Sintattica di Bambini con Disturbo Specifico del Linguaggio." Poster presented at the Conference CLASTA VII (Communication and Language Acquisition Studies in Typical and Atypical Populations), Calambrone, Pisa, Italy, May 29–30.

De Nichilo, Alessandra. 2017. "Insegnamento Esplicito delle Strutture Sintattiche a Movimento: Pronomi Clitici, Frasi Passive e Frasi Relative in uno Studente Bengalese con Italiano L2." Unpublished Master Thesis, Ca' Foscari University of Venice.

Diessel, Holger, and Michael Tomasello. 2005. "A New Look at the Acquisition of Relative Clauses." *Language* 81(4): 882–906.

Dixon, Peter. 2008. "Models of Accuracy in Repeated-Measures Designs." *Journal of Memory and Language* 59(4): 447–456.

D'Ortenzio, Silvia. 2019. "Analysis and Treatment of Movement-Derived Structures in Italian-Speaking Cochlear Implanted Children." Unpublished Ph.D. Thesis, Ca' Foscari University of Venice.

D'Ortenzio, Silvia, Silvia Montino, Alessandro Martini, and Francesca Volpato. 2017. "Il Trattamento delle Frasi Relative in un Bambino Sordo Portatore di Impianto Cocleare." In *Lingua e Patologia. Le Frontiere Interdisciplinari del Linguaggio*, edited by F. Dovetto, 271–283. Canterano (Roma): Aracne Editrice.

D'Ortenzio, Silvia, Silvia Montino, Alessandro Martini, Patrizia Trevisi, and Francesca Volpato. 2020. "A Syntactically Based Treatment of Relative Clauses: Three Case Studies of Italian Children with Cochlear Implant." In *Typical and Impaired Processing in Morphosyntax*, edited by V. Torrens, 177–207. Amsterdam: Benjamins.

Ebbels, Susan, and Heather K.J. Van der Lely. 2001. "Metasyntactic Therapy Using Visual Coding for Children with Severe Persistent SLI." *International Journal of Language and Communication Disorder* 36: 345–350.

Guasti, Maria Teresa, Chiara Branchini, Marta Vernice, Lisa Barbieri, and Fabrizio Arosio. 2015. "Language Disorders in Children with Developmental Dyslexia." In *Specific Language Impairment. Current Trends in Research*, edited by Stavroula Stavrakaki, 35–55. Amsterdam: John Benjamins.

Guasti, Maria Teresa, and Anna Cardinaletti. 2003. "Relative Clause Formation in Romance Child's Production." *Probus* 15 (1): 47–89.

Jaeger, Florian T. 2008. "Categorical Data Analysis: Away from ANOVAs (Transformation or not) and towards Logit Mixed Models." *Journal of Memory and Language* 59 (4): 434–446.

Jones, Manon W., Margareth J. Snowling, and Kristina Moll. 2016. "What Automaticity Deficit? Activation of Lexical Information by Readers with Dyslexia in a RAN Stroop-Switch Task." *Journal of Experimental Psychology: Learning, Memory and Cognition* 42 (3): 465–474.

Kayne, Richard S. 1994. The Antisymmetry of Syntax. Cambridge, MA: MIT Press.

Levy, Hagar, and Naama Friedmann. 2009. "Treatment of Syntactic Movement in Syntactic SLI: A Case Study." *First language* 29: 15–50.

Manetti, Claudia and Adriana Belletti. 2017. "The Production of Clitic Left Dislocations by Italian-Speaking Children and the Role of Intervention". In *Proceedings of the 41st Annual Boston University Conference on Language Development*, edited by Maria LaMendola and Jennifer Scott, 443–451. Somerville, MA: Cascadilla Press.

Manetti, Claudia, Vincenzo Moscati, Luigi Rizzi, and Adriana Belletti. 2016. "The Role of Number and Gender Features in the Comprehension of Italian Clitic Left Dislocations." In *Proceedings of the 40th Annual Boston University Conference on Language Development*, edited by Jennifer Scott and Deb Waughtal, 229–240. Somerville MA: Cascadilla Press.

Piccoli, Elisa. 2018. "Ripetizione e Produzione di Frasi Complesse in Studenti Adolescenti con DSA e Bilingui. Un Protocollo di Insegnamento Esplicito." Unpublished Master Thesis, Ca' Foscari University of Venice.

Pivi, Margherita, Giorgia Del Puppo, and Anna Cardinaletti. 2016. "The Elicited Oral Production of Italian Restrictive Relative Clauses and Cleft Sentences in Typically Developing Children and Children with Developmental Dyslexia." In Acquisition of Romance Languages edited by P. Guijarro-Fuentes, M. Juan-Garau, and P. Larrañaga, 231–261. Berlin: De Gruyter Mouton.

Rizzi, Luigi. 1997. "The Fine Structure of the Left Periphery." In *Elements of Grammar*, edited by L. Haegeman, 281–337. Berlin: Springer.

Segala, Irene. 2017. "Linguistic Treatment of Relative Clauses in an Adult Deaf LIS Signer: A Case Study." Unpublished Master Thesis, Ca' Foscari University of Venice.

Stanford, Emily, and Hélène Delage. 2019. "Complex Syntax and Working Memory in Children with Specific Learning Difficulties." *First Language* 40 (4): 411–436.

Stanford, Emily, Stephanie Durrleman, and Hélène Delage. 2019. "The Effect of Working Memory Training on a Clinical Marker of French-Speaking Children With Developmental Language Disorder." *American Journal of Speech-Language Pathology* 28 (4): 1388–1410.

Szterman, Ronit, and Naama Friedmann. 2015. "Insights into the Syntactic Deficit of Children with Hearing Impairment from a Sentence Repetition Task." In *Language Acquisition and Development*, edited by Cornelia Hamann, and Edgar Ruigendijk, 492–505. Newcastle upon Tyne: Cambridge Scholars Publishing.

Thompson, Cynthia K., and Lewis P. Shapiro. 1994. "A Linguistic–Specific Approach to Treatment of sentence production deficits in aphasia." *Clinical Aphasiology* 22: 307–323.

Thompson, Cynthia K., and Lewis P. Shapiro. 2007. "Complexity in Treatment of Syntactic Deficits." *American Journal of Speech-Language Pathology* 16 (1): 30–42.

Thompson, Cynthia K., Lewis P. Shapiro, Swati Kiran, and Jana Sobecks. 2003. "The Role of Syntactic Complexity in Treatment of Sentence Deficits in Agrammatic Aphasia: The Complexity Account of Treatment Efficacy (CATE)." *Journal of Speech, Language, and Hearing Research* 46: 591–607.

Vender, Maria, Shenai Hu, Federica Mantione, Denis Delfitto, and Chiara Melloni. 2018. "The Production of Clitic Pronouns: A Study on Bilingual and Monolingual Dyslexic Children." *Frontiers in Psychology* 9: Article 2301.

Volpato, Francesca, and Giulia Bozzolan. 2016. "Explicit Teaching of Syntactic Movement in Passive Sentences and Relative Clauses: The Case of a Romanian/Italian Sequential Bilingual Child." Annali di Ca' Foscari – Serie Occidentale 51: 357–381.

Volpato, Francesca, and Alessandra De Nichilo. 2020. "Multimodalità e Multimedialità in un Intervento Didattico sull'Italiano L2 a Scuola: il Caso di uno Studente Bengalese." In *Orale e Scritto, Verbale e non Verbale: la Multimodalità nell'Ora di Lezione*, edited by M. Voghera, P. Maturi, and F. Rosi, 69–84. Firenze: Franco Cesati Editore.

Phonetic Effects of Language Co-Activation in Bilingual Speech Production

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Abstract: Increased language co-activation during speech production in the bilingual mode is known to have impact on phonetic realization of speech segments. The short-term cross-language phonetic interference has been researched with code-switching or language-switching paradigms in different types of bilinguals. Our study compares phonetic effects of switching elicited in both paradigms from one group of non-immersion L1-Czech L2-English bilinguals who are highly proficient and frequent users of the L2. In two data-collection sessions, we manipulated the degree of language activation, once biasing it toward L1, once toward L2, and measured the impact of switching in the more activated language, focusing on the voice onset time (VOT) of /k/. We document significant shifts in VOT of /k/ induced by switching from the less into the more activated language. We observed the same degree of VOT shifts in the code-switching task and the language-switching task. The phonetic switch cost was symmetrical, affecting both L2 and L1.

Keywords: bilingual speech; cross-language influence; code switching; picture-cued naming; VOT

1. Introduction

This paper describes a study on bilinguals producing speech in the bilingual mode (Grosjean 2008). Specifically, it focuses on bilingual speakers switching between their languages within a short span of time and on the effect that such switching may have on their pronunciation. It considers the speakers' control of their phonetic production in the light of their specific bilingual experience.

The bilingual language experience shapes the speaker's knowledge of their languages as well as language processing. Greatly varied language learning experiences result in different bilinguals processing language differently (Luk and Bialystok 2013, Bonfieni et al. 2019). The bilingual speakers in this study have a specific type of language experience: they are foreign language learners who have reached high levels of proficiency in an additional language through formal learning in a classroom, i.e. without the benefit of immersion in an L2 community. The study was set up to explore their ability to switch rapidly between their languages in the course of a single speaking task. The participants performed two speech production tasks involving both their first language (L1) Czech and their second language (L2) English. The aim was to find out whether L1-L2 co-activation has phonetic consequences on speech production in the two languages.

1.1 Cross-Language Phonological and Phonetic Influences

The question of how phonologies of a bilingual's languages interact has been investigated extensively over decades to shed light on long-term crosslinguistic interference, albeit mainly with immersed learner populations. It is understood that cross-language interactions of L1 and L2 shape a bilingual's long-term phonological representations in both their languages. L2 phonology research explains how one's L1 (and other previously acquired languages) constrains the developing knowledge of L2 sounds, hypothesizing about memory representations of L2 and L1 sound categories utilized in production and perception and about the formation of non-native contrasts. The best-tested sound-learning models that have been developed to account for the patterns of cross-language influence include the Speech Learning Model, SLM, (Flege 1995, Flege and Bohn 2021), the Perceptual Assimilation Model of Second Language Speech Learning, PAM-L2 (Best and Tyler 2007, Tyler 2019), Native Language Magnet Model (Iverson and Kuhl 1995), and the Second Language Linguistic Perception model (Escudero 2005, van Leussen and Escudero 2015). They all assume precedence of perceptual learning and make specific predictions about L2 learners' perception and encoding of L2 speech sounds and forming new phonological representations. They provide explanatory mechanisms, such as perceptual assimilation (PAM-L2), which explains how L2 learners' assimilation of non-native speech sounds to their native categories may result in their failure to distinguish second-language phoneme contrasts (Best and Tyler 2007). At the same time, the models account for changes in learners' native phonetic categories under the influence of similar L2 speech sounds (e.g. Flege 1995).

More recently, L2 speech studies have also been researching cross-linguistic phonological/phonetic interactions of a bilingual's languages in a dynamic sense: as short-term, transient effects arising at the moment of speaking (see Šimáčková and Podlipský 2018 for a review). The immediate dynamic influences have been tested and documented in data elicited via psycholinguistic language-switching experiments. Typically, these

experiments use a cued picture-naming task in which participants are prompted to switch between their languages as they name objects that appear on a computer screen. Cross-language sound interactions have also been explored via code-switching paradigms. Code switching, an activity bilinguals engage in naturally, involves going from one language into the other within one utterance as shown in the title of a classic paper on code-switching: "Sometimes I'll start a sentence in Spanish *y termino en español*" (Poplack 2000). Phonetic effects induced by code switching have been explored in spoken corpora but also tested experimentally. In addition to language-switching and code-switching experimental paradigms, relevant data also come from single-language experiments involving cognates, words that have the same or similar meaning and phonological form in both languages. Such phonological and semantic overlapping also induces language co-activation and leads to momentarily augmented cross-language phonetic interference (Amengual 2012).

The current study too is concerned with the short-term cross-language phonetic interactions arising in the course of a speech task that puts bilingual speakers into the bilingual processing mode (Grosjean 2008). Language mode refers to the "state of activation of the bilingual's languages and language processing mechanisms at a given point in time" (Grosjean 2001**,** 3). Depending on the situational context, language activation varies on a continuum between two endpoints. In some conversations it may be efficient for only one language to be active (monolingual mode)[1] while conversations between bilinguals may require high activation of two languages (bilingual mode). Language co-activation during processing in the bilingual mode means that the target language produced or perceived at a given moment may be influenced by the active non-target language. Phonetic effects of these cross-language interactions are explored in two tasks – a code-switching (CS) task and a language-switching (LS) task. We draw on the finding that in CS, with both languages used within a single utterance, phonetic effects are greatest in words appearing immediately before the switch from one language into the other (see 1.3). In other words, pronunciation of the pre-switch word shifts in anticipation of what is coming next (Olson 2013, Bullock et al. 2006, Fricke et al. 2016). However, speech planning cannot explain phonetic effects found in LS cued picture-naming tasks, in which there is no look-ahead as new picture-and-language cues are given only after the previous word has been uttered. Based on data from a LS picture-naming task and a CS reading task collected from one group of participants, this study examines the influence of task on phonetic cross-language interaction, comparing the anticipatory and carry-over phonetic interference. To our knowledge, phonetic effects of language co-activation have not been tested with the same bilinguals for both code- and language-switching tasks.

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1   Abundant psycholinguistic evidence shows that the non-target language is always somewhat activated when a bilingual processes language (e.g., Thierry and Wu 2008; Costa, Caramazza, and Sebastian-Galles 2000).

In the rest of this section, we are first going to outline the basic features of the LS and CS paradigms used in previous studies that we draw on and then we formulate our research questions.

1.2 Language Switching in a Cued Picture-Naming Task

In a typical cued picture-naming task, participants are presented with a series of pictures on a computer screen. On each trial they are to name the object represented in the picture as fast as possible. For example, an English-Spanish bilingual may be shown a picture of a small round container with a handle. Simultaneously with the picture a cue to the language is presented, e.g. a flag, a coloured frame or background, which indicates to the participant whether they should respond with the English (*cup*) or the Spanish word (*taza*). Some trials are so-called 'switch trials': they involve naming a picture after the previous picture has been named in the other language of the experiment, e.g. a participant is prompted to respond with Spanish *taza* after they had previously produced a word in English. On a 'stay trial', a participant would be saying *taza* after they have just produced another Spanish word. Responses to switch trials are then compared with responses to stay trials. In studies researching cross-language phonetic interference the focus is on realization of individual sounds, frequently (though not always, cf. Simonet 2014) on the voice onset time (VOT) of voiceless stops.

Phonetic effects due to switching, specifically VOT shifts on switch trials vs stay trials, have been documented in Olson (2013). Two aspects of Olson's results are important. First, the effect of switching was present when the amount of switching was minimal and the bilinguals spoke mainly in one language, pronouncing only 5% of the words in the other language. Second, the observed cross-language phonetic interaction was unidirectional: only switching from bilinguals' non-dominant L2 into their dominant L1 induced changes in VOT of voiceless stops; specifically, Spanish-dominant bilinguals produced longer, more English-like VOT in Spanish, and English-dominant bilinguals shortened their VOT in English. Olson observed that the phonetic influence of the bilingual's weaker language on their stronger language paralleled findings of asymmetrical switch costs in naming studies of bilingual lexical access. He argued for a similar general mechanism to work at the phonetic and lexical levels, namely inhibitory control (Green 1998). Green's inhibitory control is a mechanism for resolving between-language competition during non-selective lexical retrieval by inhibiting activation of the non-target language item. In this account, the degree of inhibition is proportionate to the degree of activation of the non-target competitor. Consequently, when speaking in their weaker L2, non-balanced bilinguals need to inhibit the highly activated non-target items in their dominant L1 more strongly. Occasional switching from L2 into L1 then requires overcoming the strong inhibition, which incurs a cost. According to Olson, this cost is observable not only as a longer lexical retrieval but also as a greater L2-to-L1 phonetic interference. On the other hand, speaking in L1

does not require the same high level of L2 inhibition and switching into L2 does not lead to comparable cost. Goldric and colleagues (2014) also reported effects of switching on VOT but observed the dominant L1 influencing the non-dominant L2. Such asymmetry is not consistent with the inhibition account proposed by Olson. One difference between the two studies was the language bias in the experimental tasks. Olson (2013) observed the phonetic influence of L2 on L1 switch words in a task that was heavily biased towards L2. In contrast, Goldrick et al.'s task was balanced with half the words in each language. It would appear then that when the level of overall activation of L1 and L2 is similar during a naming task, the phonological processing of L2 switch words reflects the influence of L1 but L1 switch words are unaffected by the L2, as the equally-often used L1 is not so strongly inhibited.

In the current study, like in Olson (2013), the proportion of dominant L1 and non-dominant L2 (and hence the degree of activation of L1 and L2) is manipulated. In one condition, the naming task is biased towards the L1 Czech and in another towards the L2 English. Crucially, unlike in Olson's (2013) study, the cross-language impact on VOT is tested when bilinguals *switch back* into the primary language of the task after producing words in the other, less represented, secondary language. Or, to put it other way round, the base language, i.e. the language that the participants *switch from*, is the secondary language of the task. We assume that the proportion of the primary and the secondary language in the task affects their relative activation and that the task-primary language is more strongly activated throughout the experimental situation. Consequently, because we consider switches into the task-primary language, rather than the task-secondary language as in Olson's (2013) design, we should not observe the L1-L2 asymmetry in the phonetic switch cost found by Olson (2013). It is an open question to what degree the phonetic quality of speech sounds in the primary language of the task (L1 or L2) may be influenced by a brief activation of the other language.

1.3 Experimental Code-Switching

Eliciting code switching in a controlled experimental setting often involves a reading task. For example, in a frequently cited study of bilingual pronunciation by Bullock et al. (2006), Spanish-English bilinguals were asked to read out loud bi-language sentences in which, halfway through, the speaker had to switch from one language into the other, e.g. "The typhoon damaged techos y paredes." or "Todos mis amigos talked Spanish as kids." The target sounds were again voiceless stops in both English and Spanish words, i.e. in our example the /t/ in *typhoon*, *techos* "roofs", *todos* "all", and *talked*, /p/ in *paredes* "walls" and /k/ in *kids*. The stop sounds appeared in three positions with respect to the switch, /t/ in *techos* and *talked* occur in the switch words, /t/ in *typhoon* and *todos* are in the pre-switch position, /p/ and /k/ in *paredes* and *kids* appear after the switch. The VOT in the bi-language sentences was compared to VOT in sentences pronounced in a single language. Bullock and colleagues found that code

switching led to momentary shifts in VOT in the switch and, most markedly, in the pre-switch positions. The authors proposed that this anticipatory effect is the result of planning: thinking of what to say next has an influence on the currently articulated word. Following up on Bullock et al. (2006), we place the target words in our CS experiment in the position *before the switch*.

In some CS studies, the degree of language co-activation is manipulated. Olson (2016) varied the language mode by using contextualizing texts whose final sentences contained a p/t/k-initial target word. The target word was either in the same language as the rest of the text (minimal language co-activation), or it was the only code-switch in an otherwise monolingual text (unbalanced/disproportionate co-activation), or it was preceded by several code-switches in a language-balanced bilingual text (equivalent high activation of both languages). While CS had an impact on VOT, adjusting the language context did not confirm the prediction of cumulative cross-language influence on VOT in the language-balanced context compared to monolingual texts with a single switch. In our study, the proportion of languages in the CS reading task is manipulated to match the LS naming task. This is important, as in our study both the CS and the LS task are administered to the same participants, and we make direct between-task comparisons. In one condition, the CS task is biased towards the dominant L1, in the other towards the non-dominant L2. The focus is on VOT realization in the primary language of the task, which in the CS task is the base language, i.e. the language that participants switch from. We ask whether VOT in the pre-switch words show influence of anticipatory interference.

1.4 Research Questions

Whether cross-language phonetic effects appear at all, their magnitude, in which direction the influence between languages flows – all that depends on factors related to the bilinguals' linguistic background. This includes the questions of which language was learned first (Antoniou et al. 2011), which is the bilingual's stronger, dominant language (Olson 2013, Amengual 2018), and whether they learned the language through instruction or immersion (Jacobs et al. 2016). We can also wonder about the impact of regular vs sporadic use of the particular language, which is known to play a role in long-term cross-language influence (Flege and Liu 2001, Piske et al. 2001). In our study, we focused on the type of bilinguals we know best: L1-Czech dominant learners of English as a foreign language. They were experienced classroom learners, who reported no experience with language immersion in a native-speaking community. All achieved a high-level of proficiency in their L2, training to become English-language professionals.

As already mentioned, we operationalized the degree of cross-language influence in terms of VOT shifts in voiceless stops. In our bilinguals' L1 Czech, voiceless stops /p, t, k/ are pronounced with a short positive VOT, i.e. voicing of the following vowel starts almost immediately after the release of the stop. In English, our bilinguals' L2,

there is aspiration caused by a delay between the release of the stop and the onset of voicing, i.e. English voiceless stops have long positive VOT. In the current study, we limit our observations to the VOT of the velar voiceless stop /k/. Our research questions are:

1. Do L1-Czech L2-English bilinguals, who are advanced non-immersion learners of English as a foreign language (EFL), produce /k/ with distinct VOT values in L2 English and L1 Czech? We expected them to do so based on observation of other learners from the same population (Šimáčková and Podlipský 2018). Nevertheless, demonstrating that the bilinguals could categorically separate their *k*-sounds in terms of VOT was necessary before investigating gradient VOT shifts induced by switching.

2. When the Czech-English bilinguals use one of their languages during ¾ of a speaking task, does VOT of /k/ in this primary language of the task show an effect of momentary cross-language interference due to switching briefly into the other, less activated, language? If so:

   2.1. Which language is affected: the bilinguals' L1, L2, or both? In Czech, cross-language interference would manifest itself as extended VOT of voiceless stops and in English as shortened VOT. We hypothesize that L1-L2 asymmetry of the phonetic effect is precluded by the high overall activation of the target language (ensured by the ¾ proportion of usage of that language within the task).

   2.2. Is phonetic cross-language interference modulated by the speaking task? During the language-switching picture-naming task, perseverative cross-language interference would manifest itself in VOT shifts in the /k/-initial switch words. During the code-switching reading task, anticipatory cross-language interference would manifest itself in VOT shifts in pre-switch words. We hypothesize a cross-language phonetic interference in both tasks.

2. Methodology
2.1 Participants

The data were collected as a part of a larger study of bilingual lexical access. Thirty advanced EFL learners participated in the CS task, the LS task, and also completed the LexTale vocabulary test (Lemhöfer and Broersma 2012) and an online language-experience questionnaire. At the time of the recording they studied English as an academic subject, some specializing in interpreting (n = 7), others in philology (n = 23). For the purposes of this study, 14 bilinguals (11 women, 3 men) were selected: the 7 student interpreters and 7 philology students matched for their LexTale scores, their L2 learning

experience, and their attitude to switching between languages, as measured by the online questionnaire. Importantly, they all reported not having experience of living in an English-speaking environment (e.g. none have ever been on an Erasmus exchange). The learners were all Czech dominant, as Czech is the language of the community in which they live.

2.2 Stimulus Words

The voiceless velar stop /k/ was elicited in both the bilinguals' languages. In each language, 10 /k/-initial words (5 targets and 5 controls) were used. The choice of words was guided by concerns about lexical frequency, about the ease of visual representation, and by phonetic concerns. Since lexical frequency may affect word recall (Levelt et al. 1999), which is relevant in the naming task, but also VOT duration (VanDam and Port 2005), important in both tasks, the targets and controls were as best as possible matched for frequency within each language. Information about the relative lexical frequency of the targets and controls comes from the Czech National Corpus using the ORAL Version 1 and from the BNC Spoken demographic corpus (Davies, 2004) and is included in the Table 1, listing the stimulus words. Pictures representing the stimulus words were modified black and white line drawings selected from Snodgrass and Vanderward (1980). In order to minimize loss of data, we piloted all pictures (including those representing fillers) with Czech-English bilinguals who did not partic-ipate in the study, ensuring the presentation of each image resulted in the naming of the intended word. Phonetically, since vowel height may affect VOT (e.g. Berry and Moyle 2011), the requirement was for the vowel following /k/ to be of a similar height within each target-control pair and across the languages, high vowels occurring in one target-control pair in each language. Our plan to maintain the same number of syllables for all stimuli was abandoned in order to satisfy the other constraints. As a result, the members of each target-control pair did have the same number of syllables within each language; however, across the languages, the word length varied: all Czech pairs consisted of disyllabic items while one English pair had disyllabic words and 4 pairs included monosyllabic ones.

Identical targets and controls were used for the code-switching and the language-switching naming tasks. In the LS naming task, the targets were the switch words and in the CS sentences the targets occurred before the switch. The control words occurred in stay trials in the LS naming task and in monolingual sentences in the CS reading task.

Czech				English			
Target words		Control words		Target words		Control words	
Switch (LS) Pre-switch (CS)	i.p.m.	Stay (LS) No switch (CS)	i.p.m.	Switch (LS) Pre-switch (CS)	i.p.m.	Stay (LS) No switch (CS)	i.p.m.
kabát "coat"	17.8	*kachna* "duck"	17.5	*coffin*	10.0	*candle*	12.7
komín "chimney"	14.9	*kočár* "carriage"	14.8	*corn*	8.8	*kite*	6.7
konev "watering can"	5.7	*kohout* "rooster"	4.8	*cow*	19.8	*cap*	18.1
kostka "cube"	15.6	*košík* "basket"	15.7	*cup*	46.9	*cat*	40
kuře "chicken"	33.6	*kufr* "suitcase"	24.2	*king*	64.6	*key*	53

Table 1. Czech and English stimulus words and their relative lexical frequencies in number of instances per million (i.p.m)

2.3 Elicitation Instrument and Procedure

Participants were recorded individually in a soundproof recording studio at Palacký University during two separate sessions A and B, which took place between 7 and 11 days apart and their order was counterbalanced between participants. Session A was English-biased, i.e. the stimuli were biased towards English and the administration of the session was conducted entirely in English. Session B was Czech-biased analogously.

In the language-switching task in session A, 150 pictures were named in the primary language of the task, i.e. in English, and 50 in the secondary language, i.e. in Czech. There were ten switches from English into Czech and back from Czech back into English. The latter, i.e. the switches from the task-secondary into the task-primary language, were the target switch trials. Each English switch trial involved one of the 5 /k/-initial words and 5 fillers and it followed at least 3 and at most 7 consecutive stay trials in Czech. The control stay trials elicited the 5 /k/-initial English control words, each after at least two consecutive English trials. In session B, biased towards Czech, the proportion of languages was reversed and the target switch and stay trials involved the Czech words. Pictures were not repeated within a session.

The procedure of the LS picture naming task was similar to that described in the Introduction and is schematized in Figure 1. The response language was indicated by the colour of the frame around the picture (red for English, blue for Czech) and by a flag in the corner of the screen. Participants learned the colour code during 20 practice trials. A 200-ms beep sounded simultaneously with the appearance of the picture. The

participants were instructed to name the object in the picture in the prompted language as fast as they could. In the example shown in Figure 1, the participants were cued to produce the Czech word *kohout* "rooster". Each fifty trials were followed by a break of a few minutes during which the participant was encouraged to sip water.
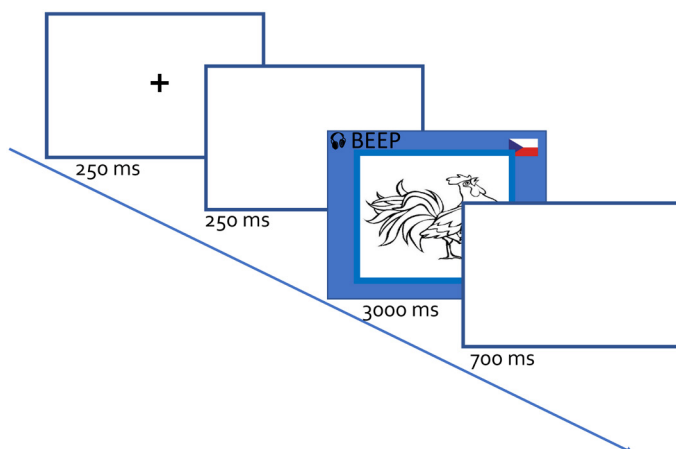
Figure 1. Example of an experimental trial.

The code-switching reading task included 30 bilingual sentences with a code-switch, i.e. an English-to-Czech switch in Session A and a Czech-to-English switch in Session B. Out of these, 10 sentences contained the 5 /k/-initial target words in a pre-switch position (each appearing twice), while the remaining 20 sentences had fillers. In addition, the task included 70 monolingual sentences, 10 of which contained the 5 /k/-initial control words (again each appearing twice). The remaining monolingual sentences contained fillers. All sentences in the CS reading task were composed of one of 3 two-clause frames into which the targets, controls or fillers were embedded at the end of the first clause. Table 2 gives the three sentence frames used in each Session, one monolingual and two bilingual. Having two different bilingual frames was motivated by wanting to see if the presence of /k/ after the switch would affect the articulation of the target pre-switch /k/: one frame contained the post-switch /k/-initial word and the other did not.

The sentences were elicited in a 'pseudo-reading' task. They were presented one at a time on a computer screen. Participants were instructed to read each sentence to themselves, then move their head towards the microphone positioned on the side of the screen and say the sentence out loud. Other than the text of the sentence, there were no additional visual cues to the bilingual vs monolingual content of the sentence. The order of sentences was random (although the same for each participant).

Session A (English words fill the gap.)	Session B (Czech words fill the gap.)
Kate must choose the word ___ *a pak ho říct nahlas.*	*Kája dá důraz na slovo* ___ *and she'll say it aloud.*
"and then say it aloud"	"Charlie will stress the word"
Kate must choose the word ___ *a splnit každý úkol.*	*Kája dá důraz na slovo* ___ *to do the task correctly.*
"and fulfil every task"	"Charlie will stress the word"
Kate must choose the word ___ *to do the task correctly.*	*Kája dá důraz na slovo* ___ *a tak splní každý úkol.* "Charlie will stress the word and so fulfil every task"

Table 2. Sentence frames used in the Code-switching task. Sessions A and B were English and Czech biased respectively.

The data elicitation was preceded by an informal talk in the primary language of the session about everyday topics unrelated to the recording. The LS picture naming task, regarded as more demanding, always preceded the CS reading task. The length of the break between the two tasks was determined by each participant, keeping the minimum of 5 minutes.

2.4 Data Processing

The raw recordings were annotated in Praat (Boersma and Weenink 2021). The target words and matched controls were coded for the Task (LS naming or CS reading), Language (L2 English or L1 Czech) and Trial type (Switch or Stay) using a custom-made Praat script. In each token, the interval between the release of the /k/-sound and the onset of voicing in the following vowel, i.e. VOT (Lisker and Abramson 1964), was labelled manually. The annotation was performed by a research assistant and checked by the first author.

For the CS reading data, paired sample *t*-tests found no difference between VOT measurements from the two bilingual sentences (Table 2). In the subsequent statistical analysis, the first token of each target word and of each control word recorded during CS reading are used for comparison to the same words elicited in the LS picture-naming task.

The analysis of VOT included 488 measured words in total. Out of the planned 560 /k/-initial words (2 tasks x 2 languages x 10 words x 14 subjects) 18 items were not realized correctly, including 12 English and 6 Czech words. In the naming task, 17 trials either elicited an unintended word or the trial was missed by the participant or the VOT could not be reliably measured from the recording. One word could not be analysed in the reading task. To maintain the designed balance, for each word not measured, the word and its matched counterpart were excluded from both tasks, amounting to 72 (13%) excluded words.

3.   Results

The effect of switching on VOT during bilingual speech production was examined by a mixed-model ANOVA (TIBCO Statistica, 2018). For the purposes of the statistical analysis, the VOT measurements were log-transformed since VOT of word-initial voiceless stops (in Czech and English) can only have positive values (Sonderegger 2012). The model included the log-transformed VOT values as the dependent variable and Language (Czech, English), Task (Picture-naming, Reading), and Trial (Stay, Switch) as the fixed factors. Subject was included as a random factor. We present the results of the model with reference to our three research questions. First, we consider the question of distinct VOT values in the bilinguals' two languages. Then, we focus on whether switching between languages affects VOT and address the question of L1~L2 direction of cross-language influences. Finally, we review the evidence for anticipatory and perseverative cross-language influence in the CS reading task and in the LS naming task respectively. The mixed-model ANOVA results are given in full in Table 3. It presents the Type 3 ANOVA table for the fixed and random effects included in the model and their interactions. Two additional mixed-model ANOVAs that further explore the switching effect separately for Czech and English are also reported below (Table 4).

Predictor	Effect	df Effect	MS Effect	df Error	MS Error	F	p
{1} LANGUAGE	**Fixed**	**1**	**10.33**	**13.05**	**0.19**	**55.01**	**0.000**
{2} TASK	**Fixed**	**1**	**0.30**	**13.15**	**0.06**	**5.18**	**0.040**
{3} TRIAL	Fixed	1	0.00	14.18	0.01	0.06	0.810
{4} Subject	Random	13	0.32	14.78	0.22	1.47	0.239
1*2	Fixed	1	0.02	13.31	0.03	0.70	0.417
1*3	**Fixed**	**1**	**0.43**	**13.76**	**0.01**	**36.91**	**0.000**
1*4	**Random**	**13**	**0.19**	**12.03**	**0.03**	**6.23**	**0.002**
2*3	Fixed	1	0.03	13.89	0.01	2.87	0.112
2*4	Random	13	0.06	11.12	0.03	2.00	0.127
3*4	Random	13	0.01	6.22	0.01	0.61	0.788
1*2*3	Fixed	1	0.00	13.96	0.01	0.00	0.999
1*2*4	**Random**	**13**	**0.03**	**13.00**	**0.01**	**3.08**	**0.026**
1*3*4	Random	13	0.01	13.00	0.01	1.26	0.339
2*3*4	Random	13	0.01	13.00	0.01	1.08	0.448
1*2*3*4	Random	13	0.01	376.00	0.02	0.49	0.932

Table 3. Mixed-model ANOVA results for Synthesized Errors, degrees of freedom, error, F-value, and corresponding p-value computed using the Satterthwaite method. Significant effects and interactions are in bold.

3.1 Language: L1 Czech vs. L2 English

The clear effect of Language on log(VOT) confirms that the Czech-English bilinguals in the current study were able to phonetically separate /k/ sounds in their two languages overall, producing a longer, more English-like VOT in their L2 and a shorter VOT in L1 Czech. However, the significant interaction of Language * Subject indicates that individual variation played an important role. This is illustrated in Figure 2 showing the difference between each bilingual's mean English log(VOT) and their mean Czech log(VOT).
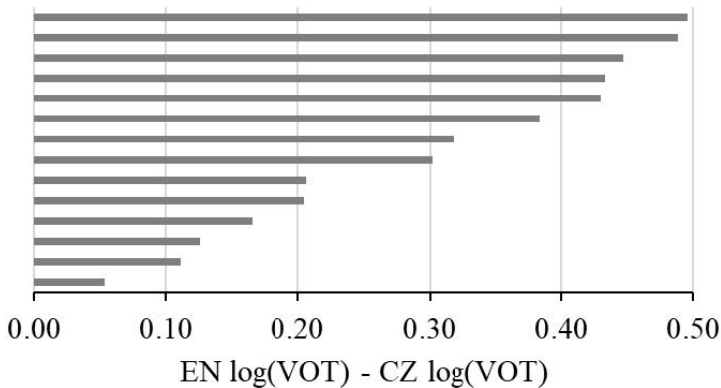
Figure 2. Difference between mean English log(VOT) and Czech log(VOT) for 14 bilinguals, ordered by magnitude.

3.2 Trial: Switch vs. Stay

Our main question is whether VOT of /k/ in speech of Czech EFL bilinguals is affected by switching between languages. On its own, Trial did not have a significant effect. Importantly however, the analysis detected a significant Trial * Language interaction. The model-estimated means charted in Figure 3 show that Language affected the switch-induced VOT shift in the expected way: whereas in the Czech switch words, the VOT of the initial /k/ increased compared to stay words, in the English switch words, vis-à-vis the English stay words, the VOT decreased. The confidence intervals displayed in Figure 3 show that the switch-stay difference is significant for Czech but may not be for English. Following up on the two-way interaction between Trial and Language, a mixed-model ANOVA was run for each language separately. These results are summarized in Table 4. Focusing on the fixed factor of Trial in the table, we observe that switching had a significant effect on VOT in English as well as in Czech.
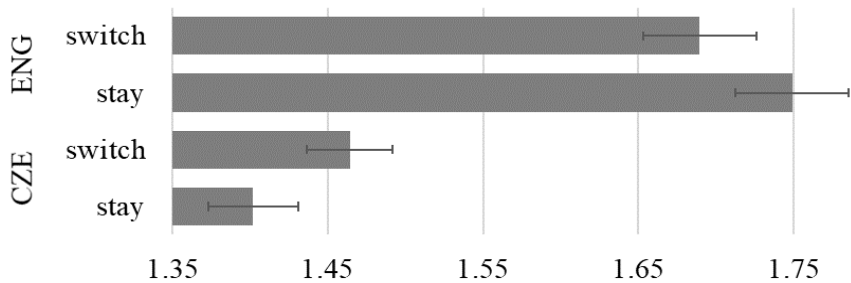
Figure 3. Model-estimated means of log(VOT) across the two tasks split by language and trial type. Error bars indicate 95% confidence intervals.

	Effect	df Effect	MS Effect	df Error	MS Error	F	p
			Czech				
{1} TASK	**Fixed**	**1**	**0.25**	**13.37**	**0.03**	**8.42**	**0.0121**
{2} TRIAL	**Fixed**	**1**	**0.25**	**13.75**	**0.01**	**16.63**	**0.0012**
{3} Subject	**Random**	**13**	**0.13**	**11.35**	**0.03**	**4.01**	**0.0125**
1*2	Fixed	1	0.02	13.96	0.01	1.30	0.2732
1*3	Random	13	0.03	13.00	0.01	2.57	0.0502
2*3	Random	13	0.01	13.00	0.01	1.26	0.3395
1*2*3	Random	13	0.01	200.00	0.02	0.60	0.8537
			English				
{1} TASK	Fixed	1	0.08	13.52	0.05	1.53	0.2367
{2} TRIAL	**Fixed**	**1**	**0.19**	**17.90**	**0.01**	**28.96**	**0.0000**
{3} subject	**Random**	**13**	**0.37**	**11.62**	**0.05**	**7.41**	**0.0008**
1*2	Fixed	1	0.01	16.61	0.01	1.61	0.2225
1*3	**Random**	**13**	**0.05**	**13.00**	**0.01**	**6.60**	**0.0009**
2*3	Random	13	0.01	13.00	0.01	0.75	0.6938
1*2*3	Random	13	0.01	176.00	0.02	0.44	0.9549

Table 4. Mixed-model ANOVAs results for Synthesized Errors, degrees of freedom, error, F-value, and corresponding p-value computed using the Satterthwaite method for each language separately. Significant effects and interactions are in bold.

3.3 Task: CS Reading Task vs. LS Picture-Naming Task

Finally, we asked whether short-term phonetic interference is modulated by the type of the bilingual task. We planned to address this question by considering the interaction

between Task and Trial. Neither in the more complex model including Language as a fixed factor (Table 3), nor in the two separated models (Table 4) was the Task * Trial interaction significant. The VOT of /k/ did not show a different degree cross-language interference in the switch trials of the LS picture-naming task as compared with the pre-switch trials of the CS reading task.

There was some overall effect of Task on VOT. The full model (Table 3) detected a significant effect of Task and a significant three-way interaction of Task * Language * Subject. The models run separately for Czech and English (Table 4) found Task to have a significant effect in Czech. A closer inspection of the data shows longer, more English-like, VOT of Czech /k/ in the LS picture-naming task compared to the CS reading task. For English, there was a significant Task * Subject interaction: some bilinguals showed interference in CS reading others in LS picture-naming and for yet others task or did not make a difference.

4.   Discussion

This study aimed to investigate three principal questions: (1) whether non-immersion bilinguals can produce phonemes equivalent in their L1 and L2 with distinct phonetic realizations, (2) whether language co-activation changes the phonetic implementation of these categories in the language used more during the data-elicitation task, and (3) whether the shifts in phonetic realization are modulated by the nature of the bilingual task.

First, this study found that overall and as expected, the participants, advanced Czech learners of English as a foreign language, were able to produce the voiceless velar stop with distinct VOT values in the two languages. This provides evidence that non-immersion language learning experience does not prevent successful differentiation between similar L1 and L2 sounds. However, the success was not uniform: the degree to which the EFL learners separated their L1 and L2 VOT categories varied greatly.

Second, the bilinguals' realization of VOT was impacted by performing in the bilingual mode. To recap, language mode was manipulated to produce a difference in the relative degree of activation of the two languages within the data-elicitation tasks. In each of the two data-collecting sessions, the code-switching and language-switching tasks were biased towards one language also used in informal communication with the experimenter before the data collection and in-between the tasks. Since this task-primary language was used throughout the recording session, it was assumed to have a high global activation compared to the other language in the session. The secondary language, used as a response language to a smaller portion of stimuli in the experimental tasks and never used for communication outside the tasks, was activated to a lesser degree. Previous studies demonstrated short-term phonetic interference in experiments with unbalanced proportion of languages in favor of the base language, i.e. the language that the participants switch from (Olson 2013, 2016), and in experiments with balanced proportion of language use (Goldrick et al. 2014, Olson 2016). Our main goal was to investigate whether the switch-trial target words in the

language-switching naming task and the pre-switch target words in the code-switching reading task would show increased phonetic cross-language interference even when the language spoken on these trials was the task-primary language. The results show that switching did affect the bilinguals' realization of VOT. In the LS switch-trial target words and the CS pre-switch target words, the distinctness of the phonetic properties of the L1 and L2 sounds was lowered suggesting that the cross-language interference was momentarily increased. This occurred even though the language of the switch trials had a high global activation throughout the tasks. Therefore, a local increase in language activation, i.e. having just spoken or planning to speak in the secondary language of the recording session, had a phonetic effect on the session-primary language. Interestingly, a comparable degree of interference was observed when the task-primary language was the bilinguals' dominant L1 Czech and when it was their non-dominant L2 English. Thus, the processing of the phonetic shape of a word was modulated by the immediate language context regardless of language dominance.

The third question we addressed is the influence of the task on the cross-language interaction in the bilingual mode. The absence of a significant interaction between Task and Trial shows that the local impact of language co-activation did not differ between the anticipatory effect in code-switched reading and the perseverative effect in picture naming.

In the context of the exploring the impact of the Task, language dominance was observed to make a difference. The results showed a greater *overall* influence of the task on VOT in the participants' L1 Czech. During the language-switching task, when the participants named most pictures in Czech and some in English, the Czech short VOT of /k/ of both switch and stay words became longer, i.e. more English-like. In contrast, during the code-switching task, when participants read mostly Czech sentences and sometimes had to produce a switch into English, the VOT of /k/ was unaffected. One factor to consider are the cognitive demands of the two tasks. Arguably, the more demanding picture-naming task, in which the target language was prompted by a separate cue, affected the overall language control in a way that the simpler reading task did not. The asymmetrical increase in interference (i.e., the overall increase in L2-to-L1 interference and not of L1-to-L2 interference) gives some support to the inhibition account of language control (Olson 2013). It suggests a greater overall inhibition of L1 during picture naming in two languages as opposed to reading in two languages.

5. Conclusion

In this study, the pronunciation of non-immersion bilinguals showed a short-term increase in phonetic interference induced by switching between languages. The phonetic effect of switching was found despite the fact that the target items were realized in the more activated language within the experimental session while the source of the interference was the less activated language. The bilinguals' language dominance did not affect this

outcome. Further, the same bilinguals manifested similar anticipatory and carry-over cross-language phonetic effects in two experimental tasks. Both situations, i.e. saying a word immediately after having spoken in another language and saying the (same) word while planning a switch into another language, led to a momentary increase in co-activation of the L1 and L2 phonologies and to a gradient decrease in the distinctness of the actual phonetic realization of an equivalent sound in the two languages.

Works Cited

Amengual, Mark. 2012. "Interlingual Influence in Bilingual Speech: Cognate Status Effect in a Continuum of Bilingualism." *Bilingualism: Language and Cognition* 15 (3): 517–30.

Amengual, Mark. 2018. "Asymmetrical Interlingual Influence in the Production of Spanish and English Laterals as a Result of Competing Activation in Bilingual Language Processing." *Journal of Phonetics* 69: 12–28.

Antoniou, Mark, Catherine T. Best, Michael D. Tyler, and Christian Kroos. 2011. "Inter-Language Interference in VOT Production by L2-Dominant Bilinguals: Asymmetries in Phonetic Code-Switching." *Journal of Phonetics* 39 (4): 558–570.

Best, Catherine T., and Michael D. Tyler. 2007. "Nonnative and Second-Language Speech Perception: Commonalities and Complementarities." In *Language Experience in Second Language Speech Learning: In Honor of James Emil Flege*, edited by Ocke-Schwen Bohn and Murray J. Munro, 13–34. Amsterdam/Philadelphia: John Benjamins.

Berry, Jeff, and Maura Moyle. 2011. "Covariation among Vowel Height Effects on Acoustic Measures." *The Journal of the Acoustical Society of America* 130 (5): EL365–EL371.

Bonfieni, Michela, Holly P. Branigan, Martin J. Pickering, and Antonella Sorace. 2019. "Language Experience Modulates Bilingual Language Control: The Effect of Proficiency, Age of Acquisition, and Exposure on Language Switching." *Acta Psychologica* 193: 160–170.

Bullock, Barbara E., Almeida Jacqueline Toribio, Verónica González, and Amanda Dalola. 2006. "Language Dominance and Performance Outcomes in Bilingual Pronunciation." In *Proceedings of the 8th Generative Approaches to Second Language Acquisition Conference*, edited by Mary Grantham O'Brien, Christine Shea, and John Archibald, 9–16. Somerville, MA: Cascadilla Proceedings Project.

Costa, Albert, Alfonso Caramazza, and Nuria Sebastian-Galles. 2000. "The Cognate Facilitation Effect: Implications for Models of Lexical Access." *Journal of Experimental Psychology: Learning, Memory, and Cognition* 26 (5): 1283–1296.

Escudero, Paola. 2005. *Linguistic Perception and Second Language Acquisition: Explaining the Attainment of Optimal Phonological Categorization*. Utrecht: Netherlands Graduate School of Linguistics.

Fricke, Melinda, Judith F. Kroll, and Paola E. Dussias. 2016. "Phonetic Variation in Bilingual Speech: A Lens For Studying the Production–Comprehension Link." *Journal of Memory and Language* 89: 110–137.

Flege, James E. 1995. "Second Language Speech Learning: Theory, Findings, and Problems." In *Speech Perception and Linguistic Experience: Issues in Cross-Language Research*, edited by Winifred Strange, 233–277. Timonium, MD: York Press.

Flege, James Emil, and Serena Liu. 2001. "The Effect of Experience on Adults' Acquisition of a Second Language." *Studies in Second Language Acquisition* 23 (4): 527–552.

Flege, James Emil, and Ocke-Schwen Bohn. 2021. "The Revised Speech Learning Model (SLM-R)." In *Second Language Speech Learning: Theoretical and Empirical Progress*, edited by Ratree Wayland, 3–83. Cambridge: Cambridge University Press.

Goldrick, Matthew, Elin Runnqvist, and Albert Costa. 2014. "Language Switching Makes Pronunciation Less Nativelike." *Psychological Science* 25 (4): 1031–1036.

Green, David W. 1998. "Mental Control of the Bilingual Lexico-Semantic System." *Bilingualism: Language and Cognition* 1 (2): 67–81.

Grosjean, François. 2008. *Studying Bilinguals*. Oxford: Oxford University Press.

Grosjean, François. 2001. "The Bilingual's Language Modes." In *One Mind, Two Languages: Bilingual Language Processing*, edited by Janet L. Nicol, 1–22. Oxford: Basil Blackwell.

Iverson, Paul, and Patricia K. Kuhl. 1995. "Mapping the Perceptual Magnet Effect for Speech Using Signal Detection Theory and Multidimensional Scaling." *The Journal of the Acoustical Society of America* 97 (1): 553–562.

Jacobs, April, Melinda Fricke, and Judith F. Kroll. 2016. "Cross-Language Activation Begins during Speech Planning and Extends into Second Language Speech." *Language Learning* 66 (2): 324–353.

Levelt, Willem JM, Ardi Roelofs, and Antje S. Meyer. 1999. "A Theory of Lexical Access in Speech Production." *Behavioral and Brain Sciences* 22 (1): 1–38.

Lemhöfer, Kristin, and Mirjam Broersma. 2012. "Introducing Lextale: A Quick and Valid Lexical Test for Advanced Learners of English." *Behavior Research Methods* 44 (2): 325–343.

Lisker, Leigh, and Arthur S. Abramson. 1964. "A Cross-Language Study of Voicing in Initial Stops: Acoustical Measurements." *Word* 20 (3): 384–422.

Luk, Gigi, and Ellen Bialystok. 2013. "Bilingualism Is Not a Categorical Variable: Interaction Between Language Proficiency and Usage." *Journal of Cognitive Psychology* 25 (5): 605–621.

Olson, Daniel J. 2013. "Bilingual Language Switching and Selection at the Phonetic Level: Asymmetrical Transfer in VOT Production." *Journal of Phonetics* 41 (6): 407–420.

Olson, Daniel J. 2016. "The Role of Code-Switching and Language Context in Bilingual Phonetic Transfer." *Journal of the International Phonetic Association* 46 (3): 263–285.

Piske, Thorsten, Ian RA Mackay, and James E. Flege. 2001. "Factors Affecting Degree of Foreign Accent in an L2: A Review." *Journal of Phonetics* 29 (2): 191–215.

Poplack, Shana. 2000. "Sometimes I'll Start a Sentence in Spanish Y Termino En Español: Toward a Typology of Code-Switching." In *the Bilingualism Reader*, edited by Li Wei, 205–240. London/New York: Routledge.

Boersma, Paul, and David Weenink. 2021. Praat: Doing Phonetics by Computer [Computer Program]. Version 6.1.56, Retrieved 3 November 2021 from http://www.praat.org/.

Šimáčková, Šárka, and Václav Jonáš Podlipský. 2018. "Patterns of Short-Term Phonetic Interference in Bilingual Speech." *Languages* 3 (3): 34.

Simonet, Miquel. 2014. "Phonetic Consequences of Dynamic Cross-Linguistic Interference in Proficient Bilinguals." *Journal of Phonetics* 43: 26–37.

Sonderegger, Morgan. 2012. "Phonetic and Phonological Dynamics on Reality Television." Phd Diss., University of Chicago.

Snodgrass, Joan G., and Mary Vanderwart. 1980. "A Standardized Set of 260 Pictures: Norms for Name Agreement, Image Agreement, Familiarity, and Visual Complexity." *Journal of Experimental Psychology: Human Learning and Memory* 6 (2): 174–215.

TIBCO Software Inc. 2018. TIBCO Statistica [computer program]. Version 13.4.0.14.

Thierry, Guillaume, and Yan Jing Wu. 2007. "Brain Potentials Reveal Unconscious Translation During Foreign-Language Comprehension." *Proceedings of the National Academy of Sciences* 104 (30): 12530-12535.

Tyler, Michael D. 2019. "PAM-L2 and Phonological Category Acquisition in the Foreign Language Classroom." In a *Sound Approach to Language Matters: In Honor of Ocke-Schwen Bohn*, edited by Anne Mette Nyvad, Michaela Hejná, Anders Højen, Anna Bothe Jespersen, and Mette Hjortshøj Sørensen, 607–630. Aarhus: Aarhus University.

Vandam, Mark, and Robert Port. 2005. "Voice Onset Time Is Shorter in High-Frequency Words." *The Journal of the Acoustical Society of America* 117 (4): 2623–2623.

van Leussen Jan-Willem and Paola Escudero. 2015. "Learning to Perceive and Recognize a Second Language: The L2LP Model Revised." *Frontiers in Psychology*, 6: 1000. Doi: 10.3389/fpsyg.2015.01000

Corpora

Czech National Corpus – Oral [version 1]. Institute of the Czech National Corpus. Available online at http://www.korpus.cz/.

Davies, Mark. 2004. *British National Corpus* (from Oxford University Press). Available online at https://www.english-corpora.org/bnc/.

Towards a Phonological Model of Czech Sign Language: A Case Study of Lexical Variants

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Abstract: This paper brings some modifications of the phonological Hand-Tier model proposed by Sandler (1986, 1987a, 1987b, 1989, 2006) for American Sign Language. Based on Czech Sign Language data, we refined Sandler's latest version of the model as follows: (i) we added the features for planes into the handshape category; (ii) we specified the application of the repetition feature; (iii) we added a feature and refined a feature ([back] and [wrist], respectively) within the orientation set of the handshape features; (iv) we removed a redundant feature for the thumb positions ([opposed]); and (v) we redefined the feature [arm] as a complex subcategory by adding a set of orientation features. This work has been initially motivated by the need for variant/synonym distinction during the lemmatization process in the first online Czech Sign Language dictionary (*Dictio*).

Keywords: sign language; phonology; variants; lexicography; Czech Sign Language

1. Introduction

This paper aims to propose an adaptation of a phonological model of American Sign Language (ASL), namely the Hand-Tier model (HTM) by Sandler (2006), to the data from Czech Sign Language (český znakový jazyk; ČZJ). The secondary goal is to present a lexicographic application of the phonological model to categorize lexemes into variants and synonyms.[1]

This paper is structured as follows: Section 2 introduces Sandler's HTM and briefly mentions other phonological models proposed for sign languages (SLs). Section 3 turns to the data source of this paper, *Dictio*, the largest electronic database of ČZJ up to date. Section 4 presents the three main categories of the HTM and our modifications based on ČZJ data. Section 5 summarizes the contributions of the paper.

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1 The authors would like to thank the anonymous reviewer, the editorial board and also the audience of The Olomouc Linguistics Colloquium (Olinco) 2021 for the helpful comments and suggestions that improved this article.

All the exemplified signs with their URLs as well as the models in the Appendix can be found in an online repository at: muni.cz/go/czj+htm_materials.

The handshape fonts are created by CSLDS, CUHK.

2.   The Hand-Tier Model

This section introduces the HTM and gives a general overview of its feature categories elaborated in more detail in Section 4. We briefly mention a few alternative approaches to SL phonology and justify our choice of HTM.

It is crucial to note that there are several distinct versions of HTM (Sandler 1986, 1987a, 1987b, 1989, 2006). In each version, there are slightly different sets of features in the individual categories. We have based our proposal on the newest version of the model, which is, at least to our knowledge, Sandler (2006).

The model distinguishes three main phonological categories of a sign: hand configuration (or handshape), place of articulation, and movement. The three categories are linked together in a way that recognizes the simultaneous nature of the signs while preserving their sequential characteristics (for example, the place category can be branched into two locations). Figure 1a below visualizes the categories of the HTM, while Figure 1b exemplifies the phonetic realization of these categories on the ČZJ sign DEAF. As seen from the corresponding colours, the hand configuration category, marked in green, is realized by ⟨-handshape. Place of articulation, marked in blue, is the head, while the initial and final locations (in darker blue) are the ear and the chin, respectively. Finally, the movement between the two locations is indicated by pink.
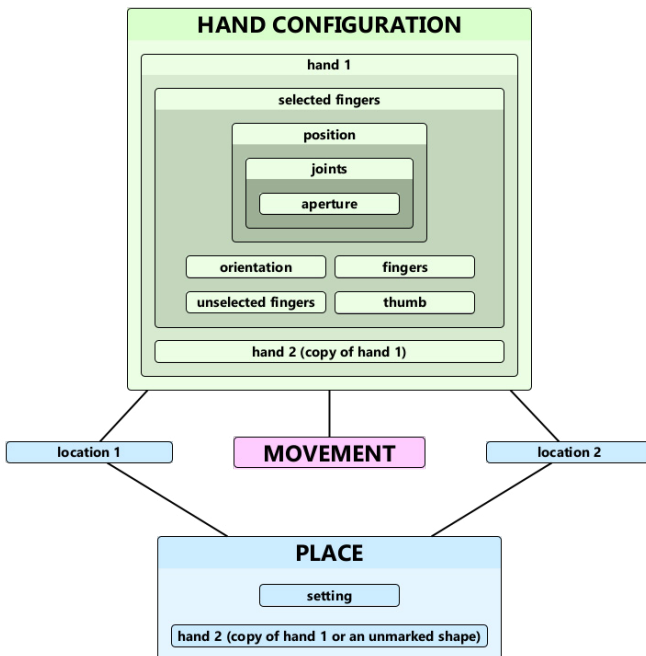
Figure 1a. HTM.
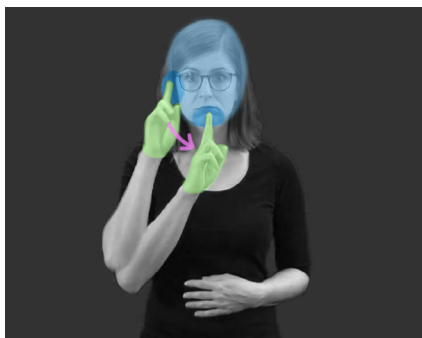
Figure 1b. DEAF.

The features within each category are further divided into classes and subclasses. The model obeys the principles of Feature Geometry (Clements 1985; Sagey 1986), by which the features that control articulatory parts close to each other should also be treated as related and behave as a feature class. The classes, and in some cases also individual features, are in a hierarchical position, which emulates the advantages of Dependency Phonology (Durand 1986; Anderson and Ewen 1987; van der Hulst 1989).

The category of *hand configuration* can be divided into subclasses of *selected fingers*, *orientation*, *position*, and *aperture* (applied to different finger joints). The five fingers are then divided into *fingers* and the *thumb*. The last subclass is *unselected fingers*, the specification dependent on the position of the selected fingers, and therefore, hierarchically subordinate. The other category within *hand configuration* is *non-dominant hand* (hand 2 or h2), which is specified in two-handed symmetrical signs. Hand 2 in this type of signs behaves as a copy of the dominant hand (h1).

Place of articulation can be defined by a set of features describing one of the main areas of the signing space (the neutral space, the head, the trunk, the arm, or, in two-handed asymmetrical signs, the non-dominant hand). These can be combined with the features from a setting subcategory specifying the concrete location of the signing within the main area. The setting features can be branched into two sets, corresponding to two locations within a sign. Moreover, a sign's initial and final location can be linked to individual position and orientation features from the hand configuration category.

The *movement* category is the simplest one, from the hierarchical point of view. It groups a set of features specifying the shape or repetition of the movement(s). The categories and features mentioned above will be further described in Section 4, where their motivation and application in modeling concrete signs will be further elaborated. However, it is important to note that all qualities and refinements to the model are posited to represent data from ČZJ and that these could differ wrt other SLs.

Sandler's HTM presents just one way how to approach SL phonology. The Move-Hold model was put forward by Liddell (1984, 1990) and Liddell and Johnson

(1989 [1985]) and built for American Sign Language (ASL). It is the first one that rejects the purely simultaneous nature of a sign (Stokoe 1960) and recognizes a sequential structure composed of two types of segments: movements (the hands move) and holds (the hands hold still). The Prosodic model proposed by Brentari (1989) also works with ASL. Its main characteristic is the non-sequential representation of the movement category. The main reason for our choice of HTM was the lexicographic task at hand: distinguishing variants from synonyms. We needed to work with a notion of a main phonological parameter of a sign (traditionally understood as the handshape, the place, and the movement of a given sign). The models described above were not suitable for such an approach since the Move-Hold did not recognize the autosegmental category of the handshape, and the Prosodic model did not distinguish an individual movement parameter. Other phonological models, such as the Moraic model (Perlmutter 1992, 1993), the model of van der Hulst (1993) and Channon (2002a, 2002b), or van der Kooij (2002), were not suitable for independent reasons, but discussing them would exceed the scope of this article.

3. Data

This section introduces the lexicographic task that initially motivated our need for an exact phonological representation of ČZJ lexemes. The second part of the section presents essential information about *Dictio*, the largest online database of ČZJ, that provides all examples quoted in this paper.

3.1 Lexicographic Task

The primary motivation for developing a phonological model of ČZJ was a practical lexicographic task of distinguishing lexical variants from synonyms in a multilingual online dictionary *Dictio* developed at Masaryk University, Brno, Czech Republic.

It is often the case that what has been already described in spoken languages causes problems in the visual-spatial modality, and merely adopting the same terminology and methodology is not enough. When it comes to distinguishing lexical variants from synonyms, we cannot depend on the reliable methodology known from spoken languages, where two variants share a common root and differ in affixes or some pieces of phonology (Czech gender variants as *brambor-0* 'potato' masculine vs. *brambor-a* 'potato' feminine), whereas a pair of synonyms can have different roots which vary, for example, in their etymology (Czech examples *fotbal* 'football' foreign origin vs. *kopaná* 'football' native origin).[2]

Typologically, SLs are an unusual combination of the analytic and the polysynthetic language types. They almost lack sequential morphology; on the contrary, they exhibit a great richness in the simultaneous plane of articulation, namely within the classifier subsystem, verb modification, numeral incorporation, and spatial agreement

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2 More details in Čermák (1995) or Filipec (1995).

(Aronoff et al. 2004). However, focusing on the variant/synonym problem, we cannot rely on any simultaneous morphology. The issue of variant classification was brought to the phonological level by Fenlon et al. (2015, 201), who state that the pairs of signs that "differ in one parameter are likely to be variants". However, it was not always clear what was meant by that difference. This vagueness leads us to base our decision process on a relatively strict phonological model and posit the One Parameter Criterion; in (1).

(1) **The One Parameter Criterion**
A pair of lexemes with equal meaning is classified as variants if their (possibly multiple) differing phonological features fall within only one of the three main categories in the Hand-Tier Model: handshape, place of articulation, or movement. In other cases, a pair of lexemes are classified as synonyms.

Let us look more closely at the decision process. The most straightforward cases constitute pairs of signs that differ in just one feature or a couple of closely related features. Such differences could be found within each of the three main parameters. The signs PRAGUE#1 and PRAGUE#2 illustrate the variation in *hand configuration*. They differ in the selection of fingers and the position of the thumb: PRAGUE#1 selects the pinky, the thumb is extended (🖐). PRAGUE#2 does not select any finger, and the thumb is flexed (✊). The difference in *movement* is shown on WHY#1 (single movement) and WHY#2 (repeated movement). The pair of COFFEE#1 and COFFEE#2 exemplifies the difference in *place*. COFFEE#1 performs the first contact at the ipsilateral side of the head and the second contact at the contralateral side. In COFFEE#2, all contact is made at the ipsilateral side.

Apart from the intuitively simple cases mentioned above, we have encountered several more complicated pairs. Consider TUNISIA#1 and TUNISIA#2. At first sight, they use different handshapes and movements. In TUNISIA#1, the selected fingers are extended and move from an open to a closed position; the unselected fingers are closed (from 🖐 to ✊). In TUNISIA#2, the selected fingers are curved and closed, and their position does not change; the unselected fingers are open (🖐). BROTHER-IN-LAW#1 and BROTHER-IN-LAW#2 have different places of articulation that influence the orientation of the dominant hand. In BROTHER-IN-LAW#1, the hand contacts the upper part of the trunk, and it is oriented by the radial side to the addressee. In BROTHER-IN-LAW#2, the hand contacts the non-dominant hand; it is oriented by the fingertips to the addressee. Using the detailed phonological model, we propose clear criteria for classifying data of similar complexity (Section 4).

We have seen a brief preview of the practical application of the One Parameter Criterion to classifying multiple pairs of lexemes with various degrees of differences between them. It is important to note that this criterion is only applicable to monosyllabic signs at this moment. The discussion of the multisyllabic signs would outscope the current article.

3.2 The *Dictio* Database

The data presented in this paper come from *Dictio*, the largest electronic dictionary database of ČZJ up to date. *Dictio* includes online dictionaries of languages of both modalities, sign and spoken (Czech and ČZJ, English and ASL, and others). The heart of the database is the ČZJ dictionary, currently containing more than 12 000 entries. The teams of editors consist of linguists, interpreters, and native signers.

While working on the content of a particular entry, the Deaf editors often discuss alternative ways of expressing the same meaning. Consider, for example, MONDAY#1 with the ⑂-handshape and a path movement with the first contact of the radial side of the hand on the forehead and the second contact on the chin. Using their introspection, the editors registered two more signs with the same meaning: MONDAY#2 (two-handed symmetrical sign with ⑁-handshape, with a repeated circular movement and continuous contact of the hands) and MONDAY#3 (two-handed asymmetrical sign with the ⑂-handshape, articulated with a repeated forward movement and the initial contact on the non-dominant hand). The relation of synonymy is displayed for all three signs; see, for example, the entry for MONDAY#1. The Deaf editors do not distinguish between synonyms and variants. It is the task of the linguistic team to give the exact criteria for filtering the two groups.

As part of that team, we propose a (partial) phonological model for ČZJ that would help us make a clear cut. Our formal apparatus is based on HTM; however, we already included some modifications resulting from our work with ČZJ. The ČZJ examples in this paper and their analyses should be understood as training data. We keep testing the HTM with our modifications against the real data from *Dictio*. Our goal is to map the strong and weak points of the current version of the model on the way to an adequate phonological representation of ČZJ. However, there is still no comprehensive study of ČZJ phonemes. Descriptions of related issues are given in some BA theses (Silovská [2012] on minimal pairs in ČZJ, or Oberfalzerová [2015] focusing on the handshapes). Unfortunately, we are still a long way from a research-based list of ČZJ phonemes. The rest of the section briefly describes the elicitation of the examples for this paper. More information about the linguistic methodology of *Dictio* can be found in Vlášková and Strachoňová (2021).

Since *Dictio* is an electronic database, it enables to create a list of unique entries with registered synonyms. After generating the list, we went through it manually and filtered out evident synonyms (the sign-pairs that do not share any parameter, as MONDAY#1 and MONDAY#2). The pairs that share at least one parameter (by intuitive evaluation at this point) were included in the training data set. Consider the semi-formal description of the pair of signs translated as 'brother in law', in (2). (2a) and (2b) evidently share the handshape. We created a formal representation of them by evaluating their relevant phonological features and concluded that they also share the same movement, differing only in the parameter of the place. Thus, the pair complies

with the requirement of a minimal difference (difference in one parameter), and it is classified as variants. See their full specification in the Appendix (Figures A and B).

(2) (a) BROTHER-IN-LAW#1: ⋔-handshape, place of articulation: trunk, movement: path, straight, continuous contact
     (b) BROTHER-IN-LAW#2: ⋔-handshape, place of articulation: non-dominant hand, movement: path, straight, continuous contact

4. Categories and Features in the Revisited HTM

In this section, we discuss in detail the modified HTM. In each subsection, we focus on one of the main categories (the hand configuration, the place, and the movement). We show the strong and weak aspects of Sandler's HTM and make suggestions that account for more accurate descriptions of the contrasts in ČZJ data. The schematic picture of the fully specified model including our modifications is in the Appendix (Figure C).

4.1 The Hand Configuration

The first category of the model is the most complex, as seen in Figure 2. It reflects the shape of the hand(s). In this section, we proceed from the number of hands involved in the articulation to the configuration of the selected and unselected fingers of the dominant hand (the hand that moves).
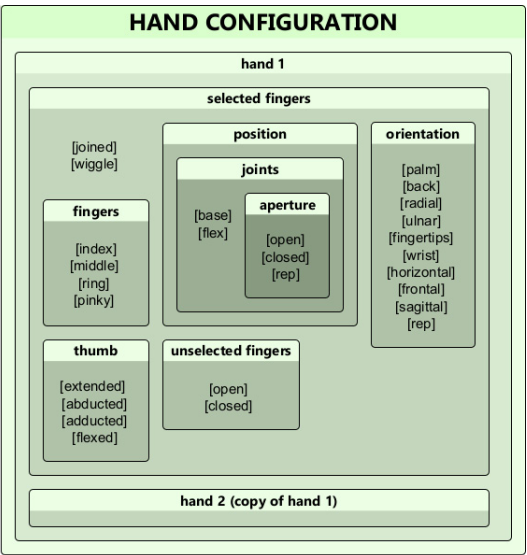
Figure 2. Hand configuration.

4.1.1   The Number of Hands

In ČZJ, as in all known SLs, signs can be articulated with one (dominant) hand or two hands. The two-handed signs are further classified into symmetrical (both hands move) and asymmetrical signs (only the dominant hand moves). For the one-handed signs in HTM, the hand configuration category bears the hand's features (DEAF in the Appendix, Figure D). The phonological form of the two-handed symmetrical signs is described by the Symmetry Condition, in (3).

(3)   The Symmetry Condition: (a) if both hands of a sign move independently during its articulation, then (b) both hands must be specified for the same handshape, the same movement (whether performed simultaneously or in alternation), and the specifications for orientation must be either symmetrical or identical.

(Battison 1978 [1973])

Assuming the constraint, the hand configuration node branches and creates a copy of the dominant hand without evaluating the features for the non-dominant hand independently CONSEQUENCE (in the Appendix, Figure E). This architecture reflects the observation that both hands act as equal articulators. The two-handed asymmetrical signs are subject to the Dominance Condition, in (4).

(4)   The Dominance Condition: (a) if the hands of a two-handed sign do not share the same specification for handshape (i.e., they are different), then (b) one hand must be passive while the active hand articulates the movement and (c) the specification of the passive handshape is restricted to be one of a small set: A,S,B,G,C,O.

(Battison 1978 [1973])

The HTM parts form the assumption that the non-dominant hand act as a place of articulation. It remains static while the dominant hand performs the movement.[3] Consequently, the complex subcategory of h2 (non-dominant hand) appears under the parameter of *place*. The specification of the dominant hand (h1) remains in the category of hand configuration. See the partial representation of the sign TEST in the Appendix (Figure F).

4.1.2   Selected Fingers

A selected finger is a prominent finger, i.e., extended or otherwise differing from the rest of the fingers (curved index finger in WANT, or the extended index and middle fingers in

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3   We are aware of borderline cases like SHOW that violate the Symmetry and the Dominance constraint (hands with different shapes moving with continuous contact). However, we must postpone the discussion of such cases on another occasion.

RESPONSIBILITY). In cases where the handshape is comprised of all fingers in the same position, all fingers are selected (ATOM).

What we intuitively understand as 'fingers' is in HTM divided into two subcategories: *fingers* and *thumb*. The motivation behind asserting an individual feature class to the thumb lies in the higher number of possible positions. Therefore, a special set of features is needed to capture them (Ann 1993; Greftegreff 1993; Sandler 1995).

Let us focus on the first subclass of the selected fingers category: the fingers. In this subclass, there are four features: [index], [middle], [ring] and [pinky]. Specifying a sign for a selected finger (or their combination) means placing the respective feature(s) into the underlying phonological model. Moreover, the feature [joined] is also connected to selected fingers (the contrast between MEANING and IMPORTANT). [joined] is placed outside the fingers class because it can also apply to the thumb.

Various revisions of the HTM employed various features for the thumb position, but we decided to depart from Sandler and consult medical literature (Olson and Pawlina 2008) to describe the anatomical possibilities appropriately. We propose the following set of features, also partly reflected in van der Kooij (2002): [extended]: (EXPLAIN), [abducted]: (TOGETHER), [adducted]: (REPEAT), [flexed]: (KING).

In HTM, there was another thumb feature, [opposed], described as the thumb being in contact with the fingertip of the selected finger(s). We propose to eliminate this feature from the model due to its redundancy. To explain, let us first look more closely at the next class of features called finger position. There are two tiers of contrast: the selected finger(s) can either be [open] (as in OWN) or [closed] (as in FRIEND), and their position can be determined wrt two finger joints. This way we get the minimal pair of FIRST (thumb: [flexed], aperture: [open] + [closed], joints: [flex]) and MINUTE (thumb: [flexed], aperture: [open] + [closed], joints: [flex] + [base]). The feature [closed] involves contact between the thumb and the fingers (Sandler 2006, 154). Thus, every handshape with the thumb touching any finger is sufficiently described with the position feature [closed], making the thumb feature [opposed] redundant.

The last feature subclass of *selected fingers* is *orientation*. The orientation of the hand has long been under discussion. Some researchers treated orientation as a main parameter on a par with handshape, place, and movement (e.g., Battison 1978 [1973]), while others argued for its subordinate position under the handshape parameter (originally in Newkirk et al. 1980). We follow the treatment of HTM and understand orientation as a subclass of the selected fingers category within the handshape parameter. However, we found that the features proposed by Sandler cannot account for the data attested in ČZJ. Sandler uses [palm] when the palm faces the place of articulation and [wrist] in the opposite case. [radial] describes signs with the thumb side of the hand turned towards the place and [ulnar] when the pinky side faces it. [fingertips] is for signs where the hand's fingertips are aimed at the place of articulation, with no counterpart, although it is anatomically possible (and indeed attested) that such signs can be formed.

Based on the logic that there should be three pairs of features for the six possible ways a hand can be oriented, we propose to add [back] to the model. This feature describes signs where the hand faces the place of articulation with its back, as in YOUR (the counterpart for [palm]). This orientation was formerly analyzed as [wrist], but we have kept the [wrist] feature and redefined it like the hand facing the place of articulation with its wrist (CHILD). For an overview and comparison of Sandler's orientation features and our proposal, see Table 1. To avoid the clash between our and Sandler's understanding of [wrist], we rename the original feature to [back] (the back of a hand).

Sandler's model	[palm]	[wrist]	[radial]	[ulnar]	[fingertips]	∅
Our proposal	[palm]	[back]	[radial]	[ulnar]	[fingertips]	[wrist]
Example from ČZJ	WANT	YOUR	INTERESTING	HALF	TEST	CHILD

Table 1. Comparison of the orientation features

Note that the dominant hand in HALF is not oriented with its ulnar side towards the neutral signing space but the non-dominant hand. We specify the sign by [ulnar] because orientation in HTM is evaluated relative to the place of articulation (the neutral signing space in CHILD, the signer's body in INTERESTING, or h2 in HALF); Sandler (2006, 167).

We propose one important addition to the orientation features: the notion of three spatial planes implemented as features [horizontal], [frontal], and [sagittal] with the mutually disjoint distribution. Such signs would be articulated in alignment with the given plane while also preserving the given orientation. This proposal is motivated by the inability of HTM to properly distinguish the orientation of signs such as TIDY-UP and COMPARE, uniformly described as [wrist]. We avoid this clash by modelling the orientation of TIDY-UP as [wrist] + [sagittal] and the orientation of COMPARE as [wrist] + [horizontal]. Note that not all combinations of orientation and plane features are anatomically possible, i.e., [wrist] + [frontal]. Although the addition of plane features proved useful in distinguishing the orientation of many sign-pairs, some cases still need further attention (e.g., COMPARE and CHILD, both analyzed as [wrist] + [horizontal]).

Finally, two elements bring together the orientation and position subclasses of features: internal and secondary movement. Both the orientation and position features can be branched into two sets, and in that way, multiple (even contradictory) features can be associated with a single hand configuration. Moreover, the branching classes can be temporally linked to a sign's different initial and final locations (Figure G in the Appendix).

The internal movement within a sign with a single location is produced when there are two specifications for orientation (TRANSLATE [palm] and [back]) or finger position (LAMP [closed] and [open]).

The secondary movement, also described as "rapid repetition of handshape or orientation change, or else finger wiggle" (Sandler 2006, 197), is treated by [rep] and

[wiggle]. In signs with rapid opening and closing of the fingers (SHOWER), [rep] is added to the subclass of finger position. On the other hand, signs with quick orientation changes (NO) are supplemented with [rep] within the orientation subclass. We follow Sandler (2006), a.o., in understanding the finger wiggle (HOW-MANY) as a type of secondary movement, and model it with a separate [wiggle] feature at the level of selected fingers.

4.1.3   Unselected Fingers
The last subclass of the selected fingers category is the *unselected fingers*. The unselected fingers and their position features ([open], [closed]) are in a subordinate relation wrt to the selected ones. They are dependent on the *selected fingers* and largely predictable. We are following Corina (1993) and her Unselected Fingers Redundancy Rule: "If specified fingers are closed, unspecified fingers are open; otherwise, unspecified fingers are closed." An example of open *unselected fingers* is FRIEND. In KING, the unselected fingers are closed. Both positions are predictable from the Redundancy Rule and therefore are not represented in the underlying model.

Another predictable property of the unselected fingers is the joined vs. spread opposition. We follow Sandler (1995, 121) and her addition to the Redundancy Rule: "When the unselected fingers are open, they must be spread." To the best of our knowledge, this is in accordance with all the ČZJ data attested so far.

However, there are cases where the position of the unselected fingers is not predictable, e.g., in signs with internal or secondary movement. In the absence of Sandler's treatment of such cases, we propose an additional constraint: when the selected finger position is branched, the position of the unselected fingers must be specified in the underlying model. This pertains to signs with internal movement (10-AM vs. WHERE) and with secondary movement (BETTER vs. NOON).

4.2 Place
The category of *place* includes five main areas: the neutral signing space (PRAGUE#1), the trunk (BROTHER-IN-LAW#1), the head (COFFEE#1), the arm (COUNTRY#1), and the non-dominant hand (BROTHER-IN-LAW#2). In HTM, the neutral signing space is considered a default option. Therefore it is not specified with any feature. The rest of the areas is represented by respective values: [trunk], [head], [arm], and a complex subcategory *h2*. Each area is further described with features specifying the exact location (*setting*): [high] for placing the hand higher than the center of the area, [low] for the lower part, [contra] for the part that is on the opposite side from the dominant hand, [ipsi] for the part that is on the same side, [prox] for the hand in a proximal location, and [dist] for the hand in a distal location; see Figure 3. The category of *place* branches into *locations* in case the sign contains a path movement (NORMAL). Each location is then specified with *setting* features, as in Figure 4.
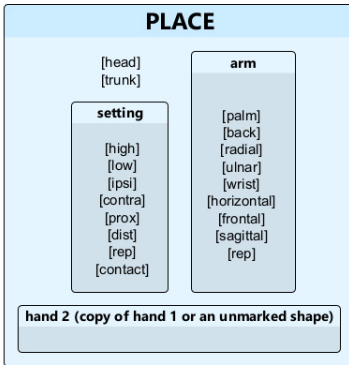
**Figure 3.** Place of articulation.
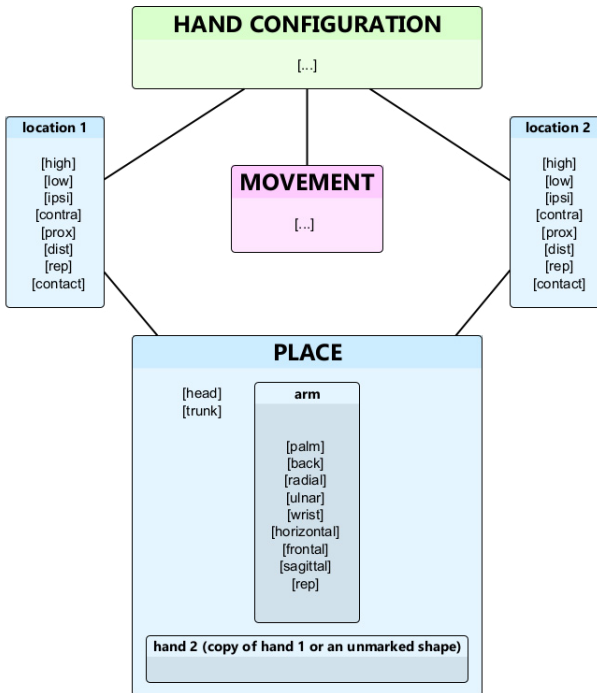
Figure 4. Place of articulation branching into two locations.

Examples from ČZJ illustrating the specific location features are the following: THINK ([head], [high], [ipsi], [prox]), THROW ([head], [high], [ipsi], [dist]), RED ([head], [low]), FRIEND ([trunk], [high], [contra]). The signs articulated in the middle of the neutral space

(AREA) do not have any *place* features since this configuration is considered the default. FATHER contains two locations (L1, L2): the movement begins at the forehead (L1: [head], [high]), and it ends at the chin (L2: [head], [low]). The same features transfer to the non-dominant hand, which serves as a place of articulation in two-handed asymmetrical signs. Consider BEGINNING: The movement of the dominant hand starts with the contact on the fingertips of the non-dominant hand. The dominant hand moves with continuous contact toward the wrist of the non-dominant hand. The specification for place contains two locations (L1: h2 and [high]; L2: h2 and [low]).

Sandler (2006, 171) pointed out that in signs that contain both the internal movement and the path movement, the first position of the fingers temporally coincides with the first location; and analogically for the second position and location. Consider an example HOME. The hand starts from the proximal location to the *head*. All selected fingers and thumb are extended and open (🖐). While moving to the distal location from the head, the hand keeps closing. At the final location, the fingers are closed (✌). The correspondence between the two finger positions and the two locations of the hand is captured by the link between the branching nodes of the *hand configuration* category and the category of *place*. See Figures G–J in the Appendix for AREA, FATHER, BEGINNING, and HOME.

The non-dominant hand (h2) is a complex subcategory within the *place*. Besides the features employed for the rest of the areas, *h2* inherits the specifications for hand configuration. The shape of h2 in two-handed asymmetrical signs is defined by the Dominance Condition (in (4) above) and revisited by Sandler, who pointed out that h2 either has one of the unmarked shapes or as a copy, it mimics the shape of h1 (Sandler 2006, 184). The HTM implements the Dominance Condition by allowing the handshape specification of *h2* to be as complex as the specification of *h1* (in case h2 is a copy). ČZJ can provide examples of variant pairs that exploit both strategies. Consider the pair of COUNTRY#1 (unmarked shape on h2) and COUNTRY#2 (h2 copies h1).

The boundary between the area of the non-dominant hand and the arm is defined by the wrist (belonging to h2).[4] In our modifications of HTM, we suggest the extension of the orientation features to the *arm* (as an area that shares certain physiological properties of h2).[5] In HTM, the *arm* is a simple feature within the category of *place*. By adding the set of orientation features, we redefine *arm* as a complex subcategory. This update allows us to adequately describe the difference, e.g., between signs that employ contact on the opposite sides of the forearm (COUNTRY#1 vs. BLOOD).

The last two features are [contact] and [rep] (repetition). [contact] can be placed on the main area of articulation (MASK: [head] and [contact]), on one of the two locations (APARTMENT: [contact] on L2), or at both locations (COFFEE#1). COFFEE#2 shows the appli-

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4   A similar transitive area is between the *head* and the *trunk* (the neck forms part of the *head*).

5   Only the orientation features that are physiologically possible are inherited (that excludes, e.g., [fingertips]).

cation of [rep] with [contact] on *head*, specified by location features [low] and [ipsi]; See Figure K in the Appendix for the full specification.

4.3 Movement

The movement category is the simplest among the three; see Figure 5. It covers only the primary (path) movement. As we have explained in Section 4.1.2, the secondary and internal movements are accounted for in the hand configuration category.

MOVEMENT

[arc]
[convex]
[horizontal]
[frontal]
[sagittal]
[rep]
[contact]

Figure 5. Movement.

It is common (Sandler 2006, a.o.) to account for signs with a straight movement between L1 and L2 as having no movement features (FATHER). When two locations are determined between which the hand(s) must move, a straight path is a phonetic necessity.

When [contact] is defined on movement, two situations are possible: (i) the sign exhibits a *brushing* movement (the hand only touches the place during the movement and not on the locations; NUDE); or (ii) the sign exhibits a *continuous* contact (the hand touches the place throughout the whole articulation; TEA); Sandler (2006, 202).

The circular movement is more complex. We follow Sandler (1989, 1990, 2006) and Corina (1990) in modeling circular movements as a series of arcs with opposite concavity. The default arc movement defined with [arc] (WORLD) is concave, meaning that both L1 and L2 are closer to the body or the middle of the signing space than the midpoint of the movement. The opposite effect is derived by [convex] (DRESS). When combined, these features describe a circular movement (HOUR).

However, HTM could not account for distinctions between a near-minimal pair of signs such as HOUR and WE. The two signs would have to be defined in the same way wrt to their place, and movement (L1 in the middle of the neutral space, L2 on the ipsilateral side of the neutral space; and the movement between them as a series of arcs defined for [arc] and [convex]). Such a model does not reveal the difference between the two movements without the additional features for the planes. The features can distinguish the movements in the horizontal (WE), frontal (HOUR), and sagittal (YEAR) plane. Therefore, we propose adding the corresponding features to the movement segment as well.

Another feature that has already been mentioned is [rep]. When applied individually, it gives rise to signs with a repeated straight path movement between two locations (TOURISM). In combination with [contact], we get signs such as BATHROOM,

where the hand(s) contact the place of articulation or each other during the repeated movement. The most complex case is represented by signs such as TORNADO#1 and TORNADO#2 (combination of [arc], [convex], and [rep]). We part from the HTM here. Sandler regards every arc as an individual temporal segment, but this prevents her from combining circular and path movements (TORNADO#2). In our solution, the circular movement fills a regular timing slot for movements, which accounts for TORNADO#1, and is also compatible with defined initial ([high], [ipsi]) and final ([low], [ipsi]) locations (TORNADO#2). In this way, we account for the simultaneous articulation of the path and the circular movement.

There are other types of path movements attested in the literature and also in ČZJ (FAMOUS or THREE), a so-called α-movement (FACTORY; Pfau and Quer 2007), or the ASL movement '7' (Sandler 2006, 197). Some of these could be considered iconic movements, together with the movement in classifier constructions, and therefore are not part of the underlying phonological representation. In any case, more research in this area is needed to determine what is the correct way of analyzing these types of complex movements.

5. Conclusion

The HTM outlined above has proven to be useful in describing ASL and ČZJ data. However, in applying the HTM descriptions to ČZJ, we encountered some theoretical problems of the model, to which we proposed solutions based on certain refinements. The main adjustments are: (i) addition of features [horizontal], [frontal], and [sagittal] into the categories of handshape (namely orientation) and movement in order to propose a solution to the problems of phonologically distinguishing certain types of hand orientation or movement direction; (ii) explicitly characterizing the position and conditions of use of the [rep] within all three main parameters; (iii) addition of the orientation feature [back] and the redefinition of [wrist], according to the anatomical possibilities of the hand orientation; (iv) removal of the thumb feature [opposed] due to its redundancy; and (v) redefinition of the *arm* as a subcategory of the place parameter with its orientation features, rather than keeping it as an individual feature [arm].

6. References

Anderson, John, and Colin Ewen. 1987. *Principles of Dependency Phonology*. Cambridge: Cambridge University Press.

Ann, Jean. 1993. "A Linguistic Investigation into the Relation Between Physiology and Handshape." PhD diss., University of Arizona.

Aronoff, Mark, Irit Meir, Carol Padden, and Wendy Sandler. 2004. "Morphological Universals and the Sign Language Type." In *Yearbook of Morphology 2004*, edited by Geert Booij and Jaap van Marle, 19–39. Dordrecht: Kluwer.

Battison, Robbin. 1978 [1973]. *Lexical Borrowing in American Sign Language*. Silver Spring: Linstok Press.

Brentari, Diane. 1998. *A Prosodic Model of Sign Language Phonology*. Cambridge, MA: MIT Press.

Clements, George N. 1985. "The Geometry of Phonological Features." *Phonology* 2 (1): 225–252.

Corina, David. 1990. "Reassessing the Role of Sonority in Syllable Structure: Evidence from Visual-Gestural Language." *Papers from the Chicago Linguistic Society* 26 (2): 33–44.

Corina, David. 1993. "To Branch or Not to Branch: Underspecification in ASL Handshape Contours." In *Current Issues in ASL Phonology*, edited by Geoffrey R. Coulter, 63–95. New York: Academic Press.

Dictio: Multilingual Online Dictionary. 2020. Brno: Masaryk University. Accessed October 31, 2021. www.dictio.info.

Durand, Jacques. 1986. *Dependency and Non-Linear Phonology*. London: Croom Helm.

Channon, Rachel. 2002a. "Beads on a String? Representations of Repetition in Spoken and Signed Languages." In *Modality and Structure in Signed and Spoken Language*, edited by Richard P. Meier, Kearsy Cormier, and David Quinto-Pozos, 65–87. Cambridge: Cambridge University Press.

Channon, Rachel. 2002b. "Signs Are Single Segments: Phonological Representations and Temporal Sequencing in ASL and Other Sign Languages." PhD diss., University of Maryland.

Čermák, František. 1995. "Paradigmatika a syntagmatika slovníku: možnosti a výhledy." In *Manuál lexikografie*, edited by František Čermák and Renata Blatná, 90–115. Jinočany: H&H.

Fenlon, Jordan, Kearsy Cormier, and Adam Schembri. 2015. "Building BSL SignBank: The Lemma Dilemma Revisited." *International Journal of Lexicography* 28 (2): 169–206.

Filipec, Josef. 1995. "Teorie a praxe jednojazyčného slovníku výkladového." In *Manuál lexikografie*, edited by František Čermák and Renata Blatná, 14–49. Jinočany: H&H.

Greftegreff, Irene. 1993. "Anatomy and Features in Sign Language Handshapes." Ms., University of Trondheim.

Liddell, Scott K. 1984. "THINK and BELIEVE: Sequentiality in American Sign Language." *Language* 60: 372–392.

Liddell, Scott K. 1990. "Structures for Representing Handshape and Local Movement at the Phonemic Level." In *Theoretical Issues in Sign Language Research*, edited by Susan Fischer and Patricia Siple, 37–65. Chicago: Chicago University Press.

Liddell, Scott K., and Robert E. Johnson. 1989 [1985]. "American Sign Language: The Phonological Base." *Sign Language Studies* 64 (1): 195–277.

Newkirk, Don, Ed Klima, Carlene Canady Pedersen, and Ursula Bellugi. 1980. "Linguistic Evidence from Slips of the Hand". In *Errors in Linguistic Performance: Slips of the Tongue and Hand*, edited by Victoria Fromkin, 165–197. New York: Academic Press.

Oberfalzerová, Anna. 2015. "Tvary ruky českého znakového jazyka a typy jeho znaků (frekvenční analýza komunikace českých neslyšících)." Bachelor's thesis. Charles University in Prague.

Olson, Todd R. and Wojciech Pawlina. 2008. "Upper Limb." In *A.D.A.M. Student Atlas of Anatomy*, edited by Todd R. Olson and Wojciech Pawlina, 277–346. Cambridge: Cambridge University Press.

Perlmutter, David. 1992 [1993]. "Sonority and Syllable Structure in American Sign Language." *Linguistic Inquiry* 23: 407–442.

Pfau, Roland and Josep Quer. 2007. "On the Syntax of Negation and Modals in German Sign Language (DGS) and Catalan Sign Language (LSC)." In *Visible Variation: Cross-linguistic Studies on Sign Language Structure*, edited by Pamela Perniss, Roland Pfau, and Markus Steinbach, 129–161. Berlin: Mouton de Gruyter.

Sagey, Elizabeth. 1986. "The Representation of Features and Relations in Non-linear Phonology." PhD diss., MIT.

Sandler, Wendy. 1986. "The Spreading Hand Autosegment of American Sign Language". *Sign Language Studies* 50: 1–28.

Sandler, Wendy. 1987a. "Assimilation and Feature Hierarchy in American Sign Language." *Papers from the Chicago Linguistic Society, Parasession on Autosegmental and Metrical Phonology*: 266–278. Chicago: Chicago Linguistic Society.

Sandler, Wendy. 1987b. "Sequentiality and Simultaneity in American Sign Language." PhD diss., University of Texas.

Sandler, Wendy. 1989. *Phonological Representation of the Sign: Linearity and Nonlinearity in American Sign Language*. Berlin: Walter de Gruyter.

Sandler, Wendy. 1990. "Temporal Aspect and American Sign Language." In *Theoretical Issues in Sign Language Research*, edited by Susan Fischer and Patricia Siple, 103–129. Chicago: University of Chicago Press.

Sandler, Wendy. 1995. "Markedness in the Handshapes of Signs: A Componential Analysis." In *Leiden in Last: Holland Institute of Linguistics Phonology Papers*, edited by Jeroen van der Weijer and Harry van der Hulst, 369–399. The Hague: Holland Academie Graphics.

Sandler, Wendy. 2006. "Phonology." In *Sign Language and Linguistic Universals*, edited by Wendy Sandler and Diane Lillo-Martin, 111–278. New York: Cambridge University Press.

Silovská, Zuzana. 2012. "Minimální páry v českém znakovém jazyce." Bachelor's thesis. Charles University in Prague.

Stokoe, William C. 1960. "Sign Language Structure: An Outline of the Visual Communication Systems of the American Deaf." *Studies in Linguistics: Occasional Papers*. Buffalo: University of Buffalo.

van der Hulst, Harry. 1989. "Atoms of Segmental Structure: Components, Gestures and Dependency." *Phonology* 6: 253–284.

van der Hulst, Harry. 1993. "Units in the Analysis of Signs." *Phonology* 10: 209–242.

van der Kooij, Els. 1998. "The Position of Unselected Fingers." In *Linguistics in the Netherlands 1998*, edited by Renée van Bezooijen and René Kager, 149–162. Amsterdam: John Benjamins.

van der Kooij, Els. 2002. "Phonological Categories in Sign Language of the Netherlands: The Role of Phonetic Implementation and Iconicity." PhD diss., Netherlands Graduate School of Linguistics.

Vlášková, Lucia, and Hana Strachoňová. 2021. "Sign Language Lexicography: A Case Study of an Online Dictionary." *Slovenščina 2.0: Empirical, Applied and Interdisciplinary Research* 9 (1): 90–122. Accessed October 31, 2021. https://revije.ff.uni-lj.si/slovenscina/article/view/9860.

Zeshan, Ulrike. 2003. "Towards a Notion of 'Word' in Sign Languages." In *Word: A Cross-linguistic Typology*, edited by Robert M. W. Dixon and Alexandra Y. Aikhenvald, 153–179. Cambridge: Cambridge University Press.

7. Appendix

Figure A. BROTHER-IN-LAW#1.

Figure B. BROTHER-IN-LAW#2.
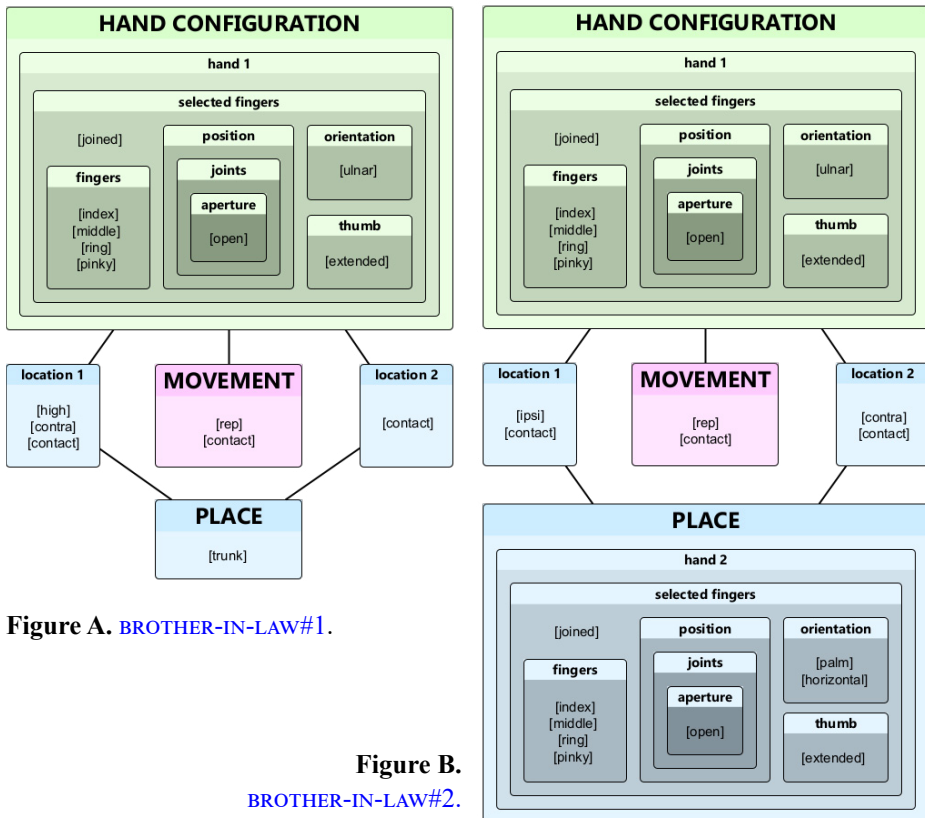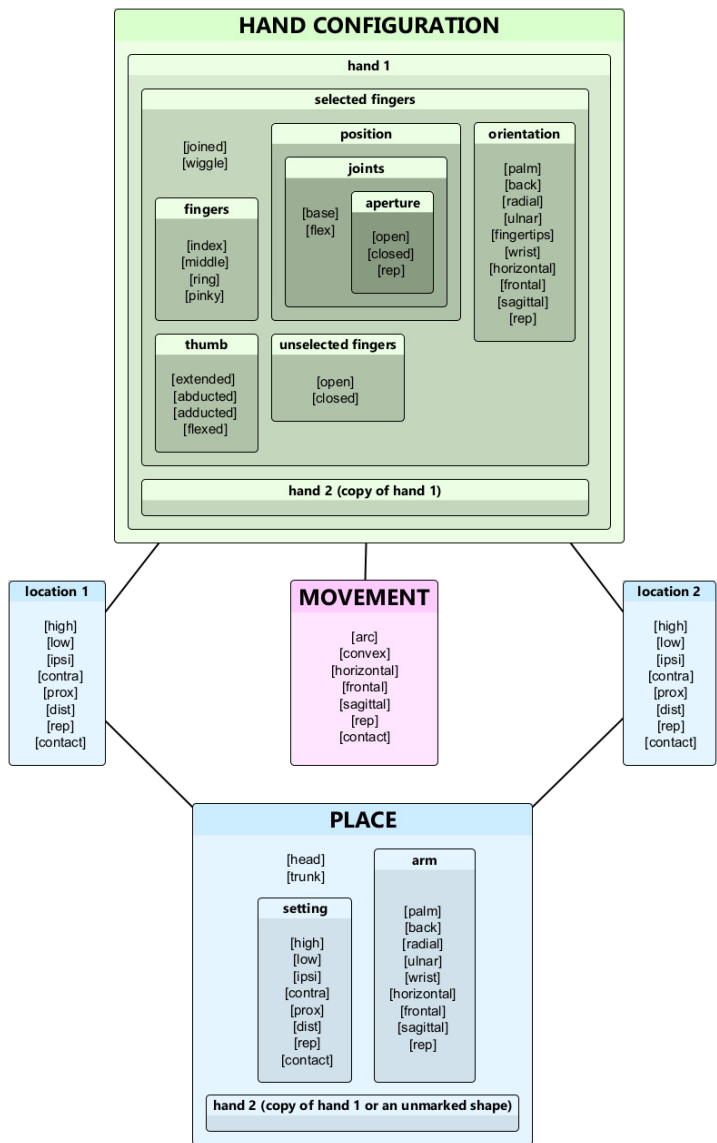
Figure C. HTM with terminal features.
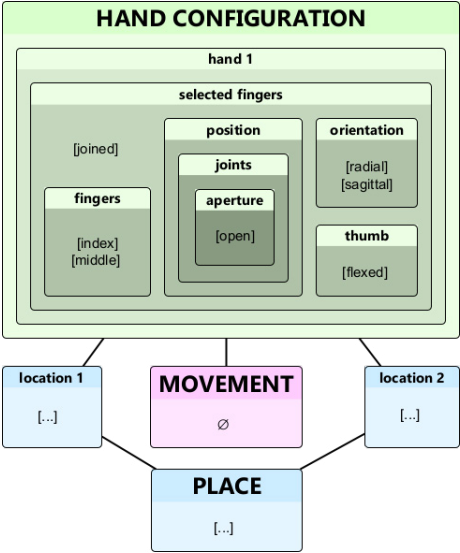
Figure D. DEAF.
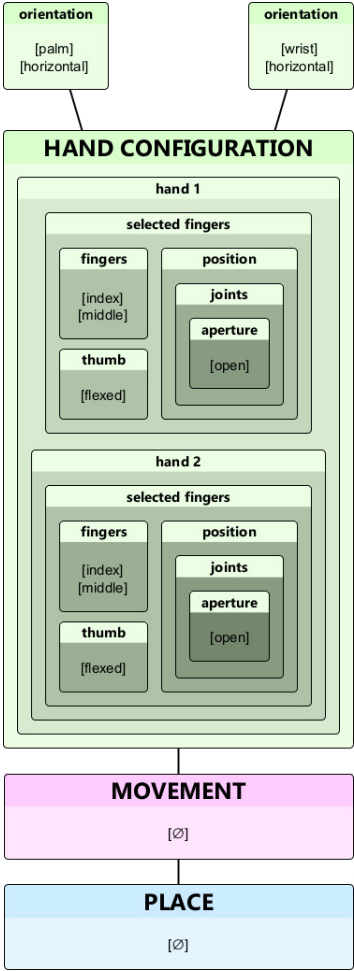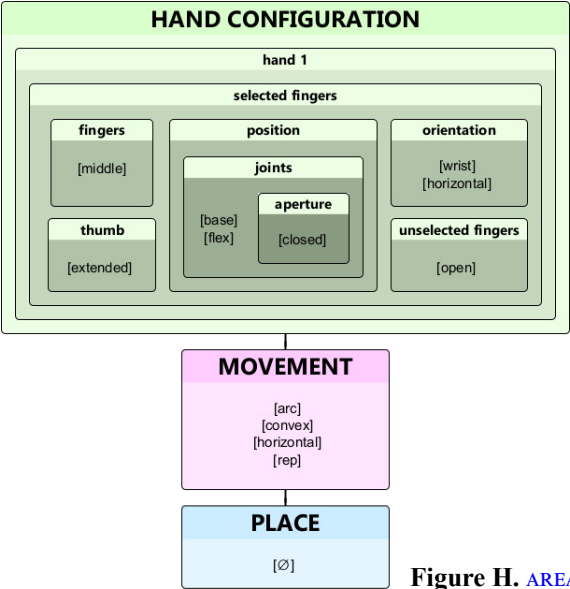

Figure E. CONSEQUENCE.
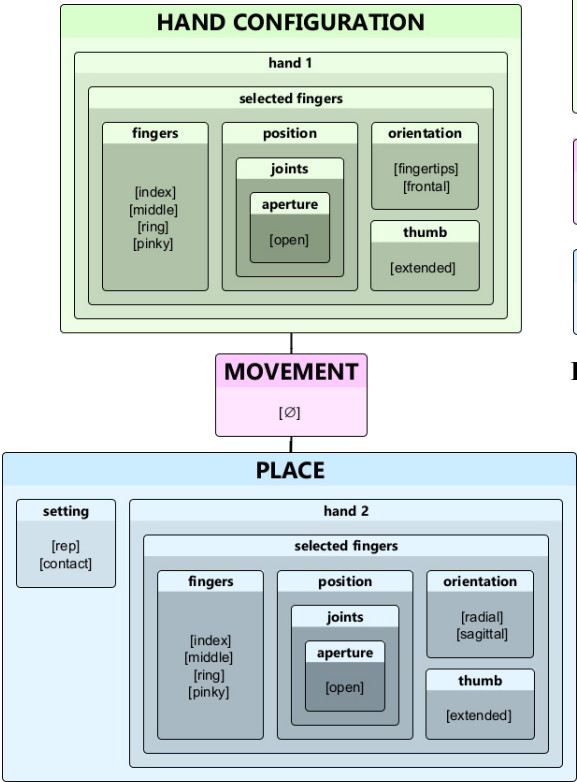
Figure F. TEST.
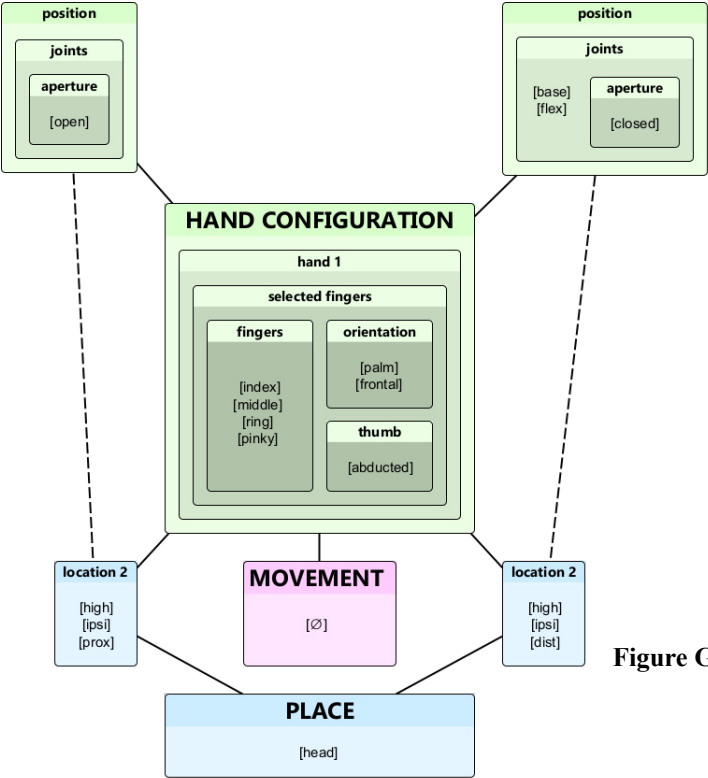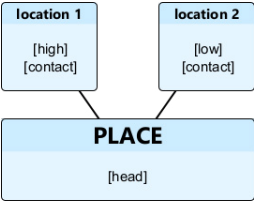
Figure G. HOME.
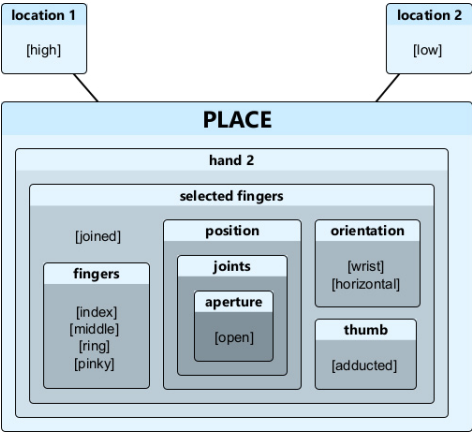

Figure H. AREA.
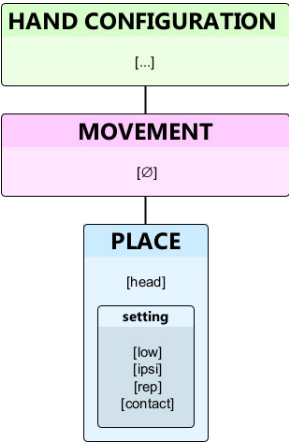
Figure I. FATHER.

Figure J. BEGINNING.

Figure K. COFFEE#2.

Language Use and Linguistic Structure
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