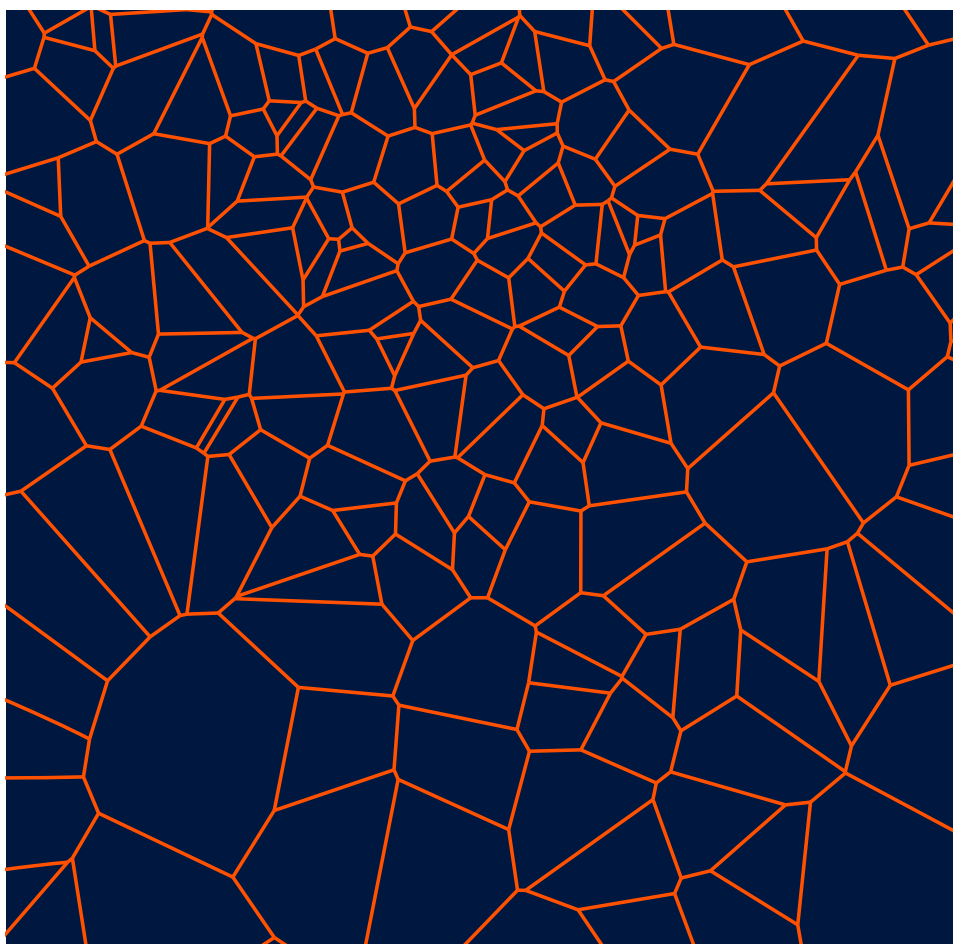Edited by
Markéta Janebová, Michaela Čakányová, and Joseph Emonds

Language Use and Linguistic Structure

Proceedings of the Olomouc Linguistics Colloquium 2023

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Language Use and Linguistic Structure

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Acknowledgements

Introduction

The articles in this volume are based on papers and posters presented at the sixth Olomouc Linguistics Conference (OLINCO), held at Palacký University Olomouc in the Czech Republic in June 2023. At this conference, papers combined analyses of language structure with generalizations about language use. The essays included here can be seen, we believe, as a representative sample of the conference contributions, covering a broad range of topics and methodologies.

Part I. Explorations in Morphology and Syntax
In the opening paper, **Irina Burukina** examines embedded rationale infinitives and imperatives in Mari (Uralic) and offers a uniform semantico-syntactic analysis for both constructions based on the idea that rationale clauses contain a MoodP with a teleological modal as its head: in infinitival rationale clauses the MoodP is built on top of the non-finite TP/FinP, and in imperative rationale clauses the usual imperative modal is utilized with a shifted modal flavor.

Gioia Cacchioli's paper investigates a particular use of the copula in a lesser-studied language of the Ethio-semitic branch: by providing a substantial amount of novel data in Tigrinya, she claims that the individual-level copula in this language marks Verum Focus.

In her contribution, **Michaela Čakányová** examines the question whether the non-nominative agents of verbs of cognition and perception in Czech might have some other properties typical for grammatical subjects and whether they might be considered "quirky" subjects.

Joseph Emonds investigates the difference between central syntactic categories and their close cognitive counterparts, which are not uniform across categories. It is argued that marked extensions of cognitive categories maintain those categories, and are defined by the lack ("cancellation") of some central interpretive component of their syntactic category.

Chang Liu examines the syntax of two groups of "subject-less" constructions in Mandarin Chinese and argues against the existence of a null expletive in these constructions.

Mark Newson and **Krisztina Szécsényi**'s paper proposes that English has a neutral case system in which only unmarked case is assigned. They argue that the form pronouns take, which mimics the nominative-accusative system that the language once had, is a matter of the context dependent realisation of the underlying uniform case.

In his contribution, **Feras Saeed** investigates split agreement on internominal adjectives in Arabic, and argues that these adjectives are born predicates in a relative structure. The core proposal rests on two novel observations: adjectival modification is tied to definiteness marking in the relative structure, and adjectival agreement takes place in two separate agreement domains.

In this section's closing paper, **Leonardo Savoia** and **Benedetta Baldi** examine the case system of the Southern Albania Aromanian varieties, in which a specialized oblique inflection preceded by the Possessive Introducer (PI) characterizes plural definite nouns. Assuming that morphology is part of syntactic computation, the authors propose an analysis of inflections, oblique and syncretism.

Part II. Explorations in Semantics and Pragmatics
In this section's opening paper, **Peter Hallman** documents differences between the determiners *few* and *no*, and concludes that they should not be treated on par, contrary to previous literature. Rather, *few* functions as a degree quantifier while *no* is a reflex of a hidden clausal negation.

The following two papers were presented at the thematic session entitled "Deictics and demonstratives", organized by Volker Gast. In his contribution, **Péter Szűcs** investigates Hungarian nominal

demonstrative pronouns in contexts where they are associated with some clause and argues that the pronouns in question may function as either arguments or predicates. Taking a Nanosyntactic perspective, he relates this to the presence/absence of a syntactic layer responsible for referentiality (RefP) in the feature structure that the demonstratives realize.

The joint paper by **Enikő Tóth** and **Péter Csatár** investigates demonstrative selection in Hungarian, in face-to-face conversations restricted to table-top space, in three regions: within easy arm reach, at forced arm reach or beyond reach from the speaker. The findings confirm that the use of demonstratives shows different patterns in contrastive and non-contrastive situations and emphasize the need to distinguish same region and across region contrast.

The section concludes with **Tue Trinh** discussing various forms of second order questions, i.e., questions about questions, and argues that many puzzling facts can be made to follow from the thesis that speech acts are syntactically represented. Trinh also shows that assuming speech acts in syntax makes it possible to systematize some differences between matrix and embedded sentences.

Part III. Explorations in Language Acquisition and Processing

This section opens with **Csaba Csides**, who aims to demonstrate that the minimal word constraint and the assignment of word-stress in English can be captured by the same machinery within the framework of strict CV-phonology. In his account, Csides parts with two tenets of standard strict CV-phonologies: on the one hand he argues for bidirectional government in Phonology, while on the other hand he proposes that both empty and contentful skeletal positions can serve as the target of government.

In their paper, **Mojmír Dočekal** and **Žaneta Šulíková** discuss the issue of the acquisition of distributivity, quantifiers, and nominal phrases in the Czech language. The study aims to discover at what age the obligatory distributive interpretation of the universal quantifier (UQ) *každý* 'each' appears in the language of Czech children.

The contribution by **Krisztina Szécsényi** and **Tibor Szécsényi** proposes a representation of arguments and adjuncts in terms of probability value vectors that can be extended to identifying the argument structure variants of the same verb. They present a method for determining argument structure, the predictions of which correlate with the results of a manual annotation control with a high degree of accuracy.

In the concluding paper, **Tibor Szécsényi** and **Lívia Gyulai** focus on the argument structure of non-compositional verbs modified by verbal modifiers, using data obtained from a corpus and an asemantic version of the principle of compositionality. The study aims to investigate the compositionality of the meaning of the complex expressions from a syntactic perspective, focusing on their formal features and formal behaviour instead of their semantic properties.

We hope that the papers in this collection will capture the readers' interest. Organizing the conference was both a demanding and rewarding experience, and we are now eager to share the challenges and outcomes of this linguistic forum with a broader audience. Through these proceedings, we aim to extend the insights and discussions of the conference via the written word, which was, after all, invented by our species so that the pleasures and benefits of speech and hearing could be extended to the widest possible audience.

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Part I.
Explorations in Morphology

Deriving Rationale Clauses: Infinitives and Imperatives

Irina Burukina

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Abstract: The paper examines rationale clauses in Mari (Uralic; head-final), which come in two types: infinitival clauses and imperatives. It develops a uniform semantico-syntactic analysis for both constructions based on the idea that rationale clauses contain a MoodP with a teleological modal as its head: in infinitival rationale clauses the MoodP is built on top of the non-finite TP/FinP, and in imperative rationale clauses the usual imperative modal is utilized with a shifted flavor. The research fills in a gap in the description of Uralic and contributes to the discussion of the split CP and modality in adjunct clauses by demonstrating how embedded non-finite and finite CPs can be predicated directly of the main clause.

Keywords: rationale clauses, adverbial clauses, Mood, modality, infinitive, imperative

1.   The Rationale Puzzle

The paper focuses on rationale clauses in Meadow Mari, a Uralic head-final language (henceforth, Mari).[1] They come in two types. **Infinitival rationale clauses** are marked with the suffix *lan* (1). They contain either an implicit subject that is controlled by a matrix dependent (1a) or a referentially independent subject marked dative (1b). The suffix *lan* and the complementizer *manən* have null allomorphs, and either of these items (or even both at the same time) can be silent; similarly, *manən* can be dropped in embedded indicative and imperative clauses. The co-occurrence of the two items is also allowed, although the speakers that I consulted found some of such examples unnecessarily long. So far I have not found any correlation between the absence/presence of overt *lan* and *manən* and any other syntactic or semantic properties of the rationale dependents. Throughout the paper I mark both *lan* and *manən* as optional in the examples.

(1)   a.   [PRO_i   kudəvečə-š   pur-**aš**(-lan)   (manən)],
                          yard-ILL   go-INF-MOD   COMP
             təj_i   pečə-m   sümər-en-at.
             you   fence-ACC   break-PST-2SG
             'You broke the fence in order to get into the yard.'

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b. [Məlanna   kudəvečə-š   pur-**aš**(-lan)   (manən)],
   we.DAT   yard-ILL   go-INF-MOD   COMP
   təj$_i$ pečə-m   sümər-en-at.
   you   fence-ACC   break-PST-2SG
   'You broke the fence in order for us to get into the yard.'

The construction is not unusual from a cross-linguistic perspective: consider, for instance, infinitival rationale clauses in Russian headed by the complementizer *čtoby* and *in order to* adverbial clauses in English, all of which allow overt subjects. What makes Mari stand out is the second type of rationale clauses available in the language, namely, **embedded imperatives**. (I use the term *imperative* in a broad sense to also include jussives and cohortative-hortatives.) As exemplified in (2) in comparison to (3), such rationale clauses allow nominative subjects and require subject agreement on the main verb, and they are identical in the verbal morphology to root imperatives.

(2) a. [Čəla-m   kalas-en   puo-**Ø**   manən],   rveze-vlak-əm   per-en-na.
           all-ACC   tell-CVB   give-IMP   COMP   boy-PL-ACC   hit-PST-1PL
           'We hit the boys in order for you to tell (us) everything.'

     b. [Rveze-vlak   čəla-m   kalas-en   pu-**Ø**-əšt   manən],
           boy-PL   all-ACC   tell-CVB   give-IMP-3PL   COMP
           təj-əm   per-en-na.
           you-ACC   hit-PST-1PL
           'We hit you in order for the boys to tell (us) everything.'

(3) a. Čəla-m   kalas-en   puo-**Ø**!
           all-ACC   tell-CVB   give-IMP
           'Tell us everything.'

     b. (Tek)   rveze-vlak   čəla-m   kalas-en   pu-**Ø**-əšt.
           PTCL   boy-PL   all-ACC   tell-CVB   give-IMP-3PL
           'The boys should tell us everything.'

Cross-linguistically embedded imperatives are not uncommon, see Kaufmann (2014) for an overview. However, their distribution is usually restricted to being embedded under speech act predicates, where they are still used in the primary directive function; see Platzack (2007) on Old Scandinavian; Pak et al. (2008) on Korean; Rus (2005) and most recently Štarkl (2023) on Slovenian; Kaufmann and Poschmann (2013) on German. Imperatives in Mari also appear in indirect speech reports to express commands; such examples lie beyond the scope of this paper and I refer the reader to Burukina (2023a) for more data. When it comes to embedded imperatives being used specifically as rationale clauses, to the best of my knowledge, this has only been reported in Chukchi by Naumov (2018). I discuss his work in section 4 and compare his analysis to my proposal.

To account in a unified way for both phenomena, i.e., the distribution of rationale infinitives and imperatives, I work up a syntactico-semantic analysis in the core of which lies the idea that rationale clauses contain a modal operator, Mod$_{Rat}$(Nissenbaum 2005; Grosz 2014; Dąbkowski and AnderBois 2024). The modal is structurally present as the head of MoodP (section 2). In rationale infinitives MoodP is added on top of the non-finite TP/FinP and its head is spelled out as *lan*; I outline the derivation of such clauses in section 3. In imperative rationale clauses the already present covert imperative modal

is used as Mod_{Rat} with its modal flavor shifted to teleological (see Schwager 2006; Kaufmann 2012 on Mod_{Imp}). I discuss such constructions and the attested obviation effects in section 4. Overall, the paper aims to demonstrate that all rationale clauses in Mari can be derived in the same way using the same inventory of functional heads, despite some differences in their morphosyntax.

2. Semantics and Syntax of Rationale Clauses: A General Outline

As a starting point, I argue that all rationale adjuncts contain a modal operator, in the spirit of Nissenbaum (2005) and Grosz (2014). The modal is syntactically present in the Mood head that takes the embedded propositional TP as its complement and links it to the matrix proposition. I begin this section by presenting the semantic part of the analysis, following Grosz (2014) and Dąbkowski and AnderBois (2024), and I proceed by outlining the syntactic structure.

2.1 Semantics of Rationale Clauses

Let us begin by considering the semantics of rationale clauses. I adopt the analysis proposed by Dąbkowski and AnderBois (2024) for rationale clauses in A'ingae (Amazonian). The central idea is that rationale clauses contain a teleological modal element. The modal component is inserted in the Mood head, which takes the saturated TP of the type <s,t> as its complement and facilitates turning the embedded proposition into a modifier, which can then be predicated of the main TP. The analysis of Dąbkowski and AnderBois (2024) is a modified version of an account developed by Grosz (2014) for the *um ... zu* rationale clauses in German. In what follows I present the gist of the approach, and I refer the reader to the original articles for the complete argumentation.

Grosz (2014) examines the distribution of certain modal particles in German rationale clauses and argues that they function as modifiers of a covert modal. He proposes that this modal has a teleological flavor and, as such, makes reference to the goals of the explicit or implicit agent in the matrix clause. Thus, sentences like *Sam took the Red Line [to get to Alewife]* are to be paraphrased as *Sam took the Red Line [for in view of his goals he had to get to Alewife]*.

Inspired by Nissenbaum's (2005) semantics for rationale clauses modeled after Hintikka's (1969) description of possible worlds, Grosz defines Mod_{Rat} as quantifying over the set of possible worlds that are compatible with or relevant to the matrix initiator's goals in the specific event expressed by the matrix predicate. Dąbkowski and AnderBois (2024) adopt his analysis with an important modification: they treat rationale clauses as modifiers of propositions and not events. Since their paper in semantic is nature, they do not focus much on the syntactic properties of rationale clauses and follow Huettner (1989) in placing these adjuncts at the TP level without much argumentation; as I show in the next subsection, the Mari data provide support for the TP-adjunction approach. The denotation of Mod_{Rat} is given in (4), adapted from Dąbkowski and AnderBois (2024).[2]

(4) $[\![Mod_{Rat}]\!]^{a,w} = \lambda p_{st}.\lambda q_{st}.\forall w'[w'$ is compatible with the goals relevant to q: p(w')]

2.2 Syntax of Rationale Clauses

As discussed in section 2.1, Mod_{Rat} is essentially a two-place predicate that requires two arguments of the type <s,t>: one is the embedded TP (denoted as p in (4)) and the other is the main TP (denoted as q in (4)). (As I describe below, the modal combines with the embedded TP directly, and with the matrix one 'by proxy', when the whole rationale CP is turned into a predicate and is adjoined to the

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2   Dąbkowski and AnderBois (2024) also introduce a presupposition of existence for an individual that intentionally brings about the event described by the main clause. They do this in order to accommodate examples without an explicit matrix initiator. The presupposition can be added to the modal analysis proposed in this paper without change.

main TP). The base structure of all rationale clauses is sketched out in (5); it includes the modal Mod$_{Rat}$ inserted in the Mood head.

(5)　The structure of rationale clauses
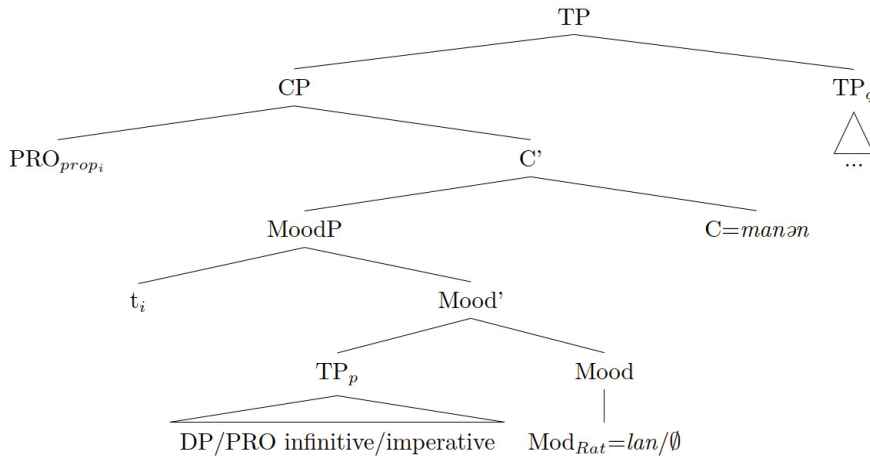
The derivation in (5) proceeds as follows. MoodP is introduced on top of the saturated embedded TP. Mod$_{Rat}$ (a two-place predicate) in the Mood head takes the TP as one of its arguments and requires one more propositional argument to combine with. I propose that a proposition-type element, namely, a silent minimal pronoun (PRO$_{prop}$), is merged in spec,MoodP; cf. Stegovec (2019) introducing a perspectival individual-type anaphor (PRO$_{pers}$) in spec,MoodP to combine with a directive/deontic modal Mood. This makes the MoodP saturated. It is then selected by a general non-interrogative complementizer *manən*, which is generally used in embedded infinitival, imperative, and indicative clauses. The final step in the derivation is for PRO$_{prop}$ to move to spec,CP where it turns into an operator.[3] This creates a derived one-place predicate out of the whole rationale CP, and the rationale clause can now be attached to the main TP and modify it.

　　As mentioned above, I side with Huettner (1989) and Dąbkowski and AnderBois (2024) and argue that rationale clauses are TP adjuncts. The interpretation of rationale clauses relative to the scope of a matrix negation supports this idea for Mari. As illustrated in (6), rationale clauses in Mari always scope above the matrix negation, regardless of whether they are positioned at the very periphery of the sentence or linearly follow a topicalized element.

(6)　a.　Oksam　anəkl-aš(-lan)　(manən),　knigam　nal-ən　onal.
　　　　money　save-INF-MOD　COMP　book　buy-CVB　NEG.PST.1PL
　　　　'In order to save the money we didn't buy the book.'
　　　　RatCl > NEG

3　A reviewer asked what motivates the movement of PRO$_{pers}$ from spec,MoodP to spec,CP. I admit that at this point the movement step remains rather speculative. Similar movement of PRO from spec,TP to spec,FinP was proposed by Landau (2015), who suggested that it was triggered by a special uninterpretable feature [uD] on Fin. Alternatively, one may suggest that the movement, i.e., the internal merge, of PRO$_{pers}$ does not need to be independently motivated (for a discussion of internal merge see Chomsky et al. (2023)); however, without it the derivation would crash, as the embedded CP would remain fully saturated and argument-like and would not be able to combine with the matrix TP.

  b. Urok-lan jamdəlalt-aš(-lan) (manən), knigam nal-ən onal.
   class-DAT prepare-INF-MOD COMP book buy-CVB NEG.PST.1PL
   Not available: 'We did not buy the book to prepare for the class.' NEG > RatCl
   Only: 'In order to prepare for the class, we did not buy the book.' RatCl > NEG

  c. Me   urok-lan jamdəlalt-aš(-lan) (manən),
   we   class-DAT prepare-INF-MOD COMP
   knigam nal-ən onal.
   book   buy-CVB NEG.PST.1PL
   Not available: 'We did not buy the book to prepare for the class.' NEG > RatCl
   Only: 'In order to prepare for the class, we did not buy the book.' RatCl > NEG

Syntactically, NegP in Mari is inserted between vP/VoiceP and TP and typically takes the highest scope (Georgieva et al. 2021). Thus, for a rationale clause to scope over the matrix negation it has to be merged above the NegP, at the TP level. Under the compositional semantics approach, at that stage a modifier can be a predicate of propositions (naturally combining with the matrix TP). However, it is very unlikely to be a predicate of events: the event(uality) variable has to be existentially closed before the negation is merged, to get the desired interpretation "there is no such event e" and not "there is an event that is not e".

3. Deriving Rationale Infinitives

The derivation of infinitival rationale clauses with referentially independent subjects proceeds straightforwardly as described in section 2, with the fully saturated TP being placed in the complement position of the modal Mood. The derivation of rationale infinitives with a controlled subject deserves more attention, as it is not immediately clear whether the embedded TP should be treated as a proposition ($<s,t>$) or rather a predicate ($<e,<s,t>>$); see Landau (2015) and references therein on obligatory control (OC) as predication. In what follows I will show that rationale TPs instantiate non-obligatory control (NOC) and are propositional. I will limit the discussion to two diagnostics commonly applied to distinguish between OC and NOC: the availability of PRO$_{arb}$ and the [+human] restriction on the controller.

  The availability of PRO$_{arb}$ proves that control in Mari rationale clauses is non-obligatory in at least some contexts. This is shown in (7): in the absence of an initiator in the main clause the silent embedded subject can receive an arbitrary reading.

(7) [PRO$_{arb}$ una-m   vašlij-aš(-lan) (manən)]
     guest-ACC receive-INF-MOD COMP
   üstel tidə   pölem-əšte šog-a.
   table this   room-INE   stand-NPST.3SG
   'The table stands in this room in order to receive guests.'

This observation alone is not sufficient to claim that Mari rationale clauses always instantiate NOC. As discussed in detail by Landau (2021), non-finite clauses of the same semantic type (e.g., rationale or purpose) can sometimes allow both NOC and OC. The following fact, however, strongly suggests that obligatory control is indeed excluded in Mari infinitival adjuncts.

Cross-linguistically NOC is distinguished from OC by the obligatory humanness of the controller in the former (Chomsky 1981).[4] When it comes to rationale clauses, it is not an easy task to come up with a scenario that would be appropriate for a [-human] subject and a rationale dependent. A plausible context in English is that with an inanimate subject and the nature/evolution as an implicit initiator: *Flowers produce pollen in order to reproduce* (Landau 2021: 40). However, the speakers that I consulted found parallel examples in Mari (8) to be extremely awkward and not acceptable. (Note that placing the rationale clause after the matrix subject does not improve the sentences; such options are not illustrated in (8), due to the limitation of space.)

(8) a. *[PRO$_i$ šarl-aš(-lan)   (manən)] peledəš$_i$ šərkam   kolt-a.
          expand-INF-MOD   COMP   flower   pollen   give.out-NPST.3SG
          Intended: 'The flowers produce pollen in order to propagate.'

     b. *[PRO$_i$ kislorod-əm   lukt-aš(-lan)   (manən)] kuškəl$_i$ užarge.
          oxygen-ACC   emit-INF-MOD   COMP   plant   green
          Intended: 'The plants are green in order to produce oxygen.'

Taking into account the availability of PRO$_{arb}$ and the ban on [-human] controllers, I conclude that OC is impossible in infinitival rationale clauses in Mari. I assume that TPs with an NOC PRO are fully saturated.[5] They are of the same semantic type as infinitival TPs with a referentially independent subject and imperatives and fit into the structure in (5) without modification.

4. Deriving Rationale Imperatives
4.1 Shifting the Modal

Let us now turn our attention to the imperative rationale clauses. I argue that they share the basic structure with rationale infinitives, as outlined in (5). Recall that rationale infinitives contain Mod$_{Rat}$, inserted in the Mood head and optionally spelled out as *lan*.[6] For rationale imperatives it is reasonable to propose that the modal is an inherently present Mod$_{Imp}$, whose modal flavor has been shifted to teleological.

I assume that imperatives are formed with a modal operator (Mod$_{Imp}$) that is comparable in its interpretation to the modal *should*; see primarily Schwager (2006), later published as Kaufmann

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4   A reviewer pointed out that some OC contexts appear to resist an inanimate controller: consider, for instance, the ungrammatical *The volcano tried to explode* and *Sunlight manages to irritate my roommate* (I am grateful to the reviewer for these examples). However, examples with *try/manage* in the main clause and an inanimate controller are not ruled out completely; the following sentences were found online: *The car managed to move up a steep driveway, The trees try to close the damaged tissue from the outside.* One may argue that *the car* and *the trees* in such cases are being anthropomorphized, but by this logic (8) would also be expected to be acceptable, contrary to the fact.

5   NOC of the embedded PRO by the logophoric center may be mediated with the help of the presupposition that Dąbkowski and AnderBois (2024) propose to add to the denotation of Mod$_{Rat}$; see also footnote 2. As schematized in (i), the presupposition establishes the presence of an impetus responsible for the matrix situation, even when this individual is not mentioned in the main clause.

(i)   a.   presupposition: $\exists i$. such that resp(i, q)

         b.   resp(a, q) $\approx$ a intentionally brings it about that q

6   As argued by Burukina (2023b), the Mood-Mod$_{Rat}$ in infinitival clauses in modern Mari is a result of historical reanalysis of the dative postposition *lan* into a functional head of the category V. I refer the reader to the original work for a detailed discussion.

(2012), but also Stegovec (2019) adopting a similar approach and calling the modal *directive*. Mod_{Imp} is essentially equivalent to a necessity modal and is syntactically introduced in the Mood domain.[7]

Cross-linguistically embedded imperatives are quite productive, however, their distribution is typically restricted to being embedded under speech act verbs and desiderative predicates, where they are still interpreted as directive; for an overview of imperatives used in the reported speech context see Kaufmann (2014). The only work that I am aware of that describes embedded imperatives used as rationale clauses is Naumov (2018) on Chukchi (9).

(9)   Imperatives as rationale clauses in Chukchi

    a.   Nota-ɣtə   Ø-qət-ɣ?-i   iŋqun   **q**-ət**ɬ**?a-re-rkən.
        land-DAT   2/3.S/A-leave-TH-2/3SG.S COMP 2SG.S/A.IMP-mother-seek-IPFV
        'You went to the tundra in order to seek for the mother'.

    b.   Nota-ɣtə   Ø-qət-ɣ?-i   iŋqun   **n**-ət**ɬ**?a-re-rkən.
        land-DAT   2/3.S/A-leave-TH-2/3SG.S COMP 3SG.S/A.IMP-mother-seek-IPFV
        'He went to the tundra in order to seek for the mother'.
        [Naumov 2018, 11]

Naumov does not provide a complete analysis for such sentences and only briefly talks about the source of the rationale semantics. He combines insights from Grosz (2014) and Stegovec (2019) and proposes that, just like all other imperative clauses, rationale imperatives contain a covert modal; however, unlike in root imperatives, this modal is teleological and not deontic. I continue this line of research and adopt a Mod_{Imp} approach to the Mari data.

Overt modals in many languages notoriously can acquire different flavors: e.g., *must* and *may* in English can be used as epistemic or deontic, and *can* can get a deontic, circumstantial, bouletic, or teleological flavor. I assume that the same is true for covert modals, in particular, for Mod_{Imp} (see Stegovec 2019 making a similar suggestion and Bhatt 1999 for a detailed discussion of covert modality). In root imperatives Mod_{Imp} is typically deontic. Alternatively, in rationale imperatives it has a teleological flavor and, due to its complex semantics, requires two arguments of the type $\langle s,t \rangle$ (section 2).

The derivation is schematized in (10), reproduced from (5); an imperative MoodP with $\text{Mod}_{\text{Imp/Rat}}$ forms the core of the rationale clause. The analysis accommodates the data from Mari, as well as from Chukchi.

(10) $[_{\text{CP}}$ PRO$_{\text{prop\_i}}$ $[_{\text{C'}}$ $[_{\text{MoodP}}$ t$_i$ $[_{\text{Mood'}}$ $[_{\text{TP}}$ DP/*pro* imperative] Mood=Mod_{imp}]] C=*manən*]]

4.2 The Obviation Effects

Although the Chukchi data in (9) look very similar to those from Mari (2), there is a notable difference

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7   An alternative to the modal approach is one of the minimal approaches. For instance, Portner (2004, 2007) argues that the force of imperatives comes from pragmatics and that they contain no special modal operator. Given that 2SG imperatives in Mari are morphologically unmarked, a reduced syntactic structure (up to TP or even smaller) would match such a semantic account. Whether a minimal approach better captures the distribution of root 2SG imperatives remains to be determined; however, I believe that it would struggle to accommodate embedded imperatives, which allow a complementizer and an overt subject, and root 3rd person jussives (with an overt subject and subject agreement). I leave the differences between root/embedded and 2/3 person imperatives in Mari to be examined by future research, and I am grateful to Hedde Zeijlstra for drawing my attention to this issue.

between them. Chukchi rationale imperatives do not exhibit the obviation effects; that is, the subject of a rationale clause can be coreferent with the matrix subject. This is not the case in Mari, where rationale imperatives are obviative: they allow only disjoint reference readings of the subjects (11), and an infinitival rationale clause must be used if the embedded and matrix subject share the referent (12).

(11) a. *Kudəvečə-š   puro-Ø   manən,   təj   pečəm   sümər-en-at.
         yard-ILL   go-IMP.2SG COMP   you   fence   break-PST-2SG
         Intended: 'You broke the fence in order to get into the yard.'

   b. Kudəvečə-š   pur-Ø-əšt   manən,
      yard-ILL   go-IMP-3PL   COMP
      rveze-vlak   pečəm   sümər-en-ət.
      boy-PL   fence   break-PST-3PL
      Not available: 'The boys broke the fence in order to get into the yard.'
      Only: 'The boys$_i$ broke the fence in order for them$_k$ to break into the yard.'

(12) a. [PRO$_i$ kudəvečə-š   pur-aš(-lan)   (manən)
                     yard-ILL   go-INF-MOD   COMP
         pro$_i$ pečəm   sümər-en-at.
                     fence   break-PST-2SG
         'You broke the fence in order to get into the yard.'

   b. [PRO$_i$ kudəvečə-š   pur-aš(-lan)   (manən)
                     yard-ILL   go-INF-MOD   COMP
      rveze-vlak$_i$ pečəm   sümər-en-ət.
      boy-PL   fence   break-PST-3PL
      'The boys broke the fence in order to get into the yard.'

To account for the absence of the obviation effects in Chukchi rationale imperatives, Naumov (2018) adopts Stegovec's (2019) account for obviation in terms of binding, whereby having coreferent matrix and embedded subject leads to a violation of Condition B ("a pronoun cannot be bound in its local domain"). Stegovec proposes that the modal element in obviative imperatives requires a type *e* (entity) dependent, the so-called "perspectival" PRO$_{pers}$. PRO$_{pers}$ is syntactically introduced in the specifier position of the Mood phrase, which hosts the modal, and it is bound by the matrix subject (typically, the agent of a speech-act verb) or the discourse SPEAKER. Because PRO$_{pers}$ is positioned within the domain of the embedded subject and c-commands it, the two cannot have the same referent, in compliance with the binding principles.

Analyzing the Chukchi data, Naumov fully adopts Grosz' (2014) semantics for Mod$_{Rat}$ and assumes that, since Mod$_{Rat}$ only makes an explicit reference to the matrix event, it does not have an argument that would require an individual antecedent. In other words, there is no PRO$_{pers}$ and hence no risk of Condition B violation and no obviation effect.

While Naumov's explanation appears to work for the Chukchi material presented in his paper, I am reluctant to extend it to the Mari data. First, it predicts that the rationale imperatives are cross-linguistically non-obviative, which is clearly not the case. It might be suggested that in some languages the modal in rationale imperatives requires an event-type argument, while in some languages it requires a PRO$_{pers}$, however, such an explanation would unlikely find much empirical support and it would be difficult to find a meaningful way to regulate the variation. Second, binding approaches to obviation

in general have been challenged by some empirical observations. For instance, Schlenker (2005) noted that overlapping reference is subject to a locality restriction, as shown in (13a), and yet it is often allowed in normally obviative constructions; consider his examples from French, reproduced in (13), where (13b) demonstrates that the complements of 'want' typically show the obviation effects, and (13c) illustrates that nevertheless the subject of the main clause and the subject of the embedded clause can be partially coreferent.

(13) a. #Tu   vous   admireras.
        you.SG   you.PL   admire.FUT
        Intended: 'You (sg) will admire you (pl).'

    b. #Tu   voudras   que   **tu**   te   rases   à   7h.
        you.SG   want.FUT   that   you.SG   yourself   shave   at   7am
        Intended: 'You (sg) will want to shave yourself at 7 am.'

    c. Tu   voudras   que   **vous**   vous   rasiez   à   7h.
        you.SG   want.FUT   that   you.PL   you.PL   shave   at   7am
        'You will want for you (plural) to shave at 7am.'

An obviative clause may also contain a non-subject pronoun or a non-nominative subject pronoun coreferent with the matrix subject, as shown in (14c) and (14d) for Russian (Avrutin and Babyonyshev 1997). (14a) proves that the first person singular pronoun *menja* complies with the binding Condition B, and (14b) clearly indicates that the clausal complement of 'want' is obviative when it comes to determining the referent of its subject. If in this sentence the embedded subject cannot be co-indexed with the matrix one because it is somehow treated as belonging to the same local domain and thus violating Condition B, it remains unclear why the same restriction does not apply to the embedded object in (14c) and the embedded dative subject in (14d). (See Bailyn 2004 on dative Experiencers occupying the structural subject position, spec,TP.)

(14) a. #Ja   uvidel   menja.
        I   saw   me.ACC
        Intended: 'I saw myself.'

    b. #Ja   xoču,   čtoby   **ja**   uvidel   Petju.
        I   want.NPST   that.SUBJ   I.NOM   saw   Petja.ACC
        Intended: 'I want to see Petja.'

    c. Ja   xoču   čtoby   Petja   uvidel   **menja**.
        I   want.NPST   that.SUBJ   Petja.NOM   saw   me.ACC
        'I want Petja to see me.'

    d. Ja   xoču,   čtoby   **mne**   bylo   xorošo.
        I   want.NPST   that.SUBJ   me.DAT   was   good
        'I want to feel good.'

With these considerations in mind, I reject an account of the presence/absence of the obviation effects in terms of Condition B violation and instead suggest an explanation in terms of blocking by a competitor.

There are currently several blocking approaches on the market: Bouchard (1982), Farkas (1992), Schlenker (2005), Costantini (2013). What all of them have in common is their reliance on the idea that the obviation effect in subjunctive or related clauses is a result of the presence in the language of an equivalent (infinitival) construction that specializes in subject control. The formal implementations vary and at this point I remain agnostic as for which particular analysis (for instance, Farkas' blocking or Schlenker's Maximize Presupposition!) is more advantageous. Crucially, the general idea that obviation results from a competition between the two constructions does find support in the Mari and Chukchi data.

As discussed in this paper, Mari uses both imperatives and infinitives as rationale modifiers. Thus, the two constructions compete, with infinitives being preferably used in subject control contexts. In contrast, only the imperative strategy is available in Chukchi. Dr. Jessica Kantarovich, who has done extensive research on Chukchi, informed me that the use of infinitives is fairly limited in her corpus of Chukchi and that there were no sentences with an infinitival rationale/purpose modifier. The only exceptionally frequently attested examples were those where the infinitive was the complement of a modal verb, such as "to be able to" or "to be unable to". I also could not find any mention of rationale infinitives in grammars (Skorik 1961; Skorik 1977; Dunn 1999) and papers on Chukchi syntax (Nedjalkov 1994; Naumov 2018). That infinitives are not used as rationale modifiers was further confirmed to me by Dr. Maria Pupynina, who consulted with a native speaker. Thus, the absence of the obviation effects in Chukchi rationale clauses is straightforwardly explained pragmatically: unlike in Mari, there is simply no other construction available that could be used instead of an imperative when the embedded subject and the matrix one are coreferent.

5. Concluding Remarks

The paper discussed rationale clauses in Mari, which alternate between infinitives and imperatives. It presented for them a uniform syntactico-semantic analysis that relies on the idea that a rationale clause is built around a teleological modal (Mod_{Rat}) inserted in the Mood head at the clausal periphery. This account successfully captures the behavior of both infinitival and imperative rationale dependents, explains their interpretation and their distribution as modifiers of propositions. I also addressed the obviation effects attested in Mari rationale imperatives: having compared them to similar rationale clauses in Chukchi, I suggested that the blocking approach to obviation, whereby imperatives compete with infinitives, is the most advantageous.

My main goal was to draw attention to rationale clauses, especially rationale imperatives, and to open a new direction in the discussion of embedded imperatives across the world's languages. Many issues remain to be addressed in the future. The infinitive/imperative alternation attested in Mari and the fact that it can be accommodated by a single structure prove that the two types of clauses should be grouped together as "modal" and contrasted to "non-modal" indicatives. The flexibility of modal flavor in imperatives gives rise to a question of whether they should, actually, be described as imperative or rather as "unmarked modal" or "unmarked non-indicative". Notice that the imperative marker in Mari, as well as in many other languages, is null, unlike for instance, the desiderative suffix (15). Furthermore, in contrast to desideratives, imperatives have no tense distinction (thus, an imperative clause would be incompatible with the past tense verb *əle* in (15)).

(15) Te   mogaj   marij   pölek-əm   nal-ne-da   (əle)
     you.PL   which   Mari   present-ACC   take-DES-2PL   PST.3SG
     'What Mari presents do/did you want to buy?'

Analyzing Mari imperatives as unmarked or default modal clauses further prompts a comparison between these clauses and subjunctives in other languages; cf. Schlenker (2005) treating subjunctives in French as the default. The two types of constructions have strikingly similar distributions: both are used to express orders, commands, suggestions, and wishes, in embedded and root contexts, and as rationale/purpose modifiers. It is thus worth exploring to what extent imperatives in Mari and subjunctives in other languages share the structure, on the one hand, and how subjunctives and imperatives differ in those languages where they co-occur (e.g., in Slavic), on the other hand. I leave these questions open for future research.

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A Note on Verum Focus in Tigrinya

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Abstract: This paper provides novel data on the phenomenon of Verum Focus (Höhle 1988) in Tigrinya (Eritrea and Ethiopia, Ethio-Semitic, SOV). I claim that the copula used in individual-level predicates in this understudied language, *ʔijju*, also has the function of marking Verum Focus. I provide a preliminary analysis of the syntax of this element by suggesting that it is a verb that raises from its first merge position to the left periphery of the clause, more specifically to the head of a Focus projection. From this position *ʔijju* attracts constituents of different sizes to its specifier, conveying the meaning of Verum but also Contrastive and Exhaustive Focus in Tigrinya.

Keywords: Tigrinya, Ethio-Semitic, verum, focus, copula, syntax

1. Introduction

This paper[1] studies a phenomenon that, to my knowledge, has never been studied before in Tigrinya, an Ethio-Semitic language spoken mainly in central Eritrea and northern Ethiopia. To claim that a linguistic phenomenon has never been investigated before in this language is however not surprising: Tigrinya is not a well-studied language, and its grammatical descriptions can almost be counted on one hand (cf. Conti Rossini 1940, Leslau 1941, Mason 1996, Kogan 1997, Bulakh 2009, Bulakh 2023). My purpose here is therefore to provide and carefully describe novel data on this language, ultimately to broaden our understanding of Tigrinya and, maybe, of the also understudied Ethio-Semitic branch.

What this short paper is not going to do is to provide a piercing analysis of the phenomenon taken into consideration. I will give a tentative examination to explain the data presented; however, a wider and more detailed study will be left to further research (Cacchioli, in preparation).

The phenomenon that will be under scrutiny is Verum Focus (Höhle 1988, 1992, Hartmann et al. 2008, Gutzmann and Castroviejo 2008, Gutzmann et al. 2020, a.o.). Consider the following Tigrinya examples:

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1   Unless otherwise noted, the data presented in this paper were collected by myself in fieldwork with three Eritrean native speakers of Tigrinya. Transcription conventions in Ethio-Semitic are subject to significant individual variation. I have followed Leipzig glossing conventions except for the φ-features in the Imperfective verbal conjugation (which are hyphenated in front of verbs) and the use of capital S and O for subject and object marking morphology on verbal forms.

I am grateful to Ur Shlonsky, Jason Overfelt, Nazareth Amlesom Kifle and Isabelle Charnavel for some very fruitful discussions. I also would like to thank the audience of the OLINCO conference who provided me with great feedback and two anonymous reviewers for their useful comments and suggestions.

(1) a. dmu   riɛj-u
         cat   see.GER-S.3MS
         'He saw a cat.'

     b. dmu   riɛj-u   **ʔɨjju**
         cat   see.GER-S.3MS   VERUM
         'He **did** see a cat.'

Example (1a) presents a declarative clause in Tigrinya with a null pronominal subject, an object and a finite verb in this order. In (1b), the element *ʔɨjju* is added at the end of the sentence. By looking at the English translation of (1b), we notice that an emphatic *do* is added. The emphatic *do* and the element *ʔɨjju* seem therefore to convey the same meaning: an emphasis on the truth of the sentence or, in other words, Verum Focus.

To this day, the specific use of the *ʔɨjju* element presented above (whose nature and properties will be revealed in the following pages) has not received proper attention. To my knowledge, only two grammars mention it and they do it in a very vague manner. One grammar says that a declarative sentence in which this element is present conveys the meaning of an "actual state" (Conti Rossini 1940, 54, personal translation from Italian) with no clarification of whether the adjective *actual* (*attuale* in Italian) means 'existing at a present time' or 'truly existing, real'. The other grammar says that the *ʔɨjju* element added to a declarative sentence is a way to express a "probability/possibility" (Leslau 1941, 90, personal translation from French), leaning more toward a modal meaning. A third vague description of the phenomenon was given more recently in a dissertation: the author claims that *ʔɨjju* is "an auxiliary", that "it shows present time" and that all in all the meaning of a sentence in which *ʔɨjju* appears is "similar" to that of a sentence without it (Yohannes 2016, 202, 203, 207). Finally, the fourth and most precise account of the phenomenon claims that the insertion of the *ʔɨjju* element (in cleft sentences) provides "more emphasis" (Kifle 2011, 258).

In this paper, I will claim that *ʔɨjju* marks Verum Focus. I will go even further and argue that *ʔɨjju*, in more general terms, marks Focus (Verum, Contrastive and Exhaustive) in Tigrinya. I will do so by providing first a background on some relevant grammatical properties of this language; secondly, in section 3, I will go through the data on Verum Focus carefully explaining and showing the peculiar characteristics of the element mentioned above; lastly, in section 4, I will discuss some preliminary ideas and tentative analyses before concluding.

2.   Background on Tigrinya

Tigrinya is an Ethio-Semitic language closely related to languages such as Tigre and Amharic and more distantly to Arabic and Hebrew. It is spoken by approximately 9 million people mainly in central Eritrea – as the national language – and in the Tigray region in northern Ethiopia (Bulakh 2023). There exist several regional varieties between Ethiopic and Eritrean Tigrinya, but at present "no dialectal research has been conducted" (Kifle 2011, 16).

As in all other Semitic languages, Tigrinya possesses non-concatenative root morphology: it has a triconsonantal root system in which roots constitute the semantic core of the words. Let us take for example the root *g-b-r*. It conveys the meaning of *doing*. From this root it is possible to create verbs: tense, aspect and modality information is obtained through vowel templates, as in (2) for perfective and in (3) for imperfective.

(2) gɛbɛr-ɛ
     do.PFV-S.3MS
     'He did.'

(3) ji-gɛbbɨr
     S.3MS-do.IPFV
     'He does.'

Tigrinya is a head-final language with canonical SOV word order (in complex verbal forms the auxil-
iary follows the verb). Both its nominal and verbal systems are head-final.[2] Consider examples (4),
(5) and (6).

(4) ʔit-i   sɛbʔay   n-it-a   lam   ʁ'ɛtil-w-a
     DEM-MS   man   DOM-DEM-FS   cow   kill.GER-S.3MS-O.3FS
     'The man killed the cow.'

(5) mɨs   dɨm-ay   ji-ts'awɛt   nɛyr-ɛ
     PREP   cat-POSS.1S S.1s-play.IPFV   BE.PAST- S.1S
     'I was playing with my cat.'

(6) kɛmzi-mɛts'i-ɛ   ji-fɛllit
     COMP-come.PFV-S.3MS   S.1s-know.IPFV
     'I know that he came.'

In (4), the verb ʁ'ɛtilwa 'kill' agrees with the subject of the clause ʔiti sɛbʔay 'the man' and the object
nita lam 'the cow' precedes the verb that is found in final position.[3] In (5), the auxiliary nɛyrɛ expresses
progressive aspect and is found in final position after the verb. Example (6) shows that subordinate
clauses precede matrix clauses in Tigrinya and that complementizers / subordinating particles are
prefixed on the embedded verbs.[4]

    As also shown in the preceding examples, in Tigrinya subject agreement morphemes on verbs
vary between prefixal and suffixal paradigms on the basis of aspect (and/or tense). Imperfective verb
forms take prefixal subject agreement and express habitual present tense, as in (7).

(7) kullu   mɛʔalti   nab   bet   tɨmhɨrti   ji-xɛjjɨd
     every   time/day   DIR   house   learning   S.1s-go.IPFV
     'I go to school every day.'

Gerundive verb forms take suffixal subject agreement and express perfectivity, as in (8).[5]

(8) tɨmali   nab   bet   tɨmhɨrti   kɛid-ɛ
     every   DIR   house   learning   go.GER-S.1s
     'Yesterday I went to school .'

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2   Note, however, that despite the order of its constituents, Tigrinya possesses prepositions and prefixes.

3   In Tigrinya, demonstratives serve the functions of determiners and Differential Object Marking is obtained
with an *n-* prefix (cf. Overfelt 2020).

4   Cf. Cacchioli (in preparation) that investigates the syntax of clausal prefixes in Tigrinya and Cacchioli and
Shlonsky (2023) that tackles the behavior of the prefix *kɛmzi-* found in example (6).

5   The Gerundive is currently used in the spoken language and has replaced the Perfective in affirmative
declarative clauses to express perfective actions (Bulakh 2019, 186; Cacchioli 2023).

Perfective verb forms also take suffixal subject agreement and also express perfectivity. However, they are used only in the presence of clausal prefixes such as sentential negation which is expressed in Tigrinya by the circumfix *ʔay-...-n* (Leslau 1941, Mason 1996 a.o.). This is illustrated in (9).

(9)　timali　nab　bet　timhirti　ʔay-kɛd-ku-n
　　　every　DIR　house　learning　NEG-go.PFV-S.1S-NEG
　　　'Yesterday I didn't go to school .'

Tigrinya possesses two verbs that can be translated with the English *to be*[6]: *ʔallo* and *ʔijju*.[7] The paradigms of these verbs in present tense appear in Table 1 below. In past tense, *ʔallo* and *ʔijju* share a common perfective form, *nɛbɛrɛ*, and a common gerundive form, *nɛyru*.

	ʔallo	*ʔijju*
1s	ʔall-ɛxu	ʔi-jjɛ
2MS	ʔall-ɛxa	ʔi-xa
2FS	ʔall-ɛxi	ʔi-xi
3MS	ʔall-o	ʔi-jju
3FS	ʔall-a	ʔi-jja
1P	ʔall-ɛna	ʔi-na
2MP	ʔall-ɛxum	ʔi-xum
2FP	ʔall-ɛxin	ʔi-xin
3MP	ʔall-ɛwu	ʔi-jjom
3FP	ʔall-ɛwa	ʔi-jjin

Table 1. The paradigms of *ʔallo* and *ʔijju*.

The verb *ʔallo*[8] has two functions: it is used as a copula in the context of stage-level predicates or locatives, as in (10), and as an auxiliary to mark progressive aspect, as in (11). Thus, prefixal Imperfective verbal forms are interpreted as habitual when they are not accompanied by the auxiliary – as in (7) – and as progressive/continuous when they are. The form of *ʔallo* in present tense morphologically follows the suffixal conjugation (perfective).

(10)　dɛximɛ　　/　ʔab　gɛza　ʔall-ɛxu
　　　tired　　　　LOC　house　BE$_1$.PRES-S.1s
　　　'I am tired/at home.'

6　A somewhat similar dichotomy is found in Spanish: in this language the verb *ser* 'to be' is used as a copula when occurring with individual-level predicates (as *ʔijju*) and the verb *estar* 'to be' is used with stage-level predicates and marks progressive aspect (as *ʔallo*) (González-Vilbazo and Remberger 2005).

7　As traditionally done in literature on Semitic languages, I will use the 3MS perfective form to label these and other verbs throughout the paper.

8　For the sake of clarity, I gloss *ʔallo* as BE$_1$ and *ʔijju* as BE$_2$.

(11) ʔindʒɛra   ni-bɛlʕ   ʔall-ɛna
     injera   S.1P-eat.IPFV   BE₁.PRES-S.1P
     'We are eating injera.'

ʔijju also has two functions: firstly, it is used as a copula in the context of individual-level predicates, as in (12).

(12) bɛlaħ   ʔi-jja
     intelligent.FS   BE₂.PRES-S.3FS
     'She is intelligent.'

Secondly, it is used in a sentence with a verb in the imperfective form prefixed by the element *ki-* – tentatively identified as a Mood° head in Cacchioli and Overfelt (2023) – to express future tense (Kogan 1997, Bulakh 2023, a.o.).

(13) Tɛsfay   ʔaħmilti   ki-bɛlʕ   ʔi-jju
     Tesfay   vegetables   COMP-eat.IPFV.S.3MS   BE₂.PRES-S.3MS
     'Tesfay will eat vegetables.'

The last grammatical property of Tigrinya relevant for this study is that in this language yes/no questions are constructed with the interrogative particle *do*. This particle is placed after "that part of the sentence which is the main object of the question" (Kogan 1997, 442; also cf. Leslau 1941; Mason 1996[9]). I interpret this *part* as being, in more formal terms, the focalized element of the sentence. This is illustrated in (14) and (15).

(14) tijatir   ti-fɛttu   do
     theater   S.2MS-like.IPFV   INT
     'Do you like theater?' (also 'Do you LIKE theater?')

(15) ti-sɛmiʕa-ni   do   ʔall-ɛxa[10]
     S.2MS-hear.IPFV-O.1s   INT   BE₁.PRES- S.2MS
     'Are you listening to me?' (also 'Are you LISTENING to me?')

When the question contains a copula, the *do* particle is prefixed to it, as in (16). Note that *do* loses its [o] vowel and the copula loses its [ʔ].

(16) a.   nsxa   Tɛsfay   d-i-xa
          you.MS   Tesfay   INT-BE₂.PRES-S.2MS
          'Are you TESFAY?'

     b.   nsxa   d-i-xa   Tɛsfay
          you.MS   INT-BE₂.PRES-S.2MS   Tesfay
          'Are YOU Tesfay?'

---

9   Note that in these works *do* is not placed after the focalized element, but it is *suffixed* to it. However, my informants write this particle as a free morpheme.

10   The order *tisɛmiʕani ʔallɛxa do* (with *do* appearing in final position) is also grammatical, but my informants prefer the version provided in (15) and cannot make a distinction between the two in terms of conveyed meaning.

The particle *do* cannot appear in *wh*-questions, as shown in (17).

(17) ʔintay   bɛliʕɛ-xa   (*do)
      what   eat.GER-S.2MS   INT
      Intended: 'What did you eat?'

With all these grammatical properties of Tigrinya in mind, we can now turn to the phenomenon studied in this paper, namely the third use of the copula *ʔɨjju*.

3. *ʔɨjju* Marks Verum Focus

I claim that aside from its presence in copular and future tense constructions, *ʔɨjju* serves the function of marking Verum Focus. Consider the difference in the English translations in (18b), (19b) and (20b) as compared with (18a), (19a) and (20a).

(18) a. dmu   riɛj-ɛ
          cat   see.GER-S.1S
          'I saw a cat.'

      b. dmu   riɛj-ɛ   **ʔi-jjɛ**
          cat   see.GER-S.1S   VER-S.1S
          'I **did** see a cat.'

(19) a. ʔit-a   mɛts'ħaf   hɨb-ka-jo
          DEM-FS   book   give.GER-S.2MS-O.3MS
          'You gave him the book.'

      b. ʔit-a   mɛts'ħaf   hɨb-ka-jo   **ʔi-xa**
          DEM-FS   book   give.GER-S.2MS-O.3MS   VER-S.2MS
          'You **did** give him the book.'

(20) a. ʔiz-a   gʷal   ti-fɛlt'-a
          PROX-FS   girl   S.3FS-know.IPFV-O.3FS
          'She knows this girl.'

      b. ʔiz-a   gʷal   ti-fɛlt'-a   **ʔi-jja**
          PROX-FS   girl   S.3FS-know.IPFV-O.3FS   VER-S.3FS
          'She **does** know this girl.'

The data above shows that adding *ʔɨjju* to a sentence means adding assertiveness and emphasis about the truth of what has been said. It can also be used in truth-value correcting contexts. This resembles the use of emphatic *do* (Breithbarth, De Clercq and Haegeman 2013) that is found in the English translations.[11]

---

11   Henceforth, I use the adverb *indeed* when the emphatic *do* is ungrammatical in the English translations of some examples in Tigrinya.

I will use the term 'emphatic *ʔijju*' when mentioning the specific use of *ʔijju* as a Verum Focus marker and I will gloss it as VER.[12]

In the rest of this section, I will present in detail the morphological and syntactical properties of emphatic *ʔijju* in Tigrinya. Preliminary explanations of the data will be provided later in section 4.

3.1 Morphological Properties of Emphatic *ʔijju*

3.1.1 Form

Emphatic *ʔijju* can appear in clauses in present tense – cf. (20b) above – and in past tense – cf. (18b) and (19b). However, its form does not change: It always takes the present tense form, *ʔijju*. Note that if the past copula *nɛyru* is added to a sentence, *nɛyru* does not convey a Verum meaning. As (21b) shows, if *nɛyru* co-occurs with a verb in imperfective, the meaning is that of the English past progressive. Whereas as (22b) shows, if *nɛyru* co-occurs with a verb in gerundive, the meaning is that of the English past perfect.[13]

(21) a. mis   dim-ay   ji-ts'awɛt   **ʔi-jjɛ**
          PREP   cat-POSS.1s   S.1s-play.IPFV   VER-S.1s
          'I **do** play with my cat.'

      b. mis   dim-ay   ji-ts'awɛt   nɛyr-ɛ
          PREP   cat-POSS.1s   S.1s-play.IPFV   BE.PAST-S.1s
          'I was playing with my cat.' (*'I WAS playing with my cat.')

(22) a. ʁ'idmi   ʔindɛgɛna   b-ʔit-a   dmu   mi-sbar-u
          before   again   by-DEM-FS   cat   NOM[14]-break-S.3MS
          n-it-i   mɛts'awɛri   ʔaʕɛr-ɛ-jo   **ʔi-jjɛ**
          DOM-DEM-MS   toy   repair.GER-S.1s-O.3MS   VER-S.1s
          'I **did** repair the toy before the cat broke it again.'

      b. ʁ'idmi   ʔindɛgɛna   b-ʔit-a   dmu   mi-sbar-u
          before   again   by-DEM-FS   cat   NOM-break-S.3MS
          n-it-i   mɛts'awɛri   ʔaʕɛr-ɛ-jo   nɛyr-ɛ
          DOM-DEM-MS   toy   repair.GER-S.1s-O.3MS   BE.PAST-S.1s
          'I had repaired the toy before the cat broke it again.'

The data above shows that Verum Focus can only be marked by the *present* tense copula *ʔijju*.

---

12   One might think that the phenomenon under investigation is Predicate Focus (Zimmermann 2014) rather than Verum Focus given that *ʔijju* seems to be adjacent to predicates in all the examples mentioned above (because verbs in Tigrinya appear in final position therefore on the left of emphatic *ʔijju*). However, if we look at a copular clause *ʔijju* does not appear adjacent to the predicate *ħamima* but in final position as expected.

(i) ʔit-a   lam   ħamima   nɛyr-a   **ʔi-jja**
     DEM-FS   cow   sick.FS   BE.PAST-S.3FS   VER-S.3FS
     '**Indeed**, the cow was sick.'

This supports the analysis according to which *ʔijju* marks Verum Focus and not Predicate Focus.

13   Note, however, that it is possible to add emphatic *ʔijju* at the end of the sentence in (22b).

14   Nominalizer.

3.1.2 Agreement

Emphatic *ʔijju* obligatorily agrees with the subject of the sentence. As illustrated in (23) below, a default 3MS subject agreement (or any other persons) leads to the ungrammaticality of the sentence.

(23) dmu   riεj-ε   ʔi-{jjε/*jj**u**}
     cat   see.GER-S.1s   VER-{S.1s/***S.3MS***}
     'I **did** see a cat.'

The presence of obligatory subject agreement on *ʔijju* is a first piece of evidence in support of the claim that in Tigrinya Verum Focus is conveyed by a *verb* (and not by a complementizer).[15] This will be discussed in more detail in section 4.

3.2 Syntactic Properties of Emphatic *ʔijju*

3.2.1 Position

We have seen that emphatic *ʔijju* is obligatorily found in final position. However, see section 3.2.6 for some further considerations.

3.2.2 Auxiliaries and Copulas

With regard to auxiliaries and copulas, emphatic *ʔijju* cannot appear in a sentence where the individual-level copula *ʔijju*, as in (24), or the stage-level copula and auxiliary *ʔallo*, as in (25) and (26), are present. Note that also in English emphatic *do* cannot be added to the sentences in the translations of (24) and (25), but an adverb like *indeed* must be inserted instead.[16]

(24) a. *bεlaħ   ʔi-jja   ʔi-jja
       intelligent.FS BE_2.PRES-S.3FS   VER-S.3FS
       Intended : '**Indeed**, she is smart.'

(25) a. *ʔab   gεza   ʔall-εxu   ʔi-jjε
       at   house BE_1.PRES-S.1s   VER-S.1s
       Intended : '**Indeed**, I am at home.'

(26) *ʔindʒεra   ni-bεlʕ   ʔall-εna   ʔi-na
     injera   S.1P-eat.IPFV BE_1.PRES-S.1p   VER-S.1P
     Intended : '**Indeed**, we are eating injera.'

Emphatic *ʔijju* is also not availabe in future constructions, as shown in (27).

(27) *Tεsfay   ʔaħmilti   ki-bεlʕ   ʔi-jju   ʔi-jju
     Tesfay   vegetables   COMP-eat.IPFV.S.3MS BE_2.PRES-S.3MS   VER-S.3MS
     'Tesfay will eat vegetables.'

---

15   However, one could think that this is an instance of complementizer agreement (I thank Tom Meadows for pointing this out to me).

16   A reviewer pointed out that the morphosyntax of English is obviously different than that of Tigrinya and the reasons for the unavailability of *do* in these cases are probably different than the ones proposed later in section 4.

However, emphatic *ʔijju* can occur along with the past copula *nɛyru* – as in (28) – and the suppletive form *xɨwwɨn*, derived from *konɛ* – as in (29).[17]

(28) ʔit-a   lam   ħamima   nɛyr-a   **ʔi-jja**
     DEM-FS   cow   sick.FS   BE.PAST-S.3FS VER-S.3FS
     '**Indeed**, the cow was sick.'

(29) Sɛgɛn   sɛb   ti-ħiggɨz   ti-xɨwwɨn   **ʔi-jja**
     Segen   people S.3FS-help.IPFV   S.3FS-become.PFV VER-S.3FS
     '**Indeed**, Segen might help people.'

A tentative explanation for why emphatic *ʔijju* cannot cooccur with the copula *ʔijju* and the copula and auxiliary *ʔallo* will be provided in section 4.

3.2.3   Negation
Emphatic *ʔijju* can appear in a negative declarative sentence but cannot itself be negated.

(30) Tɛsfay   ʔaħmɨlti   ʔay-bɛlʕɨ-n   **ʔi-jju**
     Tesfay   vegetables NEG-eat.IPFV.S.3MS- NEG   VER-S.3MS
     '**Indeed**, Tesfay doesn't eat vegetables.'

(31) *Tɛsfay   ʔaħmɨlti   ji-bɛlʕ   ʔay-kon-ɛ-n
      Tesfay   vegetables S.3MS-eat.IPFV   NEG-VER-S.3MS-NEG
      Intended: '**Indeed**, Tesfay doesn't eat vegetables.'

As illustrated in example (31), sentential negation cannot occur on the suppletive form *konɛ* to negate *ʔijju* which marks Verum Focus.

3.2.4   Subordination
The datapoints provided so far illustrated the phenomenon of Verum Focus in simple sentences. In complex sentences, emphatic *ʔijju* can occur in subordinate clauses in the presence of the complementizer *ʔɨlu*, as in (32c), but not in the presence of the complementizer *kɛmzɨ-*, as in (33c).[18]

(32) a. ʔaman   Tɛsfay   mɛts'ħaf-ti   ji-ʃɛyɨt'   ʔil-u
         Aman   Tesfay   book.P   S.3MS-sell.IPFV   COMP-S.3MS
         ji-ħasɨb
         S.3MS-think.IPFV
         'Aman thinks that Tesfay sells books.'

     b. ʔaman   Tɛsfay   mɛts'ħaf-ti   ji-ʃɛyɨt'   ʔil-u
         Aman   Tesfay   book.P   S.3MS-sell.IPFV   COMP-S.3MS
         ji-ħasɨb   **ʔi-jju**
         S.3MS-think.IPFV   VER-S.3MS
         'Aman **does** think that Tesfay sells books.'

---

17   Ongoing work on the syntax of modality in Tigrinya with Jason Overfelt (cf. Cacchioli and Overfelt 2023).

18   Note that it is not possible to have both *kɛmzɨ-* and *ʔɨlu* in the same sentence.

c. Ɂaman   Tɛsfay   mɛts'ħaf-ti   ji-ʃɛɣit'   **Ɂi-jju**
   Aman   Tesfay   book.P   S.3MS-sell.IPFV   VER-S.3MS
   Ɂil-u   ji-ħasɨb
   COMP-S.3MS   S.3MS-think.IPFV
   'Aman thinks that Tesfay **does** sell books.'

(33) a. Ɂaman   Tɛsfay   mɛts'ħaf-ti   kɛmzi-ʃɛɣit'   ji-ħasɨb
      Aman   Tesfay   book.P   COMP-sell.IPFV.S.3MS   S.3MS-think.IPFV
      'Aman thinks that Tesfay sells books.'

b. Ɂaman   Tɛsfay   mɛts'ħaf-ti   kɛmzi-ʃɛɣit'
    Aman   Tesfay   book.P   COMP-sell.IPFV.S.3MS
   ji-ħasɨb   **Ɂi-jju**
   S.3MS-think.IPFV   VER-S.3MS
   'Aman **does** think that Tesfay sells books.'[19]

c. *Ɂaman   Tɛsfay   mɛts'ħaf-ti   kɛmzi-ʃɛɣit'
    Aman   Tesfay   book.P   COMP-sell.IPFV.S.3MS
   Ɂi-jju   ji-ħasɨb
   VER-S.3MS   S.3MS-think.IPFV
   Intended: 'Aman thinks that Tesfay **does** sell books.'

Moreover, note that if we add a continuation to the sentence in (32c) such as in (34) in which what Aman thinks is contradicted, the presence of emphatic *Ɂijju* is infelicitous.

(34) Ɂaman   Tɛsfay   mɛts'ħaf-ti   ji-ʃɛɣit'   **(*Ɂi-jju)**   Ɂil-u
   Aman   Tesfay   book.P   S.3MS-sell.IPFV   VER-S.3MS   COMP-S.3MS
   ji-ħasɨb,   gin   Tɛsfay   Ɂay-ʃɛɣit'-n   **Ɂi-jju**
   S.3MS-think.IPFV   but   Tesfay   NEG-S.3MS-sell.IPFV- NEG   VER-S.3MS
   Intended: 'Aman thinks that Tesfay **does** sell books, but Tesfay **does**n't sell (books).'

The reason why emphatic *Ɂijju* can occur with *Ɂilu* but not with *kɛmzi-* will not be accounted for in this paper but will be left to further research. The data above is presented for the sake of completeness.

3.2.5   Questions
This sub-section presents several points with regard to the occurrence of emphatic *Ɂijju* in interrogative clauses. Firstly, emphatic *Ɂijju* can optionally be suffixed to the interrogative particle *do*. Compare examples (14) in section 2 (repeated below) with examples (35), and example (15) with (36).

(14) tijatir   ti-fɛttu   do?
    theater   S.2MS-like.IPFV   INT
    'Do you like theater?' (also 'Do you LIKE theater?')

---

19   This example is slightly marginal for certain native speakers (p.c. Nazareth Amlesom Kifle).

(35) tijatir   ti-fɛttu   **d-i-xa?**
     theater   S.2MS-like.IPFV   INT-VER-S.2MS
     'Do you like theater?' (also 'Do you LIKE theater?')

(15) a. ti-sɛmiʕa-ni   do   ʔall-ɛxa?
          S.2MS-hear.IPFV-O.1s   INT   BE$_1$.PRES-S.2MS
          'Are you listening to me?'

      b. ti-sɛmiʕa-ni   ʔall-ɛxa   do?
          S.2MS-hear.IPFV-O.1s   BE$_1$.PRES- S.2MS   INT
          'Are you listening to me?'

(36) a. *ti-sɛmiʕa-ni   **d-i-xa**   ʔall-ɛxa?
          S.2MS-hear.IPFV-O.1s   INT-VER-S.2MS   BE$_1$.PRES-S.2MS
          Intended: 'Are you listening to me?'

      b. ti-sɛmiʕa-ni   ʔall-ɛxa   **d-i-xa?**
          S.2MS-hear.IPFV-O.1s   BE$_1$.PRES- S.2MS   INT-VER-S.2MS
          'Are you listening to me?'

Examples (14) and (35), respectively (15) and (36), show that there is no difference in meaning between a sentence with and a sentence without emphatic *ʔɨjju*.[20]

     Secondly, emphatic *ʔɨjju* cannot appear in *wh*-questions (like the particle *do*, cf. (17) in section 2). This is illustrated in (37).

(37) a. *ʔintay   bɛliɛ-xa   **ʔi-xa?**
          what   eat.GER-S.2MS   VER-S.2MS
          Intended: 'What did you eat, indeed?'

---

20   Note that if a speaker utters the questions in (35) and (36b) with a raising pitch accent, their goal is to receive an information (the answer to the question). However, if a speaker utters the questions with a falling pitch accent, their goal is still to receive an information, but also to show that they think the opposite of what they are asking to be true (I thank an anonymous reviewer who pointed out that this phenomenon is known in the literature as *negative bias*).

     Note also that a somewhat similar effect is obtained in Italian by the insertion of the adverb *davvero* in a question, as illustrated in (ii) below.

(ii) a. ti   piac-e   davvero   il   teatro?
          DAT.2s   like.PRES.S.3MS   indeed, really   DET.MS   theater
          'Do you **really** like theater?'

      b. mi   sent-i   davvero?
          DAT.1s   hear.PRES.S.2M   indeed, really
          'Are you **really** hearing me?'

However, as pointed out by an anonymous reviewer, *davvero* may license negative bias, but does not have to.

b. *ʔintay bɛliɛ-xa   **d-i-xa?**
   what   eat.GER-S.2MS   INT-VER-S.2MS
   Intended: 'What did you eat, indeed?'

Thirdly, if emphatic *ʔijju* is present in a question, it is obligatorily (for most speakers) present in the answer, as shown in (39).

(38) Q: Tɛsfay   ʔaħmilti   ji-bɛlʕ   do?
       Tesfay   vegetables   S.3MS-eat.IPFV   INT
       'Does Tesfay eat vegetables?'

   A: Ewe, Tɛsfay   ʔaħmilti   ji-bɛlʕ   (ʔi-jju)
      yes   Tesfay   vegetables   S.3MS-eat.IPFV   VER-S.3MS
      'Yes, Tesfay eats/(does eat) vegetables.'

(39) Q: Tɛsfay   ʔaħmilti   ji-bɛlʕ   **d-i-jju**?
       Tesfay   vegetables   S.3MS-eat.IPFV   INT-VER-S.3MS
       'Does Tesfay eat indeed vegetables?'

   A: Ewe, Tɛsfay   ʔaħmilti   ji-bɛlʕ   ***(ʔi-jju)**
      yes   Tesfay   vegetables   S.3MS-eat.IPFV   VER-S.3MS
      'Yes, Tesfay **does** eat vegetables.'

Lastly, notice that emphatic *ʔijju* cannot be used alone to answer a question, such as those in (14), (15), (35), (36).

(40) A: ***ʔi-jjɛ**
        VER-S.1s
        Intended: 'I **do**.'

This contrasts with emphatic *do* in English which can be used to answer a question alone (with a VP ellipsis), as shown in the translation of (40) above.

Moreover, (15a,b) show that the *do* particle can appear before and after the progressive auxiliary *ʔallɛxa*, whereas *do*+VER, as in (36a,b) can only appear after it. *do*+VER can appear before the auxiliary, only if it is prefixed by the relative marker (which Cacchioli 2023 takes to be a morphological reflex of successive-cyclic movement) *zi-*, as in (41) below.[21]

(41) tɨ-sɛmiʕa-ni   **d-i-xa**   z-ɛll-ɛxa?
     S.2MS-hear.IPFV-O.1s   INT-VER-S.2MS   REL-BE₁.PRES- S.2MS
     'Are you listening to me?'

---

21 On the one hand, according to my informants there is no difference in meaning between (41) and (36b) and (15). However, I am fully aware that there must be a subtler difference between these sentences that cannot be grasped by naïve native speakers.

On the other hand, if Verum Focus emphasizes or reverses the truth value of a proposition, then we could ask what it means, semantically, to have it in an interrogative clause (that is not true or false).

The sentence above is structurally similar to an English cleft and could probably be interpreted as meaning something like *Is (it) listening to me that you are (doing)?*.

3.2.6   Verum Focus v. Contrastive Focus

As shown in section 3.2.1, emphatic *ʔijju* is always found in final position, namely at the edge of the matrix or embedded clause (except when appearing with *do*, as discussed in the previous section). However, as a matter of fact, the element *ʔijju* can be also found in another position: let us consider (42) below.

(42) a.   dmu   **ʔi-jjɛ**   riɛj-ɛ
          cat   VER-S.1S   see.GER-S.1S
          'I saw A CAT (not a dog).'

   b.   ʔit-a   mɛts'ħaf   **ʔi-xa**   hibka-jo
        DEM-FS   book   VER-S.2MS   give.GER-S.2MS-O.3MS
        'You gave him THE BOOK (not the bottle).'

   c.   ʔiz-a   gʷal   **ʔi-jjɛ**   ji-fɛlt'-a
        PROX-FS   girl   VER-S.1S   S.1S-know.IPFV-O.3FS
        'I know THIS GIRL (not this boy).'

When *ʔijju* appears on the left the verb (and not in final position) it expresses Contrastive Focus.[22] More specifically, this element is right adjacent to the focalized element in the sentence. Note that this behavior is similar to that of the interrogative particle *do*, as discussed in section 2.

Emphatic *ʔijju* can also express Exhaustive Focus in clauses containing the focal particle *only* as in (43) – and in what resembles English cleft clauses – as in (44).

(43) ʔanɛ   t'ray   **ʔi-jjɛ**   zi-sɛmiʕ-ɛ-ka
     I   only   VER-S.1S   REL-hear.GER-S.1S-O.2MS
     'I am the only one who heard you.'

(44) n-Tɛklɛ   **ʔi-jjom**   zi-dɛli-u   z-ɛll-ɛwu
     DOM-Tekle   VER-S.3MP   REL-search.IPFV-S.3MP   REL-BE₁.PRES-S.3MP
     'It is Tekle that they are looking for.'

As the examples above show, emphatic *ʔijju* does not only mark Verum Focus, but also Contrastive and Exhaustive Focus.

With all the morphological and syntactic properties presented in the previous sections, we can now turn to the syntactic derivation of the phenomenon.

4.   The Syntax of Emphatic *ʔijju*

The previous sections provided a description of the use and distribution of emphatic *ʔijju* in Tigrinya. It is now time to provide a (tentative) analysis of the phenomenon.

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22   Cf. Zellou (2010) for a more detailed discussion of this particular phenomenon.

We have seen that the element *ʔijju* has several functions in Tigrinya: it is the copula in the context of individual-level predicates, it is used to construct the future tense[23] and it marks Verum Focus. Leaving the two first functions aside for the time being, the question that comes to mind is: what is *ʔijju*? To which syntactic category does it belong? Is it a verb or a complementizer?[24]

I claim that because its morphological form is identical to one of the two copulas (cf. section 3.1.1) and, especially, because it obligatorily agrees with the subject of the sentence (cf. section 3.1.2), emphatic *ʔijju* must be a verb. In simpler terms, emphatic *ʔijju* and the copula *ʔijju* are the same element (and not two different elements that are coincidentally morphologically identical). However, because of its function of conveying Verum Focus (a discourse-related property) it must be associated in one way or another to the Focus projection (Jackendoff 1972 and subsequent work) found in the C° domain or Left Periphery. Moreover, the fact that the distributional properties of emphatic *ʔijju* differ from those of verbs when marking Contrastive Focus (namely that it is not found in final position) is a second piece of evidence in support of the idea that this verb must have moved from its first merge position low in the structure. Thus, I claim that a sentence where emphatic *ʔijju* appears – such as the one below in (46a) (example (1b) in the introduction) – is a mono-clausal construction in which *ʔijju* merges as a verb/copula in a verbal projection (either vP, VP, PredP, but XP for now[25]). In this position it is able to get subject agreement. Then, it moves higher in the structure to be able to mark Verum Focus.

Where does *ʔijju* land? And how can we account for the word order in (46a)? I suggest – taking a split-CP approach à la Rizzi (1997) – that *ʔijju* lands in the head of a Focus projection right above FinP and acts as a probe attracting focalized constituents, as represented in (45). I take an LCA approach to head-finality (Kayne 1994).

(45)
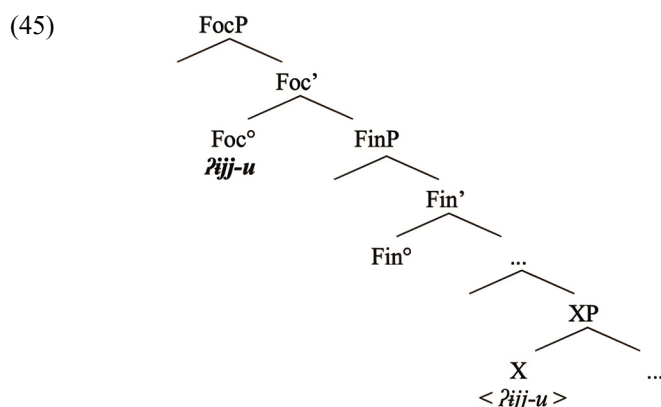
Note that a similar analysis was also put forth in Höhle (1992) and Lohnstein (2014). In the first work, Höhle claims that the head of a left peripheral φP projection, merged right above FinP, carries a feature

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23   In Cacchioli (in preparation) I suggest that the future construction in Tigrinya such as (13), repeated below, is a control construction that could literally be translated in English with *Tesfay is (about) to eat vegetables*. This would mean that in this case *ʔijju* has the function of a copula.

(13)   Tɛsfay   ʔaħmilti   kɨ-bɛlʕɨ   ʔɨ-jju
        Tesfay   vegetables   COMP-eat.IPFV.S.3MS   BE$_2$.PRES-S.3MS
        'Tesfay will eat vegetables.'

24   For example, in Gbe the particle/complementizer *wé* marks Focus (Aboh 1999).

25   I take this XP to be higher than the lexical verb.

[+VER] (Lohnstein 2014, 294). This head position can be filled by either complementizers or finite verbs (in German). The second work builds on Höhle's analysis and replaces the φP projection with MoodP, claiming that the relevant feature is Focus, not Verum (Lohnstein 2014, 296).

More specifically, when *ʔijju* marks Verum Focus, it encodes focus "on the [affirmative] polarity of the sentence" (Breithbarth, De Clercq and Haegeman 2013) and thus attracts a lower projection ΣP[26] (Laka 1993) – headed by an empty affirmative morpheme and containing the rest of the clause – in its specifier (ending up in final position), as shown in (46) below.[27]

(46) a. dmu riɛj-u **ʔijju**
cat   see.GER-S.3MS   VER-S.3MS
'He **did** see a cat.'

b.
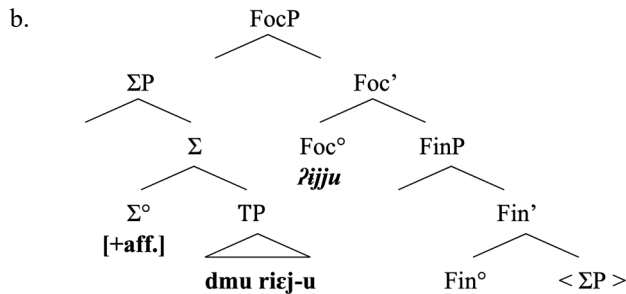
Whereas, in the case of Contrastive and Exhaustive Focus, *ʔijju* encodes focus on a different constituent than ΣP (i.e. a DP that it attracts to Spec,FocP (ending up adjacent to and on the right of it), as illustrated in (47). In this case ΣP is not merged in the structure.

(47) a. dmu **ʔi-jju** riɛj-u
cat   VER-S.3MS   see.GER-S.3MS
'I saw A CAT (not a dog).'

b.

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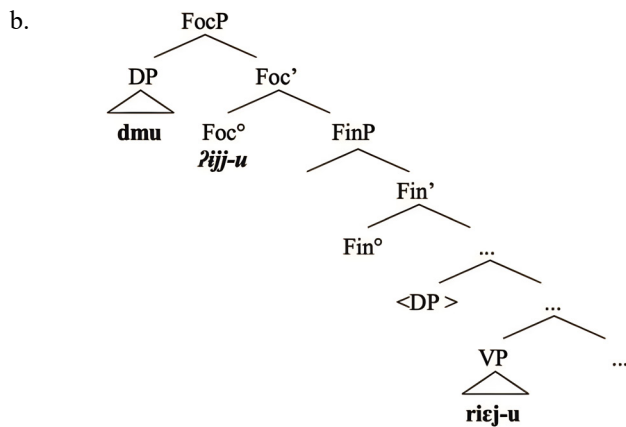
26 Also PolP for Lipták (2013).
27 Cacchioli (2023) proposes a syntactic analysis of declarative clauses in Tigrinya.

This analysis clarifies several points. Firstly, merging *ʔijju* low in the structure explains why it agrees with the subject of the sentence. In fact, if it were directly merged in the left periphery, we would not be able to explain how it gets agreement.

Secondly, claiming that *ʔijju* moves to the Foc° head explains why *ʔijju* is suffixed and not prefixed to the *do* particle (cf. example (35) in section 3.2.5). In fact, I suggest that this interrogative particle is merged in the Int° projection (Rizzi 2001) and therefore placed higher than *ʔijju*. As a consequence, being placed hierarchically lower than *do*, *ʔijju* can only be suffixed to it.

Lastly, suggesting that *ʔijju* lands in Foc° clarifies why it cannot occur in a *wh*-question (cf. example (37) in section 3.2.5): a *wh*-element (carrying a [Q] feature) is in complementary distribution with a Foc° head (Rizzi and Cinque 2016, 146).

We have seen that this analysis can account for several phenomena concerning emphatic *ʔijju*. Now, before concluding, I would like to briefly address some other issues that were identified in the data in section 3. Firstly, in section 3.2.2, I showed that emphatic *ʔijju* cannot appear with the copula *ʔijju* – cf. example (24) – and the copula *ʔallo* – cf. example (25). This could be simply the result of morphological haplology (Stemberger 1981; cf. also Kramer 2023 on haplology in Amharic): in the case of the cooccurrence of emphatic *ʔijju* and the copula *ʔijju* because these elements are actually the same element, and in the case of the cooccurrence of emphatic *ʔijju* and the copula *ʔallo* because these elements are both *present* tense copulas. It is not surprising then that emphatic *ʔijju* is predictably compatible with a *past* tense copula such as *neyru* – cf. (28) – and a modal auxiliary such as *tixɨwwɨn* – cf. (29).

In the same section, I also showed that emphatic *ʔijju* cannot cooccur with the progressive auxiliary *ʔallo* – cf. (26). On the one hand, this could be explained in prosodic terms. In English, for example, emphatic *do* cannot appear in a sentence in progressive (**We do are eating injera*). It has been claimed that this is because emphatic *do* is prosodically prominent and finite auxiliaries realize affirmative morphemes which are also prosodically prominent (Wilder 2013). There is therefore a clash in the derivation, probably at spell-out. On the other hand, this could also be explained in syntactic terms. In English, emphatic *do* (like *do*-support) can only appear in a sentence when there are no auxiliaries. This is because, presumably, auxiliaries in English move to T° and this would be the first merge position of emphatic *do.* We could extend this to Tigrinya and claim that when progressive auxiliary *ʔallo* is present there is "no space" for emphatic *ʔijju*. But then how can we account for the fact that emphatic *ʔijju* can occur with the auxiliaries *neyru* and *tixɨwwɨn*? This will be left to further research.

Finally, what needs to still be explained is the fact that emphatic *ʔijju* can occur in subordinate clauses in the presence of the complementizer *ʔilu*, but not in the presence of the complementizer *kɛmzɨ-*. I also leave this issue to future investigations (cf. Cacchioli in preparation).

5. Conclusions

In this short paper I have shown that Tigrinya possesses a phonologically overt element that marks Verum Focus. This marker morphologically corresponds to the element *ʔijju*, also used in this language as a copula in the context of individual-level predicates and to construct future tense. I have further shown that this marker is also used to convey other focus meanings, namely Contrastive and Exhaustive Focus.

To explain the data and the behavior of emphatic *ʔijju*, an attempt at a preliminary analysis was made. I suggested that *ʔijju* is a verbal head that raises to the left periphery and lands in Foc°: it attracts to its specifier either the entire sentence (in the case of Verum Focus) or a single constituent (in the case of Contrastive/Exhaustive Focus).

To conclude, future research will need to provide a more comprehensive analysis and, also, a comparison will need to be drawn between Tigrinya and other Ethio-Semitic languages. Consider for example the following sentences in Amharic, (48), and Zay, (49), below.

(48) yəhən   wät'   man   särraw?   əne   **nänn-a**
     stew   this   who   cooked   I   BE.PRES-S.1s
     'Who cooked this stew?' 'I, of course'
     (from Leslau 1995, 272)

(49) it   wot'i   särətə-**n**-u
     she   sauce   made- BE.PRES-DCM
     'She [did] prepare[] sauce.'
     (from Crass et al. 2005, 25,(71))

The Amharic and Zay datapoints above are strikingly similar to the data in Tigrinya: in these languages a copular element also seems to have the function of marking Verum Focus.

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Subjects of Verbs of Perception and Cognition in Czech

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Abstract: Verbs of cognition and perception in Czech and many other languages form a specific construction with their agent/experiencer noun phrases realized in a case other than the nominative. The typical case marking for these agents includes the dative or the accusative, depending on the verb. Stative verbs necessitate dative, while active verbs allow nominative for experiencers as well. This article examines the question whether these non-nominative agents might have some other properties typical for grammatical subjects and whether they might be considered "quirky" subjects. To determine this, a number of subjecthood tests inspired by Poole (2015) is used. These include anaphora binding, PRO control, and reduced relatives. It seems that some typical subject-like properties are present in case of the dative noun phrases.

Keywords: verbs of perception; dative; accusative; subjecthood; thematic roles switch

1. Introduction

Czech is a nominative-accusative, pro-drop language with rich inflectional morphology. It is a hallmark of Czech subjects to be in the nominative. In fact, the nominative functions as the default case, if no other case is assigned. We can see this, for example, in left dislocation (1), or in control constructions (2). For more on this see Čakányová (2022).

(1) Jana,   tu   nikdo   nemá rád.
     Jana-NOM   that-3SG.ACC   nobody   not-likes
     "Jane, nobody likes her."

(2) Petr$_x$ se   rozhodl   [PRO$_x$ jít   sám   svou   cestou].
     Petr-NOM   REFL   decided   go-INF   alone-NOM   his   way
     "Peter decided to go alone his way."

The nominative in Czech is thus not restricted to subjects only, but it also applies to all instances of NPs where the case is not assigned. In this paper, I will be focusing on structures that seem to violate this. Namely, I will be looking at NPs that are not in the nominative case yet may have some subject-like properties qualifying as "quirky subjects". Quirky subjects are non-nominative subjects, typically in a lexical case such as dative or accusative. Some NPs in Czech could qualify as quirky subjects in the sense of Russian (Moore and Perlmutter 2000), Icelandic (Sigurðsson 2002), German (Eyþórsson and Barðdal 2005), or Spanish (Gutiérrez-Bravo 2006).

An experiencer/agent in an active voice is typically realized as a nominative NP. A different case for these theta roles might be triggered in passive constructions. However, these Czech accusative/dative marked experiencer NPs appear in active voice clauses. In languages with no visible verbal agreement, this might be enough to say that they are in fact subjects. The Czech accusative and dative

subject-like NPs do not agree with the predicate though (most importantly in person), and some other typically covert NP does.

There is always a visible verbal agreement in Czech finite clauses and in case of these non-nominative NPs, the verb either agrees with some other overt nominative NP, or if no other NP is available, it shows 3rd person singular neuter agreement with the covert dummy "it". This agreement functions as the default in clauses where there is no theta role assigned to the missing subject. This would be the case of the weather *it* type of clauses. This default use of the third person singular neuter agreement is there only to saturate the external argument position according to the extended projection principle (EPP).

(3) Prší.
     rains-3SG.N
     "It is raining."

Unlike the example (3), there are also non-nominative NPs which clearly do have a theta role assigned. These are typically experiencers in dative or accusative and the verbs that assign them the theta role are very often verbs of inner perception and cognition. NPs with this theta role can in other environments function as nominative subjects in Czech.

(4) Jana   se stydí / cítí bolest / se raduje / pochybuje.
     Jane-NOM   REFL feels-shame / feels pain / REFL rejoice/ doubts
     "Jana is ashamed / feels pain / rejoices /doubts."

The question is whether the dative and accusative NPs can be considered syntactic subjects in the absence of another overt theta marked NP. Or else, whether the subject is the default dummy "it", visible only via the agreement and present for the saturation of the EPP. To find out, I will apply a series of quirky subjecthood tests first introduced by Zaenen et al. (1985) and later by Poole (2015). Before I do so, let's introduce the candidates for the subject in the dative and accusative respectively.

2.   Potential Dative Subjects

Special classes of verbs in Czech require that the experiencer NPs are in dative. These, just like in other languages (e.g.: Spanish, Russian, German), include mostly the verbs of sensory perception and cognitive states, such as *líbit se* "like", *chutnat* "like the taste", *chtít se* "feel like", and also others like *sklapnout* "shut up".

These experiencer NPs do not agree with the verb. In the absence of any overt nominative NP, the agreement on the predicate is expressed with the features of a 3rd person singular neuter. The corresponding pronoun, the dummy *to* "it" cannot be included overtly in the clause and no theta role is assigned to it. The only theta role, of an experiencer, is assigned to the NP in the dative, as in (5).[1]

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1   An overt pronoun which can potentially appear in these types of clauses is the expletive *(v)ono* "it". This expletive, which also has the feature singular and neuter, is in some contexts rather colloquial as in the following example.

i.   (V)ono se Davidovi nechce pracovat.

          "So, David doesn't feel like working."

The *(v)ono* expletive is distinct from the expletive *to* as each of them corresponds to a different kind of EPP-feature. For more on the distinction between the two kinds of EPP in Czech see Škrabalová (2003) and Biskup (2011).

(5) a. Davidovi   se   nechce   pracovat.
         David-DAT   REFL   not-want-3SG.N work-INF
         "David doesn't feel like working."

    b. *To   se   nechce   Davidovi   pracovat.
        it   REFL   not-want-3SG.N David-DAT   work-INF

Some verbs that allow but not require dative experiencers alternate with nominative NPs when not reflexive (6). The reflexivity is typical for (stative) verbs of perception and their impersonal reading while non-reflexive verbs are more agentive (active).[2]

(6) David   nechce   pracovat.
     David-NOM.M   not-want-3SG   work-INF
     "David doesn't want to work."

This connection between stative verbs and dative NPs is most apparent with the copula verb *být* 'be'. There are many possible examples of experiencers in the subject position and no other overt nominative NP is or can be expressed in the clause.

(7) Všem   je   do   pláče.
     everyone-DAT is-3SG.N   to   cry-GEN
     "Everyone felt like crying."

(8) Davidovi   je   špatně   /skvěle.
     David-DAT   is-3SG.N   poorly   /great
     "David is sick / great."

Verbs expressing personal likes and dislikes also require the NP in the dative and a reflexive pronoun. This time, however, the predicate agrees with a covert/overt nominative NP other than the dummy "it", even though its theta role (if assigned) is not typical for subjects in active voice. In (9) the agreement is with the underlying NP in the second person singular, "you". The dative expresses experiencer and the NP expressed via the agreement is the stimulus.

(9) Líbíš   se   mi.
     like-2.SG   REFL   me-DAT
     "I like you."

Subject-like datives are frequent in Indo-European languages. According to a Barðdal and Eythórsson's (2009) hypothesis, this might be an inheritance from Proto-Indo-European, which was a stative-active language rather than nominative-accusative language, and the subjects of stative intransitives were case-marked in the oblique.

   The case marking of these NPs can be the result of a covert preposition. Experiencers tend to be in oblique cases cross-linguistically (Landau 2010) and this would suggest an overt or in this case covert, null allomorph P (den Dikken 2006) triggering the case marking.

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2   This alternation has been also described for Polish (Bondaruk 2021). The suggested analysis claims that the reflexive particle which does not have any φ-features is merged with v, and prevents this v from assigning the accusative case to the NP. This seems to hold true for Polish as well as for Czech.

3.   Potential Accusative Subjects

A small class of Czech verbs requires that the theta marked NP is in the accusative. These are less common and more idiosyncratic, and sometimes even colloquial including verbs such as: *trefit* "get a stroke", *škrábat* "scrape", *zábst* "feel cold".

The theta role (typically experiencer) is assigned to the NP in the accusative (10)–(11). The accusative NP in (10) seems to be problematic considering Burzio's generalization as the verb clearly assigns accusative to this NP, yet it does not assign any theta role to the dummy (covert) subject "it".

(10) Janu   škrábe   v   krku.
      Jana-ACC   scrape-3.SG.N   in   throat-LOC.SG.M
      "Jane has a sore throat."

(11) Janu   bolí   u   srdce.
      Jana-ACC   hurt-3.SG.N   at   heart-GEN.SG.N
      "Jane's heart aches."

With the verbs of sensory perception, such as *vidět* "see", *slyšet* "hear", *cítit* "feel" we can come across sentences where there is an NP in the accusative case-marked by the verb because it functions as the object of the verb. At the same time, these NPs are in fact the only overt phrases with a semantic role in the given sentence. The agreement visible on the verb suggests that the syntactic subject is the dummy *it*.

(12) Bylo   slyšet   hudbu.
      was-3.SG.N   hear-INF   music-ACC.F
      "You could hear music."

Structures like these can be easily transformed in such a way that the NP is in the nominative and the agreement with the verb suggests that it is this NP which functions as the syntactic subject. The experiencer is unexpressed, and the structure consists of an auxiliary/copular *be* and a verb in the infinitive.

(13) Hudba   byla   slyšet.
      music-NOM.F was-3.SG.F   hear-INF
      "Music could be heard."

Since infinitives do not have all the structural properties that finite verbs have, they are unable to license the subject case of the noun phrase. For this reason, the restructuring in the sense of Wurmbrand (2004) can take place. This particular restructuring is special, however, because according to Caha and Karlík (2005), it is triggered by the lexical properties of the infinitival verb rather than by the matrix verb.

4.   Quirky Subject Tests

The question of subjecthood is by no means a simple one. This complexity arises from the fact that the term "subject" is employed with several distinct meanings. According to den Dikken (2006) there are at least three different kinds of subjects. First, there is the *thematic subject*, which serves as the external argument. Second, there is the *grammatical subject* which would be part of the subject-predicate agreement. And finally, there is also a *logical subject* which aligns with the theme or topic of the sentence. These three subjects can and often do coincide, but sometimes they might not and that is exactly what happens with the verbs of perception and cognition.

In the traditional approach, the subject in Czech is the phrase which agrees with the predicate. That is the definition of a grammatical subject. The predicate then takes a suffix which indicates the relation to this subject. In Czech the agreement would include the features of person, number, and gender. Even in traditional grammar there has been some instances of subjects that are clearly not in the nominative. These always trigger the impersonal (3rd person singular neuter) agreement inflection. One such example may be the genitive associated with Czech numerals higher than four (14), or the genitive of some partitive structures (15). So, it is apparent that the three kinds of subjects do not always align.

(14) Pět   chlapců   šlo   do   školy.
      five-NOM   boys-GEN   went-3.SG.N   to   school-GEN
      "Five boys went to school."

(15) Všeho   je   na   přidání.
      everything-GEN   is-3.SG.N   for   adding
      "There is plenty (of food) for seconds."

If there is no agreement, or if there is a discrepancy between syntax and semantics, there are tests that can be used to see what the grammatical subject is and if it might be the NP case-marked by other than the nominative case. Poole (2015) works with a Quirky Subject Hierarchy (QSH) scale for English and for other non-European languages such as Hindi and Laz. The scale includes subject binding anaphora, the ability of being PRO and the ability to appear in reduced relative clauses. These subject properties form a kind of a scale which goes from binding to PRO to reduced relatives. This means that according to QSH, if the quirky subjects in each language allow reduced relatives, then they are sure to allow PRO control structures as well as binding anaphors. In effect, it is a hierarchy of subjecthood positions in a tree structure. The higher a subject can move the more subject-like it is and vice versa. So, the ability of an NP to rise in the functional sequence correlates with its subject-like properties. Poole (2016) presents arguments for a cyclical movement of the NP from a lower position to the Spec VoiceP in case of binding, Spec TP in case of PRO reference and to Spec PrtP in case of reduced relatives. We will use all three diagnostic tools to see whether Czech has quirky subjects or not.

To test the binding of anaphora in Czech, it is necessary to establish what kind of language Czech typologically is regarding anaphoric references and whether it is just a subject that can bind anaphoras in clauses with nominative subjects. We need to consider a clause with a subject and an object such as (16).

(16) Petr$_p$ dal   Martinovi$_m$ svou$_{p/*m}$ fotku.
      Petr   gave   Martin-DAT   his-SUBJ   photo-ACC
      "Petr gave Martin his photo."

The anaphoric pronoun *svou* can be bound by the subject only. The dative object cannot bind the reflexive/possessive pronoun, which is unlike English where objects can typically bind reflexive pronouns.

(17) Jane$_j$ discovered Mary$_m$ herself$_{j/m}$.

Now we can try the test using the dative and in turn also the accusative NPs and see whether these experiencers can in fact bind the anaphoric pronoun (18).

(18) a. Petrovi_p se   líbí   v   ?jeho_p   /**své**_p   zahradě.
         Petr-DAT   REFL like-3.SG.N   in   his-LOC   his-LOC   garden-LOC
         "Peter likes it in his new garden."

    b. Janě_j   se   daří   skrývat   její_j   /**své**_j   úmysly.
         Jana-DAT   REFL succeed-3.SG.N hide-INF   her-ACC   her-ACC   intentions-ACC
         "Jana succeeds in hiding her intentions."

    c. Petrovi_p se   z(e)   *něho_p   /**sebe**_p   udělalo   špatně.
         Petr-DAT   REFL from   him-GEN   himself-GEN made   sick
         "Peter felt sick of himself."

    d. Petra_p   zábly   jeho_p   /***svoje**_p   ruce.
         Petr-ACC   feel-called-3.PL his-OBJ.NOM   his-SUBJ.NOM hands-NOM
         "His hands felt cold."

We see in (18a–b) that it is sometimes possible to use either subject anaphoric binding pronoun or the personal pronoun.[3] Both examples include the dative NP and the default verbal agreement (3rd person singular neuter). In (18a), the reflexive pronoun appears inside a PP. The binding here is just a possibility and not a necessity as it would be in finite clauses with nominative subjects. In (18b) the situation is similar, there is a dative marked NP which can bind the reflexive pronoun that is a part of a complement to the infinitival verb. In example (18c), the only option which is grammatically correct is the use of the subject reflexive pronoun which is coreferential with the NP *Petrovi*. So, in case of the dummy "it" verbal agreement, the subject reflexive pronoun binding can be even obligatory.

In example (18d) we see that the verb agrees with the noun *ruce* "hands" and this noun seems to function as the syntactic subject. For this reason, it is impossible to use the subject reflexive pronoun here that would be co-referential with the accusative marked *Petr* and only the object pronoun is possible.[4] This also corresponds to fact that anaphors cannot be embedded in a nominative subject (Chomsky 1981).

The next test to consider is the PRO control test (19). The PRO element always functions as the subject of the embedded clause no matter which element in the matrix clause controls it. In (19) the dative NPs do control the PRO in the embedded clause. This is only possible for structures with the dummy "it" verbal agreement in combination with a dative NP. An accusative NP does not seem to be able to control the PRO subject (19c).

(19) a. Člověku_c   může   [PRO_c být   dobře   samotnému].
         person-DAT   can-3.SG.N PRO be-INF   well   alone-DAT
         "A person can feel well alone."

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3   The term "subject anaphoric binding pronoun" refers to the pronoun *svůj*, which is in Czech used exclusively to refer to the NP in the position of a subject. The alternative is a personal or possessive pronoun like *jeho* "his/him" or *ji/její* "her" which is typically not referring to the subject NP but rather to an object NP.

4   I was not able to come up with an example that would have an accusative NP as the potential subject and at the same time also an object NP which could potentially be used for binding of the anaphoric reference. That is why only the example (18d) is included. In truth, accusative NP logical subjects are relatively infrequent, and their omission from some of the tests stems from the same underlying challenge.

b. Petrovi$_p$ se   nechtělo   [PRO$_p$ cestovat   samotnému].
   Petr-DAT   REFL   not-want-3.SG.N   PRO travel-INF   alone-DAT
   "Peter did not feel like travelling alone."

c. Janu$_j$ začalo   [PRO$_{*j/y}$ škrábat   v   krku].
   Jana-ACC   started-3.SG.N   PRO scrape-INF   in   throat-LOC
   "Jana's throat started aching."

And finally, we will apply the reduced relatives test (20) which includes a reduced relative clause where the reduced item is the subject. It is a sort of A-movement to the clausal edge. In (20a) we have a nominative relative pronoun, and the reduced relative is possible. However, this test does not seem to be passable for Czech non-nominative NPs of any kind, no matter if these are accusative (20b) or dative (20c) case-marked. So, this test would speak against their subjecthood or rather it would show a limitation of where the NPs can rise to.

(20) a. student,   který   žije   na   kampusu   - žijící na kampusu
        student-NOM   who-NOM   live-3.SG   on   campus   - living on campus
        "a student who lives on campus'

     b. student,   **kterého**   škrábe   v   krku   - *škrábající v krku
        student-NOM   who-ACC   scrape-3.SG.N   in   throat   - scarping in throat
        "a student who has a sore throat"

     c. student,   **kterému**   se   líbí   kniha   - *líbící se kniha
        student-NOM   who-DAT   REFL   like-3.SG.F   book- F   -liking REFL book
        "a student who likes the book"

When considering the QSH tests, it becomes apparent that Czech dative NPs can successfully satisfy two of these tests, whereas accusative NPs do not meet the criteria for any. Additional conventional subjecthood tests, such as raising to subject and conjunction reduction, do not align well with the typology of Czech. Raising to subject construction is limited to a handful of verbs, the most natural sounding of which is the verb *zdát se* "seem". The construction with a dative NP, while possible, seems somewhat limited and not most natural sounding. However, the fact that the NPs *Petrovi* and *Čechům* are raised to the subject position speaks for their subject-like properties.

(21) a. ??Petrovi   se   zdá   být   zima.
        Petr-DAT   REFL   seems-3.SG.N   be-INF   cold- NOM
        "Petr seems to be cold."

     b. A   Čechům   se   to   zdá   být   jedno.
        and   Czechs-DAT   REFL   it-NOM   seems-3.SG.N   be-INF   one- NOM
        "And the Czechs don't seem to care." [CNC, Deníky Bohemia]

The conjunction reduction test does not always work with dative or accusative NPs in Czech. Typically we must repeat the case-marked NP in order to make these grammatical. With the verb *líbit se*, it seems possible, and I was able to find some examples in the Czech National Corpus (CNC).[5]

(22) a. *Petrovi   bylo   smutno   a   bylo _____   zima.
     Petr-DAT   was-3.SG.N   sad   and   was-3.SG.N   cold

   b. Co   se   mi   líbí   a   nelíbí ____   na Brně.
      what   REFL   me-DAT   like-3.SG.N   and   not-like-3.SG.N   on Brno
      "What I like and don't like about Brno." [CNC Regionální týdeník]

So far, it seems that the dative NPs can have some grammatical subject-like properties, while the accusative NPs do not.

5. What Is So Special about the Dative NPs?

The semantic role of an experiencer is not tied to a specific sentence function. It can be realized as a subject, case marked as nominative, as well as an object of a verb, case marked as accusative. This is true even in English as can be seen with the verb *worry*.[6] The term *subjecthood* is too vague, but instead of trying to provide a definition or several definitions, we should focus on the position of the given noun phrase within the structure and its properties. It is without a doubt that the nominative is hierarchically higher than any other morphological case in Czech. The question about subjecthood only arises if there is no overt NP in the nominative. The next case on this hierarchy scale is the accusative, typically reserved for the internal argument. Then, it is the genitive and then the dative.

(23) Case hierarchy: NOM < ACC / ERG < GEN < DAT < LOC < ABL / INS < others (Cinque 1999)

Dative being so low on this scale raises a question of why are these NPs dative marked, why skip all the other hierarchically higher cases? The most plausible explanation for this seems to be that the dative marking is possibly a result of some covert licenser, perhaps a covert/silent preposition. Silent prepositions have been hypothesized for some locational expressions by Caponigro and Pearl (2008) in the sense of Emonds (1987) and his invisible category principle. The preposition can be silent because the case marking functions as its alternative realization and in turn the preposition is indeed covertly present to trigger the case marking. Even though the silent preposition hypothesis is typically verified on prepositions of location and direction, it can actually be applied to the verbs of perception and cognition as well. We may consider their distribution in other languages than Czech, and we will be able to see that a preposition in fact can manifest overtly. This is the case in Spanish with the preposition *a* which introduces the dative experiencer with some verbs.

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5   As one of the reviewers quite correctly remarked, the problem with expressions such as *být smutno* and *být zima* might also be semantic as they are difficult to combine with some other As. In case of *líbit se* this problem vanishes.

6   Experiencers are typically expressed via a nominative NP in subject position, such as *He worries about something*. And they can alternate with an object position NP in a different case namely accusative *It worries him* or even dative *It appeals to him*.

(24) A   Joaquín   le   gusta   cantar.
     to   Joaquín   him   like-SG   sing-INF
     "Joaquín likes to sing."

(25) A   ella   le   duele   la   cabeza.
     to   she   her   ache-SG   the   head-NOM
     "She has a headache."

The preposition in the examples (24)–(25) is present for emphasis, the sentences can make do without it and still be grammatically correct, but the fact that the preposition can be used overtly is a sufficient proof of its underlying presence. A similar situation can be seen in Italian also with the preposition *a*.

(26) A   Paolo   piace   caminare.
     to   Paolo   like-SG   walk-INF
     "Paolo likes to walk."

(27) A   me   piace   la   casa.
     to   me   like-SG   the   house-NOM
     "I like the house."

Another question is why Czech datives seem to be able to show some subject-like properties. The answer possibly concerns their syntactic position. The Spec TP slot is empty as there is no NP with a theta role in the nominative. The only available NP is the dative one. This NP is theta marked by the verb of perception or cognition. The origin of the dative experiencer NPs can be either in Spec vP if they are external arguments or VP internal. Passivization constraint would suggest the former. The process of passivization is one of the basic tests for subjecthood as it is an argument movement operation making a transitive verb intransitive by getting rid of the subject agent. With dative NPs and indefinite subjects realized as part of the agreement this A-movement operation does not seem to be possible.

(28) a.   Mně   se   líbí   Petr.
          me-DAT   REFL   like-3.SG   Petr-NOM
          "I like Petr."

     b.   *Petr   je   líben mnou.   / *Já jsem   líbena Petrem.
          Petr-NOM   is   liked me-INST   I am   liked Petr-INST

And even if it were possible to form a passive structure using the dative subject agent/experiencer and the object NP, the newly yielded construction would not correspond in meaning to the active sentence counterpart as we can see in (29)a–b below.

(29) a.   Nechtělo   se   nám   opustit   Janu.
          didn't-want-3.SG.N   REFL   us-DAT   leave-INF   Jana-ACC
          "We didn't feel like leaving Jana."

     b.   ?Jana   nechtěla   být   opuštěna   námi.
          Jana-NOM   didn't-want-3.SG.F   be-INF   left   us-INST
          "Jana didn't want to be left by us."

This, however, corresponds to the type of the verb as well, whether it is a raising verb or not. Verbs, such as *want*, will never yield the same interpretation in passive, no matter if this verb is used with the DAT experiencer or with a NOM subject (30).

(30) a. Jana   chtěla   pozvat   Petru.
       Jana-NOM   wanted-3.SG.F   invite-INF   Petra-ACC
       "Jana wanted to invite Petra."

     b. Petra   chtěla   být   pozvána   Janou.
       Petra-NOM   wanted-3.SG.F   be-INF   invited   Jana-INST
       "Petra wanted to be invited by Jana."

It seems impossible to come up with an example of a verb that would allow the same kind of interpretation and keep the DAT experiencer. While it is quite easy to find such examples for embedded infinitival structures that are inside matrix clauses with nominative subjects. The meaning of the active sentence corresponds to the meaning of the passive structure.

(31) a. Jana   začala   podezírat   Petru.
       Jana-NOM   started-3.SG.F   suspect-INF   Petra-ACC
       "Jana started to suspect Petra."

     b. Petra   začala   být   podezírána   Janou.
       Petra-NOM   started-3.SG.F   be-INF   suspected   Jana-INST
       "Petra started to be suspected by Jana."

The dative NPs do not undergo A-movement (in passive or in reduced relative clauses) and this only means that their syntactic position is lower than that of nominative NPs. The same applies to their inability to agree with the predicate. Nonetheless, these are not the only tests applied and we have seen that on the QSH scale the dative NPs can rise as high as the Spec TP position.

6. Conclusion

In case of the clauses with thematic subject and grammatical subject discrepancy, other case marking than the nominative can be used for the agent/experiencer. This is typically true for the agents/experiencers of verbs of perception and cognition. These verbs usually require a dative or an accusative noun phrase to which they assign a thematic role. These NPs are thematic subjects, but structurally, i.e., syntactically, they do not have all the properties of subjects. They do not originate inside the VP, yet they are theta marked by the matrix verb. They cannot undergo A-movement and they do not support reduced relatives. However, in the absence of any other overt nominative noun phrase, these can gain some subject-like properties that are usually observed with grammatical subjects only, such as binding anaphora and becoming a PRO. It is only possible if the thematic subject is in the dative and the verbal agreement, which is always obligatorily present in Czech, is with the dummy pronoun "it", that is 3rd person singular neuter. This article tried to shed some light on the subjecthood continuum of Czech NPs not triggering verbal agreement.

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Corpora

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Universal Syntactic Features of Open Categories

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Abstract: At the 1976 Conference on Formal Syntax at the University of California at Irvine, N. Chomsky remarked that the central syntactic categories (N, V, A and P) are based on non-linguistic cognitive concepts, e.g., perceived concrete objects, actions, properties of varying intensity, and locations in space-time, respectively. This observation raises the question, what is the nature of the difference between central syntactic categories and their close cognitive counterparts? The differences are not uniform across categories. Verbs generally denote "activities", yet a minority indicate rather "states" (*know, need,* etc.). Nouns primarily name discrete "objects", yet abstract mass nouns such as *evidence* and *research* don't seem akin to states. This essay resolves this conundrum by saying that the extensions of cognitive categories *lack* some feature of its more canonical members, that is, *evidence* lacks a property shared by most nouns, and *know* lacks a central verbal property. Thus, marked extensions of cognitive categories maintain those categories, and are defined by the lack ("cancellation") of some central interpretive component of their syntactic category.

Keywords: cancellation feature; stative verbs; gradable; count; locative

1. Introduction

I want to start by pointing out a long-standing quandary in syntactic and semantic analysis, or several similar quandaries: Given some very well justified syntactic feature or category, such as Verb, Preposition, Determiner, how/why is it that their members 'usually' share a core of general categorial meaning, but not always? Thus, Verbs generally denote "Activities" (Somebody or something "does something"), but a minority of Verbs does not: *believe*, *dislike*, *know*, *lack*, *need*, *owe*, *own*, *possess*, etc. Perhaps we should say that this latter class of "Stative" Verbs (Vendler 1957) are not really Verbs. Along the same lines, assuming that Pronouns generally denote "Reference", perhaps Expletives (*it*, *there*, *so*) are not really Pronouns.

But then there is a problem. For example, Stative verbs exhibit typical verbal inflections and have the word order of verbs. Similarly, expletive pronouns have morphological and syntactic properties of pronouns, etc. Overall, of thousands of English verbs, most indicate an Activity, as confirmed by diagnostics like felicitously answering 'What did Z do?' and appearing in progressive aspect. Yet some significant small number of them, so-called Stative Verbs, fail these two particular diagnostics.

(1) *What Susan did was believe the house was big enough.
  *What my friend did was dislike that new job.
  *What they should do is know the way back.

(2) *Susan is believing the house is big enough.
  *My friend was disliking that new job.
  *They are knowing the way back.

The issue here is, does linguistic theory need a syntactic category V and a separate semantic feature, say ±Activity, that corresponds to but isn't the same as V? This paper argues that no: the category V and the interpretation of Activity are the same thing. The discrepancy is due to a single uniform **'cancellation' feature +Ø**, across categories, whose positive (= Marked) value means that verbs with this feature are not 'fully verbs' in interpretation, though they are fully verbs in syntax.

Similarly, we observe that personal pronouns and expletive pronouns have similar distributions and morphological forms. Both classes are Ds not followed by (overt) NPs, where an unmarked D denotes reference. Neither permits a following *else* (**them else*, * *it else*) and both require initial labiodental to be voiced (*thee*, *them*, *there*). But expletives are also D, +Ø without any interpreted reference in Logical Form.

Likewise, the Prepositions *about*, *as*, *of*, *despite*, *without* (these latter are P, +Ø) have most of the syntax of PPs:

(3) a.   English Preposition can strand in complements but not in adjuncts.
     b.   They can be the heads of focused PPs in cleft sentences.
     c.   They are the (only) phrasal complements of N and A (Emonds 2022, Ch. 4).

Given the cancellation feature, we can associate P with an LF interpretation of location in space or time; this interpretation is cancelled for a relatively small list of these [P, +Ø]: *about*, *as*, *of*, etc. But in terms of syntax, i.e. (3a–c), both unmarked (locational) and cancelled (non-locational) P are in the same syntactic category. It is only at LF that the sub-types are expected to differ.

2.   Lexical Heads and Open Classes

Much work in Government and Binding and early Minimalism tended to adhere to the following, and this paper is no exception. An overview of this near consensual view of how phrases are generated in syntax is provided in Emonds (2000, Ch.1).

(4) a.   **Lexical Heads.** Phrases XP in syntax are always projections of the four lexical head categories, N, V, A, P.
     b.   **Functional Heads.** Extended projections of XP are of the form $[_{xP} \; x - \{XP/xP\}]$, where x (= n, v, a, p) is a closed class functional head.[1]

The four lexical head categories are the only possible open classes in human language. Others are 'closed.' Only open classes allow Neologisms/Coining, and this is one factor in why they are so large. Another is that only these four open classes can serve as heads of endocentric compounds: *greenhouse*, *by product*, *spoon feed*, *hand carve*, *salt free*, *extra-large*, *overhead*, *off center*. Regular compound English Ps have left hand heads, unlike other lexical categories.

On the other hand, it seems that strictly speaking no class other than perhaps nouns is *required* to be open class. The statement in (4a) is thus only a one-way implication.

i.   The class of Prepositions seems to be very small in Mayan languages such as Tzotzil. See for example Aissen (1987).
ii.   Analysts of the Bantu family seem to agree that adjectives in at least some of its members are closed lexical classes.

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1   Depending on the value of X, there are strong restrictions on the value of x, whose specifications vary from author to author and go well beyond the scope of this paper.

iii.   Modern Persian may well have passed through a diachronic stage where true simple syntactic verbs (not in compounds) were a closed class[2]

(5)   **Closed class categories** have at most 30 items as members (Emonds 2019, 2022a).

Even though the class P has low cardinality in English, say 150 members, this still contrasts with e.g., Determiners and Degree words, and so it is an open class.[3]

   Several analysts, perhaps influenced by traditional grammar, consider adverbs in languages such as English and French to be a fifth open class category. But in fact, the only large classes of adverbs in these languages are those formed from adjectives by suffixation (English -*ly* and French -*ment*) and others formed from intransitive prepositions (*behind*, *down*, *in*, *inside*, *nearby*, *off*, etc.). The latter are modified like prepositions (*two inches off*, *right down*) and satisfy features that select PPs. For detailed empirical arguments that these languages lack open classes of underived adverbs, see Dal (2018) and Emonds (2022a). Particularly telling is the Pre-Modification Criterion for determining category membership investigated in the latter work. In light of such arguments these authors present, there is no need to weaken or modify (4) as a working hypothesis. Thus:

(6)   **Categories of open classes of English Adverbs**
   i.   Open classes of English adverbs ending in -*ly* are *A*.
   ii.   'Adverbs' homonymous with transitive P (*in*, *inside*, *within*, *up*, *down*, *through*, *before*, etc.) are *intransitive P.*

I furthermore claim that interpretive deficit imposed by the Feature +Ø on each open class lexical head category (N, V, A, P), is reflected by the absence of some typical closed class pre-modification of that category. As an example:

(7)   **Cancellation Diagnostic for V, +Ø**
   Cancelled V, +Ø in English (stative verbs) are generally ill-formed when pre-modified by progressive aspect.

We will see that each lexical head category has a formally similar Cancellation Diagnostic, which supports the idea that the Cancellation Feature is a single, unified formal device.

3.   General Meanings Expressible by the Lexical Head Categories

A comprehensive study of how cognitive concepts are grouped is provided in Croft (1991). My view as to how members of the central cancelled syntactic categories are grouped is in Table 1. It may seem unorthodox to start an essay with so many theoretical concepts in a single table, but in this paper, the concepts themselves are familiar and rather simple ("stative verbs," "gradable adjectives," "mass nouns," etc.), and it is only the way they are grouped that is unfamiliar, and it is precisely displaying them in a table that brings out any novelty in this essay.

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2   Discussed in personal communication with Vida Samiian.

3   The abundance of data using different Ps in the following website should make this clear: https://www.itepexam.com/everything-you-need-to-know-about-prepositions/.

Lex. Head category	Usual interpretive semantic term for unmarked items	Usual interpretive semantic term for the <u>cancelled</u> members
Verb	Actions: Activity verbs Unmarked items: *do so/it, make*	STATIVE verbs: *believe, dislike exist, know, lack, owe, own, possess*
Preposition	Locations in space/time: LOC: Unmarked items *in, at*	Relations not dependent on space/time: *about, as, of, with*
Noun	Discrete vision's concrete objects: COUNT, CONCRETE Unmarked items: *one(s), stuff*	Concrete Mass Nouns: *liquid, music, water, sand*. Abstract Mass Nouns: *research, hate, knowledge, evidence*
Adjective	Properties: GRADABLE Unmarked item: *so*	Dichotomous properties: *absent, dead, empty, eternal, existent, lunar*

Table 1. Unmarked semantics of the lexical head categories V, P, N, A.

The syntactic extensions to cognitive lexical categories proposed in this essay appear to always be many *fewer in number* than the core classes and express *less complex meaning* than the core classes. Thus, mass nouns, stative verbs, non-locational prepositions, and non-gradable adjectives are each considerably fewer in number than their unmarked counterparts. Impressionistically, each lexical category in the left side below has more than four times more members than does its marked "cancelled" counterpart on the right side.

Unmarked heads	Unmarked LF interpretation	Cancelled heads	LF interpretation for marked 'cancelled' category $X_{\emptyset}$
V	ACTIVITY	**V$_{\emptyset}$**	STATIVE Vs: *detest, (dis)like, know, lack, need, owe, own, possess, prefer, resemble, want*
P	Static LOCATION (space-time locations)	**P$_{\emptyset}$**	NON-LOCATIONAL Ps: *about, concerning, despite, due to, except, in case of, instead of, of, on account of, without*
N	COUNT, Concrete: *pebble, drip, song, bang* +Abstract: *factor, issue*	**N$_{\emptyset}$**	MASS, Concrete (= unmarked): *dirt: milk, music, water* +Abstract: *evidence, hate, knowledge, research*
A	GRADABLE	**A$_{\emptyset}$**	NON-GRADABLE As (mostly dichotomies): *absent, absolute, empty, eternal, existent, infinite, lunar, present, superb*

Table 2. The eight potentially open class lexical categories.

A second interesting property that correlates with the division in Table 2 is the fact that the syntax of each of the cancelled categories is clearly simpler than the syntax of the unmarked categories. In fact, there is a formally similar 'Cancellation Diagnostic' for each lexical head category.

(8) **The syntax of cancelled head categories is simpler than for full categories.**
    a.   Stative Verbs strongly tend to be unacceptable both in the progressive and in imperatives (Lakoff and Ross 1966).
    b.   Non-locational Prepositions are not modified by measure phrases:
       *The mayor often speaks less than 10 metres {from / in front of / *about / *due to} my house.*
    c.   Mass Nouns are incompatible with certain Determiners (*every*, *each*, *many*), and Abstract Mass Nouns are incompatible with plurals (**evidences*, **hates*, **knowledges*, **researches*).
    d.   Non-gradable Adjectives are incompatible with Degree words and measure phrases. (*Her soups seem *very excellent / *three times more superb than mine.*)

(9) **Cancellation Diagnostics**
    a.   Cancelled V, +Ø in English (stative verbs) are generally ill-formed when pre-modified by progressive aspect.
    b.   Cancelled P, +Ø in English (non-locational prepositions) are incompatible with measure phrase pre-modifiers.
    c.   Cancelled abstract N, +Ø in English (abstract mass nouns) can't be plural.
       Cancelled concrete nouns (for what is perceived through the five senses) can be plural but must be interpreted as "different kinds of": *French wines*, *folk musics*, *adolescent yearnings*).
    d.   Cancelled A, +Ø in English (non-gradable) can't be modified by measure phrases: *twice as superb*, *three days existent*, *a long way absent*.

The Cancellation system thus allows statement of the generalization (8) The syntax of cancelled head categories is simpler than for full categories.8), which cannot be expressed in a traditional category system that separates syntax and semantics.

4.   Category-Specific Generalizations Expressed by Cancellation
4.1 Cancelled Verbs: What's Left of Them in Logical Form?
Cancelled verbs are what the literature has previously called 'stative,' going back to Vendler (1957) and Lakoff and Ross (1966). In the system proposed here, the stative verb in *Jane knows my car* has the syntactic category $V_\emptyset$, but when this structure enters Logical Form, the category V is cancelled (disappears), so that *know* retains only a general uninterpreted label X rather than V, plus some item-particular features (i.e., *know* ≠ *like*, *know* ≠ *own*, etc.). The lexical entries of individual verbs are then as follows, where 'f_i' stands for contentful features with no specific roles in syntax.

(10) **Lexical entries for transitive V.** Recall, V = Activity in Logical Form.

learn, V, f_i	*pester,* V, f_i	*obtain*, V, f_i
know, $V_\emptyset$, f_i	*dismay*, $V_\emptyset$, f_i	*need*, $V_\emptyset$, f_i
remind, $V_{(\emptyset)}$	*bother*, $V_{(\emptyset)}$, f_i	*get* $V_{(\emptyset)}$

To be interpreted, the phrasal arguments of, e.g., *know* must receive semantic (thematic) roles. If the verb in the sentence were *drive (Jane drives my car)*, *Jane* would be the agent, by a very general rule:

(11) "Thus *one rule (probably universal) will stipulate that for verbs of action*, the animate subject may be interpreted as the agent." (Chomsky 1972, 75)

Chomsky's interpretive LF rule has to stipulate that it applies not just to verbs, but to verbs *of action*, i.e., activity verbs, because if the verb is stative, as in *Jane knows my car*, then Jane is *not* the Agent, but the Experiencer. However, in this essay's system, the label V on a stative verb doesn't survive in LF, and so we can simplify (11) as (12).

(12) The animate subject of a V in LF may be interpreted as the agent.

The only category/feature involved here is V. There is no formal feature ACTIVITY or STATIVE. Notice that the label 'Activity' doesn't correspond to common sense semantics. The examples *do nothing*, *sleep all day*, *sit motionless*, etc. are not 'Stative', despite not being activities: *What she did the next day was do nothing, sleep all day, sit motionless.*

All verbs (thousands) are Activity except for a few dozen Statives. Stative verbs tend to be infelicitous in the progressive and in imperatives, which require Agents. In other words, only the more numerous Activity Vs have the morphosyntactic extensions of progressive and imperative.

It turns out that the Cancellation Feature plays an important role in formally expressing generalizations about complement selection. As a first example, consider the selection of non-finite V-headed complements by selecting verbs. In Emonds (2022b, Ch. 4), it is argued in detail that this selection always involves a subcategorization frame +___V, often supplemented by other features as in +___ WH^V (for indirect questions) or + ___I^V (for irrealis infinitives: *decide to retire soon* vs. **decide retiring soon*). When such selection involves obligatory control, there are two possibilities.

In all the following examples, the selecting verb is compatible with obligatory control. In (13a), the complement verb must have an agent, i.e. it must be an Activity verb, whereas in (13b), there is no such requirement and any V can be selected.

(13) a.   The embedded verb has to be agentive, i.e., it must be an activity verb:
            Jane tried to {buy/use/*need/*own} a bigger house.
            They {suggested to us / convinced us} to {buy/use/*need/*own} a luxury car.

      b.   There is no restriction on the embedded verb, it can be an activity or stative.
            Jane wanted to {buy/own/} a bigger house.
            They {discussed with us / caught us} {buying/owning} a luxury car.

The compatibility of selecting and selected verbs in these combinations, the feature-checking involved in subcategorization, appears to be carried out in Logical Form; the following sections give other examples of this. We can limit the selection of a V complement to Activity verbs, simply by using the unmarked frame +___V (the category V of a Stative verb with the Cancellation Feature is invisible in LF and hence can't be selected), or we can extend selection to both types of verb using the frame +___V$_{(\emptyset)}$, for verbs like *plan, want, discuss, describe*, etc.

There is even a type of selected complement where *only* Stative verbs V$_\emptyset$ seem allowed, in the so-called Raising-to-Object construction:

(14) The landlord considered us to {owe him more rent / lack respect / need help}.
        They believe us to {have misled / be misled by / *mislead} the school board.[4]
         He considered us to {*damage furniture / *often insult him / *break the rules}.

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4   Lakoff and Ross (1966) show that English aspectual and passive auxiliaries are stative verbs in their own right.

For the derivation of this construction, see Wurmbrand (2014) and Čakányová and Emonds (2017). However, delving into this controversial construction seems beyond the scope of this paper, without promising to enlighten us either on the nature of subcategorization features or the derivational level at which they apply.

4.2 Cancelled Prepositions: Non-locational 2-place Relations

An adequate theory of syntax must be able to distinguish full locational P from what are often referred to as "grammatical P." I claim that the latter are cancelled, and hence to be notated as $P_\emptyset$. The two subclasses differ in many of the same ways as do Activity and Stative verbs, respectively.

(15) a. **Quantity**. There are many more space-time locational P than grammatical $P_\emptyset$.
  b. **Morpho-syntactic simplicity of cancelled $P_\emptyset$**. The intensifier *right* and measure phrases can modify (even sometimes idiomatic) P of space-time, but not grammatical $P_\emptyset$: *The motels are a long way off (the freeway). The motels are (*a long way) of recent construction.*
  c. **Less complex semantics of cancelled P**. In several languages locational (full) P systematically cross-classify "surface", "interior" and "direction" of their DP object vs. "toward" and "away from." Sanskrit had such a system. Purely formal grammatical $P_\emptyset$ are never this complex.[5] And similarly, Activity Vs (*assassinate*, *boomerang*, *chase*, *disinherit*, *emulate*…) can be much more semantically complex than any Stative Vs.
  d. **Null allomorphs of cancelled categories.** The discussion above did not mention another property, that only a cancelled head X in canonical position can have a null allomorph. Rarely are *fully interpreted unmarked heads* null in this way.

Consider first category V. It is well known that the copula (the otherwise unmarked stative verb) can be null in a variety of positions in various languages (in Russian present tense, in Indonesian declaratives, etc.) In English, the otherwise unmarked stative V, namely *be*, has a null allomorph in V that occurs with the "finite copulas" in I, namely *is*, *are*, *am*, *was*, *were* and *ain't*.[6] In contrast, the minimal otherwise unmarked Activity verbs (like the English *do* in V position) rarely have a null allomorph.

Let us see if (15d) also applies to the head category P. Among English grammatical or "cancelled" $P_\emptyset$, *in* alternates with a null allomorph when the head N is *way* (*She did it the best way.*). The *for* with noun phrases of temporal duration also alternates with a zero allomorph (*work several hours / three months / a long time*). On the other hand, the English pro-forms for PP of space-time are overt: *here*, *there*, *now*, *then*, and the grammars of Classical Greek and Latin note that PPs of physical location must have overt Ps in those languages. In contrast, in all these languages, the non-locational grammatical Ps [$P_\emptyset$, DIR] that introduce animate indirect object DPs can be null.

What now of the use of the Cancellation Feature in the lexical entries for various Ps? We saw in Section 4.1 that non-finite complements in English are all arguably selected by subcategorization features that are, or contain, the frame +___V (Emonds 2022b, Ch. 4). That is, many verbs must or may select a complement phrase whose head is a V, and of course, the minimal such phrase often is or contains a VP.

As is well-known, there are also many verbs which must or may select a PP whose head is a locational P of space-time, i.e., their lexical entries contain the frame +___P, *dash*, *glance*, *hand*, *place*, *put.*

Less often remarked is the fact that grammatical P, what here are called Cancelled Ps, do not satisfy this frame:

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5   For a detailed description of another such system in Estonian, see den Dikken and Dékány (2019).
6   For a detailed analysis favouring this copula over the so-called be-raising analysis, see Emonds (2022b, Ch. 1).

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(16) Those kids {dashed/glanced} {into the yard / *of the house / *without the dog}.
     He {handed/put} the box {into my room / *due to the dust / *without a cover}.

For these verbs, it must be that the frame +___P is to be satisfied only in LF, for it is there that the syntactic category of the $P_Ø$ *of*, *without*, *due to* and *without* becomes the undifferentiated $X_Ø$ and so fails to satisfy +___P.

It may be too strong a conclusion to claim that cancelled lexical heads can never satisfy subcategorization frames, but I am aware of no cases where selection of P-headed complements can be satisfied by all Ps, whether lexical or grammatical. The only candidate that comes to mind is that the focus phrase in a cleft sentence, which might be taken as the complement to a copula, may be either a locational or a cancelled P: *It might be {about Ann / near Ann} that the neighbours were talking.* We return to this issue in Section 4.4.

4.3 Cancelled Nouns: Non-discrete Objects That Can't Be Counted

Guided by categorial parsimony, this study claims that there is no feature COUNT/ MASS separate from N (or 'small n' if you will). A Mass Noun is simply a noun whose N feature is not interpreted at LF. An uninterpreted N is called 'cancelled'. Thus, the only category/feature of a typical count noun is N (or 'n'), while that of a mass noun is $N_Ø$ (or '$n_Ø$'). I thus claim that unmarked nouns are automatically interpreted as discrete and countable. Mass nouns arise as labels only if they are lexically specified with the Cancellation Feature; see (9c).

The previous section noted that a cancelled lexical category is more easily associated with a null allomorph than is an unmarked or full one (15d). We thus expect that Mass Nouns are much more likely to have a null pro-form than are Count Nouns. This dovetails perfectly with the findings in Jackendoff (1977), who shows that the pro-form for English Count Nouns is the overt N *one*(*s*)*,* as in (17a), while the pro-form for Mass nouns, where one is allowed, is null, as in (17b).

(17) a.   John bought many white tee shirts, but few coloured *(ones).
           I liked his short novels, but got bored with his long *(one).

      b.   John bought a lot of while wine, but not much red (*ones).
           They took note of the new evidence, but forgot about the old (*one).

The claim in (15d) and the claim that Mass Nouns are "cancelled" are thus confirmed.

Previous work has expressed cancelled features by extra "semantic features", such as ±Count for Nouns and ±Activity for Verbs. Such labels provide no explanatory semantic basis and are purely taxonomic; they non-parsimoniously overlap with syntactic categories such as V and N. If Stative verbs are formally [V, +Ø], we understand why both sub-classes of V move, inflect and assign case alike. By virtue of the Cancellation Feature, we eliminate a separate set of semantic features that overlap with the central syntactic ones. The result is a single set of categories which parsimoniously moves toward an overall conflation and identification of syntax and semantics.

The lexical categories that are +Ø are thus Mass Nouns, Stative Verbs, non-locative Prepositions, and non-Gradable Adjectives. The realis subset of I (auxiliary *do* and the temporal auxiliary *have*) and the non-referential Determiners (expletives) are also +Ø. Note that these classes are again smaller than the corresponding semantically full categories of I (modals) and D (Quantifiers and definite Determiners).

If Stative verbs are V, +Ø, we understand why they inflect and, in most constructions, act just like Activity verbs, that is, both classes move, inflect and assign case alike. With this feature +Ø, we can also understand why the category I of modals (and of Romance subjunctives and conditionals) can act

syntactically like e.g., English finite inflections. In short, Modals are I, and finite inflections, which are fewer in number than modals, are I, +Ø. Both classes predictably share, e.g., the NICE properties (Emonds 2022b, Ch. 1). By virtue of the Cancellation Feature, a purely syntactic device, we can eliminate postulating a separate set of semantic features that overlap with the central syntactic categories.

For similar reasons, we want to say that Mass Nouns are N, +Ø. As expected in the system here, there are many fewer Mass than Count Nouns. But both classes of Nouns have the same possessive forms, including the same phonetically conditioned allomorphs. Both types of Ns follow the same rules for whether APs that modify them precede or follow the head N. And in general, the syntactic and semantic complexity restrictions for cancelled (= Mass) nouns $N_{\emptyset}$ is much less than for count nouns N; see the detailed treatments and contrasts analysed in Borer (2005, Part 2).

Here is a range of typical head categories for nouns, showing some variations.

(18) **N entries**

pebble, N	*bang*, N	*hailstone*, N
gravel, $N_{\emptyset}$	*silence*, $N_{\emptyset}$	*hail*, $N_{\emptyset}$
stone, $N_{(\emptyset)}$	*noise* $N_{(\emptyset)}$	*cloud*, $N_{(\emptyset)}$

N, +Abstract

factor, N	*project*, N	*fact*, N
evidence, $N_{\emptyset}$	*research*, $N_{\emptyset}$	*knowledge*, $N_{\emptyset}$
argument, $N_{(\emptyset)}$	*study* $N_{(\emptyset)}$	*justification*, $N_{(\emptyset)}$

4.4 Cancelled Adjectives: Properties That Can't Be Graded

The best candidates among adjectives for analyzing as "cancelled" in LF are those which can't occur with the very modifiers that in general seem to be the most typical in this role, namely the "degree words" or "grading adverbs." Here are underlined examples of such As.

(19) **Non-Gradable As**

*Our cat seems <u>more</u> dead than yesterday.

*Your party was <u>as</u> superb as I expected.

*The reservoir remains <u>too</u> empty.

*<u>Very</u> lunar landscapes are kind of depressing.

*No grades will be given any students <u>too</u> absent.

*She seems <u>somewhat</u> eternally grateful.

The properties of these As are comparable to several of non-locational Ps (15).

(20) a. **Quantity**. Many more As are gradable (unmarked) than are not (formally $A_{\emptyset}$).
   b. **Less complex semantics of cancelled $A_{\emptyset}$.** This is illustrated by the lack of comparative and superlative degrees of non-gradable adjectives. The unavailability of these extensions defines the class of $A_{\emptyset}$.
   c. **Less complex semantics of cancelled (ungradable) A**.

It seems that there are no pro-forms for cancelled A in English, null or not.

The examples of non-gradable adjective in Table 2 mostly reduce to one member of simple dichotomies: *dead* vs. *alive*, *absent* vs. *present*, *empty* vs. *full*. That is, cancelled $A_{\emptyset}$ do not express nuances so typical of open class Adjectives. But these words are still *interpreted as properties.* So is the minimal morpheme pro-A *so.* Non-gradable adjectives lack morpho-syntactic extensions by virtue of being sub-categorized as lacking possible Specifiers (Degree words) or Measure Phrase pre-modifiers (9d), but like As in general, they remain properties.

(21) *so eternal/existent/lunar; *too eternal/existent/lunar; *less eternal/existent/lunar,
*twice as eternal/existent/lunar, *how eternal/existent/lunar

In conclusion, it seems that cancelled As are different from other lexical heads, in that the Cancellation Feature does not deprive them of part of their usual content, unlike the way that this feature removes countability, activity, and location from the other lexical heads. It then follows that selection of an A-headed complement, by verbs like *seem*, *remain*, *believe*, *consider*, etc. (Wasow 1977) can't in principle distinguish between +___A and +___A$_\emptyset$.

5. Some Excess Content of the Cancellation Feature on Closed Class Items

In the methodology of scientific research programs outlined in Lakatos (1978), novel "auxiliary hypotheses" are deemed "progressive" if they lead to surprising predictions outside of areas for which they are originally conceived. This paper's Cancellation System of basic categories expects morphemes of category A$_\emptyset$, in particular a minimal item with no other feature (analogous to P$_\emptyset$ = *of*, V$_\emptyset$ = *be*, D$_\emptyset$ = *it*), and yet at first glance no such "pro-form" seems to present itself.

Nonetheless, I claim that that there is such an A among *the bound morphemes* of English. Consider the lexical entry for the passive participle inflection in English adjectival passives. (For full justification of this entry, see Emonds 2022b, Ch.6.)

(22) *-en,* A, +V___, D
D is the feature that "*absorbs (alternatively realizes) a passive DP "gap."*

In fact, Adjectival passives in English *must have* a VP-internal DP gap (Levin and Rappaport 1986).[7] Given the lexical entry (22), these passives are selected by auxiliary verbs, and interpreted like AP (Wasow 1977; Emonds 2022b, Ch. 6).

Now let us replace A in the entry (22) by an optionally cancelled A$_{(\emptyset)}$. If the option A$_\emptyset$ is chosen, this means that at LF the only visible category in the head word A in the passive AP is V, i.e., V and not A is present and interpretable as the LF head of a passive XP. This V can also assign case to a DP object (*Mary got sent a prize*), unlike the A head in an adjectival passive (**Mary seemed sent a prize*). Finally, this V head of AP requires an external argument (the "Extended Projection Principle" of Chomsky 1982) in verbal passives, whereas the A head of an adjectival passive does not (though it can tolerate one).

Thus, the simple device of using parentheses around the cancellation feature gives rise to a bare A$_\emptyset$ in verbal passives, and *accounts automatically for all the differences between English verbal and adjectival passives*

It remains to give a theoretical account, based on how lexical selection works in narrow syntax, of why verbal passives can be selected by only closed class verbs which accept AP as their complement structures. (There are 7 such verbs: *be*, *have*, *get*, *want*, *need*, *see*, *hear*). For full details and confirming patterns of data, see Emonds (2022b, Ch. 6). It is certainly a surprising result, that the Cancellation Feature, introduced and justified for reasons that have nothing to do with passives, effortlessly ends up expressing all the main differences between the two main subtypes of the latter. I was myself flabbergasted when I saw, while writing the final part of Chapter 6 of that book, how well this novel formal device captured the complexities distinguishing the two types of English passives. We thus arrive at a telling example of what Lakatos takes as the desired "Excess Content" of an auxiliary hypothesis in progressive scientific research program.

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7   That is, English lacks impersonal passives. Curiously, Spanish patterns with English, while French patterns with German in allowing some impersonal passives.

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Rethinking Null Expletives in Mandarin Chinese

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Abstract: We re-examine two groups of constructions for which some scholars have argued the existence of a null expletive in Mandarin Chinese. In our analysis, neither of them involves a null expletive. While Group I, which includes bare *yǒu* 'have'-existentials *without* an overt coda and unaccusative verbs, has a null light noun PLACE as subject, Group II, which includes bare *yǒu* 'have'-existentials *with* an overt coda and one type of *shì* 'be'-clefts, does not involve any null element. The coda is analysed as a relative clause, which undergoes extraposition out of a DP.

Keywords: existential sentence; null expletive; light noun; extraposition; Mandarin Chinese

1. Introduction

In this paper, we re-examine two groups of 'subject-less' constructions in Mandarin Chinese for which some scholars have argued the existence of a null expletive in the subject position (cf. Huang 1987, Li 1996). Each group will be represented by one type of existential sentences based on *yǒu* 'have', cf. (1). These two types of *yǒu* 'have'-existentials will be referred to as BARE YǑU 'HAVE'-EXISTENTIALS as they lack an overt location phrase in the subject position, in contrast with (2) in which a location phrase *fángjiān-lǐ* 'room-in' is in the subject position. The noun phrase that follows *yǒu* 'have' is referred to as PIVOT. The type of (1b) differs from that of (1a) in having an overt CODA, which refers to any material following the pivot noun.

(1) a. Bare *yǒu*-existentials *without* a coda

      _   yǒu   yī-ge   rén.
          have   one-CLF   person
      "There is one person."

  b. Bare *yǒu*-existentials *with* a coda

      _   yǒu   yī -ge   rén   [$_{coda}$ zài   zhàogù   Lǐsì].
          have   one-CLF   person   PROG   take.care   Lisi
      "There is one person that is taking care of Lisi."

(2) fángjiān-lǐ   yǒu   [$_{pivot}$ yī-ge   rén]   [$_{coda}$ zài   zhàogù   Lǐsì].
     room-in   have   one-CLF   person   PROG take.care Lisi
     "In the room there is one person that is taking care of Lisi."

Mandarin Chinese does not have overt expletives like English *there* or German *es* as shown in (3). Nevertheless, is there a null or covert expletive in the subject position of (1)? Is the subject position of (1) occupied by a covert counterpart of the location phrase? While Huang's (1987) view, which

was rejected by Li (1990), was that a null expletive occurs in sentences like (1), Li (1996) argued that a null expletive occurs in *yǒu* 'have'-existentials with a coda, whereas an implicit *here* or *now* occurs in the subject position of *yǒu* 'have'-existentials without a coda.

(3) a. **There** are [*pivot* two cats] [*coda* in the room].

  b. **Es** gibt [*pivot* einen Apfelbaum] [*coda* in meinem Garten].
    it gives a-ACC apple.tree in my-DAT garden
    "There is an apple tree in my garden."

As will be argued in this paper, the *yǒu* 'have'-existential *without* a coda has a null light noun PLACE in the subject position, whereas the *yǒu*-existential *with* a coda has neither a null light noun PLACE nor a null expletive. In addition, the coda is analysed as a relative clause, and is merged as part of a complex DP, which is introduced by the same Applicative head that can introduce the light noun in the *yǒu*-existential *without* a coda.

The paper is organised as follows. In section 2, we illustrate two groups of 'subject-less' constructions. In section 3, we show in detail the differences between two types of bare *yǒu*-existentials. In section 4, a unified [*ApplP* [*VP*]] syntax is adopted for both types, which differ in what is merged in SpecApplP. In section 5 we discuss extraposition. In section 6, we conclude.

2. Two Groups of Constructions

We have shown two types of bare *yǒu* 'have'-existentials in (1), which represent our two groups of constructions under investigation. We will show each of them in turn.

2.1 Group I

In addition to the *yǒu* 'have'-existential without a coda, Group I includes plain unaccusative verbs like *sǐ* 'die', weather predicates and *happen*-verbs. These predicates can form structures like Locative Inversion, cf. (4). While the location phrase precedes the verb, the theme argument follows the verb.

(4) a. cūn-lǐ sǐ-le yī-ge rén.
    village-in die-PERF one-CLF person
    Lit. "In the village there died one person."

  b. wàimiàn qǐ-le yī-zhèn fēng.
    outside rise-PERF one-CLF wind
    Lit. "Outside there blew a gust of wind."

  c. xuéxiào-lǐ fāshēng-le yī-jiàn shì.
    school-in happen-PERF one-CLF matter
    Lit. "In the school there happened one thing."

As shown in (5), without a preverbal overt location phrase, these sentences are also well-formed. Like bare *yǒu* 'have'-existentials *without* a coda, these sentences express that an individual or eventuality is introduced or presented in the discourse. In addition, as pointed out by Teng (1978), bare *yǒu* 'have'-existentials like (1a) obligatorily imply 'reference to the place or time of the utterance'. We notice that this meaning is also detected with the examples in (5). In other words, the constructions of Group I obligatorily encode the meaning of 'reference to the place or time of the utterance'. Li (1996)

ascribed this meaning to an implicit *here* or *now* in the subject position. However, as will be argued below, the subject position is occupied by a null light noun PLACE.

(5) a. _ sǐ-le   yī-ge   rén.
           die-PERF   one-CLF   person
        Lit. "There died one person."

    b. _ qǐ-le   yī-zhèn   fēng.
           rise-PERF   one-CLF   wind
        Lit. "There blew a gust of wind."

    c. _ fāshēng-le   yī-jiàn   shì.
           happen-PERF   one-CLF   matter
        Lit. "There happened one thing."

2.2 Group II

Group II includes *yǒu* 'have'-existentials with a coda and a type of *shì* 'be'-cleft sentences. The latter is often translated as English *it*-clefts. In the *shì* 'be'-cleft as in (6b), the noun following *shì* 'be', *Zhangsan*, receives a narrow and exhaustive focus. The coda, which refers to the string following the noun, is about some presupposed content.

(6) a. Bare *yǒu*-existentials *with* a coda
        _ yǒu   liǎng-ge   rén   [_coda zài   zhàogù   Lǐsì].
           have   two-CLF   person   PROG   take.care Lisi
        "There are two people that are taking care of Lisi."

    b. *shì* 'be'-cleft sentences
        _ **shì**   Zhāngsān   [_coda zài   zhàogù   Lǐsì].
           be   Zhangsan   PROG   take.care Lisi
        "It is Zhangsan that is taking care of Lisi."

Unlike Group I, Group II does not obligatorily imply 'reference to the place or time of the utterance'. Instead, a predication relation is established between the pivot noun and the coda. We use (7) to illustrate this predication relation further. In (7a), the pivot noun *yī-ge xuéshēng* 'one student' is interpreted as the internal argument of *xīnshǎng* 'admire', while in (7b) the coda has an INDIVIDUAL-LEVEL PREDICATE, in contrast with the example in (6a) which involves a STAGE-LEVEL PREDICATE. Clearly, the meaning of INDIVIDUAL-LEVEL PREDICATES is not related to some specific place or time of the utterance. Therefore, Group II differs from Group I in expressing a predication relation, namely, some property described by the coda is predicated on the individual denoted by the pivot noun.

(7) a. _ yǒu   yī-ge   xuéshēng [Lǐ lǎoshī   hěn   xīnshǎng   _].
           have   one-CLF   student   Li teacher   very   admire
        "There is one student that Teacher Li admires very much."

    b. _ yǒu   yī-ge   xuéshēng [dǒng   déyǔ].
           have   one-CLF   student   know   German
        "There is one student that knows German."

A reviewer considered that the examples in (7) are also interpreted as related to a specific domain. The pivot noun 'one student' must be interpreted as related to a particular class, or school (within which there is a student with the property described by the predicate) which exists in a specific place/time. We agree with the reviewer that the referent denoted by the pivot noun is related to a certain class or school. However, the information about a particular class or school is not identical to that about an utterance which involves a speaker, a hearer, place, and time. By contrast, the constructions of Group I as exemplified by (5) are uttered by a speaker to introduce an individual or eventuality in the domain of utterance.

3. Existential sentences with *yǒu* 'have'

Recall that each group of 'subject-less' constructions is studied in this paper by analysing two types of bare *yǒu* 'have'-existentials that can represent them. In this section, we show the differences between bare *yǒu*-existentials and *yǒu*-existentials with a location subject. The result rules out the possibility that the empty subject position of bare *yǒu* 'have'-existentials is occupied by a covert counterpart of a location noun. From now on, we follow Huang, Li, Li (2009) in referring to location nouns like *fángjiān-lǐ* 'room-in' in (2) repeated below as a localiser phrase. The morpheme *lǐ* 'in' has been called a *localiser* or a postposition in the literature. Localiser phrases are DPs, not PPs, as they occur in positions where a DP argument occurs and they can be coordinated with a DP, cf. Huang, Li, Li (2009).

(2)   fángjiān-lǐ   yǒu   [*pivot* yī-ge   rén]   [*coda* zài   zhàogù   Lǐsì].
      room-in   have   one-CLF   person   PROG   take.care   Lisi
      "In the room there is one person that is taking care of Lisi."

In section 3.1, bare *yǒu* 'have'-existentials are to be distinguished form *yǒu* 'have'-existentials with a localiser phrase. The subject position of the former is not occupied by a covert counterpart of localiser phrases. In section 3.2, we analyse bare *yǒu* 'have'-existentials with a coda.

3.1 Against a Covert Localiser Phrase

Unlike (8a), bare *yǒu* 'have'-existentials (8b) and (8c) do not have an overt localiser phrase. Is there a covert counterpart of localiser phrases (or a localiser phrase in its covert form) in the subject position of bare *yǒu* 'have'-existentials? If there is one, we expect bare *yǒu* 'have'-existentials to behave exactly like (8a) given the assumption that if a syntactic item is present in the structure, it should interact with other syntactic items regardless of its phonological realisation. However, two arguments are shown to suggest that the subject position of bare *yǒu* 'have'-existentials is not occupied by a null localiser phrase.

(8)   a.   fángjiān-lǐ   yǒu   guǐ.
           room-in   have   ghost
           "In the room there are ghosts."

      b.   _   yǒu   guǐ.
               have   ghost
           'There are ghosts here.'   (Huang 1987, 227, (2))

      c.   _   yǒu   guǐ   [yìzhí   kùnrǎo   tā].
               have   ghost   always   trouble   3SG
           "There are ghosts that trouble him all the time."

The first argument against the presence of a covert localiser phrase in bare *yŏu* 'have'-existentials stems from an observation related to the selection of pivot nouns. As is commonly accepted, only weak determiners are admitted in the pivot of English *there be*-existentials. Strongly quantified phrases and definite descriptions are barred from the pivot, cf. the DEFINITENESS RESTRICTION (Milsark 1974), cf. (9).

(9)   DEFINITENESS RESTRICTION
          a. There is/are [a dog/three dogs/some dogs/many dogs] [in the room].
          b. *There is/are [each dog/every dog/most dogs/both dogs] [in the room].
          c. *There is/are [the dog/John's dog/it/that dog/John] [in the room].

However, as shown by Lumsden (1988) and McNally (1997, 1998), a strongly quantified phrase can in fact be an existential pivot only when ranging over non-particulars (e.g. kinds, etc.). Take (10a) and (10b). Although both involve a strong quantifier *every*, (10b) differs from (10a) in that the universal quantifier *every* ranges over kinds (non-particulars), not individuals (particulars).

(10) Taken from McNally (1998, 358, (9a-d))
          a. *There was every doctor at the convention.
          b. There was every kind of doctor at the convention.
          c. *There were most books in his library.
          d. There were most sorts of books in his library.

We turn to Mandarin data. As shown in (11), regardless of the presence or absence of an overt localiser phrase, *yŏu*-existentials seem to behave just like English *there be*-existentials as in (9). Only weak determiners can occur in the pivot, whereas strongly quantified phrases and definite descriptions are barred from the pivot.

(11) (fángjiān-lǐ)   yŏu   [$_{pivot}$ … …].
       room-in   have
       "(In the room) there are … …"

       a. Weak quantifiers in the pivot
           …   [$_{pivot}$ rén/   liǎng-ge rén/   hěn-duō   rén].
                             person   two-CLF person   very-many person
           ("In the room there are people/two people/many people.")

       b. Strongly quantified phrases
           *… [$_{pivot}$ dà-bùfèn rén/   měi-ge   rén/   suǒyǒu rén].
                             big-part person   every-CLF person   all   person
           ("In the room there are most people/every person/all the people.")

       c. Definite descriptions
           *… [$_{pivot}$ Zhāngsān /   nà-ge   rén /   tā].
                             Zhangsan   that-CLF person   3SG
           ("In the room there is Zhangsan/that person/him.")

However, only *yǒu* 'have'-existentials with an overt localiser phrase permit strongly quantified phrases ranging over non-particulars, cf. (12). By contrast, *without* an overt localiser phrase as in (13), strongly quantified phrases are entirely barred from the pivot position regardless of their interpretive differences. If there were a localiser phrase covertly present in bare *yǒu* 'have'-existentials, (13) should have behaved exactly like (12). This is contrary to reality.[1]

(12)   With an overt localiser phrase:
        contrast particulars (individuals) vs. non-particulars (type, kind, sort…)
   a.   *huìchǎng-shàng   yǒu   měi-ge   yīshēng.
        convention-on   have   every-CLF   doctor
        ("There was every doctor at the convention.")

   b.   huìchǎng-shàng   yǒu   měi-ge   lǐngyù   de   yīshēng.
        convention-on   have   every-CLF   field   DE   doctor
        "There was every field of doctor at the convention."

(13)   Without an overt localiser phrase: *no contrast*
   a.   * _ yǒu   měi-ge   yīshēng   (zài   huìchǎng-shàng).
           have   every-CLF   doctor   PREP   convention-on
        ("There was every doctor at the convention.")

   b.   * _ yǒu   měi-ge   lǐngyù   de   yīshēng   (zài   huìchǎng-shàng).
           have   every-CLF   field   DE   doctor   PREP   convention-on
        ("There was every field of doctor at the convention.")

The second argument is built around what Milsark (1974) called ONTOLOGICAL EXISTENTIALS. Unlike locative existentials as exemplified in (14), ontological existentials as in (15) 'express statements about ontology; they tell us something about the ingredients list of the world, and thus concern existence if anything does'. (Milsark 1974, 169–170).

(14) Locative existentials
      There are [$_{pivot}$ two cats] [$_{coda}$ in the room].

(15) Ontological existentials
      a. There is a God.   (McNally 2016, 225, (32a))
      b. There are no six-legged cats.   (Milsark 1974, 173, (15))

1   Regarding the contrast between (12) and (13), a reviewer asked why an overt localiser phrase as in (12) can license strongly quantified phrases ranging over non-particulars. We think that this type of 'licensing' is generally possible in a subject-predicate structure. (12) should be understood in line with the pair as shown in (i), originally from Partee (1986), which shows that quantifiers cannot function as predicates unless they range over properties. Hence, (12) in fact suggests that *yǒu*-existentials with a localiser phrase involve a subject-predicate structure in which the localiser phrase is a subject, and the pivot noun is a predicate.

(i)   a. *John is every student in the class.
       b. John is everything his mother wanted him to be.   (Partee 1986)

It turns out that *yǒu* 'have'-existentials in root contexts can form ontological existentials only when a localiser subject is overtly present, cf. (16). If there were a localiser phrase in its covert form in (17), there would be no difference in grammatical judgement between (16) and (17).

(16) a. [yǔzhòu-lǐ]   yǒu   yī-ge   shàngdì.
     [universe-in]   have   one-CLF   god
     "In the universe there is one god."

    b. [shìjiè-shàng]   méi   yǒu   liù-tiáo tuǐ de   māo.
     world-on   NEG   have   six-CLF leg DE   cat
     "In the world there are no six-legged cats."

(17) a. *_ yǒu   yī-ge   shàngdì.
        have   one-CLF   god
     ("There is one god.")

    b. ?? _ méi   yǒu   liù-tiáo tuǐ de   māo.
        NEG   have   six-CLF leg DE   cat
     ("There are no six-legged cats.")

Given the two arguments above, bare *yǒu* 'have'-existentials should be distinguished from *yǒu* 'have'-existentials with a localiser phrase. If there is a null subject in the former, what is it? We recall that bare *yǒu* 'have'-existentials without a coda obligatorily imply reference to the place or time of the utterance. Li (1996) ascribed this meaning to an implicit *here* or *now* in the subject position. However, (18) shows that the presence of *zhèlǐ* 'here' can be compatible with a strongly quantified phrase ranging over non-particulars in the pivot. Therefore, (18) does not behave like a bare *yǒu* 'have'-existential, which rejects all the strong quantifiers. Given this observation, we will not adopt Li's analysis.[23]

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2   In addition, the presence of an overt *xiànzài* 'now' in (ia) does not mean the same as a bare *yǒu*-existential as in (ib).

(i) a. xiànzài   yǒu   guǐ.   b. _   yǒu   guǐ.
     now   have   ghost   have   ghost
     'Now there are ghosts.'   'There are ghosts.'

3   There is another argument against the idea that the null subject is a covert demonstrative. In Mandarin Chinese, there are two sets of demonstratives, namely, proximal demonstratives like *zhè/zhè'r* 'here', *zhè-lǐ* 'here/this-in', and distal demonstratives like *nà/nà'r* 'that/there', *nà-lǐ* 'there/that-in'.

(i) a. (#**nà**)   yǒu   yī-ge   rén   zài   **zhè-lǐ.**
     there   have   one-CLF person   PREP   here-in
     'There is one person here.'

    b. (#**zhè**)   yǒu   yī-ge   rén   zài   **nà**.
     here   have   one-CLF person   PREP   there
     'There is one person there.'

Unlike English 'there' which is not deictic in *there-be* existential sentences, Mandarin demonstratives are obligatorily deictic. This property is shown by (i) in which an overt demonstrative subject can semantically clash with another demonstrative in the coda. By contrast, the null subject is compatible with any deictic expression in the coda. Suffice it to say that the null subject should not be analysed as a covert counterpart of demonstratives.

(18) zhèlǐ   yǒu   měi-ge   lǐngyù   de   yīshēng.
      here   have   every-CLF   field   DE   doctor
      "Here there is every field of doctor."

What about a *pro*? We use (19) to argue against this option. (19a) is a *yǒu*-existential with a localiser phrase *túshūguǎn-lǐ* 'library-in', which is compatible with a strongly quantified phrase ranging over kinds in the pivot. In (19b), when the localiser phrase is topicalised, a *pro* subject is compatible with the same pivot as well. The contrast between (19b) and (13b) suggests that the null subject is not a *pro* in bare *yǒu* 'have'-existentials without a coda.

(19) a.   túshūguǎn-lǐ   yǒu   **dà-bùfen**   **lèixíng** de   shū.
          library-in   have   big-part   kind/type DE   book
          "There are most kinds of books in the library."

     b.   túshūguǎn-lǐ$_i$ a,   **pro**$_i$ yǒu   **dà-bùfen**   **lèixíng** de   shū.
          library-in   TOP   have   big-part   kind/type   DE   book
          "In the library, there are most kinds of books."

We would like to argue that the null subject is a covert light noun PLACE, which is introduced by an Applicative head. Unlike a localiser phrase, it is structurally and semantically deficient so it cannot be predicated of by strongly quantified phrases ranging over non-particulars.[4] In addition, since its meaning is obligatorily dependent on the time or place of the utterance, it is unable to form an onto-logical existential whose meaning does not depend on a specific time or place.

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4   A potential argument against the null PLACE analysis is that an overt bare light noun *dìfāng* 'place' cannot occur in the subject of *yǒu* 'have', cf. (ia). However, when *dìfāng* 'place' escapes from argument position (A position), it can surface, for instance, as a relative Head, cf. (ib). Why must a bare light noun be covert in argument position? We argue that bare light nouns are structurally reduced and cannot be Case-licensed in argument position, unlike canonical bare nouns.

(i)   a.   *   **dìfāng**   yǒu   guǐ.
              place   have   ghost
              ('There are ghosts.')

      b.   [_   yǒu   guǐ]   de   **dìfāng**
                  have   ghost   DE   place
              'the place where there are ghosts'

We further observe that bare light nouns can occur in the complement of factive verbs, cf. (iia). However, here, the bare light noun can be analysed as a concealed question like (iib) as the verb *zhīdào* 'know' can select a question as complement.

(ii) a.   wǒ   zhīdào   **dìfāng**.
           1SG   know   place
           'I know the place.'

      b.   wǒ   zhīdào   [**dìfāng shì shénme**].
           1SG   know   place   be   what
           'I know what the place is.'

3.2 Coda as a Relative Clause

In this section, we turn to the bare *yǒu* 'have'-existential with a coda and analyse the coda as a type of relative clause, cf. (20). Recall that this type of existentials is not obligatorily interpreted with reference to the place or time of the utterance. We argue that instead of a null PLACE, a complex DP containing the coda is introduced by the same Applicative head in the structure of the bare *yǒu* 'have'-existential with a coda.

(20) Bare *yǒu* 'have'-existentials *with* a coda

     _   yǒu   yī-ge   rén   [$_{coda}$ zài   zhàogù   Lǐsì].

        have   one-CLF   person   PROG   take.care   Lisi

     "There is one person that is taking care of Lisi."

As argued by Liu (2021), the pivot originates inside the coda. As shown in (21), Liu argued that the [pivot + coda] string is a CP in which the pivot *yī-ge rén* 'one person', as a relative Internal Head, moves to SpecCP. The raising of the relative Internal Head can be diagnosed by island effects and reconstruction effects.

(21) Liu's (2021) analysis: the [pivot + coda] string has an Internally Headed Relative Clause

     _   yǒu   [$_{CP}$ [yī-ge   rén]   [$_{TP}$ ~~yī-ge   rén~~]   [$_{coda}$ zài   zhàogù   Lǐsì]]].

        have   one-CLF person   one-CLF person   PROG   take.care   Lisi

     "There is one person that are taking care of Lisi."

Liu (2021) further argued that this CP relative clause structure is shared with one type of pre-nominal relative clauses, called *de*-less prenominal relative clauses, cf. (22a), which do not involve the modification marker *de*. It is well-known that Mandarin prenominal relative clauses often involve the marker or particle *de*, which surfaces between the relative clause and the relative Head noun, cf. (22b). Liu (2021) showed that *de*-less relative clauses are to be distinguished from *de*-relative clauses. One of his arguments is that the demonstrative in *de*-less relative clauses is obligatory (see also Cheng and Sybesma 2009).

(22) a. *de*-less prenominal relative clauses

       [zài   zhàogù   Lǐsì]   [**nà**-yī-ge   rén]

       PROG   take.care   Lisi   that-one-CLF   person

       "that one person who is taking care of Lisi"

     b. prenominal relative clauses with *de*

       [zài   zhàogù   Lǐsì]   **de**   [(**nà**)-yī-ge   rén]

       PROG   take.care   Lisi   DE   that-one-CLF   person

       "that one person who is taking care of Lisi"

If Liu's conclusion is on the right track, that is, the coda of *yǒu* 'have'-existentials and the *de*-less relative clause share a common core syntactic structure, the coda in (23) can be alternatively analysed as part of a *de*-less relative clause, which occurs to the right of the pivot. The surface string is resulted from the ellipsis of the demonstrative relative Head noun.[5] Consequently,

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5   This idea was suggested to us by Guglielmo Cinque (p.c.).

the relative Head noun is related to the pivot noun in an indirect way, rather than a direct way as proposed by Liu (2021).[6]

(23) [*pivot* yī-ge rén]   [*DP* [*coda=CP*   zài   zhàogù   Lǐsì]   ~~nà-yī-ge   rén~~]]
          one-CLF person   PROG take.care   Lisi   that one-CLF person
    "one person, that one person that is taking care of Lisi"

If the coda is inside a complex noun phrase, we expect it to behave like relative clauses with respect to extraction. This prediction is borne out. As shown in (24b), extracting an object out of the coda can yield island effects, like the extraction out of a prenominal relative clause as in (24a). (24c) demonstrates that extraction out of a *shì* 'be'-cleft yields island effects as well. Hence, we will adopt the structure as in (23) for the coda.[7]

(24) a. Pre-nominal relative clauses
        *Lǐsì$_i$,   wǒ   rènshì   [[mà-le   __$_i$]   (de)   nà-ge   rén].
        Lisi   1SG   know   scold-PERF   person   DE   that-CLF person
        ("Lisi$_i$, I know that person who scolded him$_i$.")

    b. *yǒu* 'have'-existentials with a coda
        *Lǐsì,   **yǒu**   liǎng-ge   rén   [mà-le   __$_i$].
        Lisi   have   two-CLF   person   scold-PERF
        ("Lisi$_i$, there were two people that scolded him$_i$.")

    c. *shì* 'be'-cleft sentences
        *Lǐsì,   **shì**   Zhāngsān   [mà-le   __$_i$].
        Lisi   have   Zhangsan   scold-PERF
        ("Lisi$_i$, it is Zhangsan that scolded him$_i$.")

---

6   The demonstrative Head noun (23) can surface, cf. (i). The complex demonstrative phrase occurs to the right of the pivot noun. The grammatical judgement of the sentence can be improved when a pause is inserted between the pivot and the complex demonstrative phrase. Semantically, the complex demonstrative phrase with a relative coda adds information about the newly introduced referent denoted by the pivot. Regarding the ellipsis of the demonstrative head 'that one person', it could be viewed as an application of noun ellipsis, which operates generally in Mandarin Chinese. We thank a reviewer for asking whether sentences like (i) are possible.

(i)   ? yǒu [*pivot* yī-ge rén], [*DP* [*coda=CP* zài   zhàogù   Lǐsì] [nà-yī-ge   rén]].
          have   one-CLF person   PROG take.care Lisi   that one-CLF   person
          'There is one person, that one person that is taking care of Lisi'

7   It is well-known that the insertion of a *suǒ*-clitic is possible when an object is relativised in pre-nominal relative clauses or passivised in Mandarin long passives (See Huang et al. 2009). Scholars often use this clitic to diagnose A-bar dependencies. If the existential coda is analysed as a relative clause, we expect the *suǒ*-insertion to be possible. However, this prediction is not borne out. The insertion of this clitic in the coda is not possible. Two possible ways are to be considered. The first is that the A-bar dependency involved in the coda is not of the same type as that involved in pre-nominal relative clauses. Instead, the A-bar dependency could be of the same type as that involved in questions or topicalizations, both of which are not compatible with the *suǒ*-insertion in Mandarin Chinese. The second is that while our analysis is in fact on the right track, the diagnostic with the *suǒ*-insertion ought to be reviewed, or in other words, the insertion of *suǒ* could only be compatible with a subset of relative clauses.

4.   Analysis

Both types of bare *yǒu* 'have'-existentials are to be analysed as involving the same $[_{ApplP}\,[_{VP}\,]]$ structure. They differ in that the Applicative head introduces a null PLACE in the type without a coda, while the same head introduces a complex DP in the type with a coda.

4.1 bare *yǒu* 'have'-existentials without a coda

For bare *yǒu*-existentials without a coda as in (25), a null PLACE is introduced by an Appl head. *Yǒu* 'have' is merged in V, and the pivot noun in the complement of V. The null PLACE can undergo movement to SpecTP if we assume the Extended Projection Principle (EPP), which requires every clause to have a subject. There is no null expletive.

(25)   Bare *yǒu* 'have'-existentials without a coda

    a.   **null PLACE**   yǒu   guǐ.
                         have   ghost
    "There are ghosts."

    b.   ....

```
              ......
                 ApplP
                /     \
             NP         Appl'
          null PLACE    /    \
                    Appl°      VP
                             /    \
                           V°      pivot noun
                       yǒu 'have'   guǐ 'ghost'
```
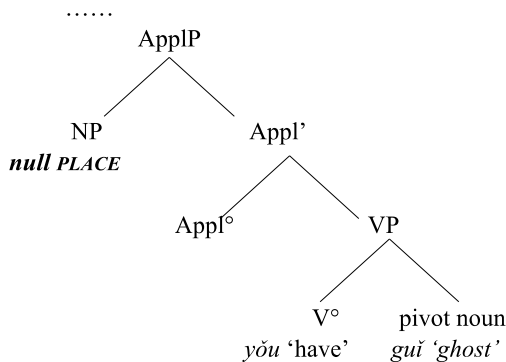
This analysis can be applied to the other constructions of Group I, cf. (26).

(26)   **null PLACE**   sǐ-le   yī-ge   rén
                      die-PERF   one-CLF   person
        Lit. "There died one person."

4.2 Bare *Yǒu* 'Have'-Existentials with a Coda

For bare *yǒu* 'have'-existentials with a coda as in (27), we argue that the coda is base-generated as part of a complex DP, which is introduced by the Appl head. The external relative Head 'those two people' is deleted under identity. The sentence-final position of the coda surfaces as a result of a rightward movement.

(27) a.   _   yǒu   liǎng-ge   rén $[_{coda}$ zài   zhàogù   Lǐsì].
                  have   two-CLF   person   PROG   take.care   Lisi
        "There are two people that are taking care of Lisi."

b.

```
                                          FP
                                         /  \
                           - - - - - - - /    \ > Spec
                          |              /\     CP
                          |             /  \
                          |            /    F°
                          |          ……
                          |      ApplP
                          |      /   \
                          |    DP     Appl'
                          |   /  \    /    \
                          | CP   DP  Appl°   VP
                          |      those two people   /  \
                        Spec   C'              V°    NumP
                      two people /  \        yǒu 'have'  two people
                               C°   TP
                                   /  \
                            two people are taking care of Lisi
```
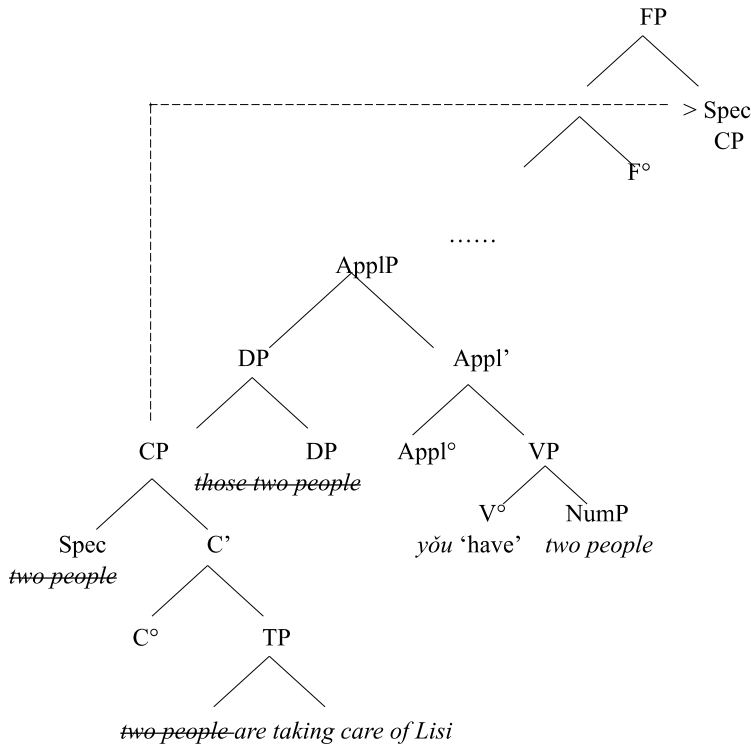
The rightward movement of the coda, which reminds us of extraposition, can be supported by two arguments. First, the coda can be separated from the pivot by a sentence final particle (SFP) such as *a* or *ne* as in (28), which occurs in the right periphery (cf. Pan 2019). This example suggests that the coda can move to the right of SFPs.

(28) _ yǒu   yī-ge   rén   **a/ne**, [_coda_ zài   zhàogù   Lǐsì].
         have one-CLF person SFP   PROG   take.care Lisi
      "There is one person that is taking care of Lisi."

Second, our analysis can account for an apparent 'island effect' caused by an argument *wh*-phrase inside the coda. It has long been observed that argument *wh*-questions do not show island sensitivity (cf. Huang 1982; Tsai 1994). (29) shows that *shéi* 'who' can occur inside a Complex NP Island (with a relative clause), without inducing island effects.

(29) tā   rènshí   [[zài   zhàogù   **shéi**] (de) nà-ge xuéshēng]?
     3SG   know   PROG   take.care who   DE   that-CLF student
     "Who is *x* such that he knows that student who is taking care of *x*?"

By contrast, the same argument *wh*-phrase cannot occur inside an existential coda or a coda of the *shì* 'be'-cleft, giving rise an island-like effect.

(30) a. Bare *yǒu* 'have'-existentials *with* a coda

    * _   yǒu   liǎng-ge   rén   [$_{coda}$ zài   zhàogù   **shéi**]?

        have   two-CLF   person   PROG   take.care   who

    ("Who is *x* such that there are two people that are taking care of *x*?")

b. *shì* 'be'-cleft sentences

    * _   shì   Zhāngsān   [$_{coda}$ zài   zhàogù   **shéi**]?

        be   Zhangsan   PROG   take.care   who

    ("Who is *x* such that it is Zhangsan that is taking care of *x*?")

(30) can be accounted for by our analysis. We follow Tsai (1994) in assuming an unselective binder (or a question operator) in the left periphery to bind an argument *wh*-phrase, which contains a variable. The binding takes place across islands, giving rise to the absence of island effects as in (29). However, if the constituent that contains an argument *wh*-phrase is not in the scope of the operator, the question reading of the *wh*-phrase should not be obtained. This is the case in (30). (31) illustrates that the *wh*-phrase fails to be bound by the question *Op*(erator) when the coda containing it moves out of its scope.

(31) Bare *yǒu* 'have'-existentials *with* a coda

    * [***Op***$_i$ yǒu t_j liǎng-ge   rén]   [zài   zhàogù   **shéi**$_i$]$_j$?

        have   two-CLF   person   PROG   take.care   who

    ("Who is *x* such that there are two people that are taking care of *x*?")

The 'island-effect'-like behaviour of argument *wh*-phrases can be observed elsewhere in the language when those potential islands occur on the right. (32a) shows that an argument *wh*-phrase can occur inside the *rúguǒ* 'if'-clause (adjunct island) without inducing any island effect. As shown in detail by Wei and Li (2018), the sentence-initial position is the unmarked or canonical position for adverbial clauses in Mandarin Chinese, as exemplified by (32a). By contrast, (32b) shows that when the *if*-clause occurs to the right of the main clause (yielding a marked order), the argument *wh*-phrase no long delivers a question. To explain the contrast between (32a) and (32b), we argue that the *if*-clause has moved out of the scope of the operator, which prevents the operator from binding the variable in the *wh*-phrase.[8]

(32) a. [rúguǒ   Zhāngsān   mǎi   **shénme**],   Mǎlì   huì   hěn   gāoxìng?

     if   Zhangsan   buy   what   Mary   will   very   happy

    "What is *x* such that if Zhangsan buys *x* Mary will be happy?"

b. */??Mǎlì   huì   hěn   gāoxìng,   [rúguǒ   Zhāngsān   mǎi   **shénme**]?

     Mary   will   very   happy   if   Zhangsan   buy   what

    ("Who is x such that Mary will be happy if Zhangsan buys *x*?")

c. *[***Op***$_i$ [~~*if ... x*$_i$ ...~~, main clause]] [*if ... x*$_i$ ...]

---

[8]   See Wei and Li (2018), who argued against right-adjunction. For them, (32b) is derived from (32a) by a leftward movement of the main clause triggered by the contrastive focus. It is unclear to us whether their analysis can account for the contrast between (32a) and (32b) with respect to an argument *wh*-phrase contained inside the *if*-clause.

We are fully aware of the literature in which right adjunction is not preferred and that since Li (1990) it has been assumed that Mandarin Chinese lacks extraposition. We do not have much to say about Kayne's (1994) antisymmetry. If only leftward movement is allowed, there will be two steps of movement from (32a) to (32b): the *if*-clause moves leftward out of the scope of the question operator, followed by the movement of the main clause to a higher position. We cast doubt on Li's (1990) argument in section 5.

In this section, we have argued for a unified syntax for two types of bare *yǒu* 'have'-existentials. They differ in what the Appl introduces in the structure. While the Appl introduces a null PLACE in the type without a coda, the Appl introduces a DP containing a relative coda in the type with a coda. There is no null expletive in either case.

5.   About Extraposition

As argued in section (4.2), the coda moves rightward to the right periphery of the bare *yǒu* 'have'-existential. However, since Li (1990), it has been widely assumed that extraposition does not exist in Mandarin grammar. In this section, we review Li's (1990) original argument.

Li first used the data in (33) and (34) to argue for the lack of null expletives in Mandarin Chinese. While the examples in (33) involve sentential subjects, those in (34) have an empty subject position. As argued by Li, if expletives do not exist in Mandarin, the sentences in (34) can be ruled out by the Extended Projection Principle (EPP), which requires every clause to have a subject. The ungrammaticality of (34) indicates the lack of null expletives in Mandarin Chinese.[9]

(33) a. [tā   huì   qù   nà'r]   kénéng   ma?
       he   will   go   there   likely   QP
       "Is that he will go there likely?"

    b. [tā   huì   qù   nà'r]   hěn   nán/róngyì   ma?
       he   will   go   there   very   difficult/easy   QP
       "Is that he will go there difficult/easy?"   (Li 1990, 129, (30))

(34) a. ?kénéng   [tā   huì   qù   nà'r].
       likely   he   will   go   there

    b. *hěn   nán/róngyì   [tā   huì   qù   nà'r].
       very   difficult/easy   he   will   go   there   (Li 1990, 129, (31))

Li (1990) went on arguing that the lack of expletives accounts for why Chinese does not allow extraposition of a sentential subject from the subject position. According to Li, when the sentential subject of (35a) is extraposed in yielding (35b), the subject position will be unfilled. Since there is no expletive to fill in the vacated position, the sentence is ruled out by the EPP.

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9   Li's argument against null expletives based on (34) has some issues. First, *kénéng* should be treated as an adverb, not a raising verb, cf. Pan and Paul (2014). Second, ungrammaticality of a subject-less sentence can be induced by other factors such as selection. Take English *there* expletive. It is well-known that the insertion of English expletive *there* is only possible with plain unaccusatives, not with transitives, unergatives or change-of-state unaccusatives (see Deal 2009 and references therein). In other words, *there*-insertion cannot save all the subject-less sentences in English.

(35) a. [tā   lái   zhè'r]   hěn   zhòngyào.
        he   come   here   very   important
        "That he comes here is important."

     b. *hěn   zhòngyào   [tā   lái   zhè'r].
        very   important   he   come   here
        ("It is important that he comes here.")   (Li 1990, 130, (33))

Although Li's analysis is attractive (but see fn 9), we would like to suggest an alternative analysis of (35b). Two assumptions are needed: the subject has a *pro*, and the sentential subject is treated as a definite description (maybe with a DP syntax). Given these assumptions, the co-indexation between this *pro* and the clause 'that he comes here' as in (36) can lead to a Condition C effect, explaining the ungrammaticality.

(36) * ***pro****$_i$*   hěn   zhòngyào   **[tā   lái   zhè'r]**$_i$.
                 very   important   he   come   here
     ("It is important that he comes here.")

The same type of Condition C effect has been discussed in the study of English *if*-conditionals with a proform *then*, cf. Bhatt and Pancheva (2017). As shown in (37), the proform *then* in the consequent clause can only follow an overt *if*-clause, not precede it. In contrast with (37a), (37b) is ungrammatical because the proform c-commands the *if*-clause, which is analysed as a definite description by Schlenker (2004), and the co-indexation between the proform and the *if*-clause gives rise to a Condition C violation.

(37) a.   If John leaves, **then** I will come.
     b. ***Then** I will come home, if John leaves.   (Bhatt and Pancheva 2017, 27, (76b), (77b))

We have shown that the data Li (1990) used to argue for the lack of extraposition can be analysed in an alternative way. If our analysis in on the right track, Li's argument does not constitute a strong argument against the existence of extraposition in Mandarin Chinese.

6.   Concluding Remarks

In this paper, we have examined two groups of 'subject-less' constructions. Each group is represented by one type of bare *yǒu* 'have'-existentials, which differ in whether an overt coda is present. We have argued that while these two types of existentials share a syntactic structure, they differ in that either a null light noun PLACE or a DP containing the coda is introduced by an Applicative head. There is no null expletive in these constructions.

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The Neutral Case System of English

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Abstract: This paper argues for a development of Dependent Case Theory by which there are only two structural cases: dependent case and unmarked case. The different forms which realise these two underlying cases are determined in post-syntactic context through a number of contextually restricted realisation rules. The distribution of English 'accusative' pronoun forms is argued to show that these realise unmarked case, rather than the expected dependent case. Furthermore, a simplification to the system is gained if we assume that the VP is an unexceptional 'hard' phase, which in terms of Baker (2015), means that even accusative objects are realisations of unmarked case. We end up with a system in which there is no dependent case assigned in the language and a small number of realisation rules determine the forms of pronouns which give the impression of an accusative system.

Keywords: Dependent Case Theory; unmarked case; case realisation; neutral case systems

1.   Introduction

English is typically thought of as an accusative language, partly because of its historical origins and the fact that this is a feature of other languages within its family.[1] Currently, however, it only distinguishes between 'nominative' and 'accusative' forms in five lexical items, all of which are pronouns. These pronouns distribute mostly in the familiar pattern, with the nominative forms as subjects of finite clauses and accusative forms appearing in object position. It is this distribution that is mainly used to maintain the claim that English is still an accusative language, despite having lost case morphology on all other nominal forms. The notion of 'abstract case' shores up this view, as it is possible to claim that all DPs are assigned the same cases that are visible only on a handful of elements.[2]

In this paper we will argue that English is not an accusative language and, in fact, it has a neutral case system, similar to languages such as Chinese.[3] We do this within the theoretical framework of Dependent Case Theory (Marantz, 1991; Baker, 2015). The approach we adopt follows from a simplification of this theory, which assumes that there are only two structural cases and that case 'forms', standardly assumed to represent different cases are contextually determined realisations of just one of the two structural cases.

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1   This is an updated version of the paper we presented at Olinco 2023, where we claimed that the English genitive case was its only dependent case. In the present paper, we have extended our analysis of English unmarked case to include the genitive too and thus we now propose a completely uniform system for the whole language. This alteration, and others, were facilitated by the comments from the audience at Olinco 2023 and we wish to hereby express our thanks to those who participated. We also thank the three anonymous reviewers of this paper for their comments and suggestions which have helped us to improve and clarify the text.

2   Some, however, have questioned this, notably Emonds (1976, 1985) and Hudson (1995).

3   A reviewer points out that English also uses accusative as a default case, a point we completely agree with. However, we see this as completely separate from its use in the constructions we will consider in this paper. See Newson (2018) for an analysis of default case within a DCT framework.

1.1 Dependent Case Theory

Marantz (1991) proposes to account for the distinction between accusative and ergative languages under the assumption that there are two types of case: dependent and unmarked. Dependent case is assigned in transitive contexts, where there is more than one DP, and unmarked case is assigned to a DP not assigned dependent case.[4] Therefore, unmarked case will be assigned to the subject of intransitive structures, where dependent case cannot be assigned, and to the DP in transitive ones not assigned dependent case. An accusative system results if the dependent case is assigned to the lower DP (object) and an ergative one results if it is assigned to the higher one (subject):

(1)   Accusative: SUBJ_{UnM}
                    SUBJ_{UnM} OBJ_{DEP}
      Ergative: SUBJ_{UnM}
                    SUBJ_{DEP} OBJ_{UnM}

Baker (2015) extends these ideas by including a locality restriction on case assignment, enlisting the notion of a case domain. According to this, dependent case is assigned to a DP within a case domain which contains at least one more DP, one c-commanding the other.

(2)   a.   In a domain containing at least two c-command related DPs, assign dependent case
           to the x DP (value of x parameterised to = higher or lower).
      b.   Assign unmarked case to a DP not assigned dependent case.

Baker equates case domains with spell-out domains of Phase Theory. One consequence of this is that the VP must be considered a case domain. While this is problematic for standard accusative and ergative languages, where subjects and objects must be considered to be in the same domain in order for dependent case to be assigned, Baker points out that there are languages, Sakha for instance, in which dependent case is only assigned if the object raises out of the VP, which happens if it is definite, placing it within the same domain as the subject. An indefinite object, which does not move, is given unmarked case, indicating that it is alone in its domain, the VP. Generally speaking, if an object raises out of the VP, this can trigger the assignment of a dependent case, either to the moved object (as in Sakha) or to the subject in ergative languages:

(3)   a. $[_{\text{TP}} \text{DP}_1 \dots \text{DP}_2 [_{\text{VP}} \cancel{\text{DP}_2} \dots]]$ - dependent case assigned to DP_1 or DP_2
      b. $[_{\text{TP}} \text{DP}_1 \dots [_{\text{VP}} \text{DP}_2 \dots]]$ - unmarked case assigned to DP_1 and DP_2

1.2 What Is Assigned?

Within this framework, there are two possible views on the nature of case assignment. The standard view is that assignment involves case features, such as [NOM], [ERG], [DAT], etc. (Marantz 1991, 22). From this perspective the terms 'dependent case' and 'unmarked case' are properties of different cases describing how they are assigned. However, it is possible to conceive of the system from virtually the opposite direction: dependent and unmarked cases are the assigned case features, and 'named' cases are just what we call them when they appear in certain contexts.

From this perspective, the system operates with just two structural cases in all domains. However, the forms used to expone these case features are contextually restricted and so there can be more

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4   Here we ignore lexical and default case, which Marantz included in his disjunctive hierarchy of cases as they will not be of relevance to the present discussion.

than one way to spell them out. This offers a simpler system in a number of ways as can be seen by consideration of unmarked case assignment in Hungarian. Newson and Szécsényi (2020) argue that both nominative and dative Hungarian subjects are assigned unmarked case, as can be seen by their similar behaviour in transitive and intransitive contexts[5]:

(4) a. Péter-∅   könyv-ek-et   olvas-∅.
         Peter-NOM   book-pl-ACC   read-3SG
         'Peter is reading books.'

     b. Péter-∅   táncol-∅.
         Peter-NOM   dance-3SG
         'Peter is dancing.'

     c. Nem   szabad   [Péter-nek könyv-ek-et   olvas-ni-a].
         not   allowed   Peter-DAT   book-PL-ACC   read-INF-3SG
         'Peter is not allowed to read books.'

     d. Nem   szabad   [Péter-nek   táncol-ni-a].
         not   allowed   Peter-DAT   dance-INF-3SG
         'Peter is not allowed to dance.'

If we assume that the case system operates with nominative and dative cases, then we have to distinguish the syntactic contexts in which they are assigned. Specifically, it must be assumed that there are different domains in which each is a designated unmarked case. This, in turn, increases the number of phase heads required to distinguish between the domains. In principle, this introduces further complications, as such a distinction might only be relevant for case assignment and not other spell-out phenomena, such as movement.[6] Alternatively, if we assume that in the examples in (4) the same case (unmarked) is assigned, it is only necessary to envisage one case/spell-out domain (the TP) and this will be uniform for all relevant syntactic phenomena. It then has to be proposed that unmarked case, when realised in a finite clause, takes a nominative form and when it is realised in an inflected infinitive context, it takes the dative form, as exemplified by the following rule[7]:

(5) N+UM   →   N+∅   /   -- +FIN
             →   N+nak/nek   elsewhere

These contexts are clearly not defined in the same way as spell-out domains are, i.e. by the merger of a phase head, but by the presence of specific elements, such as finite inflections.[8]

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5   A reviewer points out that there are other uses of dative in Hungarian, such as for goal arguments. These are instances of inherent case, which DCT treats differently and which are not relevant for the present analysis.

6   Newson and Szécsényi (2022) is an attempt to come to terms with why spell-out domains for case might be different.

7   The use of the dative as the 'elsewhere' form was argued for in Newson and Szécsényi (2020).

8   We are simplifying here a little as both nominative and dative forms are used to realise unmarked cases in more than these contexts, the definition of which would take us off at an unhelpful tangent for the purposes of the present paper.

It is important to point out, however, that the case system envisaged here has a syntactic basis as well as a post-syntactic component. The fact that case domains coincide with phases demonstrates that this is a syntactic notion. Furthermore, Baker (2015) demonstrates that case can be assigned both before and after movements, depending on various things (also see Newson and Szécsényi 2022a), clearly showing that case assignment is part of syntax and cannot be determined post-syntactically. This argues against a purely morphological approach to case (e.g. Parrott 2009). We therefore conclude that there is a syntactic and a post-syntactic aspect to the case system. We will be assuming this view of case assignment in our analysis.

2. English Uses Accusative to Realise Unmarked Case
2.1 Acc-ing Gerund (Newson 2018)
It is well known that the subject of the gerund can either be realised by an accusative or genitive pronoun[9]:

(6)   His/him committing to the project was unexpected.

As pointed out in Newson (2018), on the assumption that both of these subjects are in the same domain, it would be logical to assume one to be dependent and the other unmarked. If genitive is unmarked, the assignment of accusative should be dependent on their being another nominal element within its domain. Baker (2015) argues that possessors inside DP can be assigned a dependent case if the NP also contained in that DP counts as that other nominal element:

(7)

```
          DP
         /  \
       DP    D'
            /  \
           D    NP
```
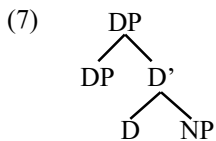
This is what we find in some ergative languages, where the possessor has the same case form as the subject of the transitive clause, for example Shipibo:

(8)   a.   Jose-kan   ochiti   ben-ai.
           José-ERG   dog   seek-IMPF
           'José is looking for a/the dog.'

      b.   Jose-kan   ochiti
           José-ERG   dog
           'José's dog'

However, it would be difficult to account for why unmarked genitive case could be assigned under these assumptions, as presumably there is an NP in the gerund with a genitive subject. However, Abney (1986) analyses the gerund with an accusative subject as being more clausal than the genitive-type, and claims that the former contains no nominal projections within it. His argument is that English gerunds differ in terms of the point in the structure they become nominalised: the higher in the structure nominalisation

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9   There are other differences between these gerunds besides the case of the subject. However, as these concern the internal lower structure of the construction and we are mainly concerned with higher structure, they play no crucial role in our analysis.

happens, the more verbal/clausal they are. As the acc-ing gerund has only nominal properties at the top of the structure, in that its distribution is that of a DP, he claims that internally this gerund is clausal and hence has no NP. If this is correct, the only possible analysis of the case assignment within the gerund is that accusative is unmarked and genitive dependent[10]. Only the genitive-type gerund contains a possessor and an NP, allowing dependent case to be assigned, whereas the accusative-type gerund contains only the subject and so only unmarked case can be assigned:

(9) a. $[_{DP}$ Poss$_{GEN}$ $[_{NP}$ V-ing]]   - dependent case can be assigned.
     b. $[_{DP}$ Poss$_{ACC}$ V-ing]   - unmarked case must be assigned.

Thus, we have at least one instance in which English realises an unmarked case as accusative. We will review this analysis later in the paper.

2.2 Other Accusative Subjects

Now consider the subject of the 'for' clause:

(10) a. I'd prefer [for him to be present]
     b. [for him to be present] would be best.

The accusative case on this subject is problematic, especially if we adopt the 'strong position' advocated by Levin and Preminger (2015) that the principles of Dependent Case Theory are the only modality of case assignment. If we take it as an instance of dependent case, the obvious question is what c-commanding DP licenses it? The complementiser, being a phase head, ensures that the licensing DP cannot be outside the embedded clause, which is reinforced by the fact that this type of clause can appear in subject position, where there is no possibility for an external c-commanding DP. But within the clause there is also no c-commanding DP. The alternative is to assume that the subject gets unmarked case, as with the gerund[11].

Another construction with an accusative subject is the Small Clause:

(11) a. They consider [him wise].
     b. [Them satisfied] is clearly desirable.

It is often claimed that the accusative case on the subject (11a) is exceptional and as such should be considered an instance of dependent case, similar to that assigned to the object. However, as with the other cases discussed, it is difficult to maintain this considering (11b), as in subject position, there is no c-commanding DP to licence dependent case. Here, the unmarked analysis is an attractive alternative. This then opens the question of how to analyse the case assignment in (11a). Given that an unmarked accusative analysis is possible, it can be argued that such an analysis is preferable over the standard one as this requires fewer assumptions about the 'exceptional' status of the construction.

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10 This conclusion is consistent with the assumptions concerning the nature of case made in Newson (2018). However, under the view that there are only two structural cases, adopted in the present paper, another conclusion can be reached, as we show later.

11 For some discussion of why the complementiser is obligatory in this construction, see Newson and Szécsényi (2022b).

Finally, we can briefly consider ECM constructions.

(12) a.   We believe [him to be lying]
    b.   * [Him to be lying] would be unthinkable

Although these differ from the examples discussed above in that they never appear in subject positions, Newson and Szécsényi (2022) argue that ECM constructions should be given the same analysis. The issue is complex and ultimately turns out to be moot when we consider accusative case assignment in the VP, but part of the argument concerns the fact that the accusative case is not dependent on object raising, which Lasnik (2001) and den Dikken (2018) demonstrate is optional. Yet the subject remains accusative, whether or not it raises. Again, the advantage of a uniform unmarked accusative analysis is simplicity, as it removes all extra assumptions required by the 'exceptional' case marking analysis.

Under these proposals, all subjects in English have a uniform analysis: they are all assigned unmarked case. This case is realised as nominative in the context of a finite clause, but accusative elsewhere. This echoes the nominative-dative alternation in Hungarian clauses.

3.   Does English Ever Use Dependent Accusative?

The remaining instance of accusative case is that of the object. Is this assigned dependent case, or is it the same as subjects and assigned unmarked case?

Recall that Baker's proposal to equate case domains with spell-out domains means that the VP should be a case domain. If we assume the English VP to be a case domain, the object would typically be the only DP within it. As there is not much evidence that it moves out of the VP, it follows that it should be assigned unmarked case. This is the simplest assumption. If we want to maintain the standard claim that the object is assigned dependent case, we must either arrange for the object to be extracted out of the VP, without much empirical evidence, or for the VP to be exempt it is case domain status. Baker (2015) proposes a way for this to happen, claiming that in some languages, some DPs can remain active even after the VP has been spelled out. Thus, the VP can be a 'soft' domain, in that not every DP within it becomes inactive at spell-out. It remains to be seen whether or not this notion is specific to case assignment, but if so, it drastically undermines his attempt to unify case domains with spell-out domains.

However, for English at least, there is a simple way round this problem, which is to claim that the VP is a 'hard' domain and therefore a VP internal DP will only be eligible for unmarked case. It would then transpire that English has no instances of dependent accusative and in all relevant domains the accusative form of the pronoun spells out unmarked case. Of course, this jibes well with the observation that all other English DPs, apart from the five pronouns, show no case distinctions in any of the positions we have discussed. The overall picture we achieve is one in which English assigns unmarked case to all DPs in these positions, but for just five lexical items there is a difference in how this unmarked case is realised: the 'nominative' form in finite clause subject position and the 'accusative' form in all other contexts.

Consider the alternative. We might claim that the VP is soft for English, a complication in and of itself. We would then have to say that English uses the same form to realise dependent case and some instances of unmarked case. While this may not be impossible, it certainly is not very attractive.

On the basis of these considerations, we claim that English uniformly assigns unmarked case to all positions within the clause and as such has a neutral case system rather than an accusative one.
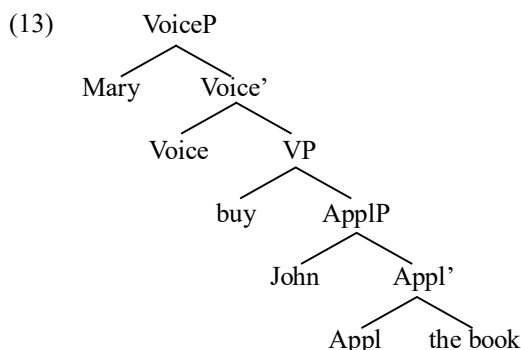
3.1 Double Objects

One potential place where dependent case could be assigned in the English clause is the double object construction, as in this there appear to be two DPs in the same domain. As both objects are realised

with accusative, this would return us to the undesirable position of claiming that accusative is used to realise both dependent and unmarked case.

There are two possible ways to avoid this. One is to assume that the neutrality of the English system is not simply a consequence of the VP being seen as a domain, but, like other case neutral systems, English simply has no dependent case to assign. While this may be possible, it is not particularly interesting. For that reason, we will briefly investigate the other possibility.

This involves claiming that the two DPs of the double object construction are situated in separate domains, and therefore, like other instances of unmarked case assignment, the two accusative forms realised on both objects is a result of the impossibility of assigning dependent case.

Pylkkänen (2008) analyses the double object construction as involving a low applicative which relates the two objects and heads a phrase in the complement position of the verb:

(13)

```
            VoiceP
           /      \
        Mary      Voice'
                 /      \
             Voice       VP
                        /   \
                     buy    ApplP
                           /     \
                        John      Appl'
                                 /     \
                              Appl    the book
```

Clearly, in this structure, the two objects are within the same VP domain, and therefore this is not suitable for our purposes and for this reason, we will not adopt this proposal, though we will make use of Pylkkänen's suggestion that there is an extra head within the VP. We will suggest two possible alternative analyses, though will not be able to go into the details in order to select between them, for lack of space.

Interestingly, most of Pylkkänen's examples involve a possessive reading on the indirect object, which she builds into her analysis as part of the meaning of the low applicative. However, this is not the only possibility. One could conceive that the Appl head takes a possessive structure as its argument, the possessor being the indirect object and the possessed element being linked to the direct object:

(14)

```
              ApplP
             /     \
           DP       Appl'
          /  \     /     \
  DP_IDO … N  Appl      DP_DO
```
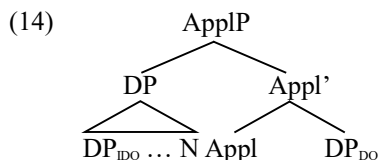
In this structure, the direct and indirect objects are not in the same domain and so neither would be eligible for dependent case.

A disadvantage of this analysis is that it places the two arguments in a non-command relationship to each other, and the evidence is that the direct object c-commands the indirect object. There might be solutions to this found by investigating the relationship between the DO and the possessed element of the possessive DP, but we will not follow these up here.

A second possibility would be to claim that the structure of the double object construction is similar to that proposed for *give,* which Pylkkänen claims to be different from that for other double object

verbs, such as *bake* as the former involves an obligatory change of possession. Under our analysis the difference between *give*-type verbs and *bake*-type verbs would have to be seen in terms of properties of the applicative head: one involves a possessive feature which is not cancellable and the other has one that is. The difference could be down to the selectional properties of the cause head involved with *give*. The structure of the double object would be therefore as follows:

(15)

```
          ApplP
         /    \
     DP_IND   Appl'
            /      \
         Appl       VP
                   /  \
                  V   DP_DO
```
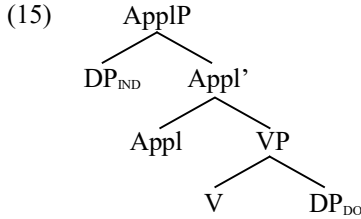
This structure conforms to the c-command relationships between the two objects, though it does not obviously distinguish between 'low' and 'high' applicatives as Pylkkänen originally proposed. However, subsequent work on applicatives by Cuervo, (2003; 2020) has suggested a wider range of positions for applicative heads. Though it should be noted that Cuervo herself does not adopt (15) for double object constructions, she does propose a more articulated structure of the VP in which there is space to insert applicative heads at different heights. The structure achieves our goals on the assumption that the applicative head is a phase head and therefore introduces the lower VP as a case domain. The indirect object is excluded from this and sits in its own domain introduced by the voice head. We will cut this discussion short here to be able to concentrate on the main topic of the paper.

4. Pronoun Realisation

Unmarked case is realised in the vast majority of cases in English uniformly in all contexts as a null morpheme. However, five of the pronouns have a specific 'nominative' realisation in a finite context and a general 'accusative' realisation in all others. This is very similar to the realisation of unmarked case in Hungarian which we discussed earlier. We propose the following realisation rules:

(16) [3 SING MASC Case$_{UnM}$] ⇔ he   / -- +F$_{IN}$
                                      him   elsewhere

    [3 SING FEM Case$_{UnM}$]   ⇔ she / -- +F$_{IN}$
                                      her   elsewhere

    [3 PLUR Case$_{UnM}$]   ⇔ they / -- +F$_{IN}$
                               ⇔ them   elsewhere

    [1 SING Case$_{UnM}$]   ⇔ I   / -- +F$_{IN}$
                               ⇔ me   elsewhere

    [1 PLUR Case$_{UnM}$]   ⇔ we   / -- +F$_{IN}$
                               ⇔ us   elsewhere

    [2]   ⇔ you

    [Case$_{UnM}$]   ⇔ ∅   / -- root

    []   ⇔ it

This system should not cause problems for language acquisition, given that there are only five lexical items that require extra information to determine their form in context. It is also not particularly difficult to account for diachronically, as the case forms of pronouns are typically lexically specified

and the high frequency of pronouns would conceivably help to maintain these forms after the loss of dependent case. This pattern of lexical specification clearly mimics the original system, which was a true accusative one.[12]

If English were the only language, then it might make sense to assume that there is only a post-syntactic system of case. However, as we argued above, there is good reason to believe that case has a syntactic and a post-syntactic aspect to it for other languages. We take a straightforward stance with respect to the universality of case in the linguistic system and assume that the differences between languages are relatively superficial and do not allow one language to have a syntactic case system and another not to. Therefore, we maintain that English has a syntactically neutral case system but realises unmarked case on some of its pronouns differently depending on context.

5.   What about Genitive?

As stated at the beginning, English might be argued to maintain one dependent case: genitive, which is specific to the possessive domain introduced by the merger of the determiner. Usually, the DP contains an NP and this, according to Baker, licences the assignment of dependent case on the possessor.

There is much discussion in the literature on the status of the English genitive '*s*. Typically it is seen as a functional head, either a determiner or a possessive head, which fits well with the traditional view that cases are assigned by such heads. From a Dependent Case Theory perspective, however, there is little that holds us to this view. Furthemore, there are reasons to think that the morpheme might be a realisation of case. The common argument that since it does not behave like a case inflection, it cannot be a case morpheme, holds no water when we consider that there are many languages in which case morphemes are realised as clitics and not inflections. Coast Tsimshian (Dunn 1979; 1995), for example expresses case via a morpheme which cliticises to the element in front of the DP which bears it:

(17) a. Yágwa   húumsg-a   geen.
       PRES   sniff-ABS   skunk
       'The skunk is sniffing around.' Dunn (1979)

    b. Yagwa-t   t'uus-da   'yuuta-(a)   hana'k.
       PRES-3SE   push-ERG   man-ABS   woman
       'The man is pushing the woman.' Dunn (1995)

Another typical argument that genitive '*s* is a head points to its complementary distribution with determiners. However, this is not an observation specific to Modern English. Even in Old English, where the genitive was realised as a case inflection, prenominal possessors were in complementary distribution with determiners:

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12   A reviewer asks why English could not be viewed as a Differential Object Marking language, with pronouns conforming to the accusative system and full DPs being neutral. The split between pronouns and full DPs can be found in other languages, but one needs to consider how such phenomena are handled within the framework. In DCT, such a split would have to be due to different position of pronouns and full DPs, in a similar way to how Baker (2015) handles the definite/indefinite based DOM in Sakha. But, given the data discussed above, it would be difficult to claim that pronouns occupy a unique position in which they receive the cases that they do, especially accusative. It is far less problematic to assume that English has a uniform case system and five of its words simply have contextually determined realisations.

(18) a. Forgang   ðu   an-es   treow-es   wæstm.
         forgo   you   one-GEN   tree-GEN   fruit
         'Forgo the fruit of one tree.'

   b. þa   digelnysse   þis-re   ræding-e
         the   mystery   this-GEN   text-GEN
         'The mystery of this text' Ceolin (2021)

There must be other reasons for the complementary distribution of pre-nominal possessors and determiners, and therefore we cannot conclude that genitive *'s* must be a head on these grounds.

The absence of the '*s* morpheme with pronouns, even if only phonological, is also problematic if it is a head: why does it have to be absent or phonologically null only with pronominal possessors? On the other hand, if it is a case morpheme, its absence with pronouns is completely understandable as these already realise case in their own forms.

Thus, there is reason to think that the possessive morpheme '*s* is a case morpheme, but we still need to establish which case it realises. The analysis in Newson (2019) was based on the assumption that the case system operates with standard case features, such as accusative and genitive. Therefore, the appearance of two forms of pronouns in the gerund indicated that two different cases were being assigned. It was this assumption that led to the claim that one must be dependent and the other unmarked. However, under present assumptions, this is not a necessary conclusion. Indeed, given that the rest of the language operates without the assignment of dependent case, it is likely that the same is true for the nominal context as well. This would make English a completely case neutral language, where the only case that is assigned is unmarked.

There remains the question of how to analyse the alternation between the 'genitive' and the 'accusative' forms, *his/him* etc. in pronouns and '*s*/∅ for full DPs, in gerunds. The alternation between nominative and dative possessor in Hungarian might offer some clue. In Hungarian, however, there is clear evidence that the two forms of the possessors sit in different structural positions, with the dative preceding, and the nominative following the determiner. This is most obviously demonstrated with pronouns, where a preceding determiner cannot be taken to be associated with the possessor but only with the possessive DP:

(19) a. az   én   kalap-om
         the   I.NOM   hat-1SG
         'my hat'

   b. nekem   a   kalap-om
         I.DAT   the   hat-1SG
         'my hat'

Our analysis here, given that the Hungarian DP works similarly to the Hungarian clause in realising unmarked case as nominative or dative in different contexts (Newson and Szécsényi 2020), is that within the context of the preceding determiner, a 'nominative' realisation is selected. But once the possessor moves out of this position, the elsewhere 'dative' form is selected.

Of course, the problem of applying this analysis to the English gerund is that it would be difficult to show that the 'accusative' and 'genitive' subjects appear in different positions, due to the lack of an overt determiner:

(20) a. him agreeing to the investigation
    b. his agreeing to the investigation

However, another possible analysis exists based on the analysis of Newson (2019). Following Abney's (1987) analysis of the gerund, we can assume that it is not the structural position of the subject which differs in these constructions, but the constructions themselves. As discussed above, according to Abney, (20a) involves a DP with no NP within it, while (20b) does contain an NP. We can make use of this to define the contexts in which the forms exponing unmarked case are selected, in that the 'genitive' form is selected in the presence of the NP and elsewhere, the accusative form is selected. Essentially, the unmarked case will be realised by the possessive marker when it is followed by an NP, which only occurs within the DP, with the exclusion of the acc-ing gerund. In the absence of an NP, we get the null realisation

(21) [3 SING MASC Case$_{\text{UnM}}$] $\Leftrightarrow$ he   /   -- +F$_{\text{IN}}$
                                  his   /   -- NP
                                  him   elsewhere

    etc. for other pronouns
    Case$_{\text{UnM}}$ $\Leftrightarrow$'s   /   -- NP
                                     $\varnothing$ /   elsewhere

6. Conclusion

In this paper we have argued that English assigns only one structural case to all DPs – unmarked. It is mainly the distribution of its accusative pronoun forms which demonstrates this, though the fact that the vast majority of its DPs display no case morphology at clause level is indicative. Accusative pronouns, when viewed as realisations of unmarked case, are fairly easily accounted for as the elsewhere forms and thus we find them in a variety of positions, including subjects and objects. There are two pronoun forms which are related to specific contexts: the nominative, in the context of a finite inflection, and the genitive, in the context of a local NP. Full DPs are usually realised with a null case morpheme, but in the context of an NP unmarked case is realised by the possessive *'s*.

The system we achieve is a mixture of Marantz's (1991) original proposal, which claimed that morphological case is something which is assigned post-syntax, and Baker's (2015) work, which places case assignment at spell-out and so is closer to syntax. For us, case assignment, restricted to dependent and unmarked case, is a spell-out process and is confined by syntactic notions such as phases. These assigned cases are not equivalent to traditional notions of case, which are closer to what we take as the forms which are used in a language to realise them. The determination of case forms, though based on the structures that syntax provides, does not use the mechanisms which produces those structures and the contexts for determining the realisation of unmarked and dependent case do not necessarily coincide with phases which play a role in the assignment of those cases.

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Split Inflection on Internominal Adjectives

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Abstract: Adjectives in the Arabic noun phrase can appear in between two nouns [N1-A-N2], i.e. cases where an adjective modifying a following noun ([N2]) is preceded by another noun ([N1]). In this position, the adjective displays split inflection, agreeing with [N1] in definiteness and case and with [N2] in number and gender. In this paper, I propose a new analysis of this agreement pattern and argue that internominal adjectives are born predicative, in a copular subject-predicate configuration, which explains the obligatory agreement in number and gender with the modified noun [N2]. In order to derive the internominal position of the adjective, I argue that the predicative adjective undergoes raising into a higher position as a result of the relativisation of the predication structure. In its new position, the predicative adjective falls in the agreement domain of the relativised noun, resulting in agreement with it in definiteness and case, thereby deriving split agreement on the adjective.

Keywords: nominal agreement, split features, adjectives, predicates, relativisation.

1. Introduction

Adjectives in Standard Arabic (henceforth Arabic) can appear postnominally, internominally and prenominally, accordingly the adjective can show different patterns of agreement depending on its position relative to the position of the noun(s). The general tendency is that agreement on the adjective works in one direction, i.e. the adjective tends to show agreement with the preceding noun rather than the following noun. Thus, while postnominal adjectives agree with the preceding noun in all features, prenominal adjectives do not agree with the following noun in any morphological feature. The conditions and configurations under which these fully matching and fully mismatching patterns are derived have been argued to be distinct from each other and many attempts have been made in the literature to account for these patterns (see Fassi Fehri 1993, 1999, Benmamoun 2000, Shlonsky 2004, a.o.).

In this paper, the focus is on internominal adjectives. These are adjectives that can appear in between two nouns [N1-A-N2] where the adjective is modifying the following noun ([N2]) but is preceded by another noun ([N1]). In this position, the adjective displays split inflection, agreeing with [N1] in definiteness and case and with [N2] in number and gender:

(1) al-makaan-a   al-shadiid-at-a   Haraar-at-u-hu
     DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC   heat-F.SG-NOM-its.M
     'the place with the extreme heat', Literally: 'the place whose heat is extreme'

Split agreement appears to be quite complicated, but it reveals many aspects of the nature of nominal agreement and provides us with the opportunity to investigate several issues related to the system of agreement in the noun phrase. For example, the split in agreement features where the adjective agrees in one set of features with one noun and in the other set with another noun challenges our understanding of how nominal features are distributed in the nominal spine and why the two sets fail to track each other in order to derive full agreement with either noun.

Another important issue which is raised by the split agreement pattern is the type of features that are targeted on both nouns. The internominal adjective can only agree in number and gender with a specific noun [N2] and in definiteness and case with a specific noun [N1] and no other pattern of agreement is possible. This raises the following important questions: why can't the adjective agree in definiteness and case with the modified noun [N2], and in number and gender with [N1]? And why can't the adjective agree with one noun in number and case, and with the other noun in gender and definiteness? In other words, why can't nominal agreement target other permutations of features? Furthermore, since partial agreement with either noun is allowed in the grammar of the language, it is not clear why and how full agreement is triggered in this language.

In addition, split agreement poses a challenge for the current theories of nominal agreement since it is not clear if this pattern of inflection can be predicted by these theories. In particular, it is not clear how split agreement is derived and whether this pattern is derived by two different agreement mechanisms, one for number and gender and another for definiteness and case, or if this is the result of different timings for agreement, one in syntax proper and the other post-syntactically, or if this pattern actually involves multiple cycles of agreement.

In this paper, I propose a new analysis of split agreement on internominal adjectives in the Arabic noun phrase which can answer the questions raised in this brief introduction. The paper is divided into five sections. In section 2, I introduce split agreement in the [N1-A-N2] structure, review the existing analyses of this pattern of inflection and propose a new analysis to account for the word order and agreement inflection in this structure. Section 3 introduces predicative adjectives in Arabic and examines subject-predicate agreement in the copula-less structure. Section 4 introduces relativisation in Arabic and derives the [N1-A-N2] structure with split agreement on internominal adjectives. The last section draws the main conclusions argued for in this paper.

2.   Internominal Adjectives

Adjectives in the Arabic noun phrase are typically postnominal. In this position, they agree with the modified noun in number, gender, definiteness and case:

(2)   al-Haraar-at-u   al-shadiid-at-u
      DEF-heat-F.SG-NOM   DEF-extreme-F.SG-NOM
      'the extreme heat'

(3)   Haraar-at-u-n   shadiid-at-u-n
      heat-F.SG-NOM-INDF   extreme-F.SG-NOM-INDF
      'extreme heat'

Adjectives can also appear in between two nouns [N1-A-N2], i.e. cases where an adjective modifying a following noun ([N2]) is preceded by another noun ([N1]). In this position, the adjective displays split inflection, agreeing with [N1] in definiteness and case and with [N2] in number and gender.[1] Traditional Arab grammarians referred to this nominal structure as the 'indirect attribute' structure. To differentiate these adjectives from prenominal and postnominal ones, I will refer to them as *internominal* adjectives:

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1   See Siloni (1995) and Hazout (2001) for the discussion of 'relative participles' in Arabic and Hebrew which show a striking resemblance to internominal adjectives in terms of definiteness marking and agreement patterns. I assume that the analysis developed here for adjectives can also account for relative participles

(4) al-makaan-a   al-shadiid-at-a   Haraar-at-u-hu
     DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC   heat-F.SG-NOM-its.M
     'the place with the extreme heat'; literally: 'the place whose heat is extreme'

(5) makaan-a-n   shadiid-at-a-n   Haraar-at-u-hu
     place.M.SG-ACC-INDF   extreme-F.SG-ACC-INDF   heat-F.SG-NOM-its.M
     'a place with extreme heat'; literally: 'a place whose heat is extreme'

(6) al-manTiq-at-a   al-shadiid-a   jafaaf-u-ha
     DEF-area-F.SG-ACC   DEF-extreme.M.SG-ACC   drought.M.SG-NOM-its.F
     'the area with the extreme drought'; literally: 'the area whose drought is extreme'

(7) manTiq-at-a-n   shadiid-a-n   jafaaf-u-ha
     area-F.SG-ACC-INDF   extreme.M.SG-ACC-INDF   drought.M.SG-NOM-its.F
     'an area with extreme drought'; literally: 'an area whose drought is extreme'

In (4), the internominal adjective 'extreme' is definite and accusative in agreement with [N1] 'place'. If [N1] is indefinite, as in (5), the internominal adjective inflects for the indefinite suffix as well. However, the adjective 'extreme' in (4–5) must inflect for the feminine singular marker '-at-' in agreement with [N2] 'heat'. The same pattern is replicated in (6–7), but this time [N1] 'area' is feminine and [N2] 'drought' is masculine.

   Internominal adjectives show several interesting properties which set them apart from postnominal and prenominal ones. For instance, these adjectives are semantically modifying [N2], not [N1]. This is evidenced by the semantic infelicity of the noun phrase when the adjective stands in a modification relation with [N1] (compare 4 & 6 to 8 & 9, respectively):

(8) #al-makaan-a   al-shadiid-a
     DEF-place.M.SG-ACC   DEF-extreme.M.SG-ACC
     #'the extreme place'

(9) #al-manTiq-at-a   al-shadiid-at-a
     DEF-area-F.SG-ACC   DEF-extreme-F.SG-ACC
     #'the extreme area'

Adjectives that are semantically modifying [N1] can co-occur with internominal adjectives. In (10), the adjective 'empty' is semantically modifying [N1] 'place' and must agree with it in number, gender, definiteness and case. However, the internominal adjective 'extreme' can only agree with [N1] 'place' in definiteness and case:

(10) al-makaan-a   al-xaali-a   al-shadiid-at-a
     DEF-place.M.SG-ACC   DEF-empty.M.SG-ACC   DEF-extreme-F.SG-ACC
     Haraar-at-u-hu
     heat-F.SG-NOM-its.M
     'the empty place with the extreme heat'

Another property of internominal adjectives is that agreement in definiteness and case cannot track agreement in number and gender against [N2]:

(11) *al-makaan-a   shadiid-at-u   Haraar-at-u-hu
     DEF-place.M.SG-ACC   extreme-F.SG-NOM   heat-F.SG-NOM-its.M
     Intended: 'the place with the extreme heat'

Conversely, agreement in number and gender on the internominal adjective cannot track agreement in definiteness and case against [N1]:

(12) *al-makaan-a   al-shadiid-a   Haraar-at-u-hu
     DEF-place.M.SG-ACC   DEF-extreme.M.SG-ACC heat-F.SG-NOM-its.M
     Intended: 'the place with the extreme heat'

Beside these interesting patterns of inflection on the internominal adjective, the two nouns involved in this structure display some distinctive properties. For example, while the case marker on [N1] can vary depending on the structural position of the noun phrase, [N2] is invariably nominative:

(13) al-makaan-u   al-shadiid-at-u   Haraar-at-u-hu
     DEF-place.M.SG-NOM   DEF-extreme-F.SG-NOM heat-F.SG-NOM-its.M
     'the place with the extreme heat'

(14) al-makaan-a   al-shadiid-at-a   Haraar-at-u-hu
     DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC heat-F.SG-NOM-its.M
     'the place with the extreme heat'

(15) *al-makaan-a   al-shadiid-at-a   Haraar-at-a-hu
     DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC heat-F.SG-<u>ACC</u>-its.M
     Intended: 'the place with the extreme heat'

In addition, [N2] carries a resumptive pronoun which agrees in number and gender with [N1]:

(16) al-makaan-a   al-shadiid-at-a   Haraar-at-u-hu
     DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC heat-F.SG-NOM-its.M
     'the place with the extreme heat'

(17) *al-makaan-a   al-shadiid-at-a   al-Haraar-at-u
     DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC DEF-heat-F.SG-NOM
     Intended: 'the place with the extreme heat'

Moreover, while [N1] can inflect for the definite or the indefinite marker, [N2] typically cannot inflect for (in)definiteness:

(18) *makaan-a-n   shadiid-at-a-n   Haraar-at-u-n
     place.M.SG-ACC-INDF   extreme-F.SG-ACC-INDF heat-F.SG-NOM-<u>INDF</u>
     Intended: 'A place with extreme heat'

(19) *al-makaan-a   al-shadiid-at-a   al-Haraar-at-u
     DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC <u>DEF</u>-heat-F.SG-NOM
     Intended: 'the place with the extreme heat'

An anonymous reviewer raised an objection to this empirical observation, on the grounds that [N2] cannot inflect for (in)definiteness because it is always definite by virtue of carrying a possessive pronoun. However, I believe that the premise of the reviewer's assumption, that the pronominal clitic on [N2] is a possessive pronoun, is problematic on several grounds. First, if [N2] cannot inflect for (in)definiteness by virtue of carrying a possessive pronoun, one would expect [N2] to inflect for the definite/indefinite marker in the absence of this pronoun, contrary to fact:

(20) al-makaan-a   al-shadiid-at-a   Haraar-at-u   Saif-i-hi
      DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC   heat-F.SG-NOM   summer-GEN-its.M
      'the place whose summer's heat is extreme'

Note that when the internominal adjective is followed by more than one noun, it is the last noun that carries the pronominal clitic while the preceding noun appears without a pronominal clitic or a definite/indefinite marker. Second, the presence of the pronominal clitic is mandatory in the [N1-A-N2] configuration, independently of definiteness marking on [N2]. For example, [N2] is typically definite when it's followed by a PP, and in this case, it is the preposition that carries the pronominal clitic:

(21) al-makaan-a   al-shadiid-at-a   al-Haraar-at-u   fi-hi
      DEF-place.M.SG-ACC   DEF-extreme-F.SG-ACC   DEF-heat-F.SG-NOM   in-it.M
      'the place in which the heat is extreme'

Third, the pronominal clitic can appear on a deverbal/gerund noun [N2] that doesn't appear to stand in a possessive relation with [N1]:

(22) al-kitaab-a   al-Saab-at-a   qiraa-at-u-hu
      DEF-book.M.SG-ACC   DEF-difficult-F.SG-ACC   reading-F.SG-NOM-its
      'the book that is difficult to read'

Fourth, assuming that [N2] is carrying a possessive pronoun entails that [N1] and [N2] are not interrelated structurally and that both nouns are presumably subjects for the adjectival predicate. In fact, this is the analysis proposed in Doron and Heycock (1999) for a similar (clausal) construction in Arabic, i.e. [N1-N2-A], where the adjectival predicate follows both nouns:

(23) al-makaan-u   Haraar-at-u-hu   shadiid-at-u-n
      DEF-place.M.SG-NOM   heat-F.SG-NOM-its   extreme-F.SG-NOM-INDF
      Literally: 'The place, its heat is extreme.'

Doron and Heycock argue that [N1] and [N2] in this construction reside in multiple specifiers of TP, and are taken to be broad and narrow subjects, respectively. Moreover, it is assumed, in passing, that the nominal configuration [N1-A-N2] is related to the clausal configuration [N1-N2-A], in the sense that the predicative adjective in the clausal configuration can be used attributively in the nominal configuration, without providing any details on how the nominal configuration is derived from the clausal one. However, Landau (2009) has rejected this analysis and provided several theoretical and empirical arguments against the notion of broad subjects in Semitic languages, arguing that what is taken to be a broad subject, i.e. [N1], is in fact a left-dislocated noun. If this is true, then the two nouns in the [N1-A-N2] configuration must also be structurally related and the pronominal clitic on [N2] can be thought of as a resumptive pronoun generated in the gap of the left-dislocated noun. Given these observations and arguments, I

assume that the pronominal clitic on [N2] in the [N1-A-N2] configuration is not a possessive pronoun but rather a resumptive pronoun generated in the gap of non-subject nouns (see also Aldholmi et al. 2019, who take the pronominal clitic to be a resumptive pronoun). Resumptive pronouns are typically associated with relative structures and have been argued to be an effect of the relativisation of non-subject nouns. It has been argued that non-subject nouns in this language cannot raise in relative structures (due to various syntactic constraints) and this restriction triggers the base-generation of these nouns externally and the insertion of a resumptive pronoun in the gap (see Shlonsky 1992, Aoun et al. 2010).

2.1 Existing Literature

The distinctive morphosyntactic properties of the [N1-A-N2] structure have not received sufficient investigation in the generative literature on nominal agreement in Arabic and the few studies that have examined this structure have left several issues unresolved.

Kremers (2003) examines the [N1-A-N2] structure and argues that this structure is formed when an adjectival DP, comprising the internominal adjective and [NP2], is right-adjoined to a nominal DP, i.e. [NP1]. Under this analysis, the definite marker on the adjective is not a formal agreement feature but rather a D head. He also argues that [NP2] is an internal subject of the adjective, therefore the adjective must agree with it in number and gender. This agreement relation is assumed to take place in a functional projection InflP dedicated for nominal agreement. Upon agreement, the adjective moves across [NP2] to the head Deg, deriving the internominal position of the adjective. It's also assumed that the adjectival D values its case against the nominal D, and the adjective in turn values its case against the adjectival D, deriving split agreement:

(24) imr-at-a-n   jamiil-a-n   wajh-u-ha
      woman-F.SG-ACC-INDF   beautiful.M.SG-ACC-INDF   face.M.SG-NOM-her
      'a woman with a beautiful face'

(25)

(Modified from Kremers 2003, 192)
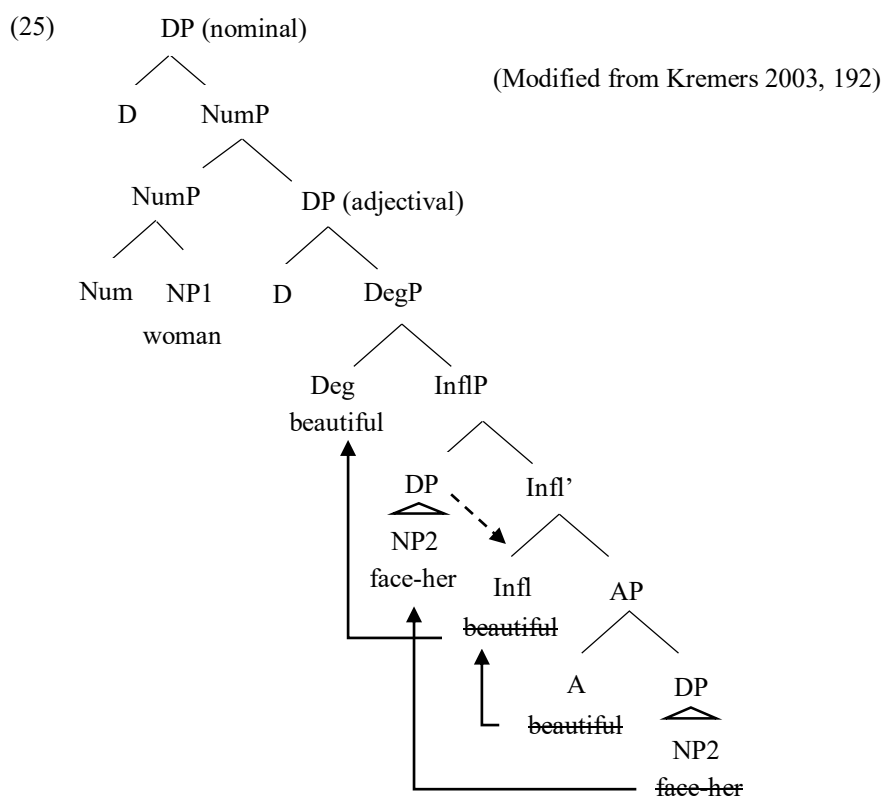
While this analysis can capture the predication relation between the adjective and its subject, it has left many issues unresolved. First, it's unclear why the subject [N2] is generated in the complement of the adjectival predicate. Second, under the configuration in (21), [N2] and the adjective stand in a direct agreement relation when they both move to InflP, however it is unclear how agreement in case is restricted here. Note that under the proposed configuration agreement in case should be possible in parallel with number and gender agreement. Moreover, no details are provided to explain why [NP2] is invariably nominative and why does it need to carry a resumptive pronoun that refers back to [N1]. In addition, the assumption that the adjective moves to the functional head Deg, in order to derive the internominal position of the adjective, lacks any independent motivation.

Assiri (2011) examines split agreement in the [N1-A-N2] structure and argues that it is made up of two recursive phases: aP1 & aP2. Under this analysis, the two nouns [NP1] and [NP2] are broad and narrow subjects, respectively, base-generated in the specifier positions of the two phases. In addition, a DP projection is assumed to merge in between the two phases:

(26) rajul-a-n   Tawiil-a-n   shaar-u-hu
      man.M.SG-ACC-INDF   long.M.SG-ACC-INDF   hair.M.SG-NOM-his
      'a man with long hair'

(27)

(Modified from Assiri 2011, 306)
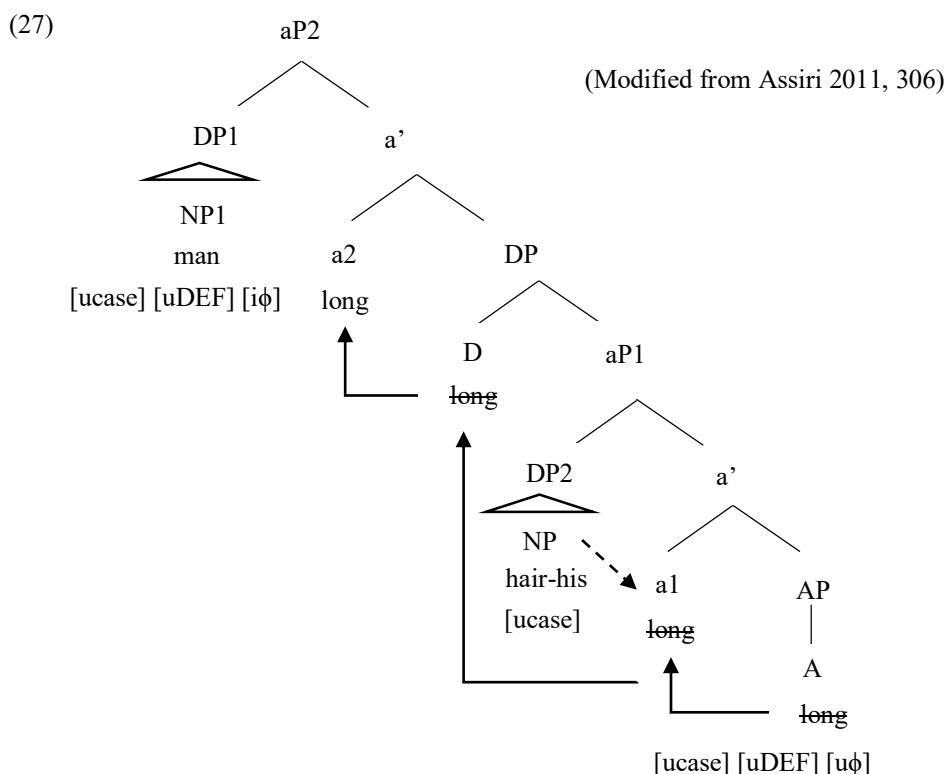
Under the configuration in (27), Case is assigned by phasal heads 'a1' and 'a2'. Under this analysis, these phase heads can only assign nominative case. However, while the head of the higher phase 'a2' can assign nominative case, the head of the lower phase 'a1' is assumed to be defective and therefore cannot assign nominative case. Therefore, the adjective, triggered by the need to value its case, undergoes successive head movements to a2. This movement derives the internominal position of the

adjective. Note that the adjective, on its way to 'a2', moves first to 'a1' where it agrees with [NP2] in number and gender. As for (in)definiteness, it is assumed that the adjective in base position is not headed by a DP and lacks a slot for (in)definiteness altogether. However, it is assumed that the adjective will be able to pick up an 'empty slot' for (in)definiteness when it moves into the head D. This allows the adjective to later agree in (in)definiteness with [NP1] once it lands in 'a2'. Upon moving to 'a2', the adjective receives external case from T/v along with [NP1]. [NP2], on the other hand, receives nominative case from the head of the higher phase 'a2'

Although the proposed analysis can capture the predication relation between the adjective and its subject, it has left many open issues. For instance, Assiri follows Kremers (2003) assumption that all adjectives in Arabic are DPs and that the definiteness marker on the adjective is not an agreement feature but a D head. However, he assumes that the predicative adjective in (27) is not headed by a DP in base position. However, this assumption is untenable given that predicative adjectives always inflect for indefiniteness in base position, which means that Assiri's assumption is solely conjectured in order to block agreement in (in)definiteness with [NP2], hence this assumption is dubious at best and lacks any theoretical or empirical motivation.
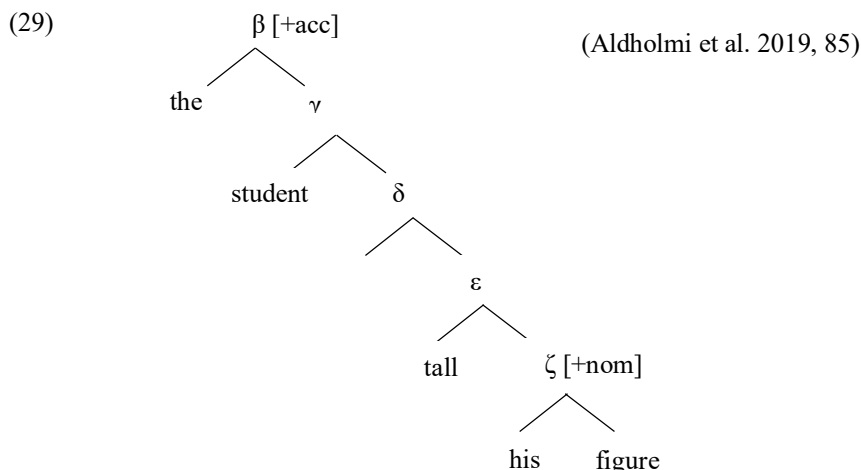
The other unusual, but related, assumption is that once the adjective crosses [NP2], it picks up an 'empty slot' for (in)definiteness from a D head that merges in between the two phases. Note that under this analysis an 'empty slot' means a D head that needs valuation for (in)definiteness since the (in)definite marker is taken to be a D head and not an agreement feature. First, it is not clear what it means to pick up an empty slot for a categorial head. This assumption is obviously conjectured in order to allow the raised predicative adjective, which is assumed to lack a D head in base position, to suddenly acquire a D head and agree in this feature with [NP1]. However, the mechanism and nature of acquiring a D head under this analysis is unconventional. Second, the postulation of a DP projection in between the two phases has no independent motivation, apart from allowing the adjective to pick up an empty slot for (in)definiteness.[2]

In addition, the assumption that the head of the lower phase 'a1' is defective and cannot assign nominative case is a stipulation that lacks any independent evidence; and the assumption that the two nouns merge in two separate phases does not explain why [NP2] carries a resumptive pronoun and why this pronoun agrees with [NP1].

Aldholmi et al. (2019) examine split agreement on internominal adjectives and provide a semantic account of this pattern. They argue that although there are two instances of the definite marker in the noun phrase, only one instance is interpreted. As for agreement in case, they argue that there are two nodes that can assign case in the noun phrase and the internominal adjective along with [N1] are dominated by the higher node, hence they both show the same case marker. As for agreement, it is argued that the adjective is a sub-constituent of [N2] and therefore must agree with it:

(28) al-Taalib-a   al-Tawiil-at-a   qaam-at-u-hu
     the-student.M.SG-ACC the-tall-F.SG-ACC   figure-F.SG-NOM-his
     'the tall student'

---

2   An anonymous reviewer notes that the structure in (27) fails to explain the distribution of the internominal adjective construction. They note that while the highest node in this structure 'aP2' is presumably adjectival, the string has the distribution of a DP.

(29)

β [+acc]
├── the
└── γ
    ├── student
    └── δ
        └── ε
            ├── tall
            └── ζ [+nom]
                ├── his
                └── figure

(Aldholmi et al. 2019, 85)

Although the analysis can capture the predication relation between the adjective and [N2], it has left some issues unresolved. First, it unclear whether the instance of the definite marker on the adjective is the result of agreement or if it is a D head. Second, no explanation is provided for why the lower node in their proposed structure is always specified for nominative case. Furthermore, the analysis assumes the presence of two domains for case assignment but neither of them correlates with the domain of agreement in number and gender. However, no explanation is provided for why the domain of agreement cannot correlate with either of the two case domains.

2.2 Proposal

The main characteristic of the split agreement pattern on internominal adjectives is that these adjectives can only agree with the modified noun in number and gender while definiteness and case can be valued separately. In other words, agreement in definiteness and case on the adjective does not track agreement in number and gender.

Strikingly, the same pattern is also attested with predicative adjectives in the copula-less structure. Predicative adjectives in Arabic inflect for number, gender, definiteness and case, but they can only agree with the subject noun in number and gender. Definiteness and case features on the predicative adjective are not valued against the subject noun:

(30) inna   al-Haraar-at-a   shadiid-at-u-n.
      COMP   DEF-heat-F.SG-ACC   extreme-F.SG-NOM-INDF
      'Certainly, the heat is extreme.'

(31) *inna   al-Haraar-at-a   al-shadiid-at-a.
      COMP   DEF-heat-F.SG-ACC   DEF-extreme-F.SG-ACC
      Intended: 'Certainly, the heat is extreme.'

In (30), the subject noun 'heat' is definite and accusative,[3] while the predicative adjective 'extreme' is indefinite and nominative. However, the predicative adjective must agree with the subject in number

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3   Accusative case on the subject of predication is assumed to be assigned by the sentential complementiser 'inna' (see Aoun et al. 2010).

and gender. Full agreement between the subject of predication and the predicative adjective as in (31) renders the copula-less structure ungrammatical.

Given the similarity between internominal adjectives and predicative adjectives in core inflectional properties, I propose the following:

(i) Internominal adjectives in Arabic are born predicative in a clausal copular structure where agreement in definiteness and case are not available.

(ii) The internominal position of the predicative adjective comes about as a result of the relativisation of this predication structure.

If true, it is predicted that the relativisation of a predication structure will result in: (i) the internominal position of the predicative adjective, and (ii) split agreement on the adjective. In order to see if these predictions are borne out, we first need to examine the two syntactic components of the proposed analysis: the predication structure and the relative structure. The next section introduces subject-predicate agreement in the copula-less structure in Arabic.

3.   The Predication Structure

Predicative adjectives in the copula-less structure[4] in Arabic can only agree with the subject noun in number and gender:

(32) inna   al-kaatib-at-a   mashhuur-at-u-n.
     COMP   DEF-writer-F.SG-ACC   famous-F.SG-NOM-INDF
     'Certainly, the female writer is famous.'

Although the predicative adjective inflects for definiteness and case, the valuation of these features does not track the valuation of number and gender against the subject noun:

(33) *inna   al-kaatib-at-a   al-mashhuur-at-a.
      COMP   DEF-writer-F.SG-ACC   DEF-famous-F.SG-ACC
     Intended: 'Certainly, the female writer is famous.'

One of the interesting properties of the copula-less structure in this language is that while the subject is always definite, the predicative adjective is invariably indefinite. The other interesting property is that although in the standard case both the subject and the predicate can appear with nominative case, there is actually no agreement between the two in case:

(34) al-kaatib-at-u   mashhuur-at-u-n.
     DEF-writer-F.SG-NOM   famous-F.SG-NOM-INDF
     'The female writer is famous.'

This can be seen when there is a sentential complementiser or a negation marker in the structure. In the presence of a sentential complementiser, the subject is always accusative while the predicative adjective is nominative:

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4 The copular verb is absent in present tense, however, it is overt in past tense, future and subjunctive contexts.

(35) inna   al-kaatib-at-a   mashhuur-at-u-n.
     COMP   DEF-writer-F.SG-ACC   famous-F.SG-NOM-INDF
     'Certainly, the female writer is famous.'

Conversely, in the presence of a negation marker, the subject is nominative while the predicative adjective is accusative:

(36) laysat   al-kaatib-at-u   mashhuur-at-a-n.
     NEG   DEF-writer-F.SG-NOM   famous-F.SG-ACC-INDF
     'The female writer is not famous.'

Similarly, when the subject of predication is a complex noun phrase, the predicative adjective can only agree in number and gender with the subject (the first noun):

(37) [xaal-at-u   al-awlaad-i]   mashhuur-at-u-n.
     aunt-F.SG-NOM   DEF-boy.M.PL-GEN   famous-F.SG-NOM-INDF
     'The aunt of the boys is famous.'

Despite the superficial impression of agreement in nominative case, the predicative adjective actually does not agree in case with the subject noun 'aunt'. As noted before, this can be seen when the sentence is negated:

(38) laysat   [xaal-at-u   al-awlaad-i]   mashhuur-at-a-n.
     NEG   aunt-F.SG-NOM   DEF-boy.M.PL-GEN   famous-F.SG-ACC-INDF
     'The aunt of the boys is not famous.'

In (38), the predicative adjective is accusative while the subject noun 'aunt' is nominative, indicating that there is no agreement in case between the subject and the predicate in this language, regardless of whether the subject is simple or complex.

The complex noun phrase in brackets in (37 & 38) has a distinctive nominal structure that has been referred to in the literature on Semitic languages as the Construct State Construction (henceforth CS). The CS is a noun phrase in which two (or more) nouns are combined to express a semantic relation such as kinship, possessiveness, partitiveness, specification, qualification etc. The earliest analysis of this structure in the generative tradition is perhaps proposed by Ritter (1991):

(39) xaal-at-u   al-awlaad-i
     aunt-F.SG-NOM   DEF-boy.M.PL-GEN
     'the aunt of the boys'

(40)

DP — (Modified from Ritter 1991, 45)

N1+D_gen
aunt

NumP

DP
N2
boys

Num'

Num

NP

N1
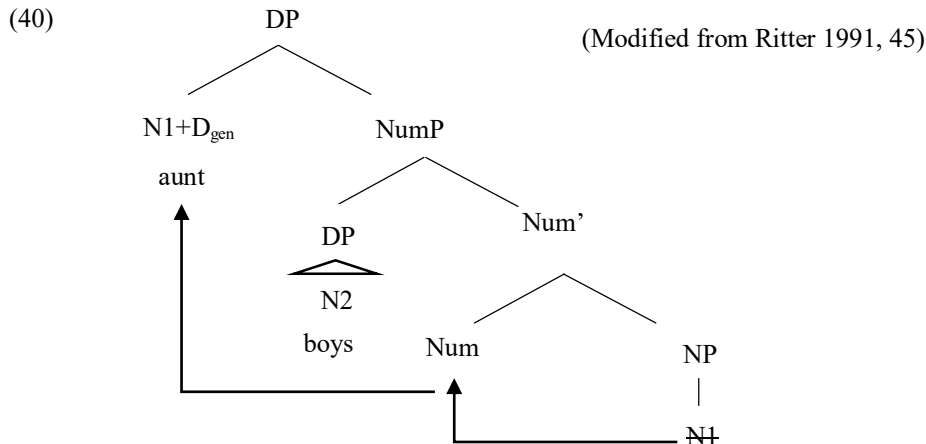
The main puzzle in the CS construction involves definiteness. While it is only the second noun in the CS that can inflect for definiteness, both nouns share the same interpretation for this feature. To account for this puzzle, Ritter argues that in (40), both the matrix D_{gen} and [N1] are unspecified for definiteness. In order for D_{gen} and [N1] to acquire this feature, they need to inherit it from another noun specified for definiteness. Therefore, another noun specified for definiteness must be merged in the structure, i.e. [N2]. The merge position of [N2] is assumed to be spec-NumP. The process of acquiring definiteness by D_{gen} and [N1] goes along the following lines: first [N1] moves to Num, in order to pick up number morphology, and in this position it 'acquires' definiteness from [N2], without inflecting for it. After that, [N1] undergoes head movement to D_{gen} to allow this head to acquire definiteness. In addition, it is assumed that D_{gen} is endowed with genitive case and can assign it on [N2] while [N1] can receive external case.

3.1 The Structure of Predicative Adjectives

I adopt the analysis of predication put forth in Baker (2008) in which the predication structure is mediated by a Pred head. Following Baker, I assume that the predicative adjective does not agree directly with the subject noun, but rather this agreement relation is mediated by a functional head F_A which bears only number and gender features. However, given that the predicative adjective in Arabic also inflects for definiteness and case, I assume that these features are on AP (in Baker's original configuration, AP does not bear unvalued features); see (41).

Under the configuration in (41), number and gender features on F_A are valued against the subject noun via bi-directional Agree. Baker does not discuss the exact mechanism of transferring the valued features on F_A to AP, therefore I assume that the adjective can enter an Agree relation with F_A to value its number and gender features. I also assume that beside number and gender, the predicative adjective bears unvalued definiteness and case.

Since the adjective cannot value its definiteness and case against the subject noun, probably because of the intervention of the functional head F_A, these two features will end up receiving default values as indefinite and nominative at spell-out as a last resort (see Al-Balushi 2011, Winchester 2019).

Given these assumptions, the configuration in (41) can successfully derive subject-predicate agreement in number and gender in the copula-less structure in Arabic. Under this configuration, definiteness and case on the predicative adjective can only receive default values at spell-out.

(41)

```
                        TP
                      /    \
                    T       PredP
              [Case: NOM]   /    \
                          DP      Pred'
                        [Num]     /    \
                        [Gen]   Pred    F_A P
                     [uDef: DEF]        /    \
                     [uCase: NOM]     F_A      AP
                                  [uNum: val]  [uNum: val]
                                  [uGen: val]  [uGen: val]
                                               [uDef: INDF]
                                               [uCase: NOM]
```
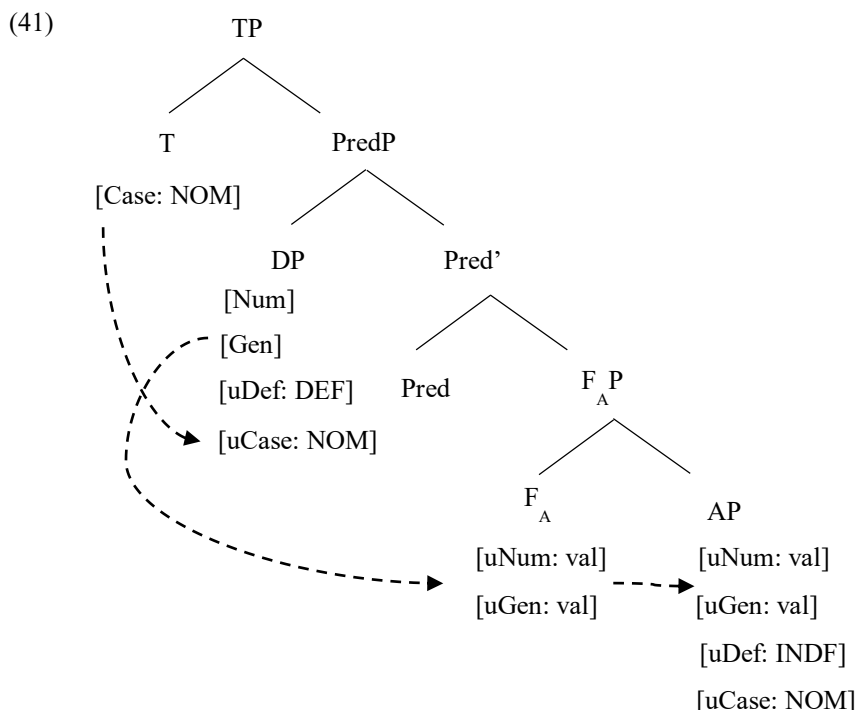
Having reviewed the subject-predicate agreement facts in the copula-less structure, we are now in a position to check if the two predictions of the main proposal of this paper are borne out, i.e. if the relativisation of the predication structure can derive the internominal position of the adjective and the split agreement pattern. This is the focus of the next section.

4.   The Relative Structure

Consider the copula-less predication structure below with a complex subject:

(42) [xaal-at-u   al-awlaad-i]   mashhuur-at-u-n.
     aunt-F.SG-NOM   DEF-boy.M.PL-GEN   famous-F.SG-NOM-INDF
     'The aunt of the boys is famous.'

When the predication structure in (42) is relativised, a relative complementiser (RC)[5] can (optionally) be inserted in the structure. In addition, the relativisation of non-subjects in Arabic always triggers the insertion of a resumptive pronoun in the gap (Aoun et al. 2010):

(43) al-awlaad-a   al-lathiina   xaal-at-u-hum   mashhuur-at-u-n
     DEF-boy.M.PL-ACC   DEF-that   aunt-F.SG-NOM-their.M   famous-F.SG-NOM-INDF
     'the boys whose aunt is famous'

---

5   RCs differ from other complementisers in Arabic in many respects. First, RCs do not trigger accusative case on the following noun. Second, RCs inflect for number, gender and definiteness in agreement with the head noun. RCs are also different from relative pronouns in some respects. First, while RCs inflect for agreement, relative pronouns cannot agree with the head noun. Second, while RCs are used in restrictive and non-restrictive relatives, relative pronouns are typically used in free relatives.

Assuming a head-external analysis of relatives (see Bhatt 2002), the head noun 'boys' in (43, schematised in 44) is generated externally and the relative CP is right-adjoined to the noun. Under this configuration, the RC *al-lathiina* is inserted in C and must inflect for the definite marker in agreement with the head noun 'boys'. The predicative adjective 'famous' can only agree in number and gender with the subject noun 'aunt'. As proposed in the previous section, definiteness and case on the predicative adjective will receive default values at spell-out. Under this analysis, all instances of agreement take place under Upward Agree (see Bjorkman and Zeijlstra 2019):

(44)
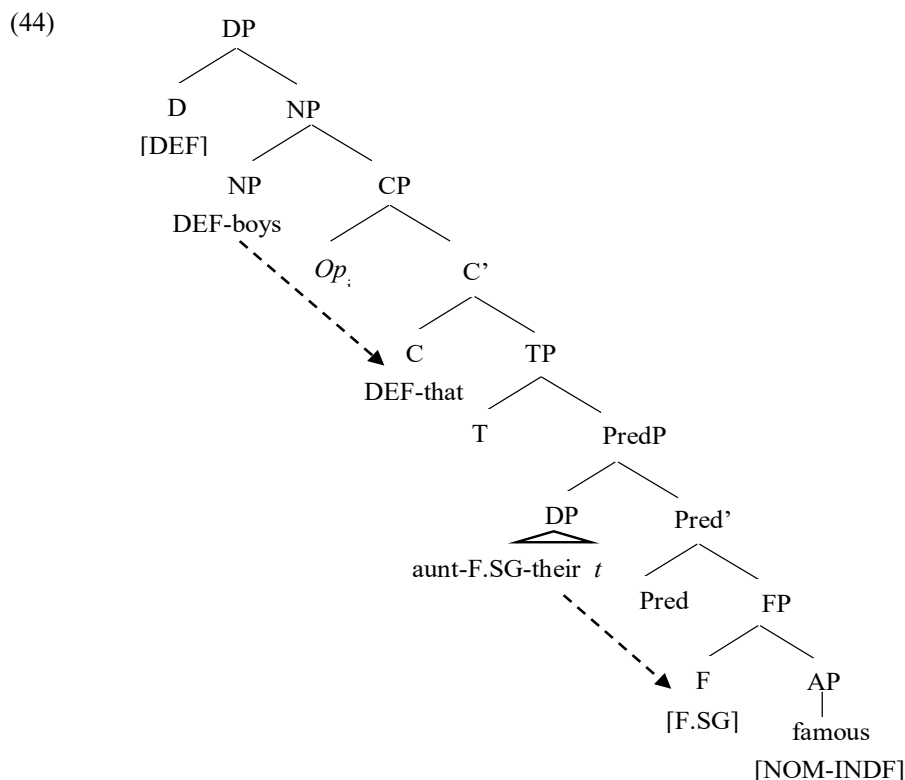
As noted earlier, the presence of the RC in the relative structure is optional, therefore the subject-predicate structure in (42) can be relativised without the insertion of the RC. However, if no RC is inserted in the relative structure, the predicative adjective must raise across the subject 'aunt' and land in between the two nouns, deriving the internominal position of the adjective. In this position, the adjective must agree with the head noun in definiteness and case, deriving split agreement:

(45) al-awlaad-a   al-mashhuur-at-a   xaal-at-u-hum
     DEF-boy.M.PL-ACC   DEF-famous-F.SG-ACC   aunt-F.SG-NOM-their.M
     'the boys with the famous aunt'

In (45), the predicative adjective agrees with the subject noun 'aunt' in number and gender in base-position. At this point in the derivation, definiteness and case on the adjective are unvalued and can receive default values only at spell-out. However, upon raising, the adjective lands in the agreement domain of the relativised noun 'boys' and can agree with it in definiteness and case, deriving split agreement. Thus, the predication structure in (42) can be relativised in one of the

following strategies, either by inserting the RC as in (46) or by raising the predicative adjective as in (47):

(46) al-awlaad-a   al-lathiina   xaal-at-u-hum   mashhuur-at-u-n.
     DEF-boy.M.PL-ACC   DEF-that   aunt-F.SG-NOM-their.M   famous-F.SG-NOM-INDF
     'the boys whose aunt is famous'

(47) al-awlaad-a   al-mashhuur-at-a   xaal-at-u-hum
     DEF-boy.M.PL-ACC   DEF-famous-F.SG-ACC   aunt-F.SG-NOM-their.M
   'the boys with the famous aunt'

It is to be noted that in both strategies, the lexical element that follows the head noun (the RC in 46 and the predicative adjective in 47) must inflect for the definite marker in agreement with the head noun. Note that the two strategies are in complementary distribution, therefore the adjective cannot be raised if the RC is present and vice versa. Given this distribution, I argue that relative C in Arabic bears a [DEF] feature that needs to be realized. Therefore, if the RC is inserted in C as in (46), the RC must inflect for definiteness in agreement with the head noun. However, if no RC is present in the relative structure as in (47), the predicative adjective is attracted to C to realize C's [DEF] feature in agreement with the head noun (Cf. Kayne 1994, Alexiadou and Wilder 1998). This analysis can derive both the internominal position of the predicative adjective in the [N1-A-N2] structure and the split agreement pattern on this internominal adjective:

(48)
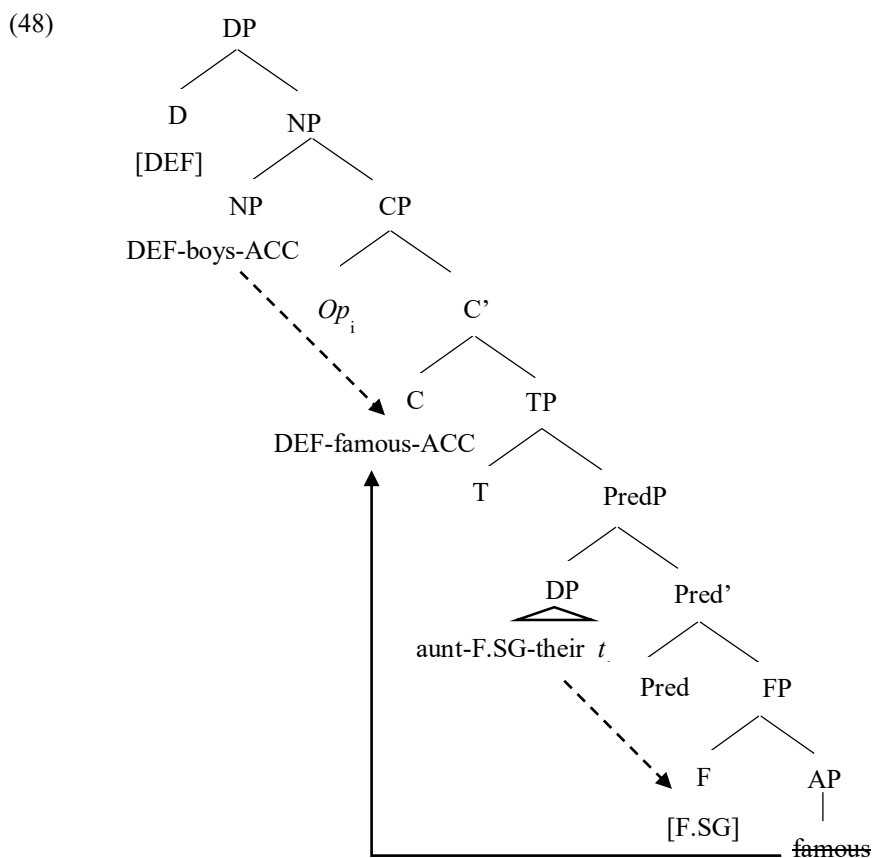
5. Concluding Remarks

It is argued here that internominal adjectives in the Arabic noun phrase are underlyingly predicative. This is supported by the empirical observation that these adjectives can only agree with the modified noun [N2] in number and gender while definiteness and case can be valued separately. This pattern of inflection on internominal adjectives is found to be similar to the one on predicative adjectives in this language, in the sense that while number and gender are uniformly valued against the subject noun, definiteness and case are valued separately. On the basis of this empirical observation, I propose that the internominal adjective in the [N1-A-N2] structure must have started life as a predicative adjective in a clausal copular configuration.

In order to account for the internominal position of the adjective in the [N1-A-N2] structure, I argue that the adjective is raised from its base-position to the head C, triggered by the relativisation of the predication structure. It is shown that the raising of the predicative adjective to the head C is in complementary distribution with the presence of a relative complementiser (RC) in the structure. The key feature that triggers the obligatory presence of either the RC or the adjective in C is definiteness. On this basis, I argue that the head C in relatives bears a [DEF] feature that needs to be realised by a lexical item. In the standard case, the RC is inserted in C to realise the [DEF] feature. However, if no RC is present in the relative structure, the predicative adjective must be raised to C in order to realise C's [DEF] feature.

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The Case Morpho-syntax in Aromanian (Southern Albania): Descriptive and Theoretical Aspects

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Abstract: The Aromanian varieties spoken in southern Albania show a restricted system of case morphology including a specialized oblique inflection in the plural of definite nouns and, partially, in the feminine singular. The oblique forms occur in genitive, dative, and complex locative prepositions where they are introduced by the Possessive Introducer (PI). Pronouns have the same distribution, with some restrictions in relation to the person, whereby a limited DOM appears, which differentiates first/second person elements and third person elements. We adopt the idea that morphology is based on Merge within the syntactic computation and that sub-word elements are provided with interpretable content. This approach, inspired by Chomsky's recent work, will guide us in the analysis of the distribution of inflections, syncretism and the occurrence of oblique and prepositions.

Keywords: nominal paradigms, oblique case, syncretism, prepositions, Aromanian

1. Introduction

This work addresses the nominal paradigm and the case system of the Aromanian[1] varieties spoken in southern Albania,[2] more precisely the variety of Myzeqeja (Musachia), Rëmën, and that of the Gjirokastër and Korça areas, Fërshërot (in Fig. 1, the circles in the map indicate the two Southern Albania areas where the data analyzed were collected).[3] In Aromanian, oblique forms are characterized by a specialized inflection (Capidan 1932, Caragiu Marioţeanu 1975, Poçi 2009), although generally

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1   In Northern Macedonia and Albania, Aromanian has the status of a linguistic minority with the legal forms of protection. As other heritage languages, its transmission and use involve family members, friends, or the village circle, and are influenced by contact with Albanian, the public language (Stoica 2021). This explains the variability that characterizes the answers of our informants. Although the data collected specifically for this work at the beginning of July 2023 are largely consistent within each systems and with data collected in previous occasions, a little margin of variability of speakers emerges, generally implying optional or parallel possibilities in each grammar.

2   As regards the geographical diffusion and number of Aromanian speakers, see Caragiu Marioţeanu (1975, 2016) and Capidan (1932). Stoica (2021), provides an important sociolinguistic investigation based on a number of oral histories collected through interviews with Aromanian informants of the region of Korça.

3   The data we discuss have been collected through field research in Myzeqeja (Libofshë, L), Rëmën, and in the region of Korça (Plasë, P), Fërshërot. We did several field surveys in the Aromanian communities, the last of which was on 4-8 July 2023. The use of the face-to-face interview explains the variability in the answers of our informants. Anyway, the data collected for this work at the beginning of July 2023 are consistent within each system and with data collected in previous investigations; a little variability generally implies optional or parallel possibilities in each grammar. We are very grateful to our informants, among others, Piro Mistaku for Libofshë, and Wilma Veriga for Korça-Plasë. They all agreed to collaborate and made a substantial contribution to the research, providing suggestions, comments and grammaticality judgments that greatly improved our understanding of phenomena.

limited to the definite plural and to the singular exponent *-i*. In addition, oblique contexts require in any case the possessive introducer (PI), thus unlike Romanian, thus differing from the old Rumanian (cf. Pană Dindelegan et al. 2019, Maiden et al. 2021). Caragiu Marioțeanu (1975, 237) assimilates these constructs to those of other Romance languages where dative and genitive require a prepositional introducer. However, as noticed, Aromanian presents a specialized inflection in some contexts. This particular morphology, which we descriptively label "case", provides a test bench for the nature of this category, its role in syntax, and its relationship with the other inflectional properties. In this paper we assume that enclitic exponents (traditionally called 'articles') are inflectional elements (cf. Giurgea 2013). Initially in the generative literature these elements were considered clitics and identified with a functional head to which the noun moves giving rise to left-incorporation (Dobrovie-Sorin 1987, Giusti 1993); however, subsequent works, cf. Dimitrova-Vulchanova and Giusti 1998, Dobrovie-Sorin and Giurgea 2006, agree on their inflectional status. Indeed, as discussed and motivated by Ledgeway (2017), the inflectional nature of these formatives is clearly supported by their distribution. Indeed, post-nominal exponents cannot be separated from the root and their paradigm subsumes gender, number (and residually case) as generally the nominal paradigms of Latin and the other ancient and modern Romance varieties.

Figure 1.
The two Southern Albania areas where the data analyzed were collected.

2.   Nominal and Pronominal Paradigms in Two Varieties

Nominal paradigms differentiate the direct form occurring in nominative or accusative contexts, from the oblique form. The latter shows a specialized inflection only in a subset of nouns and, however, requires to be introduced by the PI. In what follows, we collate the systems of direct and oblique definite and indefinite forms, in the singular and in the plural. The data of Libofshë in (1a,b) illustrate the singular direct forms: (a) exemplifies the definite form, with the so-called enclitic article, while (b) exemplifies the indefinite form preceded by the indefinite article *un/unə* "a/one". (2a,b) illustrate the same alternations in plural contexts. The oblique contexts, for definite and indefinite forms are provided in (3a,b) for the singular and in (4a,b) for the plural. Genitive and dative contexts are introduced by the PI. In some Aromanian varieties, this morphological element is combined with a morpheme agreeing with the embedded noun, as in Libofshë. In the glosses the inflectional exponents have the following descriptive labels: *-u* = MSG/OBL, *-a* = FSG, *-ʎ/l-* = DEF, *-i* = PL/SG/OBL, *-ur-* = OBL.PL. The nature of the inflections will be reconsidered in subsequent sections.

(1)

a. ari   vənit   / am   vədzut   fitʃor-**u**   / fɛt-**a**
    (s)he.has   come   / I.have seen   boy-SG.DEF   / girl-FSG.DEF
    "the boy / the girl has come" / "I have seen the boy / the girl"

b. ari   vənit   / am   vədzut   un fitʃor   / unə fɛt-ə
    (s)he.has   come   / I.have seen   a boy   / a girl-FSG
    "the/a boy/man/girl has come" / "I have seen the/a boy/girl"   Libofshë

(2)

a. arə   vənit   / am   vədzut   fitʃor-ʎ-i   / fɛt(ə)-**l-i**
    they.have   come   / I.have seen   boy-DEF-PL   / girl-DEF-PL
    "the boys/men/girls have come" / "I have seen the boys/men/girls"

b. arə   vənit   / am   vədzut   mults   fitʃor-**i** / mult   fɛt-**i**
    they.have   come   / I.have seen   many.PL boy(-PL) / many girl-PL
    "many boys/girls have come"/ "I have seen many boys/girls"   Libofshë

(3)

a. i   o   ded   **o** fitʃor-**u**   / **o** bərbat-**u**   / **a li** fɛt-**i**
    to.him/her   it   I.gave   PI boy-MSG   / PI man-MSG   / PI girl-OBL
    "I gave it to the boy / the man / the girl"

b. i   o   ded   **o** un fitʃor   / **o un** bərbat   / **a (li)** un fɛt-**i**
    to.him/her   it   I.gave   PI a boy   / PI a man   / PI a girl-OBL
    "I gave it to a boy / a man / a girl"   Libofshë

(4)

a. i   o   ded   **o** fitʃor-**ʎ-u**   / **o** bərba**ts-ur-u**   / **o** fɛt-ʎ-u
    to.them   it   I.gave   PI boy-DEF-OBL   / PI men.PL-DEF.OBL.PL / PI girl-PL-OBL
    "I gave it to the boys / the men / the girls"

b. i   o   ded   **o** ts-**uɔr** fitʃor(-ʎ)-**i**   / **o** doi bərba**ts**   / **o** mult fɛt-**i**
    to.them   it   I.gave   PI that-OBL.PL boy-DEF-PL /PI two man.PL   / PI many girl-PL
    "I gave it to these boys / to two men / to many girls"   Libofshë

A similar distribution appears in the Korça-Plasë variety in (5)–(8), where the plural oblique has the exponent *-or*. The feminine has the exponent *-i* in the plural and the singular oblique. The result is that in the singular, *-i* can be doubled in definite forms, as in (8a); besides, it is plural in definite forms, as in (6a,b). Definite singular forms insert *-u* in the masculine and *-a* in the feminine singular, in (5a), while in the plural the exponent *-l-* occurs, palatalized in *-j-* in the masculine, in (6a). Unlike Rëmën, in Fërshërot the indefinite article has the oblique inflection *-ui* in the masculine and *-ei* in the feminine, which is combined with the indefinite forms of masculine nouns or the inflected oblique of feminine nouns, in (7b).

(5)

a. vini   / vidzui   fətʃor-**u**   / bərbat-**u**   / fjat-**a**
    (s)he came   / I.saw   boy-SG.DEF   / man-MSG.DEF   / girl-FSG.DEF
b. vini   / vidzui   un fitʃor   / un bərbat   / unə fjat-ə
    (s)he came   / I.saw   a boy   / a man   / a girl-FSG
    "the/a boy/man/girl came" / "I saw the/a boy/man/girl"   Korça-Plasë

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(6)
a.   ˈvinərə   / vidzui   fətʃor-**jə**   / bərbats-**jə**   / fɛt-**i-l-i**
     they.came   / I.saw   boy-PL.DEF   / man- PL.DEF   / girl-PL-DEF-PL
     "the boys/men/girls came" / "I saw the boys/men/girls"
b.   ˈvinərə   / vidzui   mul**ts** fitʃor   / mul**ts** bərba**ts**   / mult-**i** fɛt-**i**
     they.came   / I.saw   many.PL boy   / many man.PL   / many.PL girl-PL
     "many boys/men/girls came" / "I saw many boys/men/girls"   Korça-Plasë

(7)
a.   i   det   **a (ɫ)** fitʃor-**u**   / **a** bərbat- **u**   / **a** fɛt-**i-i**
     to.him/her I.gave   PI boy-MSG.DEF   / PI man-MSG.DEF   / PI girl-OBL-OBL
     "I gave it to the boy / the man / the girl"
b.   i   det   **a un-ui** fitʃor   / **a un-ui** bərbat   / **a un-ei** fjat-**i**
     to.him/her I.gave   PI a-OBL.MSG boy   / PI a-OBL.MSG man   /PI a-OBL.FSG girl-OBL
     "I gave it to a boy/a man/ a girl"   Korça-Plasë

(8)
a.   lə   det   **a** fitʃor-**l-or**   / **a** bərba**ts-l-or**   / **a** fɛt-**i-l-or**
     to.them   I.gave   PI boy-DEF-PL.OBL   / PI men-DEF-PL.OBL   / PI girl-PL-DEF-PL.OBL
     "I gave it to the boys / the men / the girls"
b.   lə   det   **a** doi fitʃor-**l-or**   / **a** doi bərbats-**l-or**   / **a** dau fɛt-**i-l-or**
     to.them   I.gave   PI two boy-DEF-PL.OBL   / PI two man-DEF-PL.OBL   / PI two girl-PL- DEF-PL.OBL
     "I gave it to two boys / to two men / to two girls"   Korça-Plasë

A particularly extensive syncretism of -*i* emerges, which occurs in indefinite singular direct and indirect forms, and in the direct singular and plural. We synthesize the data concerning the distribution of inflections in tables (9) and (10). In (c) the distribution of PIs is provided.

(9)   a.   *Definite paradigm*

	MSG	FSG	MPL	FPL
Nom/Acc contexts	-u	-a	(Pal/ʎ)-i	(-l/ʎ)-i
Dat/Gen contexts	-u	-i	-ʎ-u/ (Pal)-ur-u/-ɣ-u	u/ʎ/l-u/-ɣ-u-r-

       b.   *Indefinite paradigm*

	MSG	FSG	MPL	FPL
Nom/Acc contexts	∅	-ə	Pal/(-i)	-i
Dat/Gen contexts	∅	-i	∅/Pal/i	-i

       c.   PI: o / __ N~MSG~,   ali / __ N~FSG~ ,   o /__ N~PL~   Rëmën (Libofshë)

Table (10) summarizes the data in (5)–(8). (10c) provides the PI paradigm.

(10)   a.   *Definite paradigm*

	MSG	FSG	MPL	FPL
Nom/Acc contexts	-u	-a	-je	i/ə-l-i
Dat/Gen contexts	-u	-i-i	-l-or/l-u	i-l-or/l-u

   b.   *Indefinite paradigm*

	MSG	FSG	MPL	FPL
Nom/Acc contexts	∅	-ə/-e	Pal/∅	-i
Dat/Gen contexts	∅	-i	-l-or/l-u	i-l-or/l-u

   c.   PI: (li) / __ N$_{FSG}$, a(ł) / __ N$_{MSG}$, a   Fërshërot (Korça-Plasë)

In Class III, which derives from the third declension of Latin, the indefinite singular has the exponent *-i* and the definite singular the exponent *-l-i*, as in (11) for *mujɛʁ-* "woman" in Korça.

(11)   *Singular*   *Plural*

Direct definite	a.	mujɛr-**i-a**	kɛnə-**l-i**	a'.	mujɛr-(**i-l**)-**i**	kɛɲ-**je**
Direct indefinite	b.	**unə** mujɛʁ-**i**	**un** kɛn-**i**	b'.	mult-**i** mujɛr	mults kɛɲ
Oblique definite	c.	**a li** mujɛʁ-**i**	**a ł** kɛn-**i-l-i**	c'.	**a** mujɛr-**l-or**	**a** kɛɲ-**l-or P**
Oblique indefinite	d.	**a** un-**ei** mujɛr-**i**	**a** un-**ui** kɛn-**i**	d'.	**a dau** mujɛr-**l-u**	**a doi** kɛɲə-**l-u**

In (11), we find *-l-i* in the singular masculine and feminine definite oblique, and *-i* in the singular masculine and feminine indefinite oblique; *-l-i* is also the inflection of the feminine plural. Finally *-i* is the exponent of the indefinite singular.

In summary:
- ✓ In the masculine singular, the enclitic definite exponents *-u* or *-l-i* are introduced in direct contexts
- ✓ The indefinite masculine singular form has no exponent except for the class in *-i*.
- ✓ The singular oblique has the inflection *-i* in the feminine, in all classes.
- ✓ The feminine singular, in direct contexts, shows the alternation between the definite exponent *-a*, as in (a), and the indefinite exponent *-ə* in (1b), and *-i* in (9b).
- ✓ In singular oblique contexts (definite or indefinite), in the feminine the inflection *-i* occurs.
- ✓ In the definite plural direct contexts in (2a), (6a), (9a), and (10a), both masculine and feminine present the plural inflection, *-ʎ/l-* (from Latin demonstrative **ille* "that"), which we associate with definiteness. In some dialects, the inflection *-je* occurs. Final obstruent or nasal of the masculine nouns palatalize, as for instance *bərbat/bərbats* "man/men", *kɛn/kɛɲ* "dog/dogs", etc.

In the plural, definite oblique contexts show a specialized inflection in which *-u* combines with the plural formative *-ʎ-*, *-r-*, in (4a), in Libofshë, and *-l-or* in Fërshërot in (8a). In indefinite contexts, the simple form of plural emerges, possibly preceded by the oblique form of the demonstrative, as in (4b), *o ts-**uɔr** fitʃor(-ʎ)-i* "to these.OBL boys" in the variety of Libofshë. Some speakers of Fërshërot produced plural obliques with definite inflection even if preceded by modifiers, as in (8b), a structure largely attested in Albanian.

In all contexts, the oblique morphology is associated with the PI, namely *o* for the masculine singular and the plural, and *a li* for the feminine singular, regardless of the definite or indefinite nature of the DP, in Rëmën[4], in (4a,b). In Fërshërot PIs are *a*, and variably *a li* before the singular

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4   In these varieties the original **l* in simple onsets has changed to ɣ. Thus, **ɣa** "to" corresponds to the original *la*, occurring in Romanian and other Aromanian languages.

feminine and *a ł* before masculines, as in (8a,b). The paradigm of pronouns reproduces the same pattern shown by nouns, as in (12) for Libofshë. The direct forms, which occur in nominative/accusative contexts, in (12a), are distinguished from the dative, introduced by the PI, in (12b,c). The third person pronominal possessors are lexicalized by the oblique forms of third person pronouns, both in dative and genitive, cf. *o ɣui / a jei / o ɣorə* "of him/her/them" in (12b) and (12c) (Manzini and Savoia 2018, Baldi and Savoia 2021).

(12)		1sg	2sg	3sg	3pl	1pl	2pl
a.	direct	mini	tini	eu/ia	eʎ/eli	noi	voi
		I/me	you	(s)he/him/her	they/them	we/us	you
b.	dative	a ɲia	a tsea	o ɣui/a jei	o ɣorə	a nau	a vau
		PI me	PI you	PI him/her	PI them	PI us	PI you

c. ɲ/ts u ar datə a ɲ-ia / a ts-ea
to.me/you it have.3PL given PI me-OBL / PI you-OBL
"they gave it to me/you"   Libofshë

A similar system characterizes Fërshërot, with the difference that the third person elements also include the forms *nɛs_M/nɛs-ɛ_F/nɛʃ/nɛs-i* "he/she/they_M/they_F".

2.1 Genitives

In contexts of possession the noun referring to the possessor has the oblique inflection introduced by the PI, as in dative, as in (13a,b) and (14a,b) for nominal contexts, and (13c) and (14c) for predicative occurrences, respectively for Libofshë and Korça-Plasë.

(13)

a. mən-a **o** fitʃor-**u** / **a li** fɛt-**i**   b. kəd-**a** **o** kɛn-**l-i**
hand- DEF.FSG PI boy-MSG / PI girl-OBL   tail-DEF.SG PI dog-DEF-OBL
"The hand of the boy/ of the girl"   "The tail of the dog / of a dog"

c. aist esti **o** fitʃor-**ʎ-u** / **o** məjɛr-**ʎ-u**
that is PI boy-DEF-OBL / PI woman-DEF-OBL
"that is of the boys / of the women"   Libofshë

(14)

a. mən-a **a/ał** fitʃor-**u** / **a li** fɛt-**i-i** **a un-ei** mujɛr-**i**
hand- DEF.FSG PI boy-MSG / PI girl-OBL-OBL PI a-OBL woman-OBL
"The hand of the boy/ of the girl/ of a woman"

b. məɲə-**l-i a** fitʃor-**l-or** / **a** fɛt-**i-l-or**
hand- DEF-PL PI boy-DEF.PL-OBL /PI girl-PL-DEF-OBL
"The hands of the boys/ of the girls"

c. aist esti al kɛn-i-l-i
this is PI dog-OBL-DEF-OBL
'this is of the dog'   Korça-Plasë

The PI precedes the possessor in all contexts, differently from Romanian where it occurs only in indefinite contexts (Dobrovie-Sorin 2013).

As we can expect, the genitive of first and second person is the possessive element, as in (15) illustrated for Libofshë and in (16) for Korça-Plasë. The feminine and masculine singular are exemplified

in (a,b) and the feminine and masculine plural in (a',b'). These forms agree with the noun designating the possessum, the head noun of DP, or the subject in predicative contexts. The third person possessors are lexicalized by the oblique forms of third person pronouns, so that dative and genitive coincide in the same forms, *o ɣui / a jei /o ɣorə* "of him/her/them" in (b), exactly as in nominal structures (Manzini and Savoia 2018, Baldi and Savoia 2021). The example in (15c) illustrates the possessive in predicative contexts.

(15)
a.　　ken-l-i　　　　　　a　　　　　　ɲe-u　　　　　/ to-u　　　　　/ nɔstər
　　　　dog-DEF.M　　　　PI　　　　　my.MSG　　　/ your.MSG　/ our
　　　　"my/your/our dog"
a'.　　kɛɲ-l-i　　　　　　a　　　　　　ɲe-ʎ-i　　　　/ to-ʎ-i　　　/ nɔst-i
　　　　dog.PL-DEF.M　　PI　　　　　my-MPL　　　/ your-MPL　/ our-PL
　　　　"my/your/our dogs"
b.　　sɔr-a　　　　　　　o ɣu-i　　　/a je-i　　　　/ o ɣ-ɔrə
　　　　sister.DEF.FSG　　PI him-OBL /PI her-OBL　/ PI them-PL.OBL
　　　　"his/her/their sister"
c.　　atsɛu　　　　esti　　　　　　　a mɛ-u/　　　/ a ta-u
　　　　that. FSG　　is　　　　　　　PI my.FSG　　/ PI your.FSG
　　　　"that is mine/yours"　　　　　　　　　　　　　　　　　　　　　Libofshë

(16)
a.　　mɛn-a　　　　　　a　　　　mia　　　　/ ta　　　　/ lui
　　　　hand-DEF.M　　　PI　　　my.FSG　　/ your.FSG　/ his
　　　　"my/your/his hand"
a'.　　mɛɲ-l-i　　　　　a　　　　mɛ-l-i　　　/ tɛ-l-i　　　/ lui
　　　　hand.PL-DEF.F　　PI　　　my-FPL　　/ your-FPL　/ his
　　　　"my/your/his hands"　　　　　　　　　　　　　　　　　　　　Korça-Plasë

The inflectional part of the possessive includes the definiteness element *-l-* that we find in nominal paradigms. In Rëmën the original *-l* has been velarized into *-u* in the final position, as in (15a,c), while in the masculine plural palatalizes in *-ʎ*. Fërshërot has the realization *-ł*, cf. (16a,a').

2.2 PI and Prepositions

Oblique morphology is associated with the PI, which covers possession and dative.[5] The other basic prepositions combine with the direct morphology, i.e. the nominative, as in (17a,b,c) for the prepositions *ku* "with", *ɣa* "at, to", and *ti* "for". A DOM effect emerges with locative elements, contrasting high-ranked referents, in (17c), with low-ranked referents, in (17d), as in many Romance varieties.

5　　It is interesting to note that a similar distribution of the oblique characterizes the Northern Istro-Romanian variety spoken in Žejane (Geană 2020). In this dialect, both the dative and the genitive use the *a lu* construction, as illustrated in (i) (from Geană 2020, 184).

(i)　　Av　　　　　　zis　　　　　　　a lu　　　tatu
　　　　they.have.AUX　say.PPLE　　　DAT　　thief.DEF
　　　　"they told the thief"

(17)

a. **ku** fitʃor-u   / un fitʃor   b. mini   nɛg   ɣa   un fɛt-ə / fɛt-a   / tini
   with boy-MSG   / a boy   I   go   at   a girl   / girl-FSG /you
   "with the boy / a boy"   "I go to a girl/ the girl / you"

c. o   fakə **ti**   atseu   d. esti   **a / tu / kət**   kas-ə
   it   I.do for   that.MSG   is   at   home
   "I do it for him"   "(s)he is at home"   Libofshë

The preposition *di* "of", in complementary distribution with the PI, occurs in possessive contexts, as (18a,b), and, systematically, in locative complex prepositions. *Di* can select the indefinite form, in (18a).

(18)

a. mən-a   **di**   mujer-ə   / ali mujɛr-i
   hand-FSG   of   woman-FSG   / PI woman-OBL
   "the hand of (the) woman"   Libofshë

b. mɛn-a   **di**   aist fitʃor   / **a ł** fitʃor-u
   hand-FSG   of   of this boy-MSG / PP boy-MSG
   "the hand of the boy / of that boy"   Korça-Plasë

Complex prepositions (with locative, temporal, or instrumental meanings) combine a lexical item specifying place, direction, and time (the Axial part, cf. Svenonius (2006)), and the DP expressing the point of reference, i.e. the whole of which the axial noun is a part. The DP is introduced either as an oblique preceded by the PI as in (19a.i,ii)/ (20a.i,ii) or by the preposition *di* followed by the noun in *direct form*, as in (19b.i,ii)/ (20b.i,ii). In these constructs, first/second person referents are realized as feminine possessives, in (19a.ii) and (20a.ii), alternating with *di* "of" followed by the pronoun, in (19b.ii) and (20b.ii).

(19)

a.i dəninti **o fitʃor-ʎ-u / o** mujɛr-**ʎ-u**   b. i. dəninti   **di**   fitʃor-**ʎ-i** / mujɛr-**l-i**
     before   PI boy-DEF-OBL /   before   of   boy- DEF-PL /
             PI women-DEF-OBL   woman-DEF-PL
     "Before the boys/ the women" / "Before the boys / the women"

a.ii dən poi **a** mɛ-u   b.ii dən poi   **di**   mini
     after   PI my-FSG   after   of   me
             "after me" / "after me"   Libofshë

(20)

a.i dininti **al** fitʃor-**u** / **a** mujɛr-**l-or**   b. i. dəninti   **di**   fitʃor / mujɛr-**i**
     before   PI boy-MSG /   before   of   boy /woman-FSG
             PI women-DEF-OBL
     "Before the boy/ the women" / "Before the boy / the woman"

a.ii tini əʃti dininti **a** miˈa / **a** lui   b.ii dininti   **di**   mini / nɛs
     you are before   PI my-FSG/ PI he.MSG   of   before of me / him
      "You are before me/ him"   Korça-Plasë

We note that speakers of Korça in (20b.i) use the indefinite form of the noun after the preposition *di* 'of'. The reading is definite, linked to the universe of discourse. The structure in which the locative preposition introduces the indefinite form of the noun is usual in Albanian and in Aromanian, as in *piʃti mən-ə* 'on hand-FSG, i. e. on the hand present in the universe of discourse.

Finally, *di* occurs in other contexts, as the introducer of the substance of an object, in (21a), and the causer, in (21b). It can also introduce the infinitive in a subset of the infinitival constructs (Manzini and Savoia 2018).

(21)

a. esti   **di**   dʒam
    it.is   of   glass
    "it is glass"

b. aist kəmiʃ-li   səntə   ɣatə   di   ia
    these shirt-FPL   are   washed by   her (lit. she)
    "these shirts are washed by her"   Libofshë

3.   The Analysis: Some Proposals

Chomsky's most recent papers (Chomsky 2019, 2020, 2021) criticize the head movement as a genuine syntactic rule at the basis of the Probe-Goal φ-feature matching in affixation. Specifically, "head raising is problematic insofar as it does not entail semantic effects and, structurally, it is counter-cyclic". The solution of Chomsky (2019, 268) "is simply to drop the condition that Internal Merge (Movement) has to be triggered, so it's free, like External Merge". Chomsky (2021, 30, 36 ff.), assumes that Merge operation can create the combination of morphemes in complex words by amalgamation. Thus, in the case of inflected verbs, the amalgamation yields complex forms such as [INFL [v, Root]], which realizes the properties of the C/T Phase. In keeping with this conceptualization of the morphology-syntax relationship, the Merge operation combines sub-word elements (root and affixes) into a complex syntactic object. The traditional head movement involving post-nominal articles and the gender/number/case inflection in NPs can in turn be seen as a type of amalgamation, like verbal inflection.

Hence, the morphological merge is part of the syntactic computation and there is no specialized morphological component (Manzini et al. 2020, Savoia et al. 2018, Savoia, Baldi 2022; see also Collins and Kayne 2020, Marantz 2001). This excludes Late Insertion and the manipulation of terminal nodes used by Distributed Morphology (Halle and Marantz 1993), where sub-word elements (affixes and clitics) are "dissociated morphemes", involving post-syntactic rules (Embick and Noyer 2001, 557). In the approach that we adopt, lexical elements, including morphemes, are endowed with interpretable content; as a consequence, the agreement is the morphological manifestation of the identity between referential features corresponding to the same argument of the sentence.

3.1 Elementary Relators

In many natural languages, genitives, datives, and locatives are realized by the same cases or adpositions, giving rise to syncretism phenomena. An idea, originally formulated by Fillmore (1968), is that dative and genitive are the inflectional equivalent of prepositions *to*, and *of*, etc. If inflections have an interpretable content, we can conclude that oblique has a relational content exactly like prepositions and dative and genitive as well as *di/a* can be analyzed as elementary relators (Manzini et al. 2019, 2020). An idea variously supported in literature is that 'possession' corresponds to the more elementary part-whole relation. Following Belvin and den Dikken (1997), we construe possessors as 'zonally including' the possessee and notate the 'inclusion' (or part–whole) relation as [⊆], to suggest that a part/whole interpretation is involved in genitives/ datives. Therefore, possession on a par with location can be understood as a type of "zonal inclusion" (Manzini and Savoia 2011, 2018). The crucial example is provided by *di*, which includes apparently diverse readings (cf. section 2.1). On this basis, we analyze *di* as the elementary operator, in (22) (Savoia et al. 2020).

(22) **di** = ⊆

In the derivation in (23), R is the lexical root and φ is the abbreviation for nominal features, here definite plural. The axial element, namely the locative noun, merges with (23a), yielding the complex construct in (23b), associated with the syntactic domain in (23c), where the locative extends the event of *v*.

(23) a. $< \text{di}_\subseteq [_\varphi [_R \text{fitʃor}]\text{-ʎ-i}]] > \rightarrow [_P \text{di}_\subseteq [_\varphi [_R \text{fitʃor}]\text{-ʎ-i}]]]$ "under the boys" (11b")
  b. $< \text{dəninti}_N, [_P \text{di}_\subseteq [_\varphi [_R \text{fitʃor}]\text{-ʎ-i}]]] > \rightarrow [_{DP} \text{dəninti}[_{PP\subseteq} \text{di} [_\varphi [_R \text{fitʃor}]\text{-ʎ-i}]]]$
  c.   v….   Locative N   P D_φ N
          dəninti $\text{di}_{/\subseteq}$ fitʃor-ʎ-i

In complex PPs the locative item (Axial Part) is associated with a "possessor", more precisely, its "zonal inclusion" fixed by the noun, in (23) *fitʃorʎi* "the boys" (Franco and Manzini 2017, Savoia et al. 2020). The motion or state-in interpretation is derived from the type of locative event introduced by the verb in conjunction with the locative noun, as highlighted by the fact that the same preposition can occur with different readings. Simple locative prepositions include a spatial restriction on the elementary relator as in (24). The DOM effect, contrasting *ɣa/la/kət* and *a/tu*, depends on the lexical properties of these prepositions, subcategorized for the animacy/ deicticity (first/second person) properties of the complement.

(24) **la/ ɣa** : [[animate] ⊆]

According to some analyses, PIs combine the invariable base *a* with the definite article, whereby *al* is essentially an agreement head, taking a genitive in Spec (Giurgea 2012, Dobrovie-Sorin 2013). Cornilescu (1995, 126–127) identifies *al* with a D marker. Other explanations assume that in *al* the preposition *a* combines with the enclitic article (cf. Grosu 1994, Cornilescu and Nicolae 2013). Actually, the invariable form *a* is attested in Old Romanian. Hence, if *a* corresponds to the Latin preposition *ad*, this explains why in Old Romanian *a* also introduced datives (Pană Dindelegan 2016).

   Our data show that *a* can introduce both dative and genitive as in (3)–(4), (7)–(8), and (13)–(14); moreover, *a* can realize a locative reading with indefinite nouns of place, as *a kasə* "in the house" in (17d). *A* combines with the definiteness root *l*- (< Latin **ille*) on which Romance articles are generally based, alternating *a l/a ɫ/o* with the masculines and plural and *a li* with the feminine. Thus *a* can be analyzed as a realization of the elementary relation [⊆], followed by the definite article, when requested, and by a fully quantificationally specified form of the noun (the oblique). On the contrary, the operator *di* is in itself able to introduce the inclusion relation, whereby it generally allows possessors to be realized as indefinite.[6] As a result, *di* and *a* are in complementary distribution, save for deictics, first/ second person pronouns, and demonstratives, where the selection restrictions are vacuously applied, as suggested by the *Elsewhere* order in (24a,b).

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6   *Di* allows possessors to be realized as indefinite. The lexical content of the verb and the inherent referential properties of the possessor are sufficient to identify the referent, like in Italian PPs of the type *in casa* 'at home' (Longobardi 1996). Similar constructs appear in Albanian (Manzini and Savoia 2011).

(24) a. **a** = [[⊆] (locative)] / __ (deictic/ Q) [[N] (Oblique)]
    b. **di** = [⊆]/ __ (deictic) N

A, unlike *di*, admits a specialized inflection on the noun, the oblique. Some varieties associate an article with *a*, at least in some contexts, as in (25a,b,c).

(25) a. **li ←→** a __ [_FSG_
    b. **ł ←→** a __ [_MSG_
    c. **o** = [⊆] / __ [_MSG/ PL_

This analysis can be also applied to other basic prepositions, such as **ti** "for", which attributes the quality "beneficiary" to the recipient/ possessor, [[⊆], (beneficiary)].

4. Syncretism and Case

Nominal paradigms show widespread syncretism, an effect of which is the overlapping between plural and oblique, as in the case of the exponent –*i*, encompassing the indefinite singular Nom/Acc and Oblique, the definite singular Nom/Acc and Oblique, and variably the definite and indefinite plural [7]. Analogously -*u* occurs in the singular and plural. The syncretism between plural and oblique can be explained by the proposal of Chierchia (1998a,b) that plurality can be thought of as a subset relationship of sets of individuals referring to a word-internal interpretation (Manzini and Savoia 2014, 2018). Thus, as an instantiation of the part-of-whole operator ⊆, the plural shares the elementary property of the oblique (Manzini and Savoia 2010, 2014), as in (26).

(26) a. PL = [⊆]/ Root __
    As a property of the noun (Chierchia 1998a,b)
    b. Dative/ Genitive = [⊆]/ __ DP
    The inclusion is read as the subset of a possessor and its scope is either sentential, or, in genitives, DP-internal. (Manzini and Savoia 2014, 422)

We know that the case, a classic category of the cartographic model, has a spurious status, in the sense that it is nothing but a manifestation of the agreement; inherent cases put other descriptive problems, interacting with prepositions or the morpho-syntactic organization of the sentence. Chomsky (2021, 16) concludes that "[c]ase doesn't enter into semantic interpretation" and is part of externalization. Actually, the distribution of nominal inflections and the syncretism we have exemplified in section 2 suggest that the case can be identified with bundles of nominal features, such as number, definiteness, or syntactic operators. Thus, if we take the sentence *i o det o fitʃor-ʎ-u* "I gave it to the boys" (4a), Libofshë, the free application of Merge (Chomsky 2019, 2021), yields the amalgamation between the root and the definite inflection, marked by -ʎ _DEF.PL_-, in (27a), with which -*u*_⊆_ is combined, creating the complex noun in (27b). The insertion of sub-word elements depends on subcategorization restrictions such as those in (27c), (27d) and (27e) for the plural

7   In the literature, the feminine singular -*i* is considered as the only exponent of the case associated with indefinite forms (Maiden et al. 2021, 75 ff.), whereas the case is generally expressed by the definiteness enclitic elements.

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oblique inflection *-or* or *-ur* in (8a). The application of selectional restriction is Elsewhere ordered, whereby the more restricted context is satisfied first.[8]

(27) a. $< [_R \text{fit}\int\text{or}], -\Lambda_{\text{DEF,PL}} > \rightarrow [_\varphi [\text{fit}\int\text{or}]-\Lambda]$

    b. $< [_\varphi \text{fit}\int\text{or}] -\Lambda], -u_\subseteq > \rightarrow [_\subseteq [_\varphi [\text{fit}\int\text{or}]-\Lambda-]u]$

    c. $-\Lambda_{\text{DEF,}\subseteq} \leftrightarrow R_M \underline{\quad}$

    d. $-\text{or} \leftrightarrow PI [[_{\text{DEF.}\subseteq}] \underline{\quad}]$ (sub-set of lexical items)

    e. $-u_\subseteq \leftrightarrow PI [[_{\text{DEF.}\subseteq}] \underline{\quad}]$

The occurrence of the oblique inflection requires the introducer, here *o* (cf. (4a)), as in (28); Merge is based on the agreement between the syntactic features, including $\subseteq$, both within the noun and DP.

(28) $< o_\subseteq, [_\subseteq [\text{fit}\int\text{or}]-\Lambda-u] > \rightarrow [_{PP} o_\subseteq [_\subseteq [\text{fit}\int\text{or}]-\Lambda-u]]$

The inflected noun realizes the referential properties associated with D in the Phase DP, i.e. class, definiteness, and number, if we assume that DP is a Phase (cf. Manzini et al. 2020). If so, head-raising is excluded according to Chomsky (2019 ff.), and the inflected noun satisfies the featural content of the phase head D, as in (29). Adapting the conclusion of Chomsky (2021, 36) for verbal inflection, once eliminated head-movement there is no need for D to be at the edge of the Phase, here DP, and can be 'within the domain of PIC and Transfer'. In other words, the inflected noun is the implementation of the agreement properties of DP[9]. The alternant *o* (in the variety of Libofshë) realizes the preposition that connects the noun to the event as the recipient.

(29)   v….   P/PI D_φ N

                 $o_{\varphi/\subseteq}$ $\text{fit}\int\text{or} -\Lambda-u_{\text{DEF.M}/\subseteq,}$

In genitival contexts, *a+possessive* is illustrated in (30) for (16a'), *mɛn-l-i a mɛ-l-i* "my hands" (P). The part-whole reading is realized by the lexical content of the possessive element in (30a), in addition to the preposition *a*, as in (30b). In these contexts, the simple preposition *a* occurs in all varieties, suggesting that the possessive satisfies the referential properties associated with D in the Phase of DP, as in (30c).

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8   An anonymous reviewer ask if syncretism is treated in terms of 'Elsewhere' ordered restrictions or specialized restrictions for each case. Our approach is not based on the ordering of restrictions as, for example, in DM, where the Impoverishment rule feeds the insertion of syncretic morphemes. In our approach, the insertion of an exponent is based on its interpretive content, whereby syncretism is the expected effect of common semantic properties. To achieve this result, it is necessary to rethink the descriptive categories of functional morphemes and reduce them to elementary semantic properties, such as the inclusion predicate in oblique and plural. Naturally, we use the Elsewhere application in the case of selectional restrictions to combine morphemes with subclasses of nominal contexts, as in (27c,d,e), independently of the occurrence of syncretism.

9   An anonymous reviewer observes that a phasal treatment 'might in fact be made compatible with theories like DM since morphology in one phase might indeed affect syntactic computation in another higher phase.' If we have understood correctly, DM could impoverish a morphological context making it possible to insert (Late insertion) the inflected form in a higher phase. Anyway, something like Late Merge is excluded by Chomsky (2019, 267) as costly and unmotivated. As for DM, the crucial point that we reject is the way to implement the relationship between syntactic information (phi-features) and morphology, that is obscured or deleted by Late insertion.

(30) a.   [[[mɛ$_⊆$]-l$_{DEF.F}$] i $_⊆$]
    b.   < a$_⊆$, [[[mɛ$_⊆$]-l$_{DEF.F}$] i $_⊆$] > → [a$_⊆$ [[mɛ$_⊆$]-l$_{DEF.F}$ i $_⊆$]
    c.   N….   P/PI   D$_φ$ N
                                a$_{φ/⊆}$ mɛli$_{⊆,FSG}$

In datives, the first/second person pronouns have a specialized inflection for the oblique, as in (31a,b) for *… a ɲ-ia* "to me" (cf. (12c)).

(31) a.   < a$_⊆$, [[ɲ$_{1SG}$] ia$_⊆$]> → [a$_⊆$ [ɲia$_⊆$]]
    b.   v….   P/PI   D$_φ$ N
                        a$_{φ/⊆}$ ɲia$_⊆$

The preceding discussion supports the idea that nominal inflections belong to a set of very elementary semantic primitives. The paradigms show such a high degree of syncretism that there is no clearly specialized morpheme for oblique contexts, maybe except for *–or*, in (28d). The oblique plural *l-u*, *r-u,* and *ʎ-u* include in turn the exponent *-u* that occurs in the definite masculine singular, as in (10) and (11). Thus, apart from *-a*, for the definite singular feminine in direct contexts, and the bases, *-l/ʎ/r-*, for definiteness, the other inflections imply diverse interpretations.

In the first class, in (10) and (11), *-i* is associated with the oblique in the feminine singular and, in Rëmën, also characterizes indefinite feminine plurals. In Class III in (11) the definite masculine assumes the exponent *-l-i* in the singular and differs from the feminine, which only introduces *-i*. A natural hypothesis is that the syncretism of *-i* (singular/plural, direct/indirect forms) is related to its functional content, as in (32a), and its distribution to (32b).

(32) a.   -i = subset-of-whole
    b.   i$_⊆$ ←→ R __ or l __

This analysis also applies to *-u*, which covers the plural in obliques and the definiteness in the masculine singular, as *fit∫or-u* "the boy" in (9a)–(10a). The extension of plural exponents to singular readings is dealt with by Manzini and Savoia (2010). In discussing the nature of the standard Romanian inflection *-i*, they observe that "essentially like Latin *-i*, as a Q element […] it will have the plural reading when taking scope over the words – or the possessive (dative/genitive) reading when taking sentential scope". Indeed, both *-u* and *-i* can introduce plurality, as in the plural oblique, and the reference to a singularity. This pattern is not exceptional. For instance, in Latin, *-i* realizes the masculine plural and the genitive and dative singular, and, similarly *-e* (<*ai) feminine plural, and genitive and dative singular (Halle and Vaux 1997). Also in Italian *-i*, typically associated with the plural, can characterize the third singular person pronouns, cf. *egl-i/ lu-i/le-i* "he/she" *colu-i* "he" and, in addition, the oblique *gl-i* "to him/her/them", *a/di cu-i* "to/of which", *altru-i* "of others".

What we mean is that if plurality coincides with the sub-set relation, a subset including a single individual is admitted (Chierchia 1998a,b).[10] Thus we conclude that the part-whole relationship can satisfy the definite singular reference, as suggested in (33).

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10   Usually, languages have the singular for this, but there are uses of the generic plural that admit a singular interpretation, such as *They are knocking at the door. (It's Peter.)* or *How many came? Just one* (cf. Manzini and Savoia 2014, 222).

(33) a. [kɛn-(l)-[-i$_{\subseteq]]}$ "dog / the dogs"
   b. ∃ x ⊆ {dog}
      "an x such that x is a subset of the set of individuals with the property dog"

As we have pointed out in the discussion about (25), even the specialized oblique inflection of person pronouns in (12), and of plural nouns, such as *-ur-u/-ʎ-u* in (9) and *-l-or* in (10), are not able to license the part-whole relationship alone, but they must be combined with *a*. This exponent can combine with forms non-specialized for the oblique, such as *a fitʃor-u* / *a un fitʃor* "to/of the boy / a boy", in (3a,b), *a li mujɛʁ-i* "to/ of Art woman" in (9c). However, *a* is compatible with the specialized oblique form, if available, as in the plural and in the singular, cf. *a li* fɛt-*i* "to/of the girl", *a un-ei* fɛt-*i* "to/of one-Obl girl" in (7a,b), etc. In other words, *-i*$_{\subseteq}$ / *-u*$_{\subseteq}$ / *-or*$_{\subseteq}$ cannot be thought as something like 'inherent cases', but do not have the referential strength to introduce the part-whole interpretation over DPs, unlike the preposition *di* "of" or *a*. They are specialized plurals requiring *a*, as in the restriction in (34).

(34) -or/-ur$_{\subseteq}$- ←→ *a* (Art) Q [N ___

Thus, a plural oblique such as (35a) cannot license a dative reading on DPs. It is only a plural allomorph selected in the PIs contexts, as (34). Merging the inflected noun with the preposition *a* gives rise to the oblique interpretation, as in (35b) and its externalization, in (35c).

(35) a. [$_{\subseteq}$[bərbats]-ur-u]]
   b. < a$_{\subseteq}$, [$_{\subseteq}$[bərbats]-ur-u]] > → [a$_{\subseteq}$ [$_{\subseteq}$[bərbats]-ur-u]]]
   c. v….   P   D$_{\varphi}$ N
         a$_{\subseteq}$ bərbats-ur-u$_{\subseteq}$

Obviously, a theoretical model where a common principle underlies oblique and plural morphology predicts a certain amount of ambiguity. However, as Chomsky (2021, 23) concludes, "Access at any other stage of the derivation will yield some form of deviance or incoherence". The sentence will have the task of assigning the correct interpretation.

Finally, like most Romance languages, Aromanian has a set of object clitics that distinguish accusative, as the accusative *mi* "me", and the dative ɲi "to me". In our data, object clitics systematically double the first and second person pronouns, in (36), and optionally the third person ones. The clitic cluster *dative+accusative* is instead anywhere required, as in the examples in section 2.

(36) mi / ti   ved-i   (pi)   mini / tini
     me / you   see-3SG   PREP   me / you
      "(s)he sees me/you"

What interests us now, is the DOM that turns out in (36), whereby the first and second person objects are (variably) introduced by the specialized preposition *pi* (< *per*), recalling DOM in Romanian (Dobrovie-Sorin 1990), Spanish (Jaeggli 1981) and Southern Italian dialects (Manzini and Savoia 2005). In Aromanian, *pi* selects the nominative/ accusative form of the pronoun, like other prepositions, and is doubled by the accusative clitic, as in (37).

(37) C   OCl   T Acc_φ v   V   (PP)   N
            mi_φ ved-i   pi $mini_\varphi$

In (37), *mi* is realized as part of the verb inflection in T, by assuming with Roberts (2010) that OCls realize the IA agreement of v. first/ second person must be interpreted as a sort of dative/ possessor of the event, here introduced by *pi*; no morpho-syntactic property prevents *mini* from agreeing with *mi*.

5. Conclusions

In this work we adopt a morpho-syntactic model in which sub-word elements are fully interpretable forms, the combination of which is implemented by syntactic computation. We follow the proposals discussed by Chomsky (2019, 2021) in the direction of a syntax based on the free application of Merge (IM and EM) and on the hypothesis that inflected words are a possible realization of the Phases. Our approach to nominal features as elementary properties, such as number, definiteness, and semantic operators, allows us to bring to light the relationship between prepositions, oblique, and plurality. They appear to be realizations of the same basic relation of inclusion, typically expressed by the preposition *di* "of". In keeping with this conceptualization, the combination of the PI and the inflected noun in oblique contexts can be accounted for as the effect of a selection restriction in a specialized context.

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Part II.

Explorations in Semantics and Pragmatics

Few ≠ Not Many

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Abstract: This paper presents evidence that the analysis of downward entailing quantity terms like *few books* should not be unified with the analysis of negative indefinites like *no book*, reinforcing conclusions drawn by Penka (2011). Differences between the two kinds of terms in their interpretational behavior in split scope constructions and negative concord constructions, and differences in their "degree of negativity", support distinct analyses. Specifically, the evidence reviewed here reinforces the analysis of *few* as a degree quantifier and the analysis of negative indefinites as existential quantifiers that require licensing by a negative operator. I argue that these two analyses give rise to the repertoire of differences that empirically distinguish *few* and *no*.

1.   Introduction

In this paper, I seek to show that the English word *few* cannot be analyzed as an amalgam of *not* and *many*, contrary to intuition, and contrary to the parallel claim for *no*, which has been fruitfully analyzed as an amalgam of negation with an existential component pronounced *any* in isolation. I claim that this view is on the right track for *no*, but that disparities between *no* and *few* counterindicate a parallel analysis of the two terms and suggest that *few* requires an analysis as a degree quantifier not built on analogy to *no*. I begin by describing the decompositional account of *no* and then in section 3 considerations suggesting that *few* might be treated similarly. In section 4, however, I describe differences between *few* and *no* that militate against a parallel treatment and in section 5 show that the analysis of *few* as a degree quantifier makes sense of these differences. Section 6 concludes.

2.   *No* as *Not Any*

Klima (1964) claims that the negative determiner *no* is underlyingly bimorphemic. One component expresses negation and the other expresses existential quantification. An initial observation pointing to this conclusion is that the determiner *no* is intuitively synonymous with *not any*. One reading of (1a) seems to describe the same state of affairs as (1b) (Klima's example's (130b) and (130a) respectively, see Klima 1964, 285).

(1)   a.   I will force you to marry no one.
      b.   I will not force you to marry anyone.

The fact that (1a) can be interpreted along the lines of (1b) indicates at least that *no* can be paraphrased as *not any*. But moreover there is some evidence that in fact the relevant reading of (1a) is structurally isomorphic to (1b) at the level at which it is interpreted. Although (1a) can be interpreted to mean that I will force you to not get married (that is, "marry no one" is what I will force you to do), it also may mean that I will not force you to get married, just what (1b) means. The reading of (1a) that denies that I will force you to get married requires the logical configuration of elements seen overtly in (1b),

where the negative force of *no one* scopes over *force* and the existential force of *no one* remains within the scope of *force*. Klima claims that these observations indicate that *no* is semantically complex. In the derivation of the reading of (1a) synonymous with (1b), the negative component of *no* is given clausal scope, leaving the existential component within the non-finite complement of *force*, deriving an LF that is more or less identical to what we see overtly in (1b).

Additional observations support this idea. Consider first (2a). This sentence consists of two conjuncts, the second of which has an elided VP. That elided VP is identified by an antecedent in the first conjunct, the VP *force you to marry anyone*. The interpretationally similar example in (2b) seems to show a mismatch between the elided content and the antecedent (Klima 1964, 285). Like in (2a), the negation in the second clause is expressed overtly by *neither* (itself evidently an amalgam of *not* and *either*). There is therefore no negation in the elided component, which seems to correspond to the string *force you to marry anyone*. But this string is not found in the first conjunct. That is, there is no antecedent with the exact form of the elided content.

(2) a. I will not force you to marry anyone, and neither will he ~~force you to marry anyone~~.
     b. I will force you to marry no one, and neither will he ~~force you to marry anyone~~

However, Klima's suggestion that the first conjunct in (2b) is permuted into a form corresponding to the first conjunct in (2a) derives an appropriate antecedent for the elided VP in the second conjunct of (2b) on the model of (2a). In (2b), ellipsis "splits" the negative indefinite *no one* into a negative component which is interpreted outside the ellipsis site, where it negates the whole antecedent VP *force you to marry anyone*, and an existential component that is interpreted within the ellipsis site, spelled out as *anyone* in the overt antecedent VP in (2a). Further, it is the wide scope of negation in (2b) that licenses the parallel clausal negation expressed by *neither* in the second conjunct. Such constructions are sometimes referred to as "split scope" constructions because the apparently monomorphemic term *no* is split into a negative component and an existential component, which are assigned different scope positions at LF.

Early literature on negative indefinites takes them to be ordinary individual quantifiers that raise to a licensing position, particularly in the case of negative indefinites that lose their quantificational force under the influence of a negative licenser, as in negative concord constructions (Rizzi 1982, Laka 1990, Haegeman and Zanuttini 1991, Haegeman 1995, Beghelli 1995). However, raising the quantifier derives a wide scope interpretation for the indefinite, not the split scope reading described above (Jacobs 1980, Hendriks 1993, and Rullmann 1995). Geurts (1996) and de Swart (2000) develop analyses in which the negative indefinite is a quantifier over kinds (Geurts) or properties (de Swart) and therefore can raise without receiving a de re interpretation. However, Penka and Zeijstra (2005) point out a problem for any analysis that raises the indefinite, namely the fact that negative indefinites have clausal negative force in idiomatic VPs like (3). The VP *einen Bären aufbinden* 'tie up a bear' in German means to fool someone. The idiom is negated by replacing the indefinite *einen Bären* 'a bear' with its negative indefinite counterpart *keinen Bären* 'no bear'.

(3) Hans hat   mir   keinen Bären aufgebunden.
     Hans has   me   no   bear   tied up
     literal: 'Hans tied me up no bear.'
     idiomatic: 'Hans didn't fool me.'

Moving the negative indefinite *keinen Bären* to the clause edge in (3) would split up the idiom and make the idiomatic reading unavailable (see Koopman and Sportiche 1991). The fact that the idiomatic reading is available in (3) militates against quantifier raising in any form.

Zeijlstra (2011) presents a version of the quantifier raising analysis based on copy theory that puts a copy of the negative quantifier in a wide scope position and differentially deletes the restriction in the wide scope position and the quantifier in the in situ copy from the semantic representation, illustrated in (4a). Craenenbroeck and Temmerman (2017) present an analysis in which the clause-level PolP housing negation immediately dominates the negative indefinite DP in situ, shown in (4b), so that DP is multiply dominated by PolP and VP. This configuration subserves fusion of Pol and D into *no*.

(4) a. [no ~~one~~] I will force you to marry [~~no~~ one]
    b. [PolP not ⎯⎯⎯⎯⎯⎯ [TP I will force you to marry ⎯⎯⎯⎯ [DP any one]]]

Penka (2011, 2012a,b), on the other hand, presents an analysis of negative indefinites that folds them into the negative concord phenomenon, building on Zeijlstra's (2004) analysis of negative concord. In negative concord languages, negative indefinites are interpreted existentially in the scope of clausal negation. In Italian, for example, the negative indefinite *nessuno* 'no one' in object position must occur in the scope of a negative term, here clausal negation *non*.

(5) *(Non) ho   visto   nessuno.
    *(not)   have.1S seen   no one
    'I have seen no one.'

A family of analyses claims that *nessuno* in this context has no negative force of its own, but means 'someone'. However, it bears a feature that requires licensing by a true negative term elsewhere in the structure (Rizzi 1982, Haegeman and Zanuttini 1991, Ladusaw 1992, Haegeman 1995, Zeijlstra 2004, Penka 2011 and others; see Kratzer 2005 for a general analysis of dependent indefiniteness that includes negative concord and multiple-wh constructions). Zeijlstra (2004), for example, claims that nessuno bears an uninterpretable negative feature [uNEG], which requires licensing by an element with the interpretable counterpart [iNEG] under a syntactic Agree relation (Chomsky 1993), clausal negation in (5), as depicted in (6).

(6) Non$_{[iNEG]}$ ho visto nessuno$_{[uNEG]}$

Penka (2011) claims that negative indefinites in English and other non-negative concord languages are also dependent on a higher negative term, which in these languages is covert, represented by the symbol $Op\neg$, as depicted in (7). Penka claims that $Op\neg$ is spelled out as clausal negation when the negative indefinite is itself covert, such as when it has been elided, explaining the presence of negative *n-* in *neither* in (2b), where the verb phrase containing the negative indefinite seen overtly in the antecedent has undergone ellipsis. That is, exactly one member of the Agree relation connecting $Op\neg_{[iNEG]}$ with a [uNEG] indefinite must be overt. On this view, negative indefinites are not negative quantifiers but feature-bearing terms that require licensing by a higher negative element, essentially a kind of negative concord.

(7) $Op\neg_{[iNEG]}$ I saw no one$_{[uNEG]}$

The various analyses of negative indefinites described above each deal with split scope constructions in different ways. With this background, I turn below to the question of whether *few* can fruitfully be analyzed on the model of any of these approaches.

3. *Few* as *Not Many*

Just as the similarity in meaning between (1a) and (1b) suggests that *no one* is interpreted as *not anyone* in some way, the similarity between (8a) and (8b) suggests that these, too, should receive a parallel syntactic/semantic analysis. That is, just as *no* means *not any*, *few* means *not many*.

(8) a. I will force you to read few books for this class.
     b. I will not force you to read many books for this class.

Just as (1a) admits a low scope reading for *no one*, where it means that what I will force you to do is marry no one, (8a) admits a reading where what I will force you to do is read few books. That is, I will prohibit the reading of large numbers of books. However, (8a) admits another reading that expresses the same proposition as (8b), indicating that *few* has a negative component meaning *not* that may scope above the main verb while the other component meaning *many* remains in situ. Klima endorses this equivalence on the basis of the observations in (9). Here, the negation inherent in *few* licenses the parallelism with negative *neither* in the second conjunct (though in the following section I cast doubt on the informativeness of such examples).

(9) a. Few writers accept suggestions, and neither do many publishers.
     b. Little rain fell, and neither did much snow.

Accordingly, several analyses seek to fold the behavior of *few* fully into that of negative indefinites. De Swart (2000), for example, extends her analysis of negative indefinites as quantifiers over properties to all downward entailing quantifiers, including *few*, though, as mentioned above, this analysis faces difficulties with the interpretation of idioms like (3). Alternatively, Solt (2006) claims that *few* means *many* but insertion of *few* is accompanied by an instruction to place a negative operator in "storage", where it stays until a truth value-denoting node is built. Negation is then removed from storage and appended to the truth value-denoting node, yielding the negation of an existential claim without movement of the existential quantifier. This analysis bears a resemblance to Penka's analysis of negative indefinites except for the difference in how the negative word (*no* or *few*) and negation are connected: While negation percolates from the insertion point of *few* to a truth value-denoting node in Solt's analysis, negation is base generated at the truth value-denoting node in Penka's analysis of *no* and licenses the dependent indefinite by virtue of an Agree relation. In the following section, however, I reconsider the question of whether a unified analysis of *no* and *few* is warranted. In fact, the two determiner-like elements display substantial differences in use and interpretation that I claim counterindicate a uniform analysis.

4. Differences between *Few* and Negative Indefinites

Penka (2011, ch. 4, 2012b, §5) considers differences between *few* and negative indefinites and concludes that *few* should not be treated as a kind of negative indefinite, but rather as a degree quantifier. In what follows, I contribute to the empirical picture motivating this conclusion and show how the degree quantifier analysis of *few* explains these differences, lending support to Penka's conclusion.

In Klima's ellipsis examples involving *few* in (9), from which he concludes that *few* is semantically complex like *no*, ellipsis itself has no empirical significance. While negation is external to the elided VP in the second conjunct (in the form of *neither*) so is the putative additional component *many*. Ellipsis does not "split" the components of *few* in these cases, unlike what we see with *no* in (2b). If we construct examples in which ellipsis splits the two putative components of *few*, the results are not nearly as acceptable as the counterpart for *no* in (2b). (10) is quite odd.

(10) ??I will force you to read few books for this class, and neither will Prof. Jones

When giving the first conjunct a split scope construal, the second conjunct in (10) is not fully coherent; it leaves one wondering what it is exactly that Prof. Jones will not do. A sensible interpretation would involve construing the elided VP in the second conjunct as *force you to read many books*, as depicted in (11a). But again, this interpretation is marginal, particularly compared to the fully grammatical counterpart in (11b) in which an antecedent of that form is overtly available.

(11) a.   ??I will force you to read few books for this class,
                    and neither will Prof. Jones ~~force you to read many books~~
        b.   I will not force you to read many books for this class,
                    and neither will Prof. Jones ~~force you to read many books~~

The contrast between *few* in (10)/(11a) and *no* in (2b) is reminiscent of an effect observed by Brasoveanu et al. (2014). They demonstrate experimentally that *few* does not license positive tag questions as readily as *no* and other terms they call "n-words". Tag questions follow a declarative "anchor" and display the reverse polarity of the anchor. The appropriate tag question for the negative sentence in (12a), for example, is the positive tag *did he?*. In Brasoveanu et al.'s experiment, subjects are given a context and an anchor statement and asked to choose for each anchor whether a positive (*did he?*) or negative (*didn't he?*) tag question is most appropriate. They find that the median probability of a positive tag being chosen for an anchor with clausal negation, as in (12a), is a little over 0.8 (on a scale of 0–1), i.e. quite likely, as expected.[1] Negative indefinites in subject position were even better at triggering positive tag questions, at a probability of almost 0.9. The probability of a positive tag being chosen for an anchor with a negative indefinite in object position (12b) was a little over 0.7—still relatively likely, but less so than clausal negation or negative indefinite subjects. In a sense, VP-internal negative indefinites are "less negative" than VP-external negative indefinites, since they pattern less like clausal negation in terms of which tag question they elicit. *Few* in object position, as in (12c), is least negative of all in this sense. The median probability of a positive tag being chosen for an anchor with *few* in object position is about 0.1—very unlikely. Examples (12a)–(12c) are test data from Brasoveanu et al. (2014, 177–178).

(12) a.   The composer did not use the cello in his late period.
        b.   The travel agents visited no Greek islands last summer.
        c.   The managers revised few contracts this month.

That is, people have trouble perceiving the anchor in (12c) with *few* in object position as being negative enough to license a positive tag question. This might mean that part of the difficulty in (10) is that *few* is not negative enough to license the parallel negation in the second conjunct in the form of *neither*. However, subject *few* (or *little*) in (9) licenses it perfectly, in contrast to subject *few*'s poor ability to license positive tag questions, as Brasovveanu et al. report. It appears that positive tag questions fall in the class of 'strong NPIs' in requiring the licenser to be not just downward entailing but also anti-additive. Negation and negative indefinites are both downward entailing and anti-additive while *few* is merely downward entailing and not anti-additive (on which see Krifka 1995, Zwarts 1995 and Giannakidou 2011, among others). The inability of *few* to license positive tag questions appears to

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1   I say "a little over 0.8" because the paper does not cite exact values, but presents them on a graph with grid marks in increments of 0.2 (Brasoveanu et al. 2014, 182). But these contrasts are statistically significant.

be due to its lack of anti-additivity. The problem with (10) appears to be due to *few*'s failure to derive an appropriate antecedent for the ellipsis site, as I describe in section 5.

Another dramatic difference between *few* and negative indefinites is that *few* does not participate in negative concord (Muller 1991, Ladusaw 1992, de Swart and Sag 2002). Recall that the negative indefinite *nessuno* in Italian must be licensed by clause-level negation (or other higher negative quantifier) (5). The Italian counterpart of *few* does not require licensing by a higher negative element, and is not readily compatible with clausal negation, as illustrated in (13).

(13) Fortunatamente, questro farmaco (*non) ha pochi effetti collaterali.
      fortunately,   this   medication (*not) has few   effects collateral
      'Fortunately, this medication as few side effects.'

Few therefore behaves very differently from negative indefinites in negative concord languages, and by extension more generally, since cross-linguistically, negative indefinites may participate in negative concord, but *few* may not. This means that whatever licensing relation obtains between clausal negation and a negative indefinite in negative concord cannot be established with *few*.

The conclusion that *few* cannot be licensed by clausal negation finds a parallel in the fact that its positive counterpart *many* cannot function as a dependent indefinite in languages that admit dependent indefinites. In such languages, a morphological marker may be appended to an existential indefinite noun to signal that it is to be interpreted within the scope of a higher licenser. In Albanian, for example, a numeral may be augmented with the prefix *nga* to signal that a higher plural noun or quantifier distributes over that numeral (Rushiti, 2019). Example (14a), for example, can only be interpreted to mean that the children each built two sand castles. Without *nga* it can be interpreted to mean that the children cooperated in the construction two sand castles total, but *nga* enforces distributivity (Rushiti 2019, 1). However, the quantificational adjective *shumë* 'many' in (14b) cannot bear *nga*. Example (14b) cannot mean that the children each built many sand castles; it is outright ungrammatical (Rushiti 2015, 4).

(14) a. Fëmijët   ndërtuan   nga   dy   kështijella   në   rërë.
        children-the build-AOR   DIST   two   castles   in   sand
        'The children built two sand castles each.'
    b. *Fëmijët   ndërtuan   nga   shumë   kështijella   në   rërë.
        children-the build-AOR   DIST   many   castles   in   sand
        Intended: 'The children built many sand castles each.'

While it is not a foregone conclusion that dependent indefinites bear the same kind of dependency to their licenser as morphologically negative words in negative concord constructions, we find in the behavior of *many* a certain resemblance to the behavior of *few*. The quantity words *many* and *few* both fail to occur in licensing configurations that indefinites participate in cross-linguistically.

These observations militate particularly strongly against applying a feature licensing analysis to *few* on the model of Penka's analysis of negative indefinites. On such a treatment, *few* would be a [uNEG] form of *many*, licensed by a covert c-commanding $Op\neg_{[iNEG]}$. Since this treatment would make *few* fully parallel to the treatment of negative concord, the fact that *few* does not participate in negative concord in languages that have negative concord with morphologically negative indefinites contraindicates such a proposal. While the analyses of Zeiljstra (2011) and Craenenbroeck and Temmerman (2017) do not seek to reduce scope splitting to negative concord, these analyses carry over to *few* "too successfully", since they do not offer any structural obstacles to a derivation of *few* as *not many*

along the lines of *no* as *not any* seen in (4), though again, the facts discussed above contraindicate a parallel analysis. This suggests that *few* warrants a different analysis from negative indefinites. In the following section, I claim that the analysis of *few* as a degree quantifier predicts the behavior seen in the preceding discussion.

5. Few as a Degree Quantifier

In this section, I attempt to show that the analysis of *few* as a degree quantifier (see especially Heim 2006) makes sense of the differences discussed above between *few* and *no*. Building on advances in degree semantics by Cresswell (1976), von Stechow (1984), Heim (1985, 1999), and Rullmann (1995), Heim (2006) claims that *few* denotes the degree quantifier in (15a) (see also Büring 2007, 2009 and Solt 2015). It combines with a degree and a degree predicate and asserts that the degree predicate does not hold to that degree. *Many* is its non-negative counterpart (15b). These quantifiers occur together with a positive operator POS which combines with a degree predicate and asserts that the degree predicate holds of every degree in a contextually supplied "neutral" or "expected" zone L_C. All three terms have the syntactic category DegP for "degree phrase". Note that on this analysis, *few* has a negative component in its meaning, and is a downward entailing operator, but is not morphosyntactically bimorphemic.
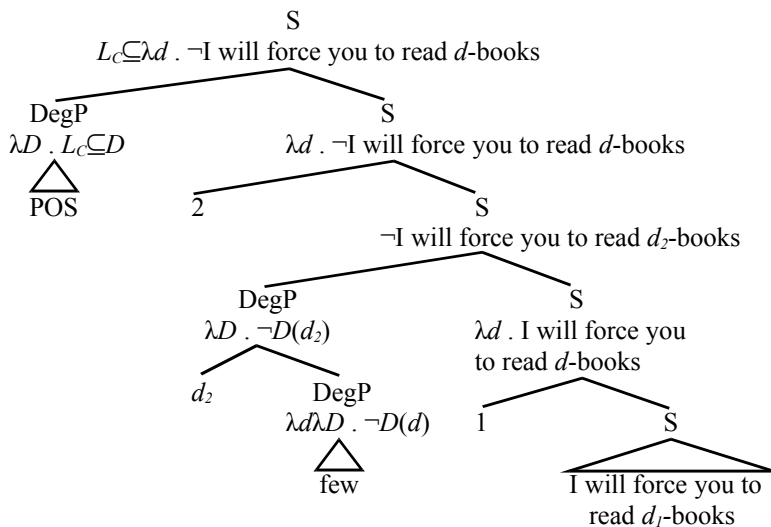
(15) a. $[[\text{few}]] = \lambda d\lambda D . \neg D(d)$
　　　b. $[[\text{many}]] = \lambda d\lambda D . D(d)$
　　　c. $[[\text{POS}]]^C = \lambda D . L_C \subseteq D$

The base structure of example (8a) *I will force you to read few books* is shown in (16), where POS and *few* form a constituent (POS is an adjunct of *few* and will undergo additional movement) that sits in the degree argument slot of *books*, which has a degree argument that measures the number of books; on some accounts this degree argument is provided by plural morphology (Link 1983) and on others it is provided by a covert measure function (Schwarzschild 2006, Solt 2015).

(16)

S
I will force you to read　NP
DegP　　NP
　　　$\lambda d\lambda x$. books(x) & $|x| \geq d$
POS few
books
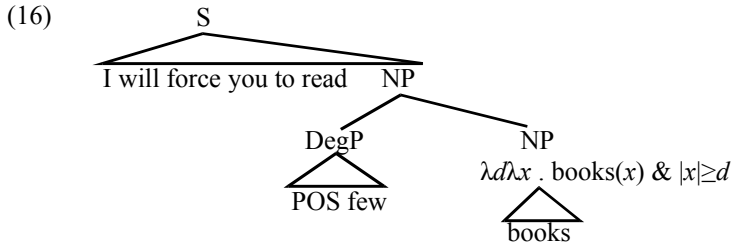
On the split scope reading of (8a), the DegP [POS *few*] moves to the matrix clause edge, leaving a degree denoting trace that saturates the degree argument of *books*. In this step, an abstraction index "1" is inserted that binds the trace of DegP and derives a predicate over that variable (see Heim and Kratzer 1998, ch. 7). In a subsequent step, the DegP headed by POS undergoes additional movement, accompanied by an additional instance of insertion of an abstraction index "2" over its degree-denoting trace within the DegP headed by *few*, resulting in the tree in (17).

(17)

$$S$$
$$L_C \subseteq \lambda d . \neg \text{I will force you to read } d\text{-books}$$

DegP
$\lambda D . L_C \subseteq D$

POS

S
$\lambda d . \neg \text{I will force you to read } d\text{-books}$

2

S
$\neg \text{I will force you to read } d_2\text{-books}$

DegP
$\lambda D . \neg D(d_2)$

d_2

DegP
$\lambda d \lambda D . \neg D(d)$

few

S
$\lambda d . \text{I will force you}$
to read d-books

1

S
I will force you to
read d_1-books

This tree derives the denotation under the topmost "S" node in (17). This formula asserts that the number of books you expected to be forced to read is a subinterval of the set of numbers of books that I will in fact *not* force you to read. You may have expected to be forced to read five, six or seven books, but all these numbers are numbers of books I will not force you to read, nor are any higher numbers due to the monotonicity of degree scales (see Cresswell 1976, Heim 1999). Consequently, any number of books that I will in fact force you to read must be less that the expected number, which is what *few* contributes to the meaning of (8a).

If this analysis is correct, then *few* contains its own negative force—the negative connective "¬" in (15a)—and need not co-occur with a higher negative operator. If negative concord involves feature licensing along the lines of what Penka describes, we do not expect *few* to participate in negative concord in languages like Italian, illustrated in (13), unlike negative indefinites, if we take the latter to be negative-marked existential quantifiers requiring licensing of their negative morphology. I note at this juncture that in some languages, the counterpart of *few* bears a morphological resemblance to other negative items, including negative indefinites (see De Clercq 2017). Such observations, I claim, do not point to the conclusion that *few* is a negative indefinite like *no*. The facts brought up in section 4 militate against this idea. Such observations do open the possibility, though, that *few* is built in the morphosyntax from multiple components, one of which is negation (that is, it is bimorphemic after all). But on the degree quantifier analysis, these components, however defined, never separate in the syntax. That is, split scope constructions do not represent positive evidence for a decompositional account of *few*. As Penka (2011) emphasizes, the degree quantifier analysis accommodates the repertoire of interpretations found for *few* without invoking morphosyntactic decomposition.

The analysis of *few* as a degree quantifier also goes some way toward explaining why examples like (10) are not fully acceptable, where ellipsis struggles to split the putative negative and existential components of *few*, unlike analogous examples with *no* like (2b). If we copy the antecedent VP *force you to read few books* into the ellipsis site in (10), then we copy the negative force of *few* into a context that is already negative by virtue of *neither*, resulting in a double negation that is not a felicitous continuation of the first conjunct. This would mean that Prof. Jones will also not force you read few books, but that is not the same as what I have promised to do in the first conjunct. The analysis of *few* as a degree quantifier therefore predicts there to be a difference between examples like (10) and corresponding examples with a negative indefinite like (2a).

Recall, though, that (10) is not fully ungrammatical, and in Brasoveanu et al.'s experiment described in section 4, they find that anchors with *few* in object position still trigger positive tags more readily than anchors with no negation at all. They behave at least a little bit like clausal negation. If the degree quantifier analysis of *few* is correct, why is (10) merely marginal and not fully ungrammatical?

I suggest that a marginally grammatical structure for (10) can be derived by building a VP in the ellipsis site with *many* in place of *few*. Raising [POS *many*] to a scope position removes it from the ellipsis site, leaving a degree denoting trace in the position corresponding to the trace of [POS *few*] in the antecedent. As a result, the elided VP in (10) is identical to the antecedent VP at LF, as illustrated in (18).

(18) POS 2 [d_2 few] 1 I will [$_{VP}$ force you to read d_1-books] and ...
        neither POS 2 [d_2 many] 1 will prof. Jones [$_{VP}$ force you to read d_1-books]

The portion of the second conjunct beginning with POS will be interpreted to mean that the neutral range L_C is a subset of the set of degrees d such that Prof. Jones will force you to read d books. The negation in *neither* negates that assertion, so that the second conjunct means that L_C is not a subset of the set of degrees d such that Prof. Jones will force you to read d books. If Prof. Jones is going to force you to read three books, then by the downward monotonicity of degree predication, the degrees "one" and "two" are also in the set of degrees such that Prof. Jones is going to force you to read that number of books. (18) asserts that the expected number of books is not in that set; perhaps you expected him to force you to read six or seven books. The second conjunct in (18), then, means that Prof. Jones is not going to force you to read as many books as you might expect, which is appropriate as a continuation of the first conjunct, making (10) acceptable **to the extent it can be given the LF in (18)**.

I suggest that the marginality of (10), then, is due to a conflict in surface identity between the elided VP (which is, on its acceptable reading, *force you to read many books*) and its antecedent (which is *force you to read few books*), and that this conflict is ameliorated by the fact that the two VPs become identical at LF by virtue of raising of the respective degree quantifiers out of VP, leaving in both cases a VP of the form *force you to read d-books*. This convergence of the form of the elided VP and its antecedent at LF salvages a sensible interpretation for (10) and partially abrogates the surface disparity in lexical composition of the two VPs (one has *few* where the other has *many*).

If this explanation for the marginality of (10) is on the right track, then the analysis of *few* as a degree quantifier makes sense of the marginality of *few* in contexts like (10), in contrast to negative indefinites, which are not semantically negative, and its non-participation in licensing relations, specifically negative concord, again in contrast to negative indefinites.

6.   Concluding Remarks

This paper has reviewed differences in the distribution of *few* and *no* and found that scope splitting analyses of *no* should not be extended to *few*. Of various current analyses of *no*, only Penka's (2011) is able to tie the differences between *few* and *no* to the fact that *few* does not participate in negative concord (see Italian (13)) and that its positive counterpart *many* does not function as a dependent indefinite (see Albanian (14)). These observations mean that quantificational adjectives are not able to a bear a morphological feature requiring licensing (for reasons that still need to be investigated). The fact that negative indefinites require licensing on Penka's analysis excludes quantificational adjectives from participating in scope splitting in the same manner. Rather, *few* is a degree quantifier, as Heim (2006), Büring (2007, 2009) Solt (2015) and others claim. The observed differences between *few* and *no* therefore fall out from the analysis of *few* as a degree quantifier with its own negative force and the analysis of *no* as a dependent term requiring licensing by a negative element.

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Predicative and Argumental Demonstratives as Clausal Proforms in Hungarian

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Abstract: The paper investigates Hungarian nominal demonstrative pronouns in contexts where they are associated with some clause. Two related proposals are put forward: (i) the proper analysis is based on a predicate-argument duality, which can be modelled within a nanosyntactic framework with the absence/presence of a Ref(erentiality) Phrase layer; (ii) both usages make use of the deictic meaning component, which is interpreted in terms of prominence in discourse deixis.

Keywords: demonstrative pronouns; deixis; referentiality; predicates; arguments

1. Introduction

Clausal proforms are occurrences of pronouns whereby these elements do not refer to some extralinguistic entity but some aspect or part of the linguistic discourse itself. A very simple example for such a proform is shown in (1), where *azt* 'that' functions as the object argument of *mond* 'say' and refers anaphorically back to the proposition "Kate is smart".

(1) Kati   okos,   mindenki az-t   mondja.
     Kate   smart   everyone that-ACC   says
     "Kate is smart, everyone says that."

This kind of usage is quite common. A more interesting type of clausal proform is shown in the Hungarian example in (2), where the demonstrative pronoun is cataphorically associated with a subordinate clause. [1]

(2) Mindenki   az-t   mondja,   hogy   Kati   okos.
     everyone   that-ACC   says   COMP   Kate   smart
     "Everyone says that Kate is smart." (Lit: Everyone says that$_{dem}$ that$_{comp}$ Kate is smart.")

Such a sentence may either be a wide focus answer to a question like "What's up?" or function (through the proform) as a narrow focus response to a question like "What does everyone say?". Notably, while

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[1] The proforms under discussion are also called "sentential"/"propositional"/"proleptic"/"anticipatory"/ "correlative"/"associate" proforms in the literature. As noted demonstrative pronouns are common in the anaphoric function, but the inner-sentential, cataphoric use seems unique to Hungarian. The neuter personal pronouns *it* in English, *es* in German and *het* in Dutch have comparable uses, see the example below in (i) and Frey, Meinunger and Schwabe (2016), Angelopoulos (2022) and Hinterhölzl (2024) for perspectives on the issue. The present paper mostly confines itself to the discussion of Hungarian, but the conclusion section includes some comments about the cross-linguistic aspects of this issue.

    (i) I regretted (it) that I called Kate an idiot.

all clause-embedding predicates are compatible with anaphoric pronouns like in (1), only a subclass (mostly (but not exclusively) the ones with assertive semantics) allows for wide focus, cataphoric *az*, see Brandtler and Molnár (2016) and footnote 8 below. More on this latter issue in section 3.1.

The accusative case on the demonstrative pronoun comes from *az* 'that' being an object in the sentence. Other cases are also possible, depending on the grammatical function of the proform and the idiosyncratic case-assignment properties of the main predicate. In (3) I show a delative example, which also highlights the fact that by default, the cataphoric use strongly prefers the distal version of the demonstrative. (*Ez-t* 'this-ACC' would also be acceptable in (1)).

(3) a. Kati   okos,   mindenki   {ar-ról   /   er-ről}   beszél.
         Kate   smart   everyone   that-DEL   this-DEL   talks
         "Kate is smart, everyone talks about that/this."

     b. Mindenki   {ar-ról   /   #er-ről}   beszél,   hogy   Kati   okos.
         everyone   that-ACC   this-DEL   talks   COMP   Kate   smart
         "Everyone talks about it that Kate is smart."

The main questions arising in connection with these concern the semantic nature of the proform, its related morphosyntactic and pragmatic/discourse properties and importantly, how the proform is syntactically associated with the proposition itself, realized as a CPs in (2) and (3). My goal in this paper is to provide novel insights for such questions.

Section 2 gives a critical overview of the existing accounts of the cataphoric clausal associate pronoun. As we shall see, there are three stances that one may take concerning the nature of the proforms: they have been regarded as expletives, arguments or predicates. I will argue against the first two approach but deem the third one feasible for the analysis of (2).

In section 3, after briefly laying some essential theoretical foundations with regards the nanosyntactic perspective word-internal syntax, I explicate my proposals. My contribution is twofold. First, I argue that that the clearly argumental, anaphoric use of the demonstrative in (1) and the cataphoric clausal associate use in (2) and (3) can be aligned under the view that the two are different realizations of a single "shrinkable" lexical entry (a nanosyntactic conceptualization), modulo a syntactic layer responsible for referentiality. While the argumental uses in (1) and (3a) have this, in (2) and (3b), where the proform is predicative, such a referential layer is missing. Such a modulation is feasible under the nanosyntactic "superset" principle and is arguably tied to the base-generation site of the proform, whether this is an A- or A'-position (specifically, complement of a theta-assigning head or the specifier of CP). My second proposal is about the predicative version of the proform: even though it is not referential, it is still composed of semantically/pragmatically interpretable material, most importantly a deictic feature, which can be associated with degrees of discourse prominence in Hungarian.

Section 4 concludes the paper and offers some theoretical and empirical research avenues for the future.

2.   On Previous Approaches

As noted, there is not much to say about the syntax of (1) or (3a), where the demonstratives function as a standard object/oblique argument of the main predicate – all existing accounts explicitly or implicitly agree on this. There is much less harmony in the proposals about the clausal associate pronoun in (2) and (3b). In this section I give a brief critical survey of the analyses on offer.

2.1 The Proform as an Expletive

The standard analysis of the Hungarian cataphoric clausal associate proform dates back to Kenesei (1994). The core idea is that the proform of a sentence like (2), repeated here as (4), is a meaningless, dummy element, a grammatical formative – an expletive filler pronoun of the sort that (according to the common view) occurs for instance in the subject position of English extraposition sentences (*it* in 5). In particular, the expletive "represents" the CP in positions that the CP itself for some independent reason cannot occupy, e.g. the preverbal focus position in Hungarian.[2]

(4) Mindenki   az-t   mondja,   hogy   Kati   okos.
     everyone   that-ACC   says   COMP   Kate   smart
     "Everyone says that Kate is smart." (Lit: Everyone says that$_{dem}$ that$_{comp}$ Kate is smart.")

(5) It is obvious that Kate is smart.

While the idea is insightful and influential in the subsequent literature (see e.g. Lipták 1998, Gervain 2004, de Cuba and Ürögdi 2009, Brandtler and Molnár 2016), it is not without problems. The crux of the issue lies in the fact that such an expletive pronoun is not well-suited within the broader context of typological and theoretical literature concerning expletive pronouns.

Expletives by the standard definition are expected to occur only as subjects, but (4) and (3b) feature the proform in object and oblique forms, which makes their expletive status questionable. Admittedly, there are some contested proposals in the literature about object-expletives (see Postal and Pullum 1988 vs. Rothstein 1995 on sentences like (i) in footnote 1) but an oblique, inherently case-marked expletive would be even more marked. Regarding the proform as an expletive is also at odds with the fact that Hungarian is a pro-drop language and such languages are not expected to contain expletives cross-linguistically: as the structural subject-position (also the object-position) can remain empty, there is no need for grammatical slot-fillers in such a language. Related to this, it should be mentioned that *azt* 'that-ACC' in (4) is optional, which is again not expected from an expletive element, functioning as a necessary filler of some structural slot.

Generally, there has been an observable concern about the status of many elements that had been analyzed as syntactic dummies, the trend gravitating towards a more restricted use of expletives as analytical solutions. Haider (2019) for example argues that genuine expletives only occur in SVO languages. Hungarian is a discourse-configurational language with a relatively free word-order, so this criterion does not predict expletives in this language. Haider does allow for the occurrence of "semantically void arguments", but I argue that this demonstrative is neither an argument (it is generated in a non-argument position), nor semantically void (it carries interpretable features like deixis). Further examples of giving content to formatives standardly thought of as expletives include Moro (1997), Tortora (1997) on specific English copular sentences involving *it* and *there* (e.g. [*it/there seems* [$_{CLAUSE}$...]]), Levin and Krejci (2019) on weather-*it* (*it is raining*) and Hinterhölzl (2024) on German clausal associates (see the conclusion section for some comments on this).

2.2 The Proform as a Referential Argument

Some accounts address the issues outlined in the previous section by proposing that the proform in (4) is a thematic argument of the main verb, and the clause itself is only an appositive adjunct. The main proponents of this view are Tóth (2000), Rákosi and Laczkó (2005) and Szűcs (2015). While the issues related to typology and properties of expletives are addressed by this solution, there

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2   The reason may be either phonological (Vogel and Kenesei 1987) or syntactic in nature (É. Kiss 2003).

are a number of problems with granting a full argumental status to the associate type propositional proform. The conceptual problem is that dissociating the proposition expressed by the clause from the main predicate is intuitively wrong, as the relevant predicates semantically subcategorize for propositions. An empirical problem is that the main predicate imposes selectional restrictions on the embedded clause which is unexpected if that CP is only an adjunct in an appositive-like relationship with the proform. In connection with this, Laczkó (2022, 191) also notes that the intonation pattern of these constructions (flat contour, no break) does not support an appositive analysis. As the main predicate imposes morphosyntactic requirements on the embedded clause (e.g. imperative mood on the embedded verb in 6), this is indication of a more direct relationship between the clause and the relevant governing predicates.

(6) | Kati | az-t | kérte, | hogy | mindenki | {*távoz-ik | /távoz-zon}. |
| | everyone | that-ACC | asked.3SG | COMP | everyone | leave-3SG.IND | leave-3SG.IMP |

     "Kate asked that everyone should leave."

2.3 The Proform as a Predicate

Den Dikken (2017) draws a parallel between Moro's (1997) treatment of copular clauses like *it's that she's pregnant* and the structure of (4). According to Moro and den Dikken the proforms *it* and *azt* 'that.ACC', respectively, serve as predicates for the associated complement clauses.

     In my view, such an approach optimally reconciles the conflicts present in the previous accounts. A predicate is a meaningful element, thus the issues concerning the typology and theory of expletives do not arise. In other words, the proform is not referential, but meaningful. At the same time, as in this approach, the whole proform-clause complex serves as an argument of the main predicate, a direct link between the main predicate and the clause may be established.

     Furthermore, the predicate-analysis allows for placing the proform in the class of "verbal modifiers", an established category of Hungarian containing for instance bare nouns (7).[3] All of these have a postverbal base-generation site but since they are all predicative in nature (Hegedűs 2013), they move to a preverbal position (e.g. to Spec-PredP) because the postverbal area in Hungarian is known to be reserved for referential elements (Alberti 1997). This is exactly what happens with the clausal demonstrative under discussion. In support of this analysis, it may be mentioned that just like the bare noun in (7), the proform is preferably singular (even if associated with several clauses).

(7) | Kati | rádió-(*k)-at | hallgat. |
| | Kate | radio-PL-ACC | listens |

     "Kate is listening to the radio ("radio-listening")."

(8) | Kati | az-(*ok)-at | mondja | hogy… |
| | Kate | that-PL-ACC | says | COMP |

     "Kate says that…"

The exact syntactic configuration for the predication is not crucial for the core issue at hand. Den Dikken (2017), in his bottom-up derivational framework places the predicate into Spec-VP and the clause is the complement to this VP, embedded in the CP. More standard approaches place the proform into Spec-CP and the clause is the complement of this CP.

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3   Also: resultative secondary predicates, predicate adjectives/adverbs/particles, idiom chunks. See Hegedűs (2013, 15–16)

In both approaches, the predicate c-commands the subject of predication. Such reversed configurations are not an issue under the assumption that predication is asymmetrical but non-directional, see den Dikken (2006).[4]

2.4 Interim Conclusion

In this section I reviewed the three main approaches to the clausal associate cataphoric proform illustrated in (4) above. We saw that while treating the proform as a dummy expletive pronoun or as a fully referential argument both face challenges, the idea put forward by den Dikken (2017), whereby the demonstrative is a predicate, is a promising path for the analysis.

In the next part of my paper, I am going to explicate my contributions to the pertinent research and discussion on Hungarian clausal proforms.

3.   The Structure and Meaning of Clausal Demonstrative Pronouns

In this section I aim to put forward two main proposals regarding the analysis of clausal demonstrative proforms. Both of these are related to how the cataphoric, predicate proform is related to the clearly argumental, anaphoric use shown earlier in (1). I repeat the relevant examples here as (9) and (10).[5]

(9)   Kati   okos,   mindenki   az-t   mondja.
      Kate   smart   everyone   that-ACC   says
      "Kate is smart, everyone says that."

(10) Mindenki   az-t   mondja,   hogy   Kati   okos.
      everyone   that-ACC   says   COMP   Kate   smart
      "Everyone says that Kate is smart." (Lit: Everyone says that$_{dem}$ that$_{comp}$ Kate is smart.")

My two proposals are the following:

- The predicate-argument duality of the proform can be understood in terms of a nanosyntactic view of pronouns. The proform is a phrasal spellout of a complex internal structure. In the full lexical entry of *az* 'that', on top of the morphosyntactic and semantic layers responsible for core meaning (nominal, number, deixis) and the categorizing DP-layer, there is a separate phrasal level contributing referentiality (RefP). However, in line with the nanosyntactic view of spellout, the full lexical entry can "shrink" and realize just a subset of its content. Accordingly, while the core semantic meaning is constant in the predicative and argumental use of the demonstrative pronoun, the RefP layer is only added if the proform is used as an argument.

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4   An important difference which should be addressed in future research is that den Dikken (2017) makes the verb the "relator" of the structure, the traditional, Spec-CP approach uses the complementizer as such. This may have deeper repercussions for the theory of predication, but the topic exceeds the confines of current paper. I thank Marcel den Dikken (p.c.) for pointing this out to me.

5   It should be noted at this point that with many main predicates, in addition to the nominal proforms in (9) and (10) there is an alternative, the adverbial *úgy* 'so.DIST'. Even though a detailed discussion does not fit this paper, much of what is proposed here is directly applicable to this demonstrative as well. *Úgy* can also be viewed a predicate. However since being a DP is a necessary (but as we will see, not sufficient) condition on argumenthood, the adverbial proform is probably never argumental. The choice between *úgy* and *az* choice is also related to the issue of factivity (factive verbs being incompatible with úgy) and evidentiality (some nonfactive verbs may be interpreted with greater degree of uncertainty towards the associated propositional content). See de Cuba and Ürögdi (2009: 46-47) and den Dikken (2017) for some discussion.

- Even though lacking the RefP layer, the predicative demonstrative proform is not referential, it still contains semantically/pragmatically interpretable features, such as the deictic feature. In the realm of discourse deixis, this is associated with discourse prominence, with effects similarly observable in argumental uses.

3.1 The Internal Structure of Demonstrative Pronouns

Even though several previous accounts have recognized a referential-nonreferential duality in the analysis of clausal proforms (see e.g. de Cuba and Ürögdi 2009, Brandtler and Molnár 2016), they did not consider the relationship between the two usages. I address this issue from the conceptual starting point of Kayne's (2019) anti-homophony principle and thus argue that predicate *az* and argument *az* are not two independent lexical entries, but two related realizations of a single item. In particular, nominal demonstrative exponences are to be seen like (11).

(11)
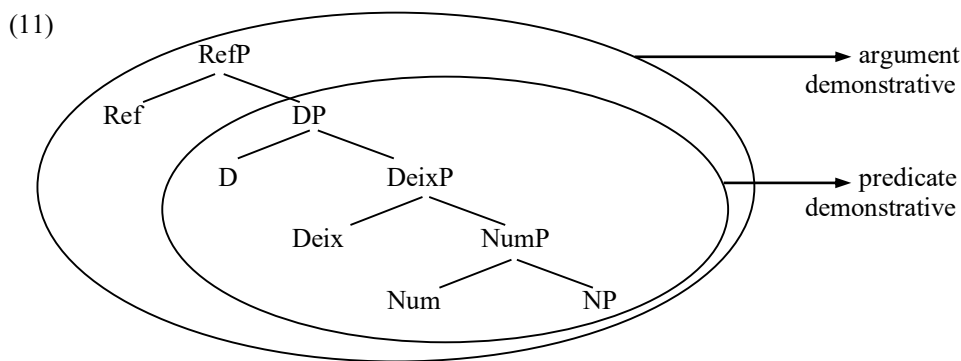
Let us elaborate on the proposal. The theoretical background is *Nanosyntax* (see e.g. Caha 2020 and references therein), whereby vocabulary items realize a set of phrases built by morphosyntactic and semantic atomic features. Vocabulary insertion takes place after the syntactic structure is built ("late insertion") and is governed by the "superset principle", which means that a vocabulary items ("lexical trees") can be used if they are at least big as the structure to be realized ("a lexical entry can spell out any subtree which it contains", Caha 2020). That is, lexical entries do not have to use their full potential, they can "shrink" to realize just a subpart (in other words, as long as they are supersets of the targeted syntactic tree, they are eligible for lexical insertion).

To take a simple example from Caha (2020), the lexical tree for *narrow* includes the verb-related projections (e.g. ProcP, InitP, following Ramchand 2008), on top of the adjectival parts (dir(ection), dim(ension)), which allows it to be used as either of these lexical categories. The full lexically stored tree of *narrow* (12a) is used in the verbal use (13a), and this may "shrink" to the appropriate size when realizing the adjective as in (13b), where the verbal projections are discarded. As a comparison, the lexical tree of *wide* (12b) does not have the verbal projections, so this word can only be used as a verb if the necessary features are carried by some additional morphology, as in (14).

(12) a. $[_{\text{ProcP}} \text{PROC} [_{\text{IntiP}} \text{INIT} [_{\text{PointP}} \text{POINT} [_{\text{NegP}} \text{NEG}^6 [_{\text{DirP}} \text{DIR} [_{\text{DimP}} \text{DIM}]]]]]] \rightarrow$ narrow
    b. $[_{\text{PointP}} \text{POINT} [_{\text{DirP}} \text{DIR} [_{\text{DimP}} \text{DIM}]]] \rightarrow$ wide

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6   The Neg feature represents the inherent „negative" semantics of *narrow*. This can be seen from comparing *How narrow is the street?* with *How wide is the street?*, where the first question entails that the street is not wide, while the second does not entail anything about the size of the street.

(13) a. They will [$_{PROCP}$ narrow] the street.
     b. The street is [$_{POINTP}$ narrow].

(14) a. They will [$_{PROCP}$ [$_{POINTP}$ wide]*(en)$_{PROC}$] the street.
     b. The street is [$_{POINTP}$ wide].

As for the demonstratives under our scrutiny, I follow Dékány (2021, 102) in that they are phrasal realizations of a nominal core (NP), a number feature (NumP), a deictic component (DeixP)[7] and DP-layer that contributes definiteness. The important modification that I utilize is the proposal that "referentiality" should be divorced from both DeixP and DP, and it should be viewed as an independent component on the top of these layers, as a Ref(erentiality) Phrase. As these claims may be somewhat unorthodox, it is is appropriate to provide justification for them. This is what I am going to do below. See also the final section for some more additional comments on RefP.

First, while it may be intuitive to take deixis to entail referentiality, such a view is arguably wrong, conceptually and empirically. Deixis does not necessarily bring about referentiality.

Conceptually, it has been long recognized that a deictic utterance has a "symbolic" or "relational" component as well as an indexical one. While the latter is tied to some referent, the first one is not. For instance, Green (2006) notes that *here* as part of its meaning includes the notion of proximity, which is the symbolic (and thus non-referential) part, while the exact place that is referred to is the indexical component. In a similar vein, Langacker (2002) notes that the temporal deictic expression *yesterday* has an adverbial (hence nonreferential) use (*I arrived yesterday*) and a use where it refers to a "thing" (*yesterday was a good day*).

In addition to such conceptual arguments, one can point to various deictic words/expressions in languages which materialize some deictic gesture or act, without themselves being referential.

(15) a. Lo and behold!   b. Voila! (French)
     c. Ecce! (Latin)   d. Íme! (Hungarian)

As a third ar gument for separating deixis and referentiality, it can be pointed out that demonstrative pronouns do not have to be nominal in character. For example, Hungarian has demonstrative pronouns for virtually every syntactic and semantic category. While the adverbial (16a), adjectival (16b) and quantificational (16c) pronouns obviously have demonstrative semantics, by virtue of their categories, they are not "referential" in the standard sense of the word.

(16) a. így   / úgy   b. ilyen   / olyan
         SO.PROX   SO.DIST   such.PROX   such.DIST
     c. ennyi   / annyi
         this.many   that.many

In conclusion, while deixis can be seen as a way to achieve reference, but it is not reference itself, which motivates for separating the two concepts.

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7   Recently it has been suggested that deixis can be decomposed into proximal, medial and distal layers, see Lander and Haegeman (2018). This is tangential for our purposes. Also not of immediate concern is case-marking, which is an independent process, handled by additional functional heads on top of the nominal sequence, see Caha (2009).

Turning to the categorizing side, being a DP is also often associated with referentiality, see e.g. Longobardi (1994), Déchaine and Wiltschko (2002). But again, this association is unwarranted. As Coppock and Beaver (2015, 381) note, it is a not particularly controversial but often ignored fact that DPs can be predicative:

(17) Kate is [$_{DP}$ the smartest student].

Furthermore, DP demonstrative pronouns specifically are also sometimes claimed to be always referential, e.g. Cheng, Heycock and Zamparelli (2017) argue that "demonstratives, the prototypical case of strong definiteness, do not make good predicates" and point to examples like (18), where the demonstrative pronoun is supposed to be the predicate in the complement small clause of the raising verb *consider*.

(18) I consider John {a/ the / *that / *this} problem.

However, whatever causes the unacceptability of *that* and *this* in (18), it cannot be an inherent incompatibility of demonstratives and predicatehood, given examples like (19) (from Poole 2017, 47) and (20).

(19) Donald thinks that he is a success, but no one else considers him that.

(20) I consider John a problem, but I don't consider him THAT problem.

In conclusion, if neither deixis nor the DP-category guarantees referentiality, it must be the result of some independent process, which can be modelled as a layer in the feature composition of pronouns (I will make some more comments on this in section 4).

Turning now back to the overall point of this section, demonstrative pronouns are argued to have the lexical tree shown in (11). This is fully instantiated in their argumental use, e.g. (9). When they function as predicates, as in (10), they shrink to lack the RefP-layer. The distribution of the two occurrences (argument, predicate) can be correlated with the base-generation sites. Arguments are created as complements of some predicate, which are A-positions. For the predicate version I follow the standard view that it is hosted by Spec-CP. This is an A-bar position, which is arguably incompatible with generating a referential argument there, so the RefP-layer cannot appear, leaving the proform as predicative. I also concur with Brandtler and Molnár (2016) in that spec-CP needs to have some licensing condition, which accounts for the fact that the proform's appearance is tied to the semantics of the main predicate and the semantico-pragmatic function of the embedded clause.[8]

I stress that even without referentiality, the other components of the proform are still active, playing a role in the interpretation. I turn to this issue in the next section.

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8   See Brandtler and Molnár (2016) for details of the licensing. In short, they posit that spec-CP in Hungarian is licensed when the CP is "predicational" (importantly, this concept of theirs is distinct with from being predicative), which is the outcome of assertivity or some other illocutionary force carried by the main predicate or information-structural focussing. Compare (i) with (2).

(i)   Mindenki   {*az-t/AZT}   sajnálja,   hogy   Kati   okos.
       everyone   that-ACC   regrets   COMP   Kate   smart
       "Everyone regrets that Kate is smart." (Lit: Everyone regrets that$_{dem}$ that$_{comp}$ Kate is smart.")

3.2 The Role of the Deictic Feature

It was mentioned in the introduction that while the anaphoric pronoun may be either distal or proximal, the cataphoric clausal associate has a strong tendency towards the distal form. This is reiterated in (21) and (22).

(21) Kati okos, mindenki {az-t / ez-t} mondja.
     Kate smart everyone that-ACC this-ACC says
     "Kate is smart, everyone says that/this."

(22) Mindenki {az-t / #ezt} mondja, hogy Kati okos.
     everyone that-ACC this-ACC says COMP Kate smart
     "Everyone says that Kate is smart." (Lit: Everyone says {that/this}$_{dem}$ that$_{comp}$ Kate is smart.")

The idea presented in the previous section was that even though the demonstratives in (21) and (22) differ in terms of referentiality ((21) containing referential ones and (22) containing nonreferential ones), they both include a deictic feature, which affects their interpretation.

To proceed, it is important to realize that although "deixis" is principally related to spatial positioning, it is generally recognized that this core meaning can be modified and extended as deixis is interpreted in different contexts. For instance, Peeters et al. (2021) describe a conceptual framework where various physical factors (distance, visibility, etc.), psychological factors (psychological distance, attention, etc.) and referent-intrinsic factors (size, animacy, etc.) all have to be taken into consideration when determining the meaning and referent of a given demonstrative pronoun in a given context. Staps and Rooryck (2023) also lay out a theory where semantic features such as deixis can be "recycled" and acquire meanings which may be conceptually related but are distinct from their original content.

I propose that in the context of the proforms now under scrutiny for us, which can be seen as special discourse-deictic uses, the proximal demonstratives are associated with higher discourse prominence and attention directing than distal ones and this results in the given patterns. More specifically, anaphoric entities have a higher degree of discourse prominence which enables them to be referred to with the proximal form in (21), while cataphoric clauses are not prominent enough for this.

In support of this viewpoint, let us see (23). There, the proform is postverbal, which as noted in section 2.3, means that it is referential (Alberti 1997). This also follows from the fact that this verb does not license a predicative proform, see footnote 8. Nevertheless, the discourse-deictic effects remain: the distal form is preferred over the proximal one.

(23) Mindenki sajnálja {az-t / #ezt}, hogy Kati okos.
     everyone regrets that-ACC this-ACC COMP Kate smart
     "Everyone regrets that Kate is smart."

Conversely, even proximal forms may be enabled for cataphoric reference if the cognitive status of the clause pointed at is boosted by contextual means, e.g. by tighter discourse-integration (24) (signalled by *also*) or making the clause fully independent, like an announcement (25). So in my view, the problem with the proximal feature in (22) is not syntactic but discourse-pragmatic in nature.[9]

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9   It an important note that (23) does not have to be anaphoric in the strict sense of the word, it is enough if it is loosely linked to the conversational universe. That is, I argue that (22) and (23) are not analytically different, (23) contains a regular subordinate clause, not an appositive one. (24) on the other hand, contains a referential pronoun.

(24) Én   is   ezt   mondom,   hogy   Kati   okos.
I   also   this-ACC   say.1SG   COMP   Kate   smart
"I also say that Kate is smart."

(25) Én   ezt   mondom: Kati   okos.
I   this-ACC   say.1SG   Kate   smart
"I say this: Kate is smart."

The proposal entails that there is a markedness-relationship between the proximal and distal features and the less marked item (the distal) can be used whenever the more marked (the proximal) can, but not vice versa. This hierarchy of the two features, the proximal being more marked than the distal, have often been claimed in the literature, see for instance Gundel et al. (1993), Strauss (2002) and Cornish (2011, 757). Associating non-referentiality with a smaller degree of prominence also explains why such uses generally gravitate towards distal forms, see this modified version of an earlier predicative example in (26) or the bound variable usage in (27).

(26) #Donald thinks that he is a success, but no one else considers him this.

(27) Every dog thinks that [that/#this] dog is the owner's favorite one.

Thus, the Hungarian pattern can be said to be in line with the general theoretical and empirical stance about principles governing demonstrative forms and reference.

4.   Conclusion and Outlook

In this paper, I argued for two main proposals: (i) there is a predicate-argument duality of Hungarian demonstrative pronouns associated with clauses, which can be modelled within a nanosyntactic framework with the absence/presence of a Ref(erentiality) Phrase layer; (ii) both usages make use of the deictic component, which is interpreted in terms of discourse saliency in discourse deixis.

There are several ways to move forward with this research. First of all, the posited syntactic projection for referentiality should be further substantiated. At this point, it is a motivated theoretical construct: being divorced from deixis and DP-hood, the semantic notion of referentiality should be somehow integrated into syntax and a separate functional layer is certainly in line with nanosyntax's "one feature-one projection" principle. It is also worth mentioning that Coppock and Beaver (2015) argue that all DPs are predicative at the core and they acquire "existential import" some semantic type-shifting operation.[10] From this perspective, the RefP-layer may be seen as a syntactic take of the same persuasion. Altogether, my proposal should be seen as a part of a more general trend of factoring out DP-related functions and meanings into a more nuanced structure and typology, see also Zamparelli (2000), Schwarz (2009) and Hanink (2020) for various aspects of the issue. Nevertheless, the details are to be worked out and perhaps most importantly,

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10   One of my reviewers noted that if the predicative analysis for the proleptic pronoun advocated here proves to be correct, it may be considered somewhat unexpected that most such elements studied so far in the literature are nominal. However, if Coppock and Beaver (2015) are right, there is nothing marked about nominals functioning as predicates. As for other categories, I call attention to footnote 5 above, which mentions an alternative proform, the adverbial *úgy* 'so'. This demonstrative is just as common in Hungarian as the nominal one detailed in this paper and according to É. Kiss (2023), historically predates the nominal form is such a usage. Teptiuk (2020) also discusses manner adverbs in discourse deictic and proleptic functions.

it is some direct empirical (morphological, typological) evidence that would ultimately justify the approach pursued here.

A technical issue that has to be addressed in refinement of the proposed analysis is that the presence of the proform in spec-CP causes seems to inhibit extraction from the clause (originally observed by Tóth 2000). This was used as an argument for treating the proform as a referential argument and the clause an adjunct (island).

(28) Hova$_i$ mondtad   (*az-t),   hogy   elmentél   t$_i$?
     where   said.2SG   that-ACC   comp   went.2SG
     "Where did you say that you had gone?"

There are two paths to explore here. One, den Dikken (2018, 37) does offer an explanation for this phenomenon in terms a connection between agreement between the main verbs and the clause/the proform and the possibility of long-distance dependency formation. Second, my native speaker intuition (which has been corroborated by a handful of other native speakers that I have consulted) is that the degradation in (27) is not as severe as one would expect from a genuine adjunct island (so the *-marking may be inappropriate), but this has to be further investigated.

Besides, one should look into how well the proposed analysis fares with clause-related proforms in other languages, e.g. German (Frey, Meinunger and Schwabe 2016, Hinterhölzl 2024), Dutch (Angelopoulos 2022), or English, see (footnote 1 and also Moro (1997)). Hinterhölzl's (2024) recent paper is of particular interest from the perspective of my proposals, as he argues that *es* 'it' in German sentences like (29) are best analyzed as a weak demonstrative element which plays a role in the contextual anchoring of the utterance.

(29) Maria   hat   (es)   verlangt   dass   Peter   kommt.   (German)
     Mary   has   it   requested.3SG   that   Peter   comes
     "Mary requested (it) that Peter should come."

Even though it is relayed through a different theoretical/technical apparatus, I find Hinterhölzl's (2024) account quite close in spirit to the proposals advocated here. The weak/strong distinction (based on Schwarz 2009) could potentially be mapped to the referential/non-referential contrast advocated here. Furthermore, the fact that the Hungarian proforms in question are visibly demonstratives (unlike the German pronoun *es*) could both a provide valuable perspective for research on the German construction and, through the interpretation of an explicit deictic feature, possibly explain the distributional differences found in the two languages. Working out the theoretical/technical details and carrying out an in-depth comparison of the proposals are not trivial but is definitely worth the effort.

Ultimately, understanding the proper interpretation of deixis and its interaction with other grammaticalizable semantico-pragmatic features (referentiality, familiarity, contextual anchoring, etc.) in various syntactic and pragmatic environments (exophoric and endophoric uses) can provide a deeper understanding of meaning construction in natural language. As deixis is also an extensively researched pragmatic field, the theoretical advances can be assimilated with and refined through experimental work, thereby fostering valuable cross-field synergies.

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Contrastive Uses Reconsidered:
The Case of Hungarian Exophoric Demonstratives

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Abstract: This paper presents the results of an elicitation study that investigated demonstrative selection in Hungarian, in face-to-face conversations restricted to table-top space, in contrastive and non-contrastive situations. Using a puzzle completion task (Shin et al. 2020), the assumption that shared space triggers only proximal demonstratives (Jungbluth 2003) is rejected; relative distance from the speaker is a crucial factor in non-contrastive situations, participants' choice of demonstratives varied depending on the location of the entity being referred to (within easy arm reach, at forced arm reach or beyond reach from the speaker). In contrastive situations, same region and across region contrast were compared. In the former case, distance features of demonstratives become neutral; the distal demonstrative can be used even within easy arm reach, however, in the case of across region contrast, the distal demonstrative retains its distance features; it always refers to the entity that is further away.

Keywords: demonstratives; contrastive; Hungarian; experimental pragmatics

1. Introduction

The question of what factors govern the speaker's choice of a given demonstrative form over other(s) in a particular speech event is an intriguing one. Extensive research on the use of demonstratives in various languages has shown that the traditional approach, where the relative distance of the referent from the speaker is the sole determining factor, offers only a partial description of this complex phenomenon (see, for example, Diessel 2006, 2012, Enfield 2009, Reile et al. 2020, Shin et al. 2020). Recent empirical studies have emphasized the need to explore the role of novel factors that capture the intricate relations between the speaker and the addressee. For example, Jungbluth (2003) called attention to the fact that different types of spatial positioning of the speaker and the addressee (face-to-face, side-by-side, face-to-back) affect demonstrative use in Spanish. Current experimental pragmatic work has also underlined the importance of investigating the interactional and dynamic features of demonstrative selection, where the speaker and the addressee work together to identify the intended referent (for an overview see Peeters and Özyürek 2016), and the communicative success of the conversation depends largely on their ability to coordinate and sustain their attention on a given object (see Diessel 2012, Shaw et al. 2017, Sidnell and Enfield 2017). Overall, contemporary research on demonstrative use focuses on collecting different types of data to investigate the simultaneous relevance of various types of factors (spatial, psychological, intersubjective, referent-intrinsic, etc.).[1] Accordingly, the central question regarding demonstrative selection can be divided into the following subquestions: (i) what factors affect demonstrative selection; (ii) is there a variation between these factors depending on the type of the speech situation; (iii) do individual factors interact with one another in a given speech situation (cf. Peeters and Özyürek 2016).

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1   Peeters et al. (2021) offers a brief overview of recent experimental work in the field.

The study reported here explores exophoric reference in Hungarian, when demonstrative terms are used to identify an entity in the physical context of the speech event. We compare the demonstrative choice of native speakers in contrastive and non-contrastive speech situations, where speakers spontaneously produce demonstrative forms not only to select, but also to compare and contrast two entities in a so-called puzzle completion game (Shin et al. 2020). In the conversations investigated, the interlocutors are located across a table; thus, data collection is restricted to face-to-face conversational settings in table-top space.

2.   Experimental Work: Demonstrative Selection in Hungarian

Traditionally, the choice of exophoric demonstratives in Hungarian, a two-term demonstrative system (*ez/az* 'this/that'), is assumed to be determined by the relative distance of the referent from the speaker (Laczkó 2010). Recent experimental work has challenged this idea. Tóth et al. (2014) investigated demonstrative choice in an online production study where participants had to select the more appropriate demonstrative term in contrastive and non-contrastive speech situations. In contrastive speech situations, demonstratives contrast more than one referent, as in (1):

(1)   *This* one (here) is bigger than *that* one (over there). (Diessel 2012, 2419, italics as in the original)

The results indicated that the factors affecting demonstrative selection were not the same in contrastive and non-contrastive situations: in the former, distal demonstratives were also used to refer to objects that were within arm's reach, i.e., close to the speaker, but in the latter, distal demonstratives were only selected to pick out referents that were further away. In the speech situations investigated, the speaker and the addressee were always located side by side, in a furniture shop scenario.

In a follow-up elicitation study based on the contrastive elicitation tool described by Wilkins (1999), Tóth (2022) collected data from five native speakers of Hungarian in table-top space, where participants referred to two or three entities located on a table in front of the subject and the experimenter. Tóth (2022) concluded that in non-contrastive situations, where the speaker and the addressee were sitting side by side and shared the same perspective of the interactional space, demonstrative selection was determined by the spatial location of the intended referent. In table-top space, there was a proximal region anchored to the speaker and a distal region complementing that, though the demarcation line between these was not clearly marked. In contrastive situations, the findings of Tóth et al. (2014) were confirmed, the distal demonstrative occurred not only when referring to an entity in the distal region, but also when referring to an entity in contrast to another within arm's reach.

In summary, our previous empirical studies (Tóth et al. 2014, Tóth 2022) show that the traditional speaker-based model of relative distance is insufficient to provide a comprehensive description of demonstrative use in contrastive speech situations in Hungarian, when the speaker and the addressee are located side by side and share the same visual perspective of the physical scenario. The aim of the present study is to investigate how speakers select demonstratives when located face to face across a table in contrastive and non-contrastive speech situations.

3.   Experimental Work: Cross-Linguistic Findings
on the Use of Demonstratives

As mentioned before, recent empirical research focuses on the question of how spatial and other, non-spatial factors influence the exophoric use of demonstratives in different speech situations and in different languages. For example, Jungbluth (2003), while investigating spontaneous language use in Spanish, a language with a tripartite demonstrative system, came to the general conclusion that "the distance-oriented system is not a fully adequate account of the use of Spanish demonstratives"

(2003, 18). More specifically, Jungbluth (2003) pointed out that in side-by-side conversational settings, the small or large scale space in front of the interlocutors is carved into three regions that can be characterized by the use of proximal, medial and distal terms, but in face-to-face conversational settings, the pattern of demonstratives is crucially different; in the so called shared space between the interlocutors, only the proximal demonstrative surfaces, i.e., the entire space in between the interlocutors becomes homogeneous and creates a contrast with the space outside the conversational dyad. We will call this the shared space hypothesis. It is important to note that, according to Jungbluth (2003), relative distance from the speaker as a factor is irrelevant in face-to-face settings; within the shared space only proximal demonstratives are used, while entities located outside the shared space are referred to by the distal term. Peeters et al. (2015) conducted two EEG experiments to test the shared space hypothesis for Dutch, a language with a two-term demonstrative system. The findings supported the dyad-oriented approach: participants preferred the proximal form to the distal form when reference was made to entities within the shared space, to entities that were psychologically proximal to the interlocutors. Overall, Peeters et al. (2015) argued that the results favored the inter-actional approach, where the speaker incorporates the position and the attitude of the addressee in his choice of demonstratives.

Shin et al. (2020) also investigated the shared space assumption in Mexican Spanish, and while the findings partially confirmed the interactional approach and emphasized that the speaker and the addressee work together to establish the intended referent, the results did not support the shared space hypothesis. In the elicitation study presented by Shin et al. (2020), participants took part in a puzzle completion task, and they had to answer questions about the location of puzzle pieces. The experimenter and the subject were seated across an 80 cm wide table; the space was divided by a band that was placed 50 cm from the participant. Subjects were not allowed to reach across the band when pointing to certain pieces of the puzzle, and they were not allowed to touch the pieces, either. The experimenter asked questions based on a script, but the respondents reacted spontaneously, i.e., they were not instructed to use demonstrative forms. In 20 sessions 523 demonstratives tokens were identified.

The results showed that the spatial arrangement of the referents influenced the choice of demonstratives; subjects tended to refer to elements beyond the band by the distal[2] demonstrative, but a certain degree of variability was detected. Thus, the shared space assumption was rejected; in face-to-face situations, subjects did not necessarily and exclusively use proximal demonstratives when referring to entities in table-top space. As opposed to this, the findings indicated that distance as a factor was at play, though Shin et al. (2020) pointed out that the boundary between near and far was not sharp, despite the presence of the band. They also noted that "speakers are more likely to construe distal physical spaces as proximal than proximal physical spaces as distal" (Shin et al. 2020, 507).

In terms of intersubjective factors, Shin et al. (2020) observed that the type of interaction also affected the use of demonstratives. In contexts of intersubjective alignment, where the subject confirmed that the experimenter had selected the correct puzzle piece, the use of the distal term was dominant. As opposed to this, in contexts of intersubjective misalignment, when the experimenter (deliberately) pointed to the wrong piece, thereby creating a misunderstanding, the subjects more frequently selected the proximal form. Furthermore, it was also observed that the participants switched from the proximal form to the distal one to signal the establishment of agreement. Overall, the results indicated that the choice of demonstratives in Mexican Spanish was determined not only by the relative distance between the speaker and the referent, but also by intersubjective factors such as intersubjective alignment or misalignment between the interlocutors.

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2   We adopt the terminology used by Shin et al. (2020) in this report: proximal and distal refer to *este/esta* 'this' and *ese/esa* 'this/that', respectively. As opposed to that, Jungbluth (2003) applies the traditional terminology: *este/esta* are proximal, *ese/esa* are medial, and *aquel/aquella* 'that' are distal.

Thus, the shared space hypothesis was supported by Peeters et al. (2015) for Dutch, but it was refuted by Shin et al. (2020) for Mexican Spanish. However, both studies emphasized that interactional factors were crucial to understanding demonstrative choice. The table-top experiments presented above showed that there were several factors that can override physical distance as a factor (for example, intersubjective alignment/misalignment). It was confirmed that physical space itself might be subject to negotiation, and that near and far might be jointly construed and re-assessed by the speaker and the addressee.

4. The Design of the Current Experiment

The aims of the elicitation study presented here were twofold:

    (i) to test whether shared space triggers the use of proximal demonstratives in table-top space in face-to-face interactions in Hungarian;

    (ii) to examine demonstrative selection in contrastive and non-contrastive speech situations in table-top space in face-to-face interactions in Hungarian.

We adopted the method developed by Shin et al. (2020). The elicitation study was conducted within the framework of a puzzle completion task. Participants gave previous consent and thus were aware of being video recorded, but they did not know what the aim of the game was. The participant and the experimenter sat face-to-face across a square table (90×90 cm), and there was an empty 20-piece puzzle board on the table in front of the participant. Before each session the experimenter explained the task, namely, that he would complete the puzzle while asking questions about which piece fitted designated spots in the board. The participant's task was to answer the questions spontaneously. It was also made clear that only the experimenter was allowed to touch the puzzle pieces.

A crucial difference between our design and the one applied by Shin et al. (2020) was that we removed a band that was placed on the table to artificially divide the table into two regions, at 50 cm from the participant. Subjects in the Spanish study were not allowed to reach across this barrier. We conducted a pilot with five participants and found that, despite the specific instructions given before the task, the participants tended to lean over the table and reach across the barrier to point to a particular puzzle piece when they wanted to identify it. The pilot revealed two potentially problematic points of the original design. Firstly, the artificial barrier made the conversation stilted; participants were not able to use manual pointing gestures in a natural, non-constrained manner, and the no-crossing rule was often broken when they reached out to point to or even to touch a certain piece of the puzzle. Secondly, the interactional space proved to be too confined when the width of the table was restricted to 80 cm; by neglecting the barrier and leaning over the surface, the participants were able to reach and manipulate entities too easily even when the pieces in question were located at the edge of the table. Thus, in the actual study we used a 90x90 cm square table for the task itself and we did not impose an artificial barrier on the shared space.

We also observed during the pilot sessions that the participants' choice of demonstratives showed the greatest variation when they referred to entities just beyond the barrier. Shin et al. (2020) also noted that "some participants construed distal pieces adjacent to the barrier as a part of the proximal space" (Shin et al. 2020, 502). Since the pilot study did not provide a sufficient amount of data to examine this pattern more closely, our final design also aimed to carefully monitor the region around the barrier. Thus, in the modified design, table-top space was divided into three regions based on arm reach ranges, but no apparent barriers were placed on the table. The first region included pieces of puzzles that were within easy arm reach of the participant (0–50 cm) and was labelled 'easy reach'. The next region, the one that lay just beyond the barrier in the study of Shin et al. (2020), was called 'forced reach'. The participants were able to reach the pieces in this region (50–60 cm from the participant) only with their arms outstretched if they did not change their body posture. Finally, the third region comprised the

puzzle pieces located beyond the forced reach region, so participants had to make a real effort if they wanted to point at a given piece. This region was called 'beyond reach' (60–90 cm).

Consequently, the pieces of the puzzle were prearranged on the table in a fixed pattern prior to each recording (see Figure 1). Eleven puzzle pieces were placed on the participant's side, in the easy reach region, five pieces were located in the forced reach region, and four puzzle pieces were located in front of the experimenter on the table; these items were beyond reach from the participant's perspective. The experimenter followed a script[3] that included a carefully selected series of questions to elicit demonstrative terms that identify particular puzzle pieces located in different spatial regions, in contrastive and non-contrastive situations. Non-contrastive uses were triggered by a simple question, as in the example:
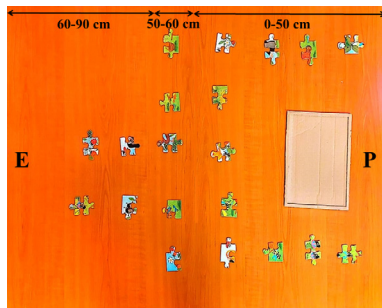
Figure 1. The layout of the game.

(2) E: Melyik   darab-on   van   a   kisvakond   has-a?
         which   piece-SUP   COP.PRS.3SG the   little.mole.NOM belly-POSS.3SG
         "Which piece has the little mole's belly?"
     P: Ez-en.
         this-SUP
         "This one."   P5, 00:28

Contrastive speech situations can be characterized as follows (for details see Tóth el. 2014, 612): contrastiveness involves "a selection of one candidate rather than another from an available set" (Chafe 1994, 77; see also Chafe 1976).

In the case of contrastive uses, the experimenter, while asking a *wh*-question, always referred to and pointed at a piece of the puzzle that did not fit the description, thereby triggering contrastive referring patterns, in which the participant first refers to the wrong piece and then selects and identifies another one. We expected that at least some participants will answer such questions by contrasting two entities as in the example below:

(3) E: Melyik-en   van   a   kapa?   Ez-en?
         which-SUP   COP.PRS.3SG the   hoe.NOM   this-SUP
         "Which piece has the hoe? This one?"
     P: Nem   az-on   van,   hanem   ez-en.
         No   that-SUP   COP.PRS.3SG but   this-SUP
         "Not that one, but this one."   P14, 04:19

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3   See Appendix.

Tóth et al. (2014) investigated a special type of contrastive situation, called 'same region' contrast, where the contrasted entities were located close to the speaker, within arm's reach, i.e. in the same spatial region.[4] In the current study, we investigated same region contrast in two different regions and another subtype of contrastive uses, where referents are positioned in different spatial regions, and we labelled the latter use 'across region' contrast.

Each session was video-recorded and ended when the puzzle was completed. Each session lasted approximately seven minutes. Sixteen native speakers of Hungarian took part in the elicitation study, nine females and seven males. Participants received a small prize at the end of their session.

The video recordings were transcribed and then question-answer pairs that contained at least one occurrence of nominal demonstratives were analyzed. The recorded prompted conversations contained 365 tokens of nominal demonstratives. These were coded along the following variables: (i) type of demonstrative: proximal vs. distal; (ii) location of the puzzle piece: easy reach, forced reach, beyond reach; (iii) type of use: contrastive vs. non-contrastive; (iv) within the contrastive subcategory: type of contrast: same region vs. across region.

The coding procedure is illustrated by the following discourse:

Figure 2. Coding procedure.

(4)　E:　Melyik　　kerül　　　　　　　a　　　　kisvakond　　　mellé?
　　　　　which　　come.PRS.3SG　　　　the　　　little.mole.NOM　　next to
　　　　　"Which comes next to the little mole?"
　　　P:　A　　　　kisvakond　　　mellé,　　　**ez.**
　　　　　the　　　little.mole.NOM　　next to　　　this.NOM
　　　　　"Next to the little mole, this one."　　　　　　　　　　　　　　　P11, 01:19

Here, the participant is referring to a piece located in the easy reach region while pointing at it. The demonstrative term in bold received the labels proximal, easy reach, and non-contrastive. We did not code demonstrative tokens for pointing or touching, as almost all uses of demonstratives were accompanied by a gesture.

5.　Results and Discussion

5.1 Non-contrastive Situations

Table 1 shows the number and relative proportions of the demonstratives produced when referring to entities in different spatial regions in non-contrastive uses. The data was analyzed using chi-square

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4　Margetts (2018, 277) also describes cases where speakers create a contrast between referents that are both located within the 'proximal space' or 'distal space'.

statistics, and there was a significant difference in the selection of demonstratives across different spatial regions ($\chi^2(2) = 60.85$, $p < .05$). Figure 3 shows the proportional distribution of demonstratives across the different spatial regions.

	ez (proximal)	*az* (distal)	Total
easy reach	71 (89%)	9 (11%)	80
forced reach	22 (69%)	10 (31%)	32
beyond reach	8 (19%)	35 (81%)	43
Total	101	54	155

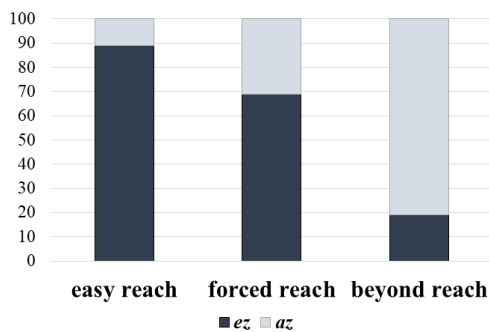**Table 1.** Non-contrastive situations.


Figure 3. Non-contrastive situations.

In non-contrastive situations, in line with the findings of Shin et al. (2020), the hypothesis that shared space triggers only proximal demonstratives is rejected. Relative distance from the speaker proved to be crucial for the choice of demonstratives in table-top space; participants used both proximal and distal terms, and proximals were preferred within easy reach, while distals were selected more frequently when referring to pieces located beyond arm's reach. In the forced reach region (50–60 cm), both terms occurred, but proximal demonstratives were used in a higher proportion. Specifically, at forced arm reach most participants preferred proximal terms, since by stretching their arm they were able to point to the pieces in question, i.e., they were physically able to extend the easy reach region. On the other hand, it is important to note that in order to extend the easy reach region subjects made an effort to point at puzzle pieces, and this fact explains why the forced reach region is not an inherent part of the easy reach region. At the same time, this forced reach region clearly is not part of the beyond reach region; the selection of demonstratives is significantly different, due to the high number of proximals in the forced reach region.[5]

The role of the change in body posture should not be underestimated; there was one subject who consequently leaned forward over the table to be able to reach a particular piece in the beyond reach

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[5] It is an open question whether the relatively high number of proximals detected in the forced reach region might be due to individual variation, since a couple of participants consistently followed this strategy, and extended the easy reach region by pointing with their outstretched arm. Shin et al. (2020) also observed that several subjects showed a fluctuating construal of physical space; in their experiment, pieces located just beyond the barrier were sometimes referred to by the proximal form.

region, and in these cases always selected the proximal form. This is the same strategy that we observed in the forced reach region, and it can be treated as its overextension.[6] This strengthens the general assumption (cf. Margetts 2018, Shin et al. 2020) that subjects are more likely to extend the easy reach region and refer to entities that are further away by proximal terms than the other way round, i.e., the use of distal terms is less likely in the easy reach region in non-contrastive situations.

5.2 Contrastive Situations

Turning to contrastive uses of demonstratives, we first noticed that relatively few participants uttered two demonstratives when creating a contrast (see example (3) above). Instead, in contrastive situations, participants often used only one demonstrative but still managed to invoke a contrast between two entities. We will label this use of demonstrative terms 'implicit' demonstrative pattern, and it is illustrated by (5) below (see also Figure 4).

(5) E: Melyik-en   van   a   talicska?   Az-on?
         which-SUP   COP.PRS.3SG   the   wheelbarrow.NOM   that-SUP
         "Which piece has the wheelbarrow? That one?"

     P: Nem,   ez-en.
         no   [contrasting with entity just mentioned]   this-SUP
         "No, this one."   P9, 06:30

Typically, the experimenter, when pointing at a piece of the puzzle, directed the attention of the participant to a particular object. Next, the participant established a contrast against this entity, but uttered only the demonstrative referring to the novel item. Despite this, the contrast was straightforward and recoverable on various contextual clues; both interlocutors were able to effortlessly identify the intended referent. For instance, Figure 4 shows the situation corresponding to (5), in which the experimenter pointed to a puzzle piece and referred to it with a distal demonstrative (see the left-hand side of Figure 4) and, in turn, Participant 9 (see the right-hand side) used a proximal term to create a contrast with the puzzle piece identified by the experimenter's gesture.

Figure 4. Creating a contrastive situation.
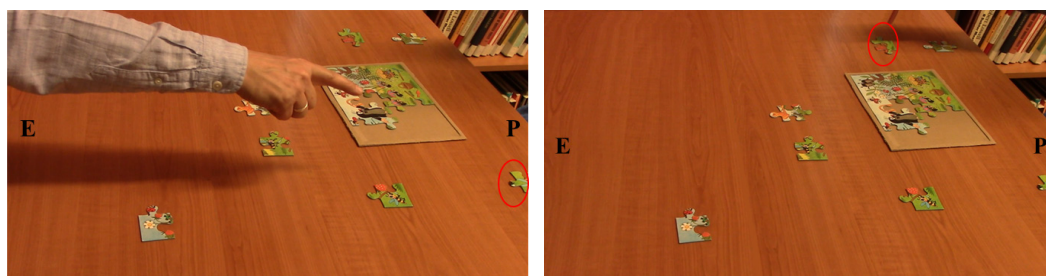
The analysis of implicit patterns is left for future research; in this study we focus on 'explicit' demonstrative patterns, when the speaker uses two demonstratives in one utterance. We distinguished two subtypes of explicit patterns. 'Iterative' patterns accommodate proximal-proximal or distal-distal pairs

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6   These results are in line with previous experimental findings that showed that the proximal region can be extended physically (for example, by the use of pointing tools, cf. Coventry et al. 2008).

of demonstratives.[7] Consider the following excerpt from the conversation between the experimenter and Participant 14 in (6) below:

(6) E: Melyik   kerül   a   sarok-ba?   Az?
       which   come.PRS.3SG   the   corner-ILL   that.NOM
       "Which one comes in the corner? That one?"
    P: Nem   ez,   hanem   ez.
       not   this.NOM   but   this.NOM
       "Not this one, but this one."   P14, 07:40

'Non-iterative' patterns are realized by two different demonstrative terms, proximal-distal or distal-proximal pairs, as in (7) below.

(7) E: Melyik   darab-on   van   a   zöld   hernyó   fej-e?   Az-on?
       which   piece-SUP   COP.PRS.3SG   the   green   worm.NOM   head-POSS.3SG that-SUP
       "Which piece has the green worm's head? That one?"
    P: Nem,   nem   ez-en   van,   hanem   az-on.
       no   not   this-SUP   COP.PRS.3SG   but   that-SUP
       "No, not this one, but that one."   P14, 06:53

Although each type of iterative and non-iterative explicit pattern exemplified above surfaced in the transcripts, the total number of occurrences was still relatively small (see Table 2).

	Item 1	Item 2	iterative	*ez-ez*	*az-az*	non-iterative	*ez-az*	*az-ez*
Same region	easy reach	easy reach		6	0		2	11
	forced reach	forced reach		2	1		1	4
Total				**8**	**1**		**3**	**15**
Across region	easy reach	forced reach		2	1		6	3
	forced reach	easy reach		3	0		1	3
	easy reach	beyond reach		0	3		10	4
Total				**5**	**4**		**17**	**10**

Table 2. Contrastive situations.

We qualitatively analyzed this set of data and coded the observed referring patterns for the type of contrast and for the location of the contrasted entities. The example in (7) and the corresponding picture in Figure 5 illustrate across region contrast, where the first entity is in the easy reach region, and the second is located in the forced reach region from the participant's perspective.

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7   Meira and Terrill (2005) and Cutfield (2018) also describe similar cases in contrastive uses, on the condition that either a manual pointing gesture or touching is present in order to explicitly signal the intended referents.
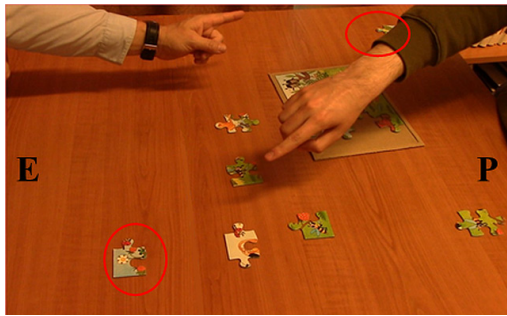
Figure 5. Across region contrast.

When both referents were within the same region, each type of contrastive pattern was detected. A closer look at the data revealed that participants tended to produce iterative *ez-ez* when the entities were arranged on the across axis, i.e., when the referents were located at an equal distance from the speaker. The proximal iterative pattern was also used to refer to entities at forced arm reach, and, in the case of same region contrast, the single observed token of iterative *az-az* was detected in the forced arm reach region.[8]

Same region contrast also often triggered the use of non-iterative patterns in the easy reach area, but only in cases where the actual distance between the intended referents was relatively big. This is illustrated by (8) and Figure 6:

(8) E: Melyik-en   van   a   zöld hernyó   többi rész-e?   Az-on?
         which-SUP   COP.PRS.3SG   the   green worm.NOM   rest-POSS.3SG   that-SUP
         "Which one has the rest of the green worm? That one?"

     P: Nem,   nem   ez-en,   hanem   az-on.
         no   not   this-SUP   but   that-SUP
         "No, not this one, but that one."   P12, 02:24

Figure 6. Same region contrast.

Such uses clearly indicate that in the case of same region contrast, when the referents are not equidistant from the speaker, but still within easy reach, the need to contrast two referents overrides the distance-based selection of demonstratives, since patterns with distal demonstratives occur. These findings corroborate our previous results on the contrastive use of Hungarian demonstratives (Tóth et al. 2014,

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8   The restricted use of iterative *az-az* is probably due to the layout of the game. Since only four pieces of the puzzle were located in the beyond reach region, it was not possible to elicit data on same region contrast.

Tóth 2022), and are in line with Levinson's generalization that "contrastive uses of demonstratives tend to neutralize proximity distinctions" (Levinson 2018, 37).

Across region contrast, where one entity is within easy arm's reach and the other beyond reach, triggers non-iterative patterns; the proximal iterative pattern is totally absent, and *az-az* is not widely used, appearing three times when the first entity is within easy arm's reach and the second one is beyond reach (see (9) and Figure 7).

(9) E: Melyik-en   van   a   kisvakond   orr-a?   Az-on?
         which-SUP   COP.PRS.3SG   the   little.mole. NOM nose-POSS.3SG   that-SUP
         "Which piece has the little mole's nose? That one?"

     P: Nem,   nem   az-on.   Az-on   lesz.
         no   not   that-SUP   that-SUP   COP.FUT.3SG
         "No, not that one. That one."   P3, 01:11

Figure 7. Across region contrast: an iterative pattern.

To return to non-iterative patterns, we observed that serial order is not present in Hungarian (see Levinson 2018 for data on English); both proximal-distal and distal-proximal contrastive pairs are available for speakers. We also noticed that in the case of non-iterative patterns, the distal term always refers to the object that is further away from the speaker. Thus, if a distal demonstrative is used, its relative distance features are preserved even in table-top space (Meira and Terrill 2005, 1145). This observation is also in line with Margetts' insights about the contrastive use of demonstratives in Saliba-Logea: "in non-contrastive use the near-speaker form refers to an object which is near the speaker but in contrastive use it refers to an object which is equidistant or nearer to the speaker than other objects with which it is in contrast. The reverse holds for distal forms" (Margetts 2018, 277).

6. Conclusion

This study reported the results of an experiment that investigated contrastive and non-contrastive uses of exophoric demonstratives in table-top space in Hungarian, where the interlocutors were located face to face. The findings indicate that in non-contrastive settings physical proximity is crucial in Hungarian, and the assumption that shared space triggers the uniform use of proximal terms is rejected. Therefore, our recent empirical investigations of Hungarian demonstrative use (Tóth et al. 2014, Tóth 2022) have provided evidence that relative distance from the speaker is a decisive factor in both face-to-face and side-by-side speech situations. The assumption that table-top space can be divided into three regions has been supported by the observed distribution of demonstratives. The use of the proximal demonstrative dominates the area within easy arm reach. There is an in-between region at forced arm reach, where

speakers make an effort to point to an entity and demonstrative use shows some variation, but the proximal form is still the preferred option. Finally, entities located beyond reach are usually referred to by the distal term.

In contrastive speech situations, two subtypes of contrast were explored: same region vs. across region contrast. Analyzing the spontaneous language use of participants, we observed two types of referring patterns: explicit vs. implicit. In the former case, subjects used two demonstratives to contrast entities and repeated the same form in an iterative pattern when they referred to objects that were equidistant from them, in the same region. When subjects referred to objects that were not at the same distance, but in the same region, they opted for two distinct forms in a non-iterative verbal pattern. In the case of implicit contrastive reference, participants used one demonstrative when they created a contrast with another entity that is recoverable from the wider context.

In line with Levinson (2018), we argued that in the case of same region contrast distance features of demonstratives become neutral; the distal demonstrative can be used even within easy arm reach in a non-iterative pattern; however, in the case of across region contrast, the distal demonstrative retains its distance features, it always refers to the entity that is further away.

In summary, our findings emphasize the need to investigate contrastive and non-contrastive uses within the same physical setting, since the comparison offers new insights on how speakers choose between demonstrative forms.

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Appendix: Script

Condition	Question	Translation
easy reach, non-contrastive	Melyik darabon van a kisvakond hasa?	Which piece has the little mole's belly?
contrastive, across region	Melyiken van a kisvakond orra? Azon?	Which one has the little mole's nose? That one?
easy reach, non-contrastive	És a kisvakond orra mellé mi kerül?	Which piece goes next to the little mole's nose?
beyond reach, non-contrastive	Keressük meg a szarvasbogarakat. Melyiken vannak?	Let's find the beetles! Which ones are they on?
forced reach, non-contrastive	Melyik darabon van a barna kukac?	On which piece is the brown worm?
contrastive, same region	És melyiken van a zöld hernyó többi része? Azon?	And which one has the rest of the green worm? That one?
listing	Melyik darabokon vannak esernyős hangyák?	Which pieces have ants with umbrellas?
beyond reach, non-contrastive	És melyiket tegyem a barna kukac mellé?	And which one should I put next to the brown worm?
easy reach, non-contrastive	És amellé melyik darabot tegyem?	And which piece should I put next to it?
forced reach, non-contrastive	Nézzük a szerszámokat! Melyiken van a kiskosár?	Let's see the tools! Which one has the small basket?
contrastive, same region	És melyiken van a kapa? Ezen?	And which one has the hoe? This one?
easy reach, non-contrastive	Melyiken van a katica feje?	Which one is the ladybird's head?
beyond reach, non-contrastive	És melyik jön ide a lyukba?	And which one goes here in the hole?
listing	És melyik két darabon vannak hangyalábak?	And on which two pieces are the ant legs?
contrastive, across region	És melyik való a kosár mellé? Az?	And which of the two ant legs should go next to the basket? That one?
contrastive, same region	Melyiken van a talicska? Azon?	Which one has the wheelbarrow? That one?
contrastive, across region	Melyiken van a zöld hernyó feje? Ezen?	Which one has the head of the green worm? This one?
easy reach, non-contrastive	És melyik kerül a lyukba?	Which one goes in the hole?
contrastive, same region	Melyik kerül a sarokba? Az?	And which one comes in the corner? That one?
easy reach, non-contrastive	És melyik jön a szélére?	And which piece goes to the edge?
easy reach, non-contrastive	Melyik az utolsó?	And which one is the last one?

A Note on Speech Act Recursion

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Abstract: I present novel observations about iterated questions, i.e. questions about questions, and propose an analysis. The conclusions I argue for are the following: (i) speech acts are represented in the grammar; (ii) speech act recursion is possible but is limited to at most two levels; (ii) declarative questions are questions about an assertion act. I also show that assuming speech acts in the grammar can help systematize some puzzling differences between matrix and embedded sentences with respect to their pronunciation.

Keywords: questions; speech acts; recursion; Performative Hypothesis

1. The Performative Hypothesis

A clear distinction is traditionally made between sentences and speech acts. Sentences are objects constructed by rules of syntax and interpreted by rules of semantics, whereby the interpretation is compositional: the meaning of a complex expression is a function of the meaning of its parts and how these are put together. Speech acts, on the other hand, are events that transpire when a sentence is put to use (Austin 1962; Searle 1969). They involve the sentence, but are not part of the sentence. Let us illustrate. Suppose person A and person B are having the following conversation.

(1)   A: Is it raining?
      B: It is not.

The logical forms of (1)-A and (1)-B are (2a) and (2b), respectively. I will henceforth follow standard practice and use the term "logical form" to refer to the output of syntactic derivation, which is also the input to compositional semantic interpretation.

(2)   a.   [~~WHETHER~~ is [it t_{is} raining]]
      b.   [not [it is ~~raining~~]]

Before we continue, a point about notation must be made. In (2) and in what follows, I will use ~~strike-through~~ to represent materials that are syntactically present, i.e. interpreted, but phonologically absent, i.e. not pronounced. The reason *why* these materials have no sound is not a concern of this paper. I will not discuss, for example, whether the silence of a constituent is lexically determined or has come about by way of PF-deletion in the syntactic derivation. Now, coming back to the discourse in (1), the speech acts performed by A's utterance of (2a) and B's utterance of (2b) are (3a) and (3b), respectively.

(3)   a.   A asks whether it is raining
      b.   B asserts it is not raining

This picture is overwhelmingly intuitive. Distinguishing between sentences and speech acts in this way seems as natural as distinguishing between cars and driving. Nevertheless, the picture is challenged by the so-called "Performative Hypothesis", henceforth PH, which states that speech acts, as we have talked about them sofar, are syntactically represented (cf. Stenius 1967; Ross 1970; Lakoff 1970; Gazdar 1979). According to PH, the logical form of the sentences uttered by A and B in (1) are not (2a) and (2b), but (4a) and (4b).[1]

(4) a. [A ~~ASK~~ [~~WHETHER~~ is [it t_{is} raining]]]
     b. [B ~~ASSERT~~ [it is raining]]

Let us assume that the abstract verbs ~~ASK~~ and ~~ASSERT~~ in (4) have roughly the same meanings as those of overt *ask* and *assert* in (2). As we can see, (4a) and (4b) look like (3a) and (3b), respectively. Under PH, the speech act performed in uttering a sentence is represented in its logical form. What (4a) and (4b) contains is a "performative prefix" indicating the speaker and the speech act. This is "A ~~ASK~~" in (4a) and "B ~~ASSERT~~" in (4b). Note that the verbs ~~ASK~~ and ~~ASSERT~~ do not show tense and agreement. I assume that performative prefixes extend the CP layer but do not introduce any new TP layer, and as T is the locus of tense and agreement, the performative verbs in these prefixes are uninflected (Trinh and Bassi 2023).

If we just reflect on the message conveyed by A and B in (1) as they produce their utterances, we would not be able to adjudicate between (2) and (4). In other words, we would not know whether PH is correct. The message conveyed by A's utterance is that A asks whether it is raining, and the message conveyed by B's utterance is that B asserts it is raining. Whether these messages are derived as literal meanings of the sentences or whether they are derived from pragmatic reasoning on the literal meanings is an empirical question. Someone who argues against having performative prefixes in the syntax on the ground that we do not hear them will, of course, be confronted with the fact that syntax is mostly silent: in addition to brackets and category symbols, which make up a large part of the syntactic tree, we also have traces, null pronouns, indices. These elements are all indispensable for an account of not only the interpretation but also the pronunciation of sentences. In fact, a case can be made that performative prefixes, even though they have no phonemic content themselves, nevertheless have an effect on pronunciation, in the sense that they help us make generalizations about the syntax-phonology mapping. Let us illustrate this point.

Suppose we say that the following facts hold of the mapping from syntax to phonology in English (cf. Katz and Postal 1964; Truckenbrodt 2006; Krifka 2021).

(5) a. ~~ASK~~ selects $C_{[+aff]}$ while other predicates select $C_{[-aff]}$
     b. If X selects CP, X is silent iff the edge of CP is silent

Here is what the terms mean. $C_{[+aff]}$ requires head movement from its complement, while $C_{[-aff]}$ does not. Assuming that syntactic operations take place only when they have to (Chomsky 1995), T moves to C if, and only if, C is [+aff]. The "edge" of an XP consists of its head and its specifier. I will represent silent C as $\varnothing$. Furthermore, I will assume that every selected C in English is silent except overt *that*, which is both [–aff] and non-interrogative in the sense that it cannot be selected by ~~ASK~~, *ask*, or any other question embedding predicate.

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1   I will not recite the arguments for and against PH that have been made in the literature, as that would take us beyond the scope of this note. The reader is referred to Levinson (1983, 243–250) for an overview on this debate.

Now, given (5), we predict the following pronunciation pattern for matrix and embedded questions.

(6) a. ... A̶S̶K̶ [$_{CP}$ W̶H̶E̶T̶H̶E̶R̶ is+$\varnothing_{[+aff]}$ [$_{TP}$ it t_{is} raining]]
    b. *... A̶S̶K̶ [$_{CP}$ whether is+$\varnothing_{[+aff]}$ [$_{TP}$ it t_{is} raining]]
    c. *... ask [$_{CP}$ W̶H̶E̶T̶H̶E̶R̶ $\varnothing_{[-aff]}$ [$_{TP}$ it is raining]]
    d. ... ask [$_{CP}$ whether $\varnothing_{[-aff]}$ [$_{TP}$ it is raining]]

When the embedding verb is the silent performative A̶S̶K̶, i.e. when the question is matrix, the edge of the embedded CP must be silent. This means the specifier must be W̶H̶E̶T̶H̶E̶R̶. Furthermore, C must be [+aff], triggering head movement from TP. Thus, there is subject auxiliary inversion and no overt *whether* in matrix questions. Now, when the embedding verb is some predicate other than the silent performative A̶S̶K̶, the edge of the embedded CP cannot be silent. Take *ask*, for example. As this predicate is overt, the edge of its CP complement must be overt, which means the embedded specifier must be *whether*. Furthermore, C must be [–aff], so T stays in situ. Thus, embedded questions show overt *whether* and no subject auxiliary inversion.

(7) a. Is it raining?   => pronunciation of (6a)
    b. *Whether is it raining?   => pronunciation of (6b)
    c. *John asked it is raining.   => pronunciation of (6c)
    d. John asked whether it is raining.   => pronunciation of (6d)

What about matrix and embedded statements? Given (5), we predict the following pattern for A̶S̶S̶E̶R̶T̶ and *assert*.

(8) a. ... A̶S̶S̶E̶R̶T̶ [$_{CP}$ $\varnothing_{[-aff]}$ [$_{TP}$ it is raining]]
    b. *... A̶S̶S̶E̶R̶T̶ [$_{CP}$ that$_{[-aff]}$ [$_{TP}$ it is raining]]
    c. *... assert [$_{CP}$ $\varnothing_{[-aff]}$ [$_{TP}$ it is raining]]
    d. ... assert [$_{CP}$ that$_{[-aff]}$ [$_{TP}$ it is raining]]
    e. ... assert [$_{CP}$ it $\varnothing_{[-aff]}$ [$_{TP}$ t_{it} is raining]]

When the embedding verb is the silent performative A̶S̶S̶E̶R̶T̶, i.e. when the statement is matrix, the edge of the embedded CP must be silent also. Since there is no underlying specifier, the head of CP must be silent $\varnothing$. Furthermore, it must be [–aff]. This means there is neither overt *that* nor subject auxiliary inversion in matrix statements. This is the scenario in (8a) and (8b). The scenario in (8c–e) is one where the statement is embedded under an overt predicate, e.g. *assert*. In such cases, either C or [Spec,C] must be overt. If C is overt, it is *that*. The overt specifier option is realized by the subject raising from [Spec,T] to [Spec,C] (Pesetsky and Torrego 2001). I assume that whatever derives the Doubly Filled Comp Filter will prevent both C and [Spec,C] to be overt in the case of non-interrogative C. We thus account for the fact that matrix declaratives cannot, while embedded declaratives can but do not have to, have *that*.[2]

(9) a. It is raining.   => pronunciation of (8a)
    b. *That it is raining.   => pronunciation of (8b)
    c. John asserts it is raining.   => pronunciation of (8e)
    d. John asserts that it is raining.   => pronunciation of (8d)

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2   For cases where *that* is obligatory, which I do not discuss here, see Haegeman and Ürögdi (2010). I thank a reviewer for drawing my attention to this point.

We see that with the generalizations in (5), we are able to capture a wide range of seemingly chaotic and unrelated facts. The necessary assumption, of course, is that PH is true. If PH is not true, there would be no ~~ASK~~ or ~~ASSERT~~, which means the pronunciation of the matrix sentences in (7) and (9) would not be accounted for by (5). Now, if speech acts are syntactically represented, the question arises whether speech act recursion is possible, i.e. whether such structures as (10) can be generated.

(10) [A ~~ASK~~ [~~WHETHER~~ [B ~~ASSERT~~ [it is raining]]]]

My answer is yes. Grammar *does* allow stacking of performative prefixes. The next section presents an argument for this claim.

2.   Repetitive and Excursive Questions

Consider the following exchange between A and B. I will use subscripts to indicate the order of utterances made by discourse participants: B_2 is the second utterance made by B, for example.

(11) Utterances
    A_1: Are you married?
    B_1: Am I married?
    A_2: Yes. (That's what I am asking.)
    B_2: I'm single.

Questions such as (11)-B_1, which seems to repeat another preceding question, are quite common in everyday speech. Let us call them "repetitive questions". Now, what does (11)-B_1 mean? Obviously, it does not mean 'whether B is married'. That reading would make what precedes and what follows (11)-B_1 nonsensical, as the reader can easily verify. Let us ask what is going on in all of (11). Intuitively, the following speech act events transpire with each utterance.

(12) Speech acts
    A_1: A asks whether B is married
    B_1: B asks whether A asks whether B is married
    A_2: A asserts A asks whether B is married
    B_2: B asserts B is single

Suppose PH is false, and speech acts are not represented in the grammar, the logical forms associated with the utterances in (11) would be as presented in (13), assuming, non-controversially, that the response particle *yes* stands for the proposition expressed by the positive answer to the preceding polar question. I will subscript pronouns with the name of the people they refer to.

(13) Non-PH logical forms
    A_1: [$_{CP}$ ~~WHETHER~~ are [$_{TP}$ you$_B$ t_{are} married]]
    B_1: [$_{CP}$ ~~WHETHER~~ am [$_{TP}$ I$_B$ t_{am} married]]
    A_2: [$_{TP}$ B is married]
    B_2: [$_{TP}$ I$_B$ am single]

The question then arises as to how (13) and (12) relate. For A_1 and B_2, the story is standard: uttering a questions means asking it and uttering a proposition means asserting it. But what about B_1 and A_2? How do we get (13)-B_1, which expresses the question whether B is married, to convey the message in

(12)-B_1. More dramatically, how do we get (13)-A_2, which expresses the proposition that B is married, to convey the message in (12)-A_2. While I do not rule out the possibility of a "pragmatic theory" which can accomplish these feats, I confess to not being clever enough to form a cogent idea as to what that theory might look like.

Now, suppose that PH is correct, and speech acts are represented in the grammar. Furthermore, suppose that speech act recursion is possible, i.e. that performative prefixes can be stacked. Then nothing prevents us from assigning the utterances in (11) the logical forms in (14).

(14) PH logical forms

A_1: [A̶ A̶S̶K̶ [W̶H̶E̶T̶H̶E̶R̶ are [you$_B$ t_{are} married]]]

B_1: [B̶ A̶S̶K̶ [W̶H̶E̶T̶H̶E̶R̶ [A̶ A̶S̶K̶ [W̶H̶E̶T̶H̶E̶R̶ am [I$_B$ t_{am} married]]]]]

A_2: [A̶ A̶S̶S̶E̶R̶T̶ [A̶ A̶S̶K̶ [W̶H̶E̶T̶H̶E̶R̶ [B is married]]]]

B_2: [B̶ A̶S̶S̶E̶R̶T̶ [I$_B$ am single]]

Relating (14) to (12) will be trivial. As we can see, the logical forms mirror exactly the speech acts which transpire when the utterances are produced. The pragmatic theory needed would be extremely simple: people convey what is expressed by the logical form of the utterances they produce. Repetitive questions, therefore, constitute evidence in favor of PH, and more specifically, in favor of speech act recursion in the grammar.[3]

Another kind of questions turn out to do the same. These are called "excursive questions" in Trinh and Bassi (2023). To illustrate, consider the exchange in (15).

(15) Utterances

A_1: Did John smoke?

B_1: When?

A_2: Last night.

B_2: No. He didn't smoke last night.

Note the utterance in (15)-B_1. The speaker seems to be taking an "excursus" away from the main line of conversation, asking a question about a preceding question. Again, let us ask what does the question mean. Obviously, it does not mean 'when did John smoke'. If it did, the whole conversation would make no sense, as the reader can verify by replacing (15)-B_1 with the question *when did John smoke?*, keeping other sentences intact. What (15)-B_1 and (15)-B_2 mean, intuitively, is (16a) and (16b), respectively.

(16) a. Which time x is such that you are asking whether John smoke at the time x

b. I am asking whether John smoked last night

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3   It was pointed out to me during my talk at Olinco, and by two reviewers of this paper, that what I call "repetitive questions" here are expressed in Czech in form of an embedded polar question. In other words, the Czech counterpart of (11-B_1) would be "whether I am married?". Here is an example, provided by one of the reviewers.

(i) A_1: Odjel Petr do Berlína?

Gloss: left Peter to Berlin

Speech act: A asks B whether Peter left for Berlin

B_1: Jestli Petr odjel do Berlína?

Gloss: whether Petr left to Berlin

Speech act: B asks A whether A asks B whether Peter left for Berlin

While I find this fact extremely interesting, I will leave the task of analyzing it to future work.

If we assume PH, it would be quite straightforward to derive the logical forms which can be assigned to the utterances in (15) to yield the intuitively correct meanings. These are presented in (17).

(17) PH logical forms for (15)[4]

    A_1: [A ~~ASK~~ [~~WHETHER~~ did [John t_{did} smoke]]]

    B_1: [B ~~ASK~~ [when [A ~~ASK~~ [~~WHETHER~~ did [John t_{did} smoke t_{when}]]]]][5]

    A_2: [A ~~ASSERT~~ [A ~~ASK~~ [~~WHETHER~~ did [John t_{did} smoke last night]]]]]

    B_2: [B ~~ASSERT~~ [he$_{John}$ did not smoke last night]]

I do not see how a non-PH analysis could account for the interpretation of (15)-B_1 and (15)-A_2. Note that these data are not exotic. Conversations such as (15) seem quite familiar, and our intuition about what the utterances convey is robust. Excursive questions, therefore, can be considered evidence in favor of PH and, more specifically, in favor of speech act recursion in the grammar.

3. A Constraint on Speech Act Recursion

We have established that speech act recursion is possible. Let us now ask whether it is constrained? The answer I want to defend is yes. Consider the exchange in (18), where the intended readings of the utterances are provided under them.

(18) A_1: Are you married?

         "Are you$_B$ married?"

    B_1: Am I married?

         "Are you$_A$ asking whether I$_B$ am married?"

    A_2: #Are you married?

         "Are you$_B$ asking whether I$_A$ am asking whether you$_B$ are married?"

    B_2: Yes. Am I married?

         "I$_B$ am asking whether you$_A$ are asking whether I$_B$ am married."

    A_3: Yes. That's what I'm asking.

         "I$_A$ am asking whether you$_B$ are married."

    B_3: No. I am single.

         "I$_B$ am single."

We can observe that (18)-A_2, under the indicated interpretation, is deviant. It cannot express the intended reading. If it could, we could imagine the conversation being continued as presented in the gray part of (18). Such a conversation, however, is clearly pathological. Note that it is hard to see what would be the problem with these meanings. If instead of the sentences their paraphrases are used, the conversation might sound clumsy, but it would still be intelligible. This suggests that the logical form which needs to be assigned to (18)-A_2 in order to yield the missing intended reading is excluded by the grammar. What would be this logical form? Presumably, it would be (19), assuming PH is correct. I will henceforth shorten ~~WHETHER~~ to ~~WH~~ when there is lack of space.

(19) *[A ~~ASK~~ [~~WH~~ [B ~~ASK~~ [~~WH~~ [A ~~ASK~~ [~~WH~~ are [you t_{are} married]]]]]]]

---

4   See Trinh and Bassi (2023) for arguments that (17)-B_1 does not violate any locality condition.

5   I assume that *when* means 'which time x is such that' and its trace, t_{when}, means 'at the time x' after application of Fox's (2003) Trace Conversion rule.

Why is (19) not available? Well, what distinguishes (19) from the PH logical forms we have considered so far is the number of stacked performative prefixes that it has. Specifically, (19) contains three levels of performative prefixes, while the other logical forms contain at most two. Let us say that there is a constraint on the number of stacked performative prefixes.

(20) Speech Act Recursion Constraint (SARC)
      Recursion of speech acts is limited to at most two levels

SARC allows (21a) and (21b), but excludes (21c). I will henceforth shorten "performative prefix" to "p-prefix". S stands for a sentence without p-prefixes.

(21) a.   p-prefix S
      b.   p-prefix ... p-prefix S
      c.   *p-prefix ... p-prefix ... p-prefix S

The logical form in (19) exemplifies (21c), which is excluded by SARC. For this reason, the reading that would result from it is unavailable for the relevant sentence. The logical forms assigned to (11) and (15), in contrast, exemplify either (21a) or (21b), which are not excluded.

Does SARC hold for excursive questions also? It seems the answer is yes. Consider the conversation in (22).

(22) A$_1$: Did John smoke?
            "Did John smoke?"
      B$_1$: When?
            "Which time x is such that you$_A$ are asking whether John smoked at the time x?"
      A$_2$: # Where?
            "Which place y is such that you$_B$ are asking which time x is such that I$_A$ am asking whether John smoked at the time x at the place y?"
      B$_2$: At Mary's place.
            "Which time x is such that you$_A$ are asking whether John smoked at the time x at Mary's place."
      A$_3$: Last night.
            "Did John smoke last night at Mary's place?"
      B$_3$: No. He didn't smoke last night at Mary's place.
            "John did not smoke last night at Mary's place."

A situation similar to (18) obtains. We observe that (22)-A$_2$ is deviant under the intended reading. If that reading were possible, we could imagine the conversation being continued as in the gray part of (22). But such a conversation is clearly pathological. Again, it is hard to see what the problem would be with the meanings, as the paraphrases are all intelligible. This suggests that the logical form that would yield the unavailable intended reading for (22)-A is excluded by the grammar. That logical form is (23).

(23)   * [A ASK [where [B ASK [when [A ASK [WHETHER did [John t_{did} smoke t_{when} t_{where}]]]]]]][6]

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6   I assume that *where* means 'which place x is such that' and its trace, t_{where}, means 'at the place x' after application of Fox's (2003) Trace Conversion rule. See note 5.

As we can see, (23) violates SARC: it has three layers of p-prefixes. The fact that the reading it would yield is unavailable, therefore, constitutes evidence in favor of SARC.

4. Declarative Questions

Repetitive and excursive questions have something in common: they are questions about a question. We can call them "iterated". SARC explains why iterated questions cannot be iterated. Because iterated questions already contain two levels of p-prefixes, iterating them would add another level, which is not possible, given SARC. But what explains SARC? I cannot answer this question yet, and will make no attempt to do that in this note. However, I will argue that SARC is in fact not as ad hoc as it seems to the reader up to this point.

The argument pertains to what is sometimes called "declarative questions". These are polar questions which exhibit declarative word order, i.e. which shows no subject auxiliary inversion, as exemplified by (24)-B_1.

(24) A_1: John is looking for a vegetarian restaurant.
    B_1: John is vegetarian?
    A_2: No he's not. But his wife is.

Here is a curious fact about declarative questions: they cannot be iterated! Compare the two exchanges in (25) and (26).

(25) A_1:   John is looking for a vegetarian restaurant.
    B_1:   Is John vegetarian?
    A_2:   Is he vegetarian?
    B_2:   Yes. That's what I asked.
    A_3:   No he's not. But his wife is.

(26) A_1:   John is looking for a vegetarian restaurant.
    B_1:   John is vegetarian?
    A_2: # He is vegetarian?
    B_2:   Yes. That's what I asked.
    A_3:   No he's not. But his wife is.

As we can see, it is quite natural to iterate (25)-B_1, which is a "regular" question, i.e. one which exhibits subject auxiliary inversion. However, when the same question is formulated in form of a declarative question, iteration is extremely odd, as evidenced by (26)-A_2. Note that it is hard to see what "pragmatic" differences there are between the two contexts (25) and (26) which can be responsible for this clear contrast in acceptability. So what can be the reason?

I hypothesize that SARC is the reason. This hypothesis, however, requires an assumption which is based on an intuition underlying several analyses of declarative questions. The intuition is that these questions ask not whether the prejacent is true, but whether the addressee is committed to the truth of the prejacent (Gunlogson 2002, 2003; Trinh and Crnic 2011; Krifka 2017).

(27) A_1: John is looking for a vegetarian restaurant.
    B_1: John is vegetarian?
        ≈ "Are you saying John is vegetarian"?

Given PH, it is quite straightforward to capture this intuition: we can assign (27)-B$_1$ the logical form in (28).

(28) [B ~~ASK~~ [~~WHETHER~~ [A ~~ASSERT~~ [John is vegetarian]]]]

This analysis accounts for two facts about declarative questions which so far have remained totally unrelated. First, it accounts for the fact that these questions cannot be iterated. They already contain two levels of speech act recursion. Iterating them would add another level, violating SARC. Thus, the logical form of the deviant (26)-A$_2$ would be (29), which contains three levels of speech act recursion.

(29) *[A ~~ASK~~ [~~WH~~ [B ~~ASK~~ [~~WH~~ [A ~~ASSERT~~ [John is vegetarian]]]]]]

The other fact about declarative questions that we account for is that they show declarative word order. Recall that only ~~ASK~~ selects C$_{[+aff]}$. Other predicates, including ~~ASSERT~~, select C$_{[-aff]}$. The full structure of (28) is given in (30).

(30) [B ~~ASK~~ [$_{CP}$ ~~WH ASSERT~~+$\varnothing_{[+aff]}$ [A t_{ASSERT} [$_{CP}$ $\varnothing_{[-aff]}$ [$_{TP}$ John is veg.]]]]]]]]

As we can see, the C head under ~~ASSERT~~ is $\varnothing_{[-aff]}$, which does not trigger head movement from its complement. The C head under ~~ASK~~ is $\varnothing_{[+aff]}$, which does trigger head movement from its complement. Consequently, ~~ASSERT~~ raises, adjoining to $\varnothing_{[+aff]}$. However, this operation has no phonological consequence, as ~~ASSERT~~ is silent. The end result is a sentence whose word order is identical to that of a declarative.

My account, as it were, predicts that declarative questions cannot be questioned. However, it does not say we cannot react to a declarative question as if it had been a normal polar question. It is not uncommon to "reanalyze" some preceding utterances in order to continue the discourse the way we want to. Consider (31).

(31) A: Have you stopped smoking?
      B: I have never smoked.

Semantically, B's utterance does not answer A's question but another one, namely *have you ever smoked?*. Now consider the exchange in (32).

(32) A$_1$: John is looking for a vegetarian restaurant.
      B$_1$: John is vegetarian?
      A$_2$: Is John vegetarian?
      B$_2$: Yes. That's what I asked.
      A$_3$: No he's not. But his wife is.

My intuition, and also that of English speakers I have consulted, is that (32)-A$_2$ is much better than (26)-A$_2$. What happens in (32), I propose, is that A reacts to B's declarative question as if it is the question *is John vegetarian?*. Note that (32) feels almost as smooth as (26). This, I believe, is due to the closeness in pragmatic meaning between a declarative question and its non-declarative counterpart.[7]

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7   A reviewer pointed out to me that in Czech, a declarative question can be "questioned" by an embedded *whether*-question. Given that repetitive questions are formulated as embedded *whether*-questions in Czech (see note 3), this fact would fall under the phenomenon I am describing here: the speaker reacts to a declarative question as if it had been a non-declarative polar question.

5.   Conclusion and Future Research

I have argued in favor of the Performative Hypothesis which states that speech acts are represented in the grammar. The argument is based on observations about iterated questions, more specifically repetitive, excursive, and declarative questions. A constraint on speech act recursion, SARC, is defended which states that speech act recursion is limited to at most two levels.

Issues remain for future research. One pertains to the following data point.

(33) A_1: Did John smoke?

   B_1: When?

   A_2: When?

   "Are you$_B$ asking which time x is such that I$_A$ am asking whether John smoked at the time x?"

   B_2: Yes. When?

   A_3: Yesterday.

   B_3: No. He did not smoke yesterday.

The question in (33)-A_2, spoken with the so-called "incredulity" contour, seems acceptable under the indicated reading. But note that this reading, assuming PH, would require the logical form in (34), which contains three levels of speech act recursion.

(34) [A ASK [WH [B ASK [when [A ASK [WH did [John t_{did} smoke t_{when}]]]]]]]

The question here is, then, what distinguishes (33)-A_2 from (18)-A_2 on the one hand and from (22)-A_2 on the other. The pattern we find is (35).

(35) a.   *~~WHETHER~~ ... ~~WHETHER~~ ... ~~WHETHER~~ S   (18)-A_2

   b.   *where ... ~~when~~ ... ~~WHETHER~~ S   (22)-A_2

   c.   ~~WHETHER~~ ... when ... ~~WHETHER~~ S   (31)-A_2

This means SARC is not the end of the story. It has to be refined or replaced.

Another issue, of course, is how to derive SARC. Syntax does not count. A constraint on the number of embedding levels, therefore, seems very counterintuitive. One possible explanation for the limit imposed by SARC is that what we have been calling "levels of speech act recursion" actually involve ontologically different objects. Specifically, the first level, i.e. that which is right above TP, seems to be "grammatical", in the sense that it is really present in the syntactic tree. This is the level that has syntactic and morphological reflexes which are often detectable in the auditory signal. The level above that is, perhaps, one of genuine speech act. It describes how the sentence is used, but is really not part of the syntactic representation. There is then no third level, because we can use a sentence but we cannot use the use of a sentence. It remains, of course, to work out and develop this vague idea.

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Part III.

Explorations in Language Acquisition and Processing

Word-Stress and the Minimal Word Constraint in English

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Abstract: This paper aims to demonstrate that the minimal word constraint and the assignment of word-stress in English can be captured by the same machinery within the framework of strict CV-phonology.[1] In order to be able to grasp the parallel between the minimal word constraint and the principle that governs the assignment of English word-stress, we have to part with some of the credos of standard strict CV phonology. In particular, two tenets of standard strict CV-phonologies must be revised. On the one hand, (contrary to mainstream assumptions) I wish to argue for bidirectional government in Phonology, while on the other I wish to argue that both empty and contentful skeletal positions can serve as the target of government. The latter amendment leads us to the conclusion that vowel reduction and the effect of traditional proper government are but two different sides of the same coin: manifestations of absolute and relative silence in phonology. The discussion has important repercussions for English stress assignment, which is a novel contribution to the theory of Csides (2008).

Keywords: government; CV-phonology; empty vocalic position; minimal CV-foot; relative silence

Introduction:

In standard strict CV phonology unidirectional theories have been promoted in the vast majority of analyses. For Lowenstamm (1996), Scheer (2004), Szigetvári (1999) – among others – government is strictly right-to-left, while for Rowicka (1999) it is left-to-right. One of my goals is to demonstrate that government goes in both directions but in a principled manner, following a strict logical order. Moreover, I claim that government is primarily left-to-right, and that right-to-left government must be licensed or takes place only as a last resort. This can only be achieved, however, if we also quit the view that government can target only empty vocalic positions.

By amending these two traditional tenets of standard strict CV phonology, we can easily capture the parallel between vowel-reduction and vowel-zero alternation (syncope). I will attempt to demonstrate that vowel-reduction and static/dynamic silence are but two different sides of the same coin, manifestations of relative and absolute silence in the phonological string. The analysis presented below is novel, in as much as it provides a clear link between segmental and suprasegmental issues without recourse to a separate "metrical phonology". The system proposed in this paper also gives a straightforward explanation for the absence of foot-initial consonant lenition and the absence of syncope before a stressed vowel.

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1   Strict CV Phonology was initiated by Lowenstamm (1996) and was further developed by Rowicka (1999), Dienes and Szigetvári (1999), Szigetvári (1999, 2000, 2007), Csides (2002, 2008), Ségéral and Scheer (1999), Scheer (1998, 2004), Scheerand Szigetvári (2005) among others. It must be emphasised that Strict CV phonology is a radical offspring of Standard Government Phonology (GP), initiated originally by Kaye, Lowenstamm and Vergnaud (1985, 1990), Kaye (1990), Charette (1990, 1991), Harris (1990) among others. It was further developed and applied to a massive number of languages in various books, articles by – among others – Harris (1990, 1992, 1994, 1997), Harris and Gussmann (1998), Brockhaus (1995), Cyran (2003), Gussmann (2002).

In order to be able to capture the essence of word-stress assignment in English, we will introduce the notions of sub-minimal, minimal and optimal CV-feet. The structural properties of CV-feet are, of course, different from those of traditional phonological feet. Nevertheless, the introduction of the concept of CV-feet also allows us to draw a parallel between traditional trochaic feet on the one hand and long vowels and diphthongs on the other. As a result of the analysis, we will arrive at the conclusion that contrary to mainstream assumptions, only two degrees of prominence can be distinguished in the analysis of English word stress. Stressed and unstressed syllables are distributed along the skeleton, the latter being accompanied by vowel reduction. The difference between primary and secondary stress follows directly from the ranking of different types of CV-feet. Syllables that have been regarded as strong unstressed syllables[2] will also be viewed as stressed ones in the present framework. This view is supported by interesting pieces of phonological evidence also advocated by, for example, Szigetvári (2020).

To sum up, the ultimate goal of the present paper is to show how certain segmental and supra-segmental processes can be dealt with in a unified manner. The proposal will hopefully shed light on how stress related issues can be accounted for in terms of lateral structural relationships in a non-arboreal phonological framework.

1. Farewell to Strict-Directionality

In Csides (2008) I put forward a number of arguments supporting the view that the unidirectionality credo of Government Phonology (GP) is untenable. One major argument was that since final empty nuclei/vocalic positions must be parametrically licensed while internal ones must be properly governed, empty nuclei/vocalic positions must be catered for by two distinct, unrelated procedures. Furthermore, since syncope never takes place in the first syllable/CV unit of the word, the syncope site must be preceded by a nucleus/vocalic position. It is even more intriguing that – as Szigetvári (2007, 2020) also demonstrates – syncope never takes place foot-initially but only footinternally. These observations prompted the hypothesis that government in phonology – as Rowicka (1999) suggests – is primarily left-to right but as opposed to Rowicka (1999), Csides (2008) also suggests that the target of government can be both an empty and a contentful vocalic position, and the result is either relative silence (vowel reduction) or absolute silence (syncope/static emptiness).

2. Absolute and Relative Silence in Phonology

In Strict CV-Phonology the skeleton consists of strictly alternating consonantal (C) and vocalic (V) positions and heavy versus light syllables are represented in the way shown in figure (1) below.

(1)   Heavy and light syllables in strict CV-phonology

    a. light syllable   b. heavy syllable   c. heavy syllable

                              type I[3]   type II

        C   V   C   V   C   V   C   V   C   V

        | | | | | | | |

        α   β   α   β   γ   α   β   γ

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2   The term 'strong unstressed' is used, for example by Nádasdy (2006) for syllables hosting a full (unreduced) vowel. Here belong all posttonic syllables that have a full vowel and all pretonic syllables that are not secondary stressed. A typical example of the latter is the pretonic closed syllable, which frequently resist vowel-reduction, like the first syllable of *activity*.

3   This representation is correct only if the 'syllable' is occupied by a diphthong. In the case of long vowels β should be linked to both vocalic positions as in the representation of the long /iː/ in *arena* in (2c). I have omitted the representation of a heavy 'syllable' containing a long vowel in order to save space.

As it appears from the representations in (1) above, light syllables consist of one, whereas heavy syllables consist of two CV pairs. A strictly alternating CV-skeleton also allows for some useful generalisations in English stress assignment. Consider the representations in (2) below.

(2) Stress assignment in English

a.

```
C   V   C   V   C   V   C   V
|   |   |   |   |   |   |   |
A   m   e   r   i   c   a
```

b.

```
C   V   C   V   C   V   C   V
|   |   |   |       |   |
a   g   e   n       d   a
```

c.

```
C   V   C   V   C   V   C   V
|   |   |        ⎣   |   |
a   r   e            n   a
```

It is striking that stress falls on the antepenultimate vocalic position in all the three items in (2) above. It is worthy of note that while in non-strict CV frameworks the location of stress could be expressed only by a disjunctive statement, the same facts can be captured here by a non-disjunctive generalisation.

In the early versions of Strict-CV Phonology, government is a structural relationship that exists between vocalic positions. In these theories a contentful vocalic position governs mostly the preceding empty vocalic position right-to-left, an idea that originates in the concept of proper government of standard Government Phonology (GP). According to Rowicka (1999), the same kind of relationship takes the opposite direction, i.e., government is a left-to-right relationship, where the governor is situated to the left of the governee. The target of government in these early versions of the theory is always an empty vocalic position and the governor is a contentful vocalic position. Besides government, another structural relationship, namely licensing is posited, which is supposed to keep skeletal positions together. Licensing capacity is a property of ungoverned contentful vocalic positions, and they license the preceding consonantal position. Licensing will not be discussed further in this paper, since it has no relevance to the points argued for in our theoretical framework.

The original idea of proper government was extended to V-to-C government by Ségéral and Scheer (1999), i.e., they proposed that the target of government can also be a consonantal position under certain circumstances. The greatest theoretical achievement of Ségéral and Scheer (1999) is that they are able to unify the effects of proper government as a force applying to both vocalic and consonantal positions. However, Szigetvári (1999) points out that despite its achievements, the theory of "Coda Mirror"[4] predicts lenition in both foot-initial and foot-internal intervocalic positions. However, it is by now a phonological commonplace that foot-internal intervocalic positions are much more favoured lenition sites than foot-initial ones in the vast majority of languages including English.[5] In order to express this fact, Szigetvári (1999,79) introduced the "Antipenetration Constraint" given in (3) below.

(3)   Antipenetration Constraint
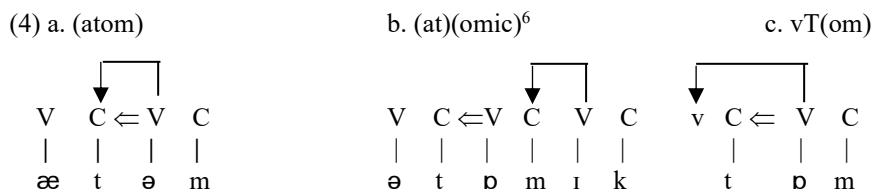   Government cannot penetrate a stress domain.

Notice that since Dienes and Szigetvári (1999) – henceforth D&S (1999) – repartition the skeleton into VC units, a stress domain – in their theory – begins with a stressed vowel and extends up to the

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4   This is the title of Ségéral and Scheer (1999) and also of the theory contained therein.

5   This does not entail that there are no examples of foot-initial lenition in languages other than English.

next stressed vowel, where the term *stressed* includes all degrees of stress. The constraint is essentially designed to account for the lack of pretonic syncope and foot-initial lenition in English and precludes stressed vowels from being able to govern from right-to-left into a preceding stress-domain.

However, since all types of government are right-to-left in D&S (1999), they could have also claimed that stressed vowels are unable to govern. They do not, however, make such a strong claim, probably because it would – in their framework – cause a problem for initial edge-marking empty vocalic positions, introduced by Lowenstamm (1999). More precisely, an initial empty vocalic position followed by a contentful consonantal position does not constitute a stress-domain in D&S (1999) and may therefore be silenced by a following stressed vocalic position. In order to illustrate the problem, consider the representations in (4) below.

(4) a. (atom)　　　　　　　　b. (at)(omic)[6]　　　　　　c. vT(om)

```
 V   C ⇐ V   C          V   C ⇐V   C   V   C       v   C ⇐   V   C
 |   |   |   |          |   |   |   |   |   |       |       |   |
 æ   t   ə   m          ə   t   ɒ   m   ɪ   k       t       ɒ   m
```

D&S (1999), following Ségéral and Scheer (1999), assume that in words like *atom* (4a), the contentful vocalic position governs the preceding consonantal position since government cannot land on a contentful vocalic position in their framework. Recall that it was the main achievement of "Coda Mirror" to unify the effects of proper government by claiming that it may hit both consonantal and vocalic positions. More precisely, proper government emanating from a vocalic position always tries first to govern the preceding empty vocalic position, as in (5a), below. If no empty vocalic position is available, as in (5b), government is deflected onto the intervening consonantal position.

(5)

```
a.      V        C ⇐  V              b.      V        C ⇐  V
                 |    |                               |    |    |
                 α    β                               α    β    γ
```

Since "Coda Mirror" does not take higher prosodic domains into consideration, it predicts consonant lenition both in foot-internal and foot-initial onsets, a prediction prompting a reaction of D&S (1999) in the form of a constraint in (3) above. The constraint allows proper government to take place foot-internally in the latter framework. Furthermore, it is evident from (4b) that the stressed vocalic position of *atómic* may govern neither the preceding vocalic nor the preceding consonantal position, since in order to be able to do so it would have to break into a preceding a stress domain. Proper government and thus silencing of the initial edge marking empty vocalic position is possible

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6　The kind of bracketing in the representations of (4) is the result of the theory of Szigetvári (1999), where he repartitions the skeleton into VC units. The brackets are supposed to indicate stress domains, where a stress domain begins with a stressed vocalic position and extends up to the next stressed vocalic position. This, however, is quite problematic in the case of (4b), where the first pair of brackets surrounding (at) does not enclose a stressed vowel. It must be regarded as a stress domain, however, otherwise the stressed vocalic position dominating /ɒ/ would be able to govern the preceding consonantal position containing /t/ hence wrongly predicting lenition (tapping) therein.

in (4c) since – as noted above – the initial empty vocalic position followed by a consonantal position does not qualify as a stress domain in D&S (1999). This is illustrated by the lack of parentheses around vT in (4c).

The above argumentation vividly illustrates that a great deal controversy may arise as result of recognising a new entity in a theoretical framework. This time the source of uneasiness is the assumption that consonant-initial words carry an empty vocalic position before them. Moreover, the proposal implies that government may strike out of its own domain but not into a preceding one, which is a very strange idea.

In Csides (2008) I propose an alternative approach when confronted with initial empty vocalic positions whose sole function is to absorb government emanating from a following contentful vocalic position. I suggest that one should get rid of the offending initial, empty vocalic position, and propose that we should return to the original skeleton made up of not VC but CV units. This, of course, constitutes a retreat to the original assumption that the phonological skeleton uniformly begins with a consonantal position. If word-initial empty vocalic positions are not there any longer, they do not need to be silenced by government, and the "Antipenetration Constraint"can be done away with.

An alternative proposal is presented in Csides (2008), where – following Rowicka (1999) – I claim that government is primarily left-to-right in English. The proposal, however, differs from that of Rowicka in three respects. First, I claim that governing potential is primarily a property of stressed vocalic positions, and its direction is left-to-right. Secondly, government in general can target contentful and empty vocalic positions alike. Thirdly, the direction of government is not necessarily left-to-right at all levels of the phonological hierarchy. In other words, stressed vocalic positions are just as good governors as their unstressed relatives, and they exert their governing potential on other vocalic positions left-to-right in the first place. More precisely, stressed vocalic positions govern unstressed contentful vocalic positions to their right within the stress-domain, call it the *foot*. If, however, there is no available contentful vocalic position to the right of the stressed vocalic position, it governs the empty vocalic position to its right, the result of which is absolute silence. When, however, a stressed vocalic position targets a contentful vocalic position, the phonetic effect of this structural relationship is relative silence, i.e., vowel-reduction. Notice that this proposal is entirely in line with the interpretation of government proposed by Ségéral and Scheer (1999) and D&S (1999). Government spoils the inherent properties of its target. Within the foot left-to-right government by a stressed vocalic position will relatively cripple the inherent loudness of its unstressed peer(s). This type of government will be referred to as "Metrical Government"

(6)   Metrical government
      A governing relation established between two contentful vocalic positions is metrical government.
      Metrical government has phonetic effects similar to proper government.

The above-mentioned arguments lead to the conclusion that the function of stressed and unstressed vocalic positions with respect to V-to-V government is entirely different. Furthermore, it is evident that government in phonology must be bidirectional. These observations are formulated as (7) and (8) below.

(7)   Bidirectionality of government in phonology
      Government in phonology is bidirectional.

(8)   The governing functions of stressed versus unstressed vocalic positions
      a.   Stressed and unstressed vocalic positions exert their governing potential following a strict
           algorithm.

b. A stressed vocalic positions governs primarily left-to-right[7]: it governs its farthest non-empty peer (if there is one) within the stress domain silencing it relatively (reduction), as in the word *happy* /ˈhæpi/. It can also exert its primary left-to-right governing potential on a neighbouring empty vocalic position only if there is no available contentful vocalic position in this direction, as in *cap* /kæp/. A stressed vocalic position may also govern the contentful vocalic position of the word-initial CV unit in the opposite direction only by default (if there is one) at the level of phonetic interpretation when the word is pronounced in isolation, as in *elect* /ɪˈlekt/.

c. Unstressed vocalic positions govern in both directions. Their primary function is to govern their farthest contentful vocalic peer (reduction) right-to-left within the stress domain, as in *skeleton* /ˈskelətən/. If there is no contentful vocalic position in sight, right-to-left licensed government targets the neighbouring empty vocalic position causing absolute silence (syncope), as in *family* /ˈfæmli/. If there is no vocalic position to the left of a government licensed contentful vocalic positions, right-to-left licensed government targets the preceding contentful (non-empty) conso-nantal position (intervocalic lenition) if there is one, as in the General American pronunciation of *city* /ˈsɪɾɪ/. If there is no available contentful vocalic position in this direction, licensed government may also hit the empty consonantal position insides a long vowel or a diphthong (smooth transition from the first vocalic position onto the second), as in *tea* /tiː/.

d. Ungoverned empty consonantal positions remain silent, ungoverned empty vocalic positions remain loud unless situated in a closed domain.[8]

There is a generalisation that can be drawn from (8), which we formulate as (9) below.

(9)   The primary domain of government
          The primary domain of government directly affecting melodic complexity is the foot.

The machinery proposed in (8) above will be amply illustrated by examples in the following sections. Let us now turn our attention to the minimal word-constraint in English in order to see how the system proposed above copes with this question.

3.   The Minimal Word Constraint in Phonology

The minimal-word constraint that could earlier be captured only by a disjunction[9] (in classical theories referring to the skeleton) becomes easy to express in strict CV if left-to-right government is recognized. Consider the representations in (10) below. The only exception is moraic theories, where the minimal word can be captured in terms of a bimoraic syllable, which is, of course, not a disjunction, cf., for

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7   The direction and the entire algorithm may proceed in the opposite direction at each level in iambic languages and in the case of proto-typical iambic (**LH**) feet. This is an issue that awaits further investigation and which I think is worth exploring. I leave this question unresolved here, and isolate it for further research.

8   The closed domain roughly corresponds to the what Dienes and Szigetvári (1999) call a burial domain. A buried vocalic position is one which is locked inside a phonotactic domain, and never manifests its phonetic identity. It is silent without being governed. Such vocalic positions are flanked by members of static consonant clusters. In the framework advocated here, a closed domain can only be produced by what we traditionally call a coda-onset cluster in standard Government Phonology, and domains produced by the vocalic positions of long vowels and diphthongs.

9   Notice that the notion of 'heavy rhyme' could be captured only by a disjunction in frameworks recognizing branching constituents, viz., in a heavy rhyme either the nucleus or the rhyme node must branch. Moraic theories, of course, escape this shortcoming.

example, Hyman (1985) and Hayes (1995). In the theory advocated here, however, one can also do away with the 'counting' machinery of moraic theories by expressing the minimal word constraint as a minimally necessary single governing relationship.

(10) The minimal-word constraint in English

a.
```
C   V   C   v
|   |   |
t   æ   p
```
tap

b.
```
C   V   c   V
|   |
t   i:
```
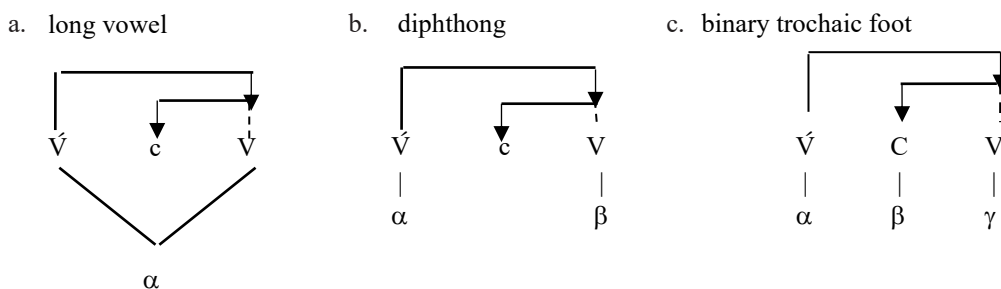*tea*

As it appears from the representations in (10) above, a minimal English word must contain an unlicensed governor vocalic position. In other words, there must be at least one governing relation erected in a minimal English word. In traditional syllable-based frameworks the minimal-word constraint can be captured only by a disjunction referring either to a branching rhyme or to a branching nucleus. Branching constituents are thus easily reinterpreted as non-branching consonantal and vocalic positions with structural relations between them. Therefore, Strict CV-phonology makes phonological parsing trivial and theoretical uniformity also requires either the retention of constituency throughout sub-syllabic chunks or the total abandonment of constituency. The representation of the minimal word constraint brings us closer to the notion of the optimal CV foot that we discuss in section 4 below.

4. The Notion of the CV-foot

One possible way of representing long vowels, diphthongs and binary trochaic feet in this framework is proposed by Csides (2008) as in (11) below.

(11) Long vowels diphthongs and binary trochaic feet[10]

a. long vowel
```
 V́   c   V
 \   |   /
   α
```

b. diphthong
```
V́   c   V
|       |
α       β
```

c. binary trochaic foot
```
V́   C   V
|   |   |
α   β   γ
```

---

10   The arrows indicate the direction and the target of government. The broken line illustrates that government flows in both directions along that section, a convention introduced by Harris (1994). That is, in all the three representations of (11) the second vocalic position governs and is being governed simultaneously. This phenomenon will recur throughout the paper, and the vowel to consonant interactions of (11) will be referred to as licensed government. Governing licence arrives from the stressed vocalic position and is transmitted to the unstressed vocalic position.

According to the representations in (11) above, long vowels, diphthongs and binary trochaic feet receive a uniform representation involving syntagmatic relations referred to by the term GOVERN-MENT, taken over from standard Government Phonology (GP). It must be noted here that other theories, including moraic ones, can also express the parallel between long vowels, diphthongs and binary trochaic feet. The advantage of the strict CV approach to these issues over moraic approaches is that the former requires no recourse to counting mechanisms. Furthermore, the strict-CV representations in (11) also express the fact the fact that all the three intervocalic consonantal positions of (11) above undergo vocalic lenition, and hence become relatively or absolutely loud. The contentful C position inside a binary trochaic foot may become relatively loud, cf., for example, English flapping, which typically takes place in this phonological position. The empty consonantal positions inside a long vowel (11a) or a diphthong (11b) are also affected by proper government, and lose their original propensity to remain silent, i.e., they also become loud by providing a smooth vocalic transition from the first vocalic position of a long vowel or a diphthong onto the second, cf. Szigetvári's (1999) definition of government in (14) below.

Bear in mind that GOVERNMENT and a supplementary technical tool, called LICENSING were both defined rather loosely and metaphorically in standard GP[11]. It was, in fact, Ségéral and Scheer (1999, 20) who attempted to capture the basic essence of these structural forces along the lines given in (12) below.

(12) The interpretation of government and licensing
    a. Proper Government inhibits segmental expression of its target.
    b. Licensing comforts segmental expression of its target.[12]

According to this proposal, government is a destructive force inhibiting the phonetic interpretation of melody specified in its target position. Licensing, on the other hand, is claimed to facilitate the phonetic interpretation of its target. Szigetvári's (1999, 56) definition of VOCALICNESS and CONSONAN-TALNESS is given in (13) below.

(13) Interpretation of consonantalness and vocalicness
    Vocalicness is loud: V slots of the skeleton aim at being pronounced.
    Consonantalness is mute: if nothing intervenes a C position will remain silent.

Szigetvári (1999) also introduces a new definition of government roughly as follows:

(14) Definition of government
    Government spoils the inherent properties of its target. A governed C position loses its inherent muteness, it loses its stricture properties and becomes louder, that is more vowellike, more sonorous, it undergoes vocalic lenition, whilst a governed V position loses its inherent loudness and becomes silent.[13]

Szigetvári (1999, 65) also argues that it is an inherent property of vocalic positions to govern and license unless they suffer some unfavourable external influence. Government is seen as a form of

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11   It was Harris (1994) to first make a distinction between the two terms by proposing that government is a stricter form of licensing, since it is always accompanied by phonotactic dependencies. For details, see Harris (1994).

12   Licensing will not be used as a technical tool in this paper because it has no direct bearing on the points made here.

13   We will later make a distinction between relative silence and absolute silence. In Szigetvári's framework only empty vocalic positions can be targeted by government.

external influence and thus a governed vocalic position loses its licensing and governing capacity[14]. Licensing, however, has a singular function, that of legalising the existence and phonetic interpretation of consonantal positions that occur before vocalic positions. The task of licensing will thus be binding CV units together, besides facilitating the phonetic interpretation of melody occurring under consonantal positions on the skeleton.

5. Stress and Vowel Reduction: Minimal and Optimal Feet and the Difference Between Stress and Accent[15]

One of the most problematic issues of English phonology is word-stress. The reason for this is that in traditional accounts English words may host different degrees of stress whose distribution is usually calculated in relation to the primary stressed (most strongly stressed) syllable/vowel of the word. Furthermore, in order to be able to predict the location of primary word-stress we need at least three different types of information: syntactic, morphological and phonological. In other words, we need to identify the word-class/part of speech (syntactic) first, then we have to examine if the word is simple or pre-fixed or suffixed (morphological), and finally we need to examine the nature of the last two syllables (phonological). Traditionally, English stress is referred to as *quantity sensitive* given that heavy syllables[16] and light syllables behave differently when attracting word-stress. Space limitations prevent me from discussing the details of English word-stress here, and therefore I will limit my discussion to what is traditionally called the basic-stress rule for verbs. A comprehensive discussion of English word-stress in strict CV would take us far beyond the scope of the present study.

5.1 The basic stress rule for verbs

Once we have identified the lexical category of the word, the basic stress rule takes phonological properties of the word into consideration when assigning primary stress.

(15) Disyllabic verbs with heavy ults

deléte	persíst
regáin	defénd
denóunce	evólve
belíeve	preténd
enjóy	eléct
refráin	eréct
deláy	repént

---

14   This is again so because in Szigetvári's framework only empty vocalic positions may be governed, contentful vocalic positions are never targeted by government.

15   Some of the data and some analyses presented in this section have already been discussed in Csides (2020). The reasoning and the arguments that accompany the data are an amended and extended version of those presented in Csides (2020).

16   A heavy syllable is characterised with reference to its rhyme and a heavy rhyme contains either a long vowel or a short vowel followed by at least two consonants. Interestingly the characterisation of syllable weight makes reference only to the rhyme constituent of the syllable and completely disregards the onset constituent even in traditional syllable-based frameworks. Consequently, we can rightfully talk about heavy and light rhymes rather than heavy and light syllables, and this constitutes another strong argument in favour of the syllabic division where the onset constituent seems to be completely independent of the nucleus and coda constituents in non-CV analyses.

In traditional syllable-based frameworks, the words in (15) above have two phonological properties in common: on the one hand they are all disyllabic (consist of two syllables), on the other hand, they all have a HEAVY ULT. In other words, their final syllable/rhyme is heavy. In sum, the lexical items presented in (15) above are said to have a heavy ult since the rhyme of the final syllable contains either a long vowel followed by any number of consonants including zero (the left-hand column) or a short vowel followed at least by two consonants (the right-hand column). The first part of the basic stress rule for verbs – at least in traditional syllable-based systems – runs as follows: disyllabic English verbs having a heavy ult are stressed on the ult.

According to our strict-CV analysis, the verbs in (15) above are stressed according to the requirement of a MINIMAL CV-FOOT. A MINIMAL CV-FOOT is a binary governing relationship incorporating two contentful vocalic positions or a single contentful vocalic position embracing a closed domain.

Viewed in these terms, the disyllabic English verbs of (15) above are stressed on the "ult" because they erect an minimal binary trochaic foot which can be initiated only by the antepenultimate vocalic position. Proceeding from the right edge of the word it is the first vocalic position that is eligible for CV-foot headship since the last two vocalic postions are empty. Consider the representations of (16) below.

(16)

a. *delete*
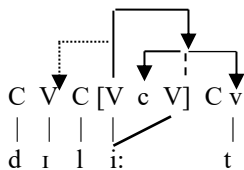
b. *persist*
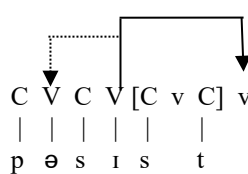
According to the analysis in (16), when metrical governing relations are erected over the skeleton, we start scanning the CV skeleton from the right edge. When the first minimal trochaic CV foot becomes available it is immediately erected. The initial unstressed vowels are incorporated into the metrical hierarchy by what we term DEAFAULT GOVERNMENT, indicated by the dotted lines/arrows above.[17]

Let us now see what happens to verbs with a heavy ult that are longer than two syllables.

(17) Verbs longer than two syllables with a heavy ult

délegate	ímplement
sátisfy	súpplement
ínstitute	cómplement
perámbulate	cátapult
pénalize	
réctify	
intímidate	
próphesy	

---

17   Default government takes place only as a last resort at the level of phonetic interpretation, when the word is pronounced in isolation and the initial contentful vocalic position has no chance to erect a CV-foot.

It appears from (17) above, that verbs having at least three syllables and a heavy ult – in traditional syllable-based frameworks – are stressed on the antepenult, i.e., on the third syllable from the right-edge of the word. Interestingly, "the final syllables" of (17) are referred to as strong unstressed – in traditional syllable-based terms –by, for example, Nádasdy (2006).

If, however, we apply the algorithm of (8) above to the items in (17), we arrive at the following conclusions. Since there is a "heavy ult" in all the items of (17), a governing relation can be established over what we call the "ultimate syllable" in traditional syllable-based frameworks, like in the examples in (16) above. However, in the examples of (17) another well-formed minimal trochaic CV-foot can be erected towards the beginning of the word, whose governor will be the first vocalic position of this CV-foot. This means that the words in (17) will have two stresses. Beyond the stress level, however, a super-foot is erected whose head will be the accented vocalic position of the word. Consider now the representations in (18) below.

(18)[18] a. *delegate* b. *implement*
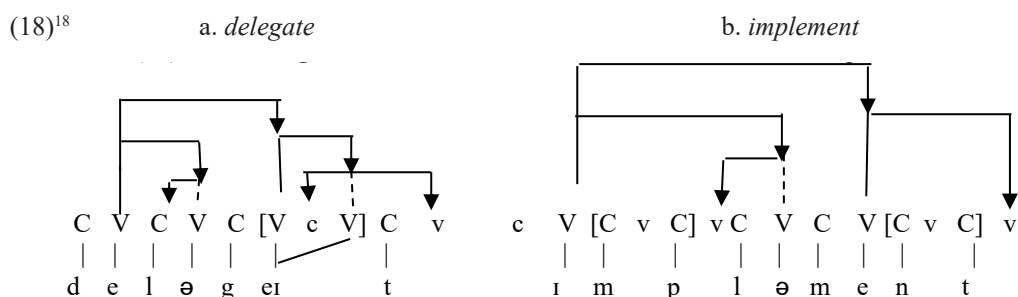
The stressing of verbs having a "heavy ult" thus depends on the number of "syllables" the verb consists of. This difference boils down to the question of WELL-FORMED FEET. In (18) two WELL-FORMED FEET can be erected from the right edge of the word, and ultimately the head of the leftmost foot will be the head of the entire word, at least when the word is pronounced in isolation. According to this analysis, the head of the rightmost foot will also be stressed, traditionally referred to as TERTIARY-STRESSED. However, it is important to make a clearcut distinction between stress and accent as Szigetvári (2020) also points out. Stress is lexical, in other words, the erection of CV-feet and hence governing relations are lexical except default government whose sole function is to integrate subminimal feet into the prosodic hierarchy, cf., the representations in (16) above. Beyond the level of stress, we arrive at the level of accent, realised by super-feet. As Szigetvári (2020) also points out, accent is not lexical, i.e., its position may change post-lexically and depends on a lot of factors.

Let us now see the stressing of verbs having a light ult, i.e., a light final rhyme.[19]

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18   The dashed lines in the representations indicate areas where government proceeds in both directions. This is a convention borrowed from Harris (1992), where he uses it for *Licensing Inheritance.* Note that not all governing relations will always be detailed in the following representations in order to save space and facilitate visual exposition. For example, the licensed proper government affecting the consonantal position dominating the melody of /l/ in (18a) is not shown because it is not relevant to the point at hand.

19   Recall that a *light rhyme* contains a short vowel which is followed by maximally one consonant.

(19) Verbs with a light ult

vómit
astónish
elícit
cóvet
réckon
rável
súmmon
hárras
devélop
abándon

It appears from table (19) that verbs having a final 'light rhyme' are stressed on the penult regardless of whether they consist of two or more syllables.

Translated into strict-CV, the argument runs as follows: only a degenerate (sub-minimal) CV-foot could be erected by the rightmost contentful vocalic position in the examples of (19), which is possible only as a last resort in the case of monosyllabic words when there is no further available phonological material, as, e.g., in the case of the word *cap*. A degenerate foot consists of a contentful vocalic position followed by a single empty vocalic position with no intervening closed domain. Recall that a well-formed MINIMAL CV-FOOT consists of three vocalic positions or at least two contentful vocalic positions. Consider now the representations in (20) below.

(20)

a. *astonish*   b. *vomit*
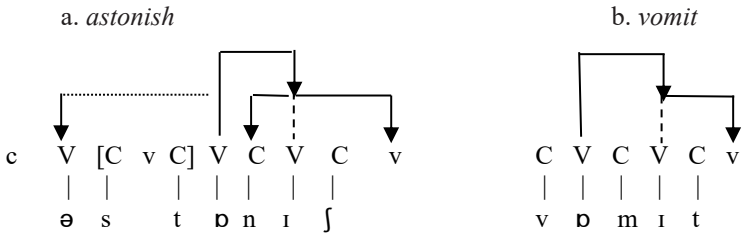
Since the penultimate vocalic position cannot erect a well-formed minimal CV-foot with the word-final empty vocalic position, the penultimate contentful vocalic position establishes a well-formed CV-foot with the ultimate contentful vocalic position. The word-final empty vocalic position is silenced by government emanating from the government-licensed penultimate vocalic position. Note again that the broken line indicates sections where government flows in both directions, i.e., where government licence is transmitted, while the dotted line in (20a) indicates default government, which incorporates the word-initial unstressed vocalic position – left untreated by core governing relations – into the metrical hierarchy. Note that DEFAULT GOVERNMENT takes place only at the level of phonetic interpretation.

In sum, the basic stress rule for verbs boils down to searching for well-formed minimal CV-feet towards the end of the word. In disyllabic verbs where the ultimate contentful vocalic position can erect a well-formed CV-foot, stress will be located on the final contentful vocalic position. In these examples no further well-formed CV feet can be erected towards the left edge of the word, and therefore only the final contentful vocalic position can serve as the metrical head of the word. In disyllabic

verbs where the well-formed foot can be erected only by the penultimate contentful vocalic position, stress will be assigned to the penultimate contentful vocalic position. Verbs that contain at least two well-formed CV-feet will be accented on the head of the first (leftmost) CV-foot. All empty vocalic positions must be silenced by government, except those situated in a closed CvC domain, i.e., inside a traditional coda-onset cluster.

6. Evidence for CV-Feet and the Absence Strong Unstressed Syllables

In this section we take stock of the arguments against the existence of strong unstressed syllables, and will take a look at the pieces of evidence supporting this view. Szigetvári (2020, 179) claims that as opposed to accent – which is a rhythmic phenomenon – stress is a segmental phenomenon. He goes onto argue that since stress is a segmental phenomenon, it should be sensitive to segmental conditioning (heavy syllables attract stress mor readily than light ones) and there should be segmental phenomena that are sensitive to stress. And indeed, the fact that certain segmental processes are stress sensitive has long been argued for by a number of phonologists. Szigetvári (ibid) lists five such processes: I will limit my discussion to two in order to save space. These processes are FLAPPING and SYNCOPE.

6.1 Flapping

Flapping takes place in a number of English accents and – as Szigetvári (2020, 179) also points out – it results in the neutralization of [t] and [d]; consider, for example, the pronunciation *latter* and *ladder* both of which are pronounced [ˈlærə] in these dialects. If you compare this state of affairs to that in *maritime* [ˈmærɪtaɪm] or *habitat* [ˈhæbɪtæt] where no flapping takes place, it is quite obvious that the final syllable in both cases is stressed although it is post-tonic. Given the algorithm that we put forward above lack of flapping may explained with reference to lack of government. While the [t] of *latter*, for example, is governed and hence it is flapped, the [t] in *maritime* fails to be governed and hence escapes flapping. Consider now the representations in (21) below.

(21)   a. *maritime*   b. *latter*
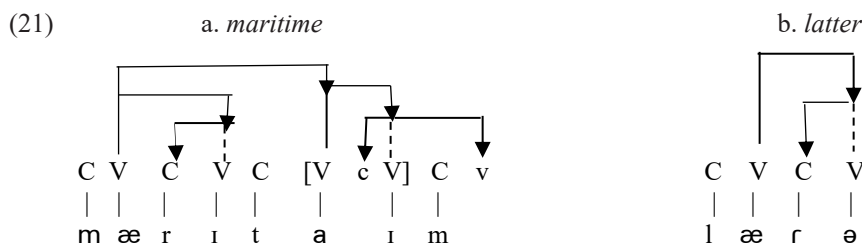
The governing relations erected in the examples of (21) clearly illustrate why there is no flapping foot-initially in English. Foot-initially the consonant fails to be governed, while the foot-internal /t/ of *latter* is targeted by government and hence undergo flapping (vocalic lenition).

6.2 Syncope

An unstressed vowel may be deleted in English under certain circumstances. One of these is that the vowel to undergo deletion must be followed maximally by one consonant (usually a sonorant) and an unstressed vowel. Syncope fails to take place if the vowel to undergo syncope is followed by a stressed vowel. While in *memory* [ˈmem(ə)rɪ] syncope is attested, it does not take place before a stressed vowel in *memorize* [ˈmeməraɪz].[20] According to Szigetvári (2020, 180) the same is true of

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20   It must be mentioned in passing that syncope is subject to further conditions. For example, the consonants flanking the syncope site must show a rising sonority profile, cf. Harris (11994).

pairs such as *barbarism* [ˈbɑːbərɪzəm] and *barbarous* [ˈbɑːb(ə)rəs]. Since *-ism* is a stressed suffix, syncope is unattested in the former, while in the latter the schwa in the second syllable can be syncopated since it is followed by an unstressed syllable. Consider now the representation of *memory and memorize* in (22) below.
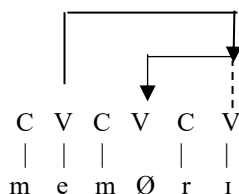
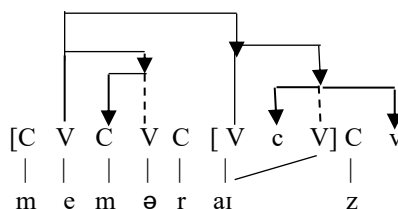(22) a. *memory* b. *memorize*

The representations in (22) illustrate the point that the word-medial unstressed vowel of *memory* may be hit by licensed proper government initiated by the government licensed word-final contentful vocalic position, and hence can be syncopated. The same vocalic position in *memorize*, however, is targeted only by unlicensed government, which is a weaker form of government, and therefore the targeted vocalic potion may undergo only vowel-reduction but no syncope. Licensed proper government is, therefore, a stronger form of government.

Summary

The idea of bidirectional government coupled with the view that government may target both contentful and empty vocalic positions may provide a unitary analysis for the minimal word-constraint and the basic stress rule for verbs. Other theories like, for example, the theory of layered feet by Martinez-Paricio and Kager (2015) account for rhythmic issues and foot structure in terms of Optimality Theory (OT) by introducing and reinterpreting constraints. These constraints are very useful when it comes to the examination of cross-linguistic data but the strict-CV approach proposed in the present paper can more straightforwardly highlight the driving force behind constructing minimal and optimal feet in the case of English verbs. This driving force is the necessity to initiate a governing relationship by the rightmost vocalic position eligible for the status of a governor (foot-head). Another welcome side-effect of the strict CV proposal is that it is able to unify the effects of proper government targeting contentful and empty consonantal positions alike.

The proposal advocated in this paper also escapes the criticism levelled at strict CV-phonology by Schwartz (2016), for example, since the present framework has no recourse to Lowenstamm's (1999) and Scheer's (2004) initial edge marking empty CV units. Unfortunately, the discussion of initial consonant-strength, vowel-zero alternations, cluster phonotactics and sandhi processes would take us far beyond the scope and the space limitations of the present paper.[21]

I also attempted to briefly argue that traditional post-tonic "strong-unstressed" syllables are in fact stressed and that this view can be supported by interesting pieces of phonological evidence

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21   I deliberately mention Martinez-Paricio and Kager (2015) and Schwarz (2016) in the summary of the present study because an anonymous reviewer suggested that these works also discuss issues raised in the present paper from the perspective of other theoretical frameworks, and suggested that certain problems might be solved more successfully in a non-strict-CV framework. Unfortunately, space limitations of maximum 5,500 words prevent me from comparing Martinez-Paricio and Kager's (2015) and Schwarz's (2016) proposals to the framework presented here.

independently of stress-assignment. The theory advocated here has an important advantage over theories presented earlier. By proposing a single algorithm, it is able to unify the effects of stress assignment, proper government, the minimal word constraint, flapping and syncope.

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The Distributive and Cumulative Readings Acquisition: Experimental Evidence from Czech

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Abstract: The child's mother tongue acquisition is a gradual process of linguistic and communicative competencies. It is related to the child's overall development, thinking, and cognition. This paper discusses the issue of the acquisition of distributivity, quantifiers, and nominal phrases in the Czech language. The study aims to discover at what age the obligatory distributive interpretation of the universal quantifier (UQ) *každý* 'each' appears in the language of Czech children. We focused on Czech UQs and bare NPs concerning their distributive and cumulative interpretation (since definiteness in Czech as a grammatical category is questionable at least, see Šimík and Demian 2020), which left us with two issues that we would like to address in the current paper: (i) What is the learning development of UQs/bare NPs? (ii) Is there a correlation between the acquisition of the correct obligatory distributive meaning for Czech UQs and the tendency to reject the distributive interpretation of bare NPs?

Keywords: distributivity; cumulativity; universal quantifiers; language acquisition

1. Introduction

Singular universal quantifiers such as English *each*, German *jedes*, or Czech *každý* 'each' are obligatorily interpreted distributively if they c-command other plurality denoting expressions in a clause. See (1) with the correct interpretation in (1a) and incorrect interpretation in (1b), the cumulative reading, or (1c), the collective reading. In this respect, the singular universal quantifier differs from indefinite descriptions as the numerical subject NP in (2), which allows all three mentioned interpretations.

(1) Each writer wrote two books.
   a. author1 → book1, book2; author2 → book3, book4   (distributive reading)
   b. #author1 → book1; author2 → book2   (cumulative reading)
   c. #author1+author2 → book1, book2   (collective reading)

(2) Two writers wrote two books.
   a. author1 → book1, book2; author2 → book3, book4   (distributive reading)
   b. author1 → book1; author2 → book2   (cumulative reading)
   c. author1+author2 → book1, book2   (collective reading)

This empirical pattern is stable across languages for adults. However, as discussed by Geurts (2003), Musolino (2009), Pagliarini, Fiorin, and Dotlačil (2012), and Koster, Spenader, and Hendriks (2018) among others, children acquire the correct distributive interpretation of the singular universal quantifier late. Furthermore, the correct distributive reading is among other linguistic phenomena that are missing even after entering primary school. In our paper, we follow the empirical studies concerning English, Italian, and Dutch singular universal quantifiers Musolino (2009), Pagliarini, Fiorin, and

Dotlačil (2012), Koster, Spenader, and Hendriks (2018) and report the results of experiment targeting the acquisition of Czech singular universal quantifier *každý* 'each' (UQ).

Part of the research goals of our experiment was empirical. Since acquisition studies of the Slavic universal quantifiers are nonexistent (as far as we know), our first goal was mapping the territory of the distributivity acquisition in Slavic. The second goal was theoretical, however. As introduced in the next section, one of the successful and accepted linguistic explanations of distributivity acquisition errors relies on the conversational implicature approaches to the semantic and pragmatic competition in natural languages, Dotlačil (2010). We followed this line of research and focused on the distributive and non-distributive interpretation of Czech universal singular quantifiers and bare Noun Phrases. The research goals, implications for the theoretical frameworks, and other details will be discussed in the next section.

2. Research Questions

The research problem addressed in this paper is understanding whether Czech children prefer distributive or cumulative interpretations of sentences with the universal distributive quantifier *každý* and bare NPs and at what age each preference emerges.

It is known that the universal quantifier in the singular form as Czech *každý* 'each,' when found in the subject position in a sentence, is interpreted (by adults) exclusively distributively and is rejected in the cumulative interpretation. Previous studies show that children acquire this linguistic knowledge gradually and interpret UQs nondistributively for a long time (see Brooks and Braine 1996; Syrett and Musolino, 2013; Pagliarini et al. 2012, etc.)

In designing the experiment, we drew on the studies mentioned above and on Pagliarini et al. (2012) and de Koster et al. (2018). Based on their results and theoretical insights into the interpretation of UQs and their foreign-language equivalents, we established the following research questions:

Q1. What is the learning development of UQs/bare NPs in Czech?
Q2. Is there a correlation between the acquisition of the correct obligatory distributive meaning for Czech UQs and the tendency to reject the distributive interpretation of bare NPs?[1]

The research questions are based on some expectations that stem both from the previous theoretical and acquisition research. To illustrate the expectations, consider the following scenario: There are two boys (John and Paul) and two girls (Mary and Sue). They meet, and John kisses Mary, while Paul kisses Sue. There are no other kissing events. An observant speaker describes the situation with the English sentence (3). This is clearly an example of the cumulative interpretation. Nevertheless, (3) would also be true in a distributive scenario where both John and Paul kiss both Mary and Sue (in sum, there are 4 kissing events then). The distributive situation can be expressed unambiguously with (4) with the singular universal quantifier in the subject position. There is an interesting interpretation preference for (3): even if the sentence is potentially ambiguous between the cumulative and the distributive interpretation, the most salient interpretation of (3) is the cumulative one. This can be linguistically explained by Grice's Maximum of Quantity: since (4) is more informative than the ambiguous (3), a cooperative speaker uttering (3) is ceteris paribus understood as expressing the cumulative meaning, since if the distributive interpretation were in her mind, she would use (4).

This seems to hold cross-linguistically for adult speakers (see our expectations in Table 1 – but modified for Czech where definite NPs are not grammaticalized) and also is a basis for the conversational implicature approach to the acquisition of Italian universal quantifiers and definite NPs in

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1   We elaborate on research question 2 in the section 5.1. There we scrutinize whether the incorrect cumulative interpretation of universal quantifier agrees with the incorrect interpretation of bare NPs.

Pagliarini et al. (2012). Notice that in our expectations, we can rely on the previous research in case of the distributive interpretation of universal quantifiers, but in case of the cumulative interpretation of bare NPs (and universal quantifier), our work is novel and therefore our expectations (in this part) can be informed by the previous acquisition studies only partially. This is also reflected in Table 1. Notice the nature of the explanation: the distributive interpretation for definite NPs (or, in our case, bare NPs) is dispreferred. Grice's reasoning predicts that this is not a hard rule in the sense of syntactic or semantic well-formedness but rather a pragmatic preference since it is well-known that implicatures can be canceled. The data from our adult control group will corroborate this.

(3) The boys kiss the girls.
(4) Each boy kisses the girls.

3. Experiment

The research was carried out in six preschools and six primary schools through which the children's participants were recruited in Prague and the South Moravian Region, Czechia. The only criteria for selecting children were their monolingualism (native speakers of Czech) and age ranging from 5 to 11 years. None of the foreign language classes that the children might have attended were deemed as undesirable upon evaluation. 214 children (age range: 5–11, median age: 7) participated in the main research survey. The observed variables in the children's group were gender, age, and the school they attended.

The research also included a group of adult participants who constituted the reference group against which the obtained results of children were compared. A total of 47 adults took part in the testing. All participants were native speakers of Czech, which was the only condition for their participation. The observed variables in the adult group were only gender and age.

Condition	Interpretation	Children	Adults
Univ-Distr	UQ *každý* in distributive int.	Yes	Yes
Univ-Cumul	UQ *každý* in cumulative int.	Yes	No
Bare-Distr	Bare NP in distributive int.	?	Preferably no
Bare-Cumul	Bare NP in cumulative int.	?	Yes

Table 1. Summary of all the conditions with a prediction of a acceptability

3.1 Pilot Study

The task was presented to both groups on the platform PCIbex. It was carried out by children in a quiet room at their school (individually on a tablet or computer, but under the supervision of an examiner) and by adults also in a quiet location of their choice without the presence of an examiner.

Prior to the main research, a pilot study was conducted. A total of 26 children, age range 3–6, participated in the pilot testing. The tested version of the experiment was considerably more demanding in the pilot study for the children. Based on feedback from the pilot testing process, changes to the design of the experiment had to be made (mainly simplifying and shortening the task overall). The chosen method of testing the Truth Value Judgment Task and the total number of items in the main testing (3 practise items, 8 filler items, and 16 test items) were kept.

3.2 Design of the Experiment

The linguistic task was a sentence-picture verification in a 2×2 design with the factors sentence and picture. Universal quantifier *každý* 'each' or bare NP was tested against distributive or cumulative interpretation displayed in the pictures. It aimed to test the relationship between children's distributivity interpretations

and their preferences. The task included two sentence types (universal quantifier, bare NP) and two picture types (cumulative, distributive), resulting in four test conditions. Each condition contained four test sentences (i.e., a total of 16 test items were presented to the subjects).

In conditions Univ-Distr and Univ-Cumul, the UQ *každý* 'each' is always in the first position; in conditions Bare-Distr and Bare-Cumul, the sentence's subject is the bare NP. The tested sentences contained lexis that was familiar and close to the children. Each subject saw four items per condition plus eight filler items. The testing procedure remained the same as during the pilot study. The majority of children had been tested individually (one child – one examiner), older children who were able to use PC or tablet on their own and were tested in small groups up to 5 people (each child had their own device) with the assistance from the examiner. The task was presented on screen via platform PCIbex. The children had been asked to listen to the pre-recorded test sentence carefully and then decide if it corresponds with the shown picture or not. The test sentences had been judged within a situational context that consisted only of the accompanying illustrations (see Figure 1 and Figure 2)[2] which were shown on screen for the whole time during listening to the recording until moving to the next one. The test session started with three practise items onto which the participants practised answering and got familiar with the task. After that the main task had started. Participants were presented with only one test sentence against one illustration at a time during the experiment while the recorded sentence was played. All participants were allowed to replay the recordings if needed. The tested sentence was also visible on the screen in the written form. To express agreement or disagreement with the images, color-coded symbols were placed below the picture. We used green symbol for agreement and red symbol for disagreement. In case of disagreement children were asked to explain why they decided that the sentence does not correspond with the image. Their answers had been noted down by the examiner. Examples of tested sentences are (5) for a sentence with a UQ and (6) for a sentence with a bare NP. For all the tested sentences and images see Šulíková (2023).

(5)	Každé	dítě	si	koupilo	dva	bonbóny.
each	child-SG	REFL	buy-PAST.3SG	two	sweet-PL

'Each child bought two sweets.'

(6)	Děti	si	koupily	dva	bonbóny.
Child-PL	REFL	buy-PAST.3PL	two	sweet-PL

'Children bought two sweets.'

Figure 1. An example of illustration: distributive interpretation

Figure 2. An example of illustration: cumulative interpretation

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2   The pictures were created using the online editor Canva (https://www.canva.com/) and are licensed under the Free Media License Agreement.

4. Results

Children's acceptance of distributive interpretation in sentences with UQ is generally good across the board and remains stable. As expected, sentences with quantifiers in the cumulative interpretation are mainly accepted by the youngest children at age 5 and gradually begin to be rejected them from age 6 onwards. However, even at age 11, they still do not reach total rejection, as is the case with adults. The bare NPs were accepted very similarly by the children in both interpretations. Distributive interpretations were preferred by younger children up to age 7. Their acceptance decreases slightly from age 8 but does not develop further and remains at a consistently high level of around 75% (compared to adults, whose average acceptance is around 35%). Acceptance of cumulative interpretations is almost identical for both children and adults. Interestingly, there is a dip at age 8, which increases again at age 9. This can be visually inspected in Figure 3: a barplot graph representing percentual acceptance for each age, Figure 4 mean responses from children (with standard errors), and finally in Figure 5 where the barplot represents mean percentual acceptability for each condition and interpretation in the adult control group. The descriptive statistics already previews the results, which we discuss more below: the cumulative interpretation of the universal quantifier starts at the high level with children around the age of 5 but slowly decreases to approximately 25% acceptability around the age of 11 (the top right face in Figure 3 and the blue standard error bars in Figure 4). This is in strong contrast to the adult control group (the first blue bar in Figure 5), where the cumulative interpretation of the universal quantifier is strongly rejected. Table 2 contains the info about each age group, percentual acceptability and 95% confidence interval for each condition.
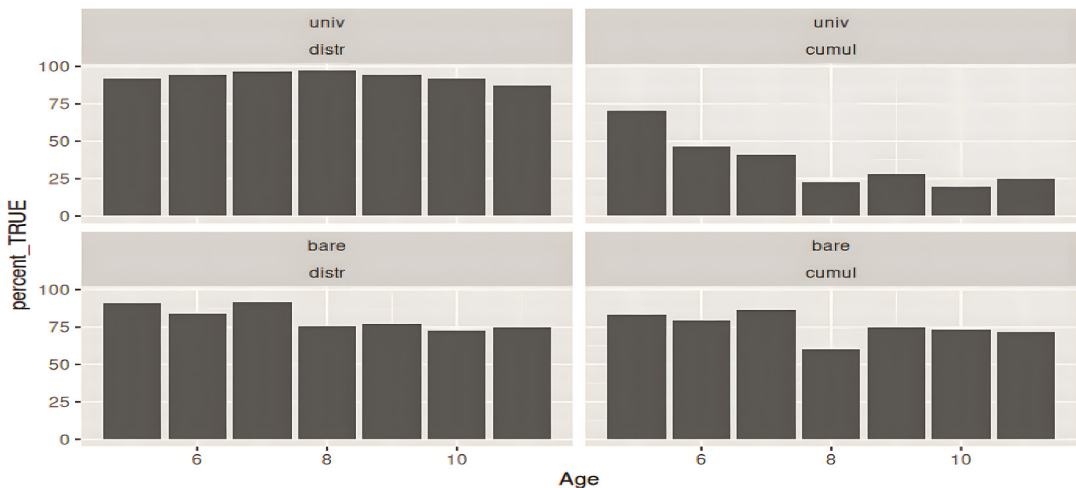

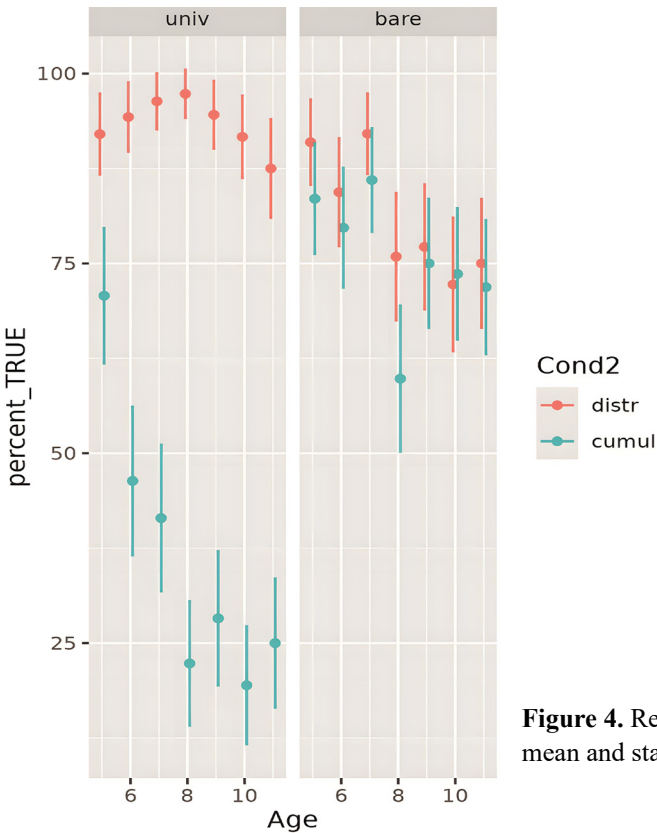
Figure 3. Learning development of children's group

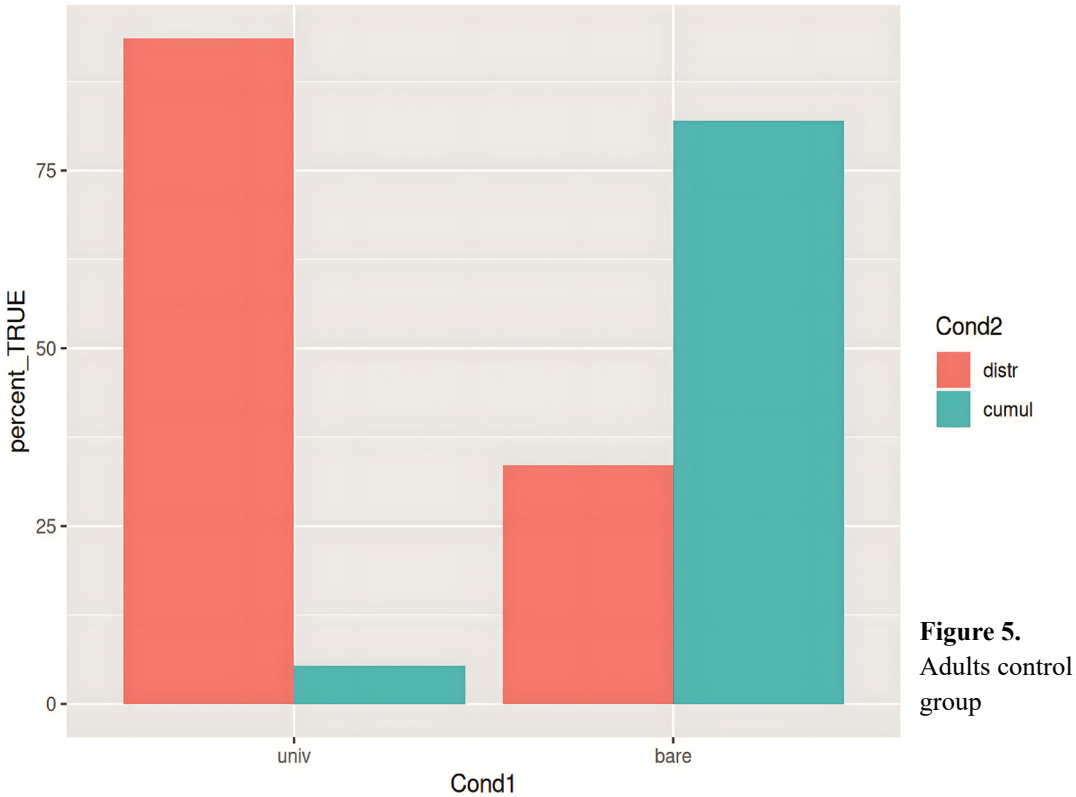**Figure 4.** Responses from children: mean and standard error

Figure 5. Adults control group

Age	Cond1	Cond2	% true	CI 95%	Age	Cond1	Cond2	% true	CI 95%
5	univ	distr	92.0	5.31	9	univ	distr	94.6	4.44
5	univ	cumul	70.7	8.92	9	univ	cumul	28.3	8.83
5	bare	distr	91.0	5.62	9	bare	distr	77.2	8.23
5	bare	cumul	83.5	7.27	9	bare	cumul	75.0	8.49
6	univ	distr	94.3	4.56	10	univ	distr	91.7	5.42
6	univ	cumul	46.4	9.77	10	univ	cumul	19.4	7.76
6	bare	distr	84.4	7.12	10	bare	distr	72.2	8.78
6	bare	cumul	79.7	7.89	10	bare	cumul	73.6	8.64
7	univ	distr	96.3	3.68	11	univ	distr	87.5	6.48
7	univ	cumul	41.5	9.66	11	univ	cumul	25.0	8.49
7	bare	distr	92.1	5.30	11	bare	distr	75.0	8.49
7	bare	cumul	86.0	6.81	11	bare	cumul	71.9	8.81
8	univ	distr	97.3	3.16	-	-	-	-	-
8	univ	cumul	22.3	8.16	-	-	-	-	-
8	bare	distr	75.9	8.38	-	-	-	-	-
8	bare	cumul	59.8	9.61	-	-	-	-	-

Table 2. Acceptability of conditions in percentage, incl. 95% confidence interval

5. Model

The Bayesian logistic hierarchical model with random effects and default priors was fit using the R package RSTANARM Goodrich et al. (2022): the dependent variable was the subject's answer, which was either a green checkmark indicating that the image corresponds to the sentence or a red cross indicating that the image and the sentence do not correspond. The independent variables were the 2×2 conditions (expressions: UNIV, BARENP and their interpretations: DISTR, CUMUL). Next, the dependent variable was the subject's age (in the case of children). The model also included the interaction of the age and the conditions. The reference level was BARE, CUMUL.

Let us start by describing the results of the model for adults. For them, the cumulative interpretation of bare NPs – reference level (Intercept in the model) – is well accepted: $\mu = 0.82$, 95% Credibility Interval, CI = [0.76, 0.87], 0% in ROPE. On the other hand, the distributive interpretation of bare NPs is much worse than the reference level: $\mu = -0.48$, CI = [-0.55, -0.42], 0% in ROPE.

The cumulative interpretation of universal quantifiers is much worse than the reference level: $\mu = -0.77$, CI = [-0.83, -0.70], 0% in ROPE. However, the distributive interpretation of universal quantifiers is very well accepted: there is a strong positive interaction of UNIV:DISTR: $\mu = 1.37$, CI = [1.27, 1.46], 0% in ROPE. The posterior samples graph for the adults Bayes model is in Figure 6; the full posterior distributions are in Table 3.
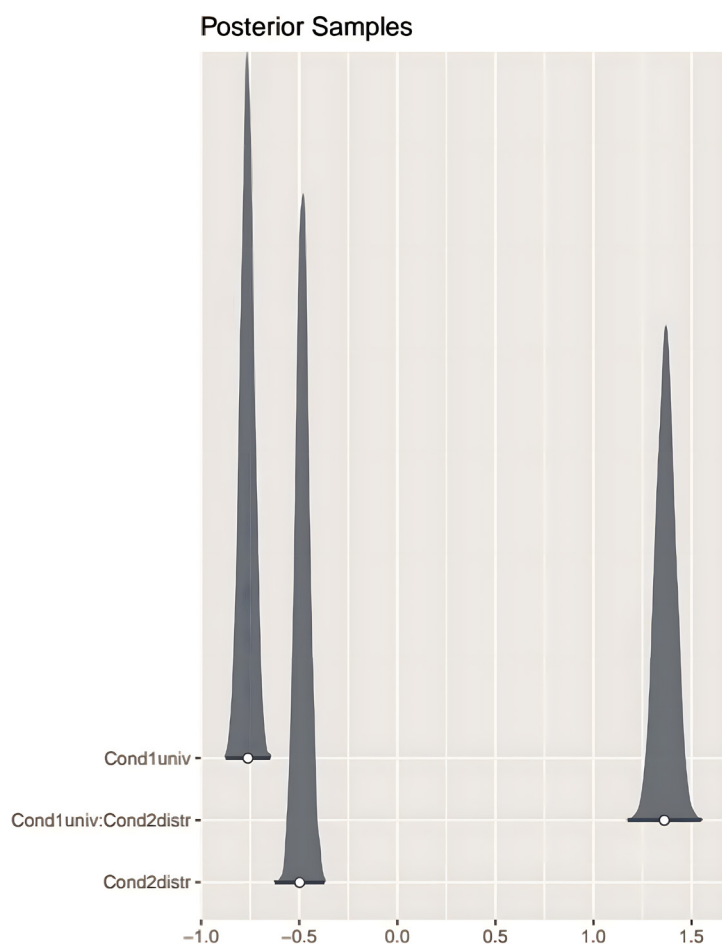
Figure 6. Posterior samples: adults

5.1 Bayesian Model: Adults

Parameter	Median	95% CI	pd	ROPE	% in ROPE	Rhat	ESS
(Intercept)	0.82	[0.76, 0.87]	100%	[-0.05, 0.05]	0%	1.000	3972.00
Cond1univ	-0.77	[-0.83, -0.70]	100%	[-0.05, 0.05]	0%	1.000	4337.00
Cond2distr	-0.48	[-0.55, -0.42]	100%	[-0.05, 0.05]	0%	1.000	4606.00
Cond1univ : Cond2distr	1.37	[1.27, 1.46]	100%	[-0.05, 0.05]	0%	1.000	4329.00

Table 3. Summary of posterior distribution: adults

As for children, the cumulative interpretation of bare NPs (the reference level) is well acceptable: Intercept of the model is $\mu = 1.09$, CI = [0.88, 1.30], 0% in ROPE. The distributive interpretation of universal quantifiers is worse than the reference level: the interaction between UNIV and DISTR is strongly negative ($\mu = -0.90$, CI = [-1.25, -0.52], 0% in ROPE). However, this improves dramatically

during the acquisition: there is a strong positive interaction of Univ with Distr and by Age: $\mu = 0.70$, CI = [0.51, 0.88], 0% in ROPE. The main negative effect is the reflex of the wrong interpretation of the universal quantifier by younger children, and the improvement of the universal quantifier acceptability in distributive contexts during the acquisition is confirmed by the interaction Univ:Distr:Age.

Unlike adults, children accept the distributive interpretation of bare NPs to the same extent as the reference level ($\mu = 0.19$, CI = [-0.07, 0.44], 10.34% in ROPE: Univ). Moreover, at least in the sample, the development towards the adult state is non-credible: the interaction between Distr and Age is $\mu = -0.06$, CI = [-0.20, 0.07], 33.45% in ROPE. The cumulative interpretation of universal quantifiers is for children as the main effect even better than the reference level: $\mu = 0.57$, CI = [0.31, 0.83], 0% in ROPE. Nevertheless, there is a clear development towards adult grammar: the interaction between Univ and Age is a strong negative interaction effect: $\mu = -0.48$, CI = [-0.62, -0.34], 0% in ROPE.

As stated above, the reference level (cumulative interpretation of bare NPs) is well acceptable (Intercept of the model for children: $\mu = 1.09$, CI = [0.88, 1.30], 0% in ROPE). There is a slight change during the acquisition: the main effect of Age is: $\mu = -0.16$, CI = [-0.27, -0.05], 0% in ROPE. The full posterior sample graph for the children's Bayes model is in Figure 7. The full posterior distributions for children are in Table 4.

Figure 7. Posterior samples: children

5.2 Bayesian model: Children

Parameter	Median	95% CI	pd	ROPE	% in ROPE	Rhat	ESS
(Intercept)	1.09	[0.88, 1.30]	100%	[-0.04, 0.04]	0%	1.000	1868.00
Cond1univ	0.57	[0.31, 0.83]	100%	[-0.04, 0.04]	0%	1.002	1944.00
Cond2distr	0.19	[-0.07, 0.44]	91.75%	[-0.04, 0.04]	10.34%	1.000	1828.00
Age	-0.16	[-0.27, -0.05]	99.88%	[-0.04, 0.04]	0%	1.000	1887.00
Cond1univ: Cond2distr	-0.90	[-1.25, -0.52]	100%	[-0.04, 0.04]	0%	1.001	1709.00
Cond1univ: Age	-0.48	[-0.62, -0.34]	100%	[-0.04, 0.04]	0%	1.002	1944.00
Cond2distr: Age	-0.06	[-0.20, 0.07]	82.80%	[-0.04, 0.04]	33.45%	1.000	1846.00
Cond1univ: Cond2distr: Age	0.70	[0.51, 0.88]	100%	[-0.04, 0.04]	0%	1.001	1722.00

Table 4. Summary of posterior distribution: children

The model results for children are supported by the posterior interactions graph in Figure 8: the x-axis is the subject's age, and the y-axis is the probability of acceptance of the sentence. The red line represents the acceptability of bare NPs, and the blue line represents the universal quantifiers. The left facet of the graph contains the posterior interaction for cumulative readings, and the right facet for the distributive interpretation. In the left graph, the decrease in the acceptability of the cumulative interpretation for universal quantifiers can be clearly observed (there is also a slight decrease for bare NPs, but this is not credible, as revealed by the model). The right graph shows a decrease in the acceptability of the distributive interpretation of bare NPs. However, it stops above 0.7 relative acceptability at the age of 11 (and as revealed by the model, this interaction effect is not credible).

Based on the descriptive statistics and the model, we hypothesize that the acquisition timing is: 1. the proper obligatory distributive semantics of ∀ (universal quantifier) is acquired; 2. the bare NPs can get the proper cumulative interpretation via implicature. To check whether the experimental data supports such timing, the following correlation in (7) was checked – and indeed, the correlation was found: Pearson's product momentum correlation exists between (by subject) acceptability of universal quantifiers interpreted cumulatively and bare NPs interpreted distributively: $t = 3.11$, $p < 0.05$. The correlation graph is in Figure 9: the x-axis represents the (z-transformed) acceptability of the universal quantifiers interpreted cumulatively; the y-axis represents the (z-transformed) acceptability of bare NPs interpreted distributively.[3]

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3   One of the two anonymous reviewers raised a question concerning the strength of the reported correlation. It is true that the visual inspection of the correlation graph reveals that there are many residual errors: many data points are not exactly close to the best-fit correlation line. This is the normal course of events, though, no regression model predicts 100% accurately. But to be sure about the strength of the correlation, we run a Bayesian correlation analysis since in the Bayesian analysis, it is straightforward to get support for the correlation hypothesis (unlike in the frequentist version). The Bayesian correlation yields a posterior median of 0.20 in a 95% Confidence Interval [0.07, 0.32]. Since the confidence interval doesn't include 0, the Bayesian correlation confirms the existence of the correlation (the value 0.20 is also close to the R = 0.21 from the frequentist version and reported in the graph). Furthermore, the Bayes factor of the correlation is 15.57, which is interpreted as strong evidence in favor of the correlation. Therefore, we conclude that the correlation exists and that we have strong evidence for its positive polarity and value.
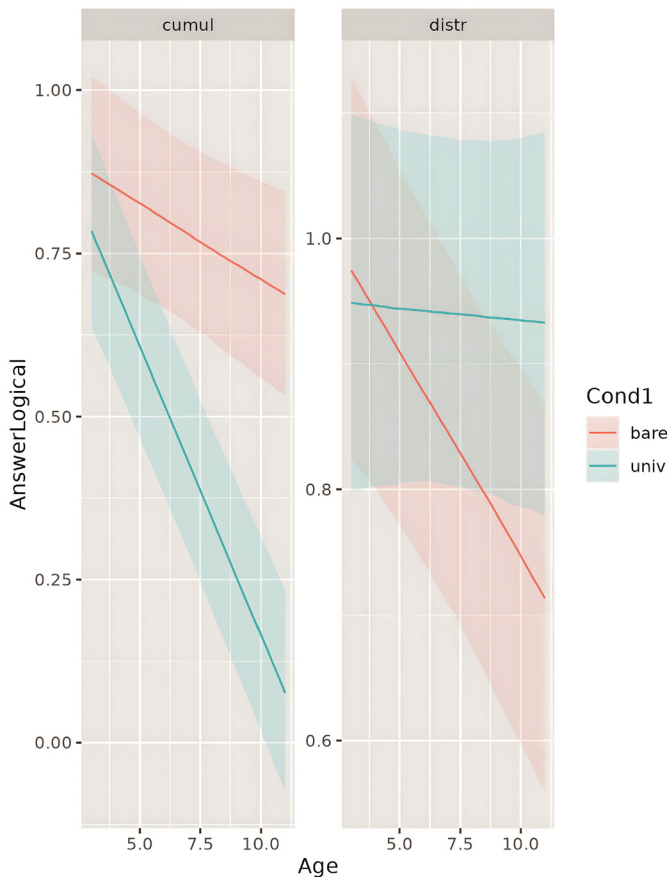
Figure 8. Posterior distribution: interactions

The correlation is positive, and as discussed in footnote 2, the data gives us strong evidence to believe in its existence. Furthermore, we ran standard frequentist correlation tests (between the distributive interpretation of universal quantifiers and the cumulative interpretation of bare NPs, etc.), and we found out that other correlations were not significant. Therefore, even if we accept the usual statistical lore that correlation doesn't mean causation, we interpret the existence of the correlation reported above and, in the graph, its strength (and non-existence of other correlations) as follows: children who accept the cumulative interpretation of universal quantifiers are more likely to accept the distributive interpretation of bare NPs (top right part of the graph). These children behave non-adult-like. Next, there are children who are more likely to disagree both with the cumulative interpretation of universal quantifiers and the distributive interpretation of bare NPs (they approach the adult grammar). Crucially, no children accept the cumulative interpretation of universal quantifiers but reject the distributive interpretation of bare NPs (the bottom right part of the graph is empty). This at least supports the idea of timing we suggest, as we will discuss further in section 6.1.

(7)   Children accepting the cumulative interpretation of ∀ should also agree to the distributive interpretation of bare NPs.
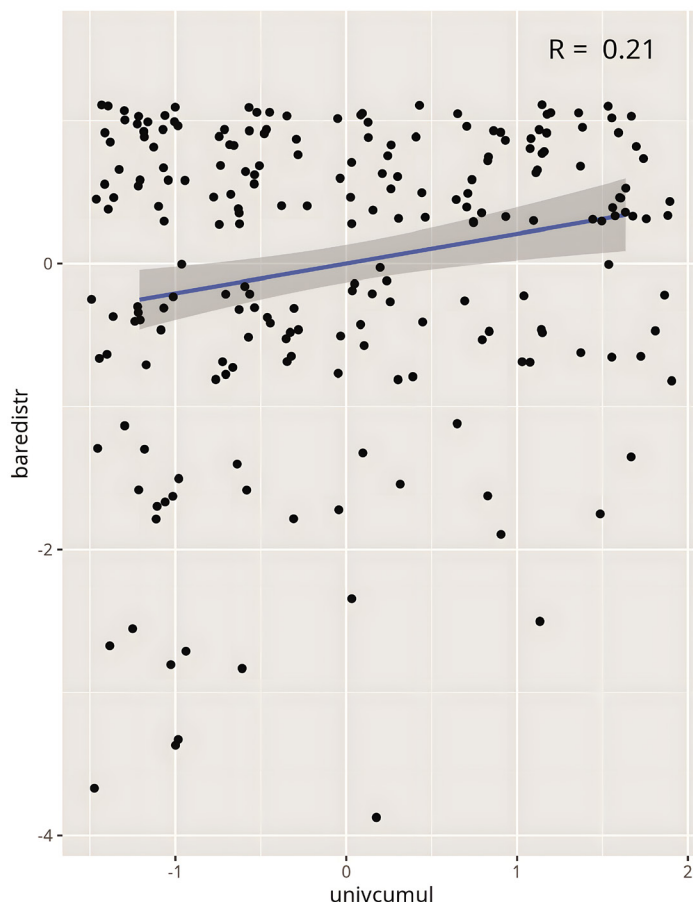
Figure 9. Correlation: cumulative int. of ∀ and distr. int. of bare NPs

6. Theoretical Consequences

This section discusses how the experiment results can be interpreted linguistically. First, it is clear that Czech children in the sample have problems understanding that the proper semantics of the singular universal quantifier requires obligatory distributive interpretation. Five-year old children accept both the cumulative and distributive readings of the singular universal quantifier. However, with every year, cumulative interpretation is less and less accepted, and around the age of 10 or 11, a substantial majority of children reject the cumulative interpretation and accept only the distributive one. This answers the first research question repeated below for the singular universal quantifier. As for the bare NPs, the situation is more complex: children at the age of five accept both the correct cumulative interpretation of bare NPs and the incorrect distributive interpretation of them. Moreover, in our sample, we did not find evidence about the development to the correct stage where the distributive interpretation of bare NPs is highly dispreferred.

(8)   What is the learning development of UQs/bare NPs in Czech?

The experiment's results also provide evidence for resolving the second research question repeated below. Both the descriptive statistics, the Bayesian model, and the correlation, agree on the hypothetical

timing in the acquisition: first, children acquire the proper distributive interpretation of ∀, and in this stage, around the age of ten or eleven, the correct interpretation (rejection of the distributive interpretation) of bare NPs is still not achieved. As we know from the adult control group, there is a strong preference for the cumulative interpretation of bare NPs. However, since around the age of ten or eleven, the acceptance rate of both cumulative and distributive interpretation is nearly identical (around 75%), the acquisition of the correct interpretation of bare NPs happens later and follows the stage where the obligatory distributive interpretation of UQ is correctly acquired.

(9) Is there a correlation between the acquisition of the correct obligatory distributive meaning for Czech UQs and the tendency to reject the distributive interpretation of bare NPs?

In the next section, we outline the theoretical explanation which can be applied to the data yielded by our experiment.

6.1 The Conversational Implicature Explanation

We start our theoretical explanation by introducing the core ideas of Pagliarini et al. (2012), which is the direct inspiration for our theoretical model. We then proceed to explain the main differences between our experiment and their results. We also discuss the implications of these differences for our theoretical model.

Pagliarini et al. (2012) study the acquisition of distributive universal quantifiers and definite NPs in Italian. The experiment is a truth value judgment task in which participants are asked to judge the truth of sentences like (10) and (11) in distributive and collective contexts. The context is represented by a picture: in the collective context, the picture for (10) shows a group of boys cooperating to build a single snowman (such representation is clearly non-acceptable for the adult speakers), e.g.

(10) Ciascun   bambino   costruisce   un   pupazzo   di   neve.
     Each   boy   build.3P.SING.PRES   a   puppet   of   snow
     'Each boy is building a snowman.'

(11) Le   bambine   costruiscono   un   pupazzo   di   neve
     The   girl.PL   build.3P.PL.PRES   a   puppet   of   snow
     'The girls are building a snowman.'

The results of the experiment show that Italian children first learn to reject the collective interpretation of the universal quantifier, and then they start to reject the distributive interpretation of the definite NP. Pagliarini et al. (2012) explain acquisition development in the following way: Let's assume that the definite NPs are ambiguous between the collective and distributive interpretation. We can formalize this for English in (12) as follows (the formalization is not part of Pagliarini et al., 2012, but we consider it useful for the explanation of the results): in (12-a), the definite NP is interpreted collectively (see the first argument of the predicate *build* with the supremum operator) and in (12-b) it is interpreted distributively. The distributive interpretation in (12-b) is obtained via the pluralization of the VP (see the discussion below), and the first argument of the predicate *build* is the atomic *x'* lambda bound by the pluralization operator.

(12) The girls are building a snowman.
     a. collective interpretation: $\exists x[^*girl(x) \wedge \exists y[snowman(y) \wedge build(\oplus x, y)]]$
     b. distributive interpretation: $\exists x[^*girl(x) \wedge ^*\lambda x'. \exists y[snowman(y) \wedge build(x', y)]]$

The universal quantifier, on the other hand, is interpreted only distributively. Again, using an English example, we illustrate this in (13). The conversational implicature explanation from Pagliarini et al. (2012) is then the following: for the adult speakers, the definite NPs are not interpreted distributively since there is an unambiguous expression for such meaning, namely the universal quantifier. So, even if the definite NP is, in principle, ambiguous between the collective and the distributive interpretation, Grice's Maximum of Quantity predicts that the hearer would interpret (12) as not conveying the meaning of (13) since (13) is not ambiguous and therefore more informative then (12). However, children acquire this knowledge in phases. First, they learn the obligatory distributive interpretation of the universal quantifier, and only then can they reason via the conversational implicature that the definite NPs are not interpreted distributively. This is the gist of the explanation given by Pagliarini et al. (2012) on the acquisition of distributive universal quantifiers and definite NPs in Italian.

(13) Each girl is building a snowman.
    a.   distributive interpretation: $\exists x \left[*girl(x) \wedge *\lambda\ x'.\exists y \left[snowman(y) \wedge build(x',y) \right] \right]$

Our experiment differs from Pagliarini et al. (2012) in several aspects. First, we study the acquisition of distributive universal quantifiers and bare NPs in Czech, not definite NPs. Because of that, we decided not to compare distributive and collective interpretation but rather distributive and cumulative interpretation. But in general terms, we follow the conversational implicature approach to the acquisition.

    Now, turning to our experimental finding, we apply the conversational implicature approach to our data. First, let us assume that the bare NPs are ambiguous for adults between the cumulative (14-a) and distributive reading (14-b). For the sake of presentation, we use English. However, our explanation aims at Czech data since a proper cross-linguistic interpretation of our experiment's results is beyond this article's scope. The cumulative reading in (14-a) is scopeless: both plurality-denoting expressions are conjoined, and neither of them is in the scope of the other one. The distributive interpretation of (14) in (14-b) is scopal: the subject distributes over the meaning of VP, which is achieved via the pluralization of the whole VP by the star operator (in this, we follow Landman's approach to distributivity where pluralization and distributivity are the two sides of the same coin).

(14) Children bought two sweets.
    a. $\exists x \left[*child(x) \wedge \exists y \left[\#y=2 \wedge *sweet(y) \wedge *buy(x,y) \right] \right]$
    b. $\exists x \left[*child(x) \wedge *\lambda x'.\exists y \left[\#y=2 \wedge *sweet(y) \wedge buy(x',y) \right] \right]$

Furthermore, we assume that for adults (in this formalization), the singular universal quantifiers like *each* in (15) does have just the distributive interpretation like in (15-a). (14-b)/(15-a) is logically stronger than (14-a) (it entails it); therefore, we can apply the usual Gricean reasoning to them and analogically the textbook cases like the exclusive interpretation of disjunction (via negation of conjunction) we can claim the following: adults hearing bare NPs (like in (14)) assume that a well-informed speaker would use (15) in a distributive scenario since the two interpretations of bare NPs are in asymmetrical logical relation. Because of that, she (sine qua non) interprets bare NPs only cumulatively, as in (14-a). This reasoning follows the explanation for the lack of collective reading for definite NPs in adult Italian, as suggested by Pagliarini et al. (2012). But in our case, Grice's Maxim of Quantity is even more straightforward: there is an entailment relation between (15-a) and (14-a), and the first entails the second. Moreover, we assume that bare NPs are also ambiguous between the cumulative and the distributive interpretation, which is reminiscent of the Italian data analysis from Pagliarini et al. (2012). But in any case, the universal quantifier in (15) is more informative than the bare NP since it is not ambiguous and it entails it. Therefore, an adult hearer interpreting the Czech version

of (14) will (after Grice's reasoning) interpret it not distributively, as we confirmed with the control group of our experiment.

(15) Each child bought two sweets.
    a. $\exists x \left[* \ child(x) * \lambda x' . \exists y \left[\# y = 2 \wedge * \ sweet(y) \wedge buy(x', y) \right] \right]$

With the sketch of the theoretical explanation introduced above, we proceed to research question 2, repeated below as (16): it seems we have good reasons to support the positive answer to this research question. Since: first, the timeline of the acquisition supports the positive answer – recall that first, the children acquire the correct distributive meaning of the universal quantifier, and only then do they start to reject the distributive interpretation of bare NPs (though the effect was not credible in our sample). Second, the correlation reported in Figure 9 shows that the children accepting the cumulative interpretation of universal quantifiers are more likely to accept the distributive interpretation of bare NPs (non-adult behavior) and vice versa: the children rejecting the cumulative interpretation of universal quantifiers are more likely to reject the distributive interpretation of bare NPs (adult behavior). The existence of this correlation and also the descriptive statistics supports the timing we propose: recall that the children start with the acceptance of the cumulative interpretation for universal quantifiers (as reported in Figure 3, top right facet) but slowly reject it. The younger children (in the sample) accepting the cumulative interpretation of the universal quantifier are the right part of the subjects in the correlation Figure 9; as subjects acquire the right distributive interpretation, they start to reject the cumulative interpretation (the left part of Figure 9) and correlated with this rejection is the decrease in the acceptance of bare NPs in the distributive scenarios.

(16) Is there a correlation between the acquisition of the correct obligatory distributive meaning for Czech UQs and the tendency to reject the distributive interpretation of bare NPs?

When comparing our results with the previous research, it seems that most of the facts discovered in other languages before apply to Czech as well, especially comparing our results with Pagliarini et al. (2012). Italian children also struggle with the distributive interpretation of universal quantifiers, and when they grasp its proper meaning, they start to get the correct interpretation of definite NPs. We constructed a model where our 2×2 conditions were flattened (to 4 conditions – Pagliarini et al., 2012 use this type of model). The inferential statistics results were very much comparable with only one difference: in the model of Pagliarini et al. (2012), the distributive interpretation of definite NPs significantly decreases with age (the interaction between age and the condition was significant for them), but this is not true for our model, as discussed above. One of the reasons for this is the limitation of our sample: unlike Pagliarini et al. (2012), who had children up to the age of 13, our sample was limited to a maximum of 11-year-old children. It is plausible to assume that extending our sample to older children would lead to similar results as in Pagliarini et al. (2012) since, as we were confirmed by our adult control group, non-children Czech speakers preferentially reject the distributive interpretation of bare NPs.

7. Summary and Open Questions
7.1 Summary
This article reports the results of the acquisition study targeting the meaning of Czech universal distributive quantifiers and bare NPs. We answered both research questions: first, the acquisition of the distributive interpretation of the universal quantifier is late, and second, the acquisition of the distributive interpretation of bare NPs is even later. We also found evidence for the conversational

implicature explanation of the distributivity acquisition errors since the computation of the rejection of the distributive interpretation for bare NPs cannot be processed without, first, the correct distributive interpretation of the universal quantifier. The conversational implicature explanation is also supported by the correlation found in the data: children who accept the cumulative interpretation of universal quantifiers (non-adult behavior) also accept the distributive interpretation of bare NPs and vice versa: the children rejecting the cumulative interpretation of universal quantifiers are more likely to reject the distributive interpretation of bare NP as well (adult behavior). The data patterns we found are compatible with the previous research on the acquisition of distributivity in other languages. Moreover, our findings can be theoretically explained if we assume that children start with weak semantics of universal quantifiers (and bare NPs, but there, the weak meaning is expected) and gradually enrich their meaning with the distributivity operator; pragmatic implicatures are acquired even later.

As for open questions, there are many, and we will list only some of them here: first, our research would benefit from other acquisition studies that will explore the acquisition of collective interpretation since, under some assumptions (adding covers), the collective reading is a special case of the cumulative reading (like the distributive reading) and is predicted to be acquired similarly to the distributive one. Connected to this issue is the nature of alternatives used for the computation of conversational implicatures: bare NPs and universal quantifiers are not of the same complexity, and if we assume the standard framework like Katzir (2007), we can think maximally about the bare NP being an alternative to the universal quantifier since it can be derived from it by deletion. Nevertheless, even in this case, many hinge upon the correct treatment of the syntax and semantics of bare NPs, which goes beyond the scope of this article. Elaborating on this, since the interpretation of bare NPs always hinges upon the nature of the verb (Carlson (1977)), is the late acquisition of correct bare NP meaning connected with the correct acquisition of the episodic/generic distinction in the Czech verbal system? Finally, we found some evidence for the conversational implicature hypothesis. However, a proper comparison with the alternative hypothesis (spreading errors as a source of the problems with the distributivity acquisitions, see Musolino (2009), Geurts (2003) a.o.) would need a separate study. Obviously, at the end of any research, some questions were resolved, but many of them remain open for future work.

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Determining Argument Structure Variants by Numerical Optimization

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Abstract: The paper proposes a representation of arguments and adjuncts in terms of probability value vectors, and presents a method to calculate argument structure solely based on information available in the corpus. The method can be extended to verbs with multiple argument structures, where argument structure variations associated with the same verb need to be identified. The novelty of the approach is that it relies solely on morphological and syntactic information available in the corpus, discarding the need for meaning-based methods of argument structure identification. The predictions of the probability model proposed in the paper are shown to correlate with the results of a manual annotation control with a high degree of accuracy.

Keywords: compositionality; Hungarian; corpus-based; argument structure; scalar vector

1.   Introduction

In this paper we present a scalar approach to argument structure representation based on which scalar argument structure vectors can be calculated directly from the corpus, including verbs with multiple argument structures. The novelty of the approach lies in discarding the need for meaning-based methods of argument structure identification in the corpus by introducing an automated tool that uses solely morphological and syntactic information. As a result, the traditional binary opposition between arguments and adjuncts is also reconsidered and a new method for distinguishing the two is proposed: they can be described in a uniform manner using scalar probability values. The difference between the two can be captured by the different thresholds associated with them, but this study does not aim to determine these thresholds: arguments are the constituents above a certain probability value whereas adjuncts are associated with low probability. Since the different expressions combining with the verbs are determined with scalar probabilities, the argument strucrue of predicates is not defined by listing the arguments in the traditional sense of the word but by the vector determined by the scalar values of these expressions without distinguishing between arguments and adjuncts at this point. The difference between them falls out naturally in this approach in the systematic but predicate-dependent differences in the probability values associated with the vectors.

 The structure of the discussion is as follows: in Section 2 we start with a short description of standard approaches to argument structure and highlight potential problems. Section 3 presents the method of calculating scalar argument vectors based on salient morphological or syntactic properties of the constituents appearing together with the selecting predicate. Section 4 discusses how to deal with the problem of multiple argument structures and how to break down the cumulated vector associated with the same verb with all its different argument structures into the individual argument structure representations, which is more relevant information from a linguistic perspective. Section 5 concludes the paper.

2.   Standard Approaches to Argument Structure

Argument structure is a syntactically realized lexical property. The arguments of a selecting predicate are listed in the lexical description of the predicate, which gives information on how to create minimal sentences in syntax. The difference between arguments and adjuncts is a binary opposition in standard approches: arguments are those expressions that are a part of this lexical description, whereas adjuncts are the modifiers that do not appear there.

While, theoretically, verbal complements are expected to appear in the clause, in actual language use this is not always the case, as complements can be omitted for various reasons (pro-drop, ellipsis, complement fronting, etc.). It also poses a challenge that adjuncts do not always differ from complements in terms of their formal properties. For example, the Hungarian transitive verb *bízik* ('trust') has a complement in inessive case, apart from the subject. However, this case is also typical of adjuncts expressing location or time:

(1)   Január-ban   még   nem   bíztam   Péter-ben.
       January-INE   still   not   truted.1SG   Peter-INE
       'In January, I still didn't trust Peter.'

Sentence (1) lacks the subject argument (due to pro-drop), but it includes a complement in inessive case (*Péter-ben*) as well as an adjunct in the same case form (*január-ban*). The position of the constituents cannot be used as a diagnostic for distinguishing complements from adjuncts because Hungarian is a free word order language, and *Péterben még nem bíztam januárban* (with the same meaning) is also a grammatical sentence.

The situation is further complicated by the fact that it is not only the verb's own complements or adjuncts that can appear alongside a verb: constituents can also be moved there from another clause (2).

(2)   Péter-ben   akartam   bízni.
       Peter-INE   wanted.1SG   to.trust
       'I wanted to trust Peter.'

In sentence (2), the subject of the verb *akar* ('want') is missing (again, due to pro-drop), but the inessive complement of the verb *bízik* ('trust') is in the matrix left periphery after undergoing fronting. Through qualitative analysis, it is possible to determine which constituents in examples (1) and (2) serve as the complement or adjunct of each verb. However, quantitative corpus-based methods do not make this distinction easily.

Further problems arise since very often one and the same verb has multiple argument structures associated with it, as discussed in detail in Section 4. Distinguishing between the different argument structure variants using solely automated statistical methods is highly desirable but it is a non-trivial task: while extracting the cumulated arguments of a given verb from a corpus is relatively straightforward, this information is less relevant in linguistics. The individual argument structures associated with the same predicate, however, cannot be determined directly based on this cumulated information. The following two sections present a method that can break down the cumulated results into the individual variants with high accuracy using only information available in the corpus. In doing so, we list the constituents that the verb appears together with, both arguments and adjuncts. The account is based on the frequency of these constituents resulting in scalar vector representations, which are used to characterize the different environments the predicate appears in, as well as the cumulated description of potential environments.

3.   Corpus-Based Argument Structure Representation

Our goal is to determine the argument structure of verbs without relying on native language intuition, as using intuition may result in contingent, subjective descriptions. By using large corpora, it can be established which words or expressions verbs most commonly co-occur with, and based on this data, we can proceed to determining the argument structure of the verbs.

3.1 Dependency Analysis, Arguments, and Adjuncts

Our initial corpus consists of sentences containing the verbs under discussion. When analyzing these, three tasks need to be accomplished:

1.   The sentences in the corpus are often complex, so it is necessary to isolate the part of the sentence in which the words related to the verb under investigation are located, i.e., the clause containing the verb.

2.   It is not the words in the vicinity of the verb that we want to examine but the constituents next to the verb. Therefore, it is necessary to identify the maximal constituents within the clause. Additionally, we need to know some characteristic properties of these constituents, which we use to represent them when describing their argument structure.

3.   From the mere presence of a constituent next to the verb, it cannot be determined whether it is an argument of the verb, an adjunct, or is in some other relationship with the verb. To reliably identify argument structure, a method is needed to determine which constituent should be included in the argument structure representation.

To address the first two tasks, we utilized a pre-annotated corpus. In the pre-annotated corpus, each word is accompanied by its lemma, part of speech (POS), and morphosyntactic description (MSD), which includes details such as number and case for nouns and tense and number-person features for verbs. Additionally, sentence structures are represented using dependency analysis, with dependency edges and labels. The Hungarian language corpora we employed in previous research include both manually annotated parts (for example the Szeged Dependency Treebank, (Vincze et al. 2010) in (Gyulai 2019)) and automatically analyzed sections obtained through automated tools (magyarlanc (Zsibrita, Vincze, and Farkas 2013) in (Gyulai 2023) and (Szécsényi and Gyulai 2024); e-magyar (Váradi et al. 2018)).

Dependency analysis allows us to extract the constituent structure of the sentence. We consider a constituent to be a maximal, uninterrupted word chain if it only has a single incoming dependency edge from outside the chain. This element is referred to as the head of the constituent. The complete sentence itself is also such an uninterrupted maximal constituent, with its head being the verb of the sentence. Subsequently, we searched for all the maximal uninterrupted constituents both before and after the head of the sentence. For each newly found maximal uninterrupted constituent, we recursively identified its comprising maximal constituents, continuing until every newly found constituent consisted only of its head, as shown in Figure 1.

From the list of such uninterrupted maximal constituents, we identified as clauses the ones that had a VERB as their head (Task 1), and the maximal uninterrupted constituents found directly within these clauses were considered the constituents standing next to the verb (Task 2). To represent these constituents standing next to the verb, we used specific morphosyntactic features of the constituent's head (Task 2).

The dependency analysis of the sentence *Péter Marinak akart egy könyvet ajándékozni a születésnapjára* (Péter.NOM Mari.DAT wanted a book.ACC present.INF the birthday.POSS.SUB 'Péter wanted to give Mari a book for her birthday') in Figure 1 is depicted by the grey edges connecting the syntactic categories of words. Each edge links two words, with the arrow identifying the head of the dependency (where the arrow points) and the dependent word (where the arrow comes from). The sentence contains NOM,

ACC, DAT and SUB type nouns, as well as two verbs. The sentence forms a single uninterrupted maximal constituent, with the head being the finite verb, as it has a dependency edge from outside the sentence. Since the head is a verb, the entire sentence is considered a clause: clause$_1$. Within clause$_1$, there are three uninterrupted maximal constituents, two before the head and one after the head. The constituents before the head are nouns, and its representative morphosyntactic feature is NOM and DAT, making the first constituent a NOM-type, the second one a DAT-type expression (NP). In clause$_1$, after the verbal head, we find an INF-type constituent (VP). This constituent is itself a clause (clause$_2$) because it has a verbal head. In clause$_2$, apart from the head, we find an ACC-type and a SUB-type maximal constituents. Although V$_{INF}$ is connected by a dependency edge to N$_{DAT}$, the DAT-type constituent is not part of clause$_2$ because the dependency edge pointing to the finite V interrupts it. Thus, the status of each maximal constituent is determined based on its surface position regarding which clause they belong to, and not based on its deep structure position. In the example sentence, for instance, the dative NP was originally the complement of the infinitive but was moved to the focus position of the matrix clause.
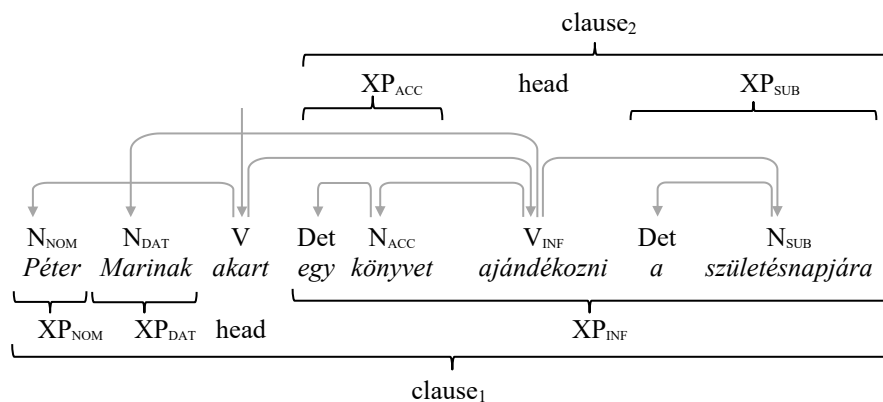
Figure 1. Dependency analysis of the sentence *Péter Marinak akart egy könyvet ajándékozni a születésnapjára* 'Péter wanted to give Mari a book for her birthday.'

For a more detailed description of the procedure for identifying clauses and maximal constituents see Szécsényi (2024).

We represent the constituents found in the clauses with one of their characteristic morphosyntactic features. For those constituents whose morphological case is specified (nouns, adjectives, pronouns, etc.), we use their case form (21 different types). For constituents with a verbal head, we differentiate between *that*-clauses, indicative, imperative, and conditional clauses, and infinitival clauses (5 types). Furthermore, adpositions, adverbials, and verbal modifiers are also constituent types, which sums up to a total of 29 different types.

The most challenging problem is the third task: the identification of constituents appearing alongside the verb as complements or adjuncts.

With a corpus-based method, it is not possible to directly determine the argument structure of a verb, meaning that we cannot straightforwardly obtain a list of the verb's complements. Instead, we propose an alternative argument structure representation that doesn't aim to strictly differentiate between complements and adjuncts. Instead of making a binary distinction between them we characterize the types of constituents appearing alongside the verb with probability-based scalar values. Rather than saying that the verb *bízik* ('trust') has an inessive complement, we say that there is an 0.88 probability of an inessive constituent appearing alongside the verb in the same clause. Since we neither can nor

want to decide which constituent is a complement or an adjunct, we determine these scalar values not only for complements but for all distinguishable constituent types, specifically the 29 constituent types mentioned earlier. Consequently, we describe each verb with 29 scalar probability values, that is with a 29-dimensional *scalar argument structure vector*, several of which is going to be zero, as a verb is not likely to appear with NP constituents in all the 21 possible case forms in the same clause. Higher probability values suggest that the constituents are more likely to be complements, while lower values indicate they are more likely to be adjuncts, a conjecture that is to be confirmed by further research. We use the term *scalar vector* instead of *binary vector* to distinguish it from traditional descriptive analyses, where the complement-adjunct binary distinction is represented as a binary argument structure vector for the argument structure of verbs.

As our argument structure model does not automatically differentiate between arguments and adjuncts and includes constituents that have no semantic relationship with the verbal head, for ease of exposition, we introduce a new term for the maximal uninterrupted constituents within a clause: we refer to them as *supplements*.

The vector-based representation of verbal argument structure proposed here is similar to how word embeddings are represented (Mikolov et al. 2013). However, a word embedding vector representation takes into account the frequency of all the words found in the context of a word, so it does not directly reflect the target word's argument structure. Moreover, due to the word2vec neural algorithm used to determine the word embedding vector, the values of the vector are not interpretable independently, and it is not clear what grammatical information each value carries.

Another corpus-driven method of determining the argument structure of a Hungarian verb is provided by Sass (2019), his Double Cube model, which, however, does not ensure the equal treatment of arguments and adjuncts.

3.2 The Calculation of Scalar Argument Structure Vectors

We determine the scalar argument structure vectors based on corpus data. In this section, we show how these can be obtained from the Szeged Dependency Treebank.

The Szeged Dependency Treebank (Vincze et al. 2010) is a hand-annotated reference corpus containing 1,200,000 tokens. The corpus texts were selected from six different domains, each comprising 200,000 tokens: fiction, compositions written by pupils between 14–16 years of age, newspaper articles, texts in informatics, legal texts, and business and financial news. The corpus consists of approximately 82,000 sentences, 165,685 verbs (and an equal number of clauses), which correspond to 13,556 different verb lemmas. The verbs were considered together with their verbal modifiers, as the verbal modifier can influence the argument structure of the verb (Gyulai 2019; 2021; Szécsényi and Gyulai 2024). Verbs were considered separately for different moods (conditional, imperative, indicative, and infinitive) and various derived forms (causative, potentiality).

Processing the corpus, we initially identified clauses, their heads (the verbs), and the maximal uninterrupted constituents within each clause, i.e., the supplements, along with their types. This information was used to create a table with 165,685 rows, where the first six columns represent the characterization of the verb (verbal modifier, lemma, verbal-modifier+lemma, mood, causative, potentiality), and the next 29 columns indicate whether a given type of supplement is present in the clause (1 if yes, 0 if no). We aggregated this table on a per-verb basis, counting how many times each verb appears in the corpus and how many times each type of supplement appears alongside it (13,556 rows). Finally, we divided the occurrence counts of supplement types by the occurrence count of the verb to obtain the argument structure vectors for the verbs. A portion of the table is visible in Figure 2:

A	B	C	D	E	F	G	N	O	P	Q	R	S	T	U	V	W
pvform	lemma	pvv	moo	cau	pot	n	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL
0	korlátoz	0+korlátoz	ind	-	-	41	0,68	0,93	0,00	0,17	0,07	0,15	0,02	0,12	0,00	0,00
0	terhel	0+terhel	ind	-	-	41	0,88	0,88	0,00	0,17	0,07	0,07	0,10	0,00	0,00	0,02
0	távozik	0+távozik	ind	-	-	41	0,59	0,00	0,00	0,10	0,27	0,05	0,17	0,15	0,00	0,29
0	ugrik	0+ugrik	ind	-	-	41	0,63	0,10	0,05	0,05	0,07	0,39	0,10	0,05	0,17	0,10
0	vágyik	0+vágyik	ind	-	-	41	0,27	0,00	0,00	0,02	0,02	0,85	0,00	0,02	0,05	0,00
be	ül	be+ül	ind	-	-	41	0,32	0,00	0,00	0,02	0,02	0,02	0,10	0,05	0,88	0,00
el	felejt	el+felejt	inf	-	-	41	0,00	0,22	0,00	0,00	0,02	0,00	0,00	0,00	0,00	0,00
el	jár	el+jár	ind	-	-	41	0,63	0,00	0,00	0,39	0,12	0,07	0,07	0,27	0,00	0,02
haza	megy	haza+megy	inf	-	-	41	0,02	0,00	0,02	0,00	0,00	0,05	0,00	0,00	0,00	0,00
meg	indul	meg+indul	ind	-	-	41	0,85	0,00	0,02	0,12	0,07	0,12	0,15	0,05	0,00	0,07
0	alakít	0+alakít	ind	-	-	40	0,60	0,93	0,00	0,18	0,28	0,08	0,08	0,10	0,00	0,00
0	bízik	0+bízik	ind	-	-	40	0,45	0,00	0,00	0,88	0,00	0,00	0,00	0,08	0,05	0,00
0	ellenőriz	0+ellenőriz	ind	-	-	40	0,55	0,75	0,03	0,18	0,08	0,00	0,05	0,08	0,00	0,00
0	emlékezik	0+emlékezik	ind	-	-	40	0,38	0,00	0,00	0,03	0,00	0,95	0,00	0,15	0,00	0,00
0	növekedik	0+növekedik	ind	-	-	40	0,88	0,03	0,00	0,30	0,18	0,15	0,33	0,18	0,00	0,05
0	válik	0+válik	ind	-	+	40	0,80	0,00	0,03	0,20	0,05	0,08	0,18	0,10	0,00	0,00
be	állít	be+állít	inf	-	-	40	0,00	0,50	0,00	0,05	0,05	0,03	0,03	0,03	0,00	0,00
ki	lép	ki+lép	ind	-	-	40	0,35	0,00	0,00	0,08	0,28	0,15	0,08	0,08	0,03	0,00
meg	fogalmaz	meg+fogal	ind	-	-	40	0,83	0,85	0,00	0,18	0,05	0,05	0,05	0,13	0,00	0,08
meg	követel	meg+köve	ind	-	-	40	0,75	0,70	0,00	0,10	0,05	0,03	0,00	0,20	0,00	0,00

Figure 2. A partial view of the argument structure vectors for verbs

Columns A-F display the characteristics of the verbs, column G shows the frequency of the verb's occurrence, and the following 29 columns present the probabilities of different supplement types occurring alongside that verb (only 10 are visible in the figure). For example, the verb *bízik* ('trust') without a verbal modifier occurred 40 times in the corpus, with a 0.45 probability of having a nominative supplement, 0.0 probability of an accusative or dative supplement, and 0.88 probability of an inessive (*-bAn*) supplement, and so on. (Apart from the nominative, accusative, and dative supplements, the supplement types are indicated with the actual case markers.) For easier interpretation, probability values have been color-coded: the darker the red in a cell, the higher the probability of that supplement type occurring.

4. Argument Structure Variants

4.1 Multiple Argument Structures: Manual Annotation and Visualization

Section 2 concluded by proposing a scalar vector-based representation of verbal argument structure with the different types of supplements characterized by a value between 0 and 1 based on the probability of the given supplement combining with the verb in a clause. This scalar value is lower than 1 even in the case of complements for a variety of independent reasons such as pro-drop or ellipsis. There is, however, another crucial factor to consider: a large number of verbs have multiple argument structures, that is, the same verb can have the same form but different meanings in a language, with the different meanings often associated with different argument structures. The procedure introduced in the previous section does not differentiate between these different uses, that is, the argument structure vector that we end up with contains only the cumulated values of all the different variants of the same verb.

In this section we show how to break down these cumulated values into the individual argument structure variants of a verb using an automated tool on the corpus. The method is demonstrated on the argument structure variants of the verb *bízik* ('trust'), with the data coming from the Szeged Dependency Treebank (Vincze et al. 2010). The data and parts of the method were first described in Szécsényi (2019).

In the examples in (3a–d) below we can see the different argument structure variants of the verb *bízik* ('trust') (examples are not from the corpus):

(3) a. (Én)   (meg)   bíztam   Mari-ban.
         I   VM   trusted.1SG   Mary-INE
         'I trusted in Mary.'

     b. (Én)   (rá)   bíztam   Mari-ra   a   level-et.
         I   VM   trusted.1SG   Mary-SUBL   the   letter-ACC
         'I left the letter in Mary's care.'

     c. (Én)   *(meg) bíztam   Mari-t   a   feladat-tal.
         I   VM   assigned.1SG Mary-ACC   the   task-INST
         'I assigned the task to Mary.'

     d. (Én)   *(el)   bíztam   magam-at.
         I   VM   trusted.1SG   myself-ACC
         'I got overconfident.'

     e. Én   bíztam   Mari-ra   a   level-et   január-ban   Péter-rel
         I   trusted.1SG   Mary-SUBL   the   letter-ACC january-INE   Peter-INST
         'I left the letter in Mary's care in January with Peter.'

The variants of the verb have different verbal modifiers (VMs), but in variants (3a–b), they are omissible, they are obligatory only in variants (3c–d). In the rest of the paper, verbal modifiers are not considered. As we will see, using the proposed method, the variants of the verb can be distinguished even without considering them. Variant (3d) has an idiomatic meaning and is relatively rare in the corpus. In the sentences in (3a–d) the variants appear only with their arguments, we are going to refer to them as $bízik_1$ (with nominative and inessive arguments), $bízik_2$ (the variant with nominative, accusative, and sublative arguments), $bízik_3$ (nominative, accusative, and instrumental arguments) and $bízik_4$ (with nominative and accusative arguments).

In the sentence in (1e) the arguments of the verb appear together with no-arguments having the same form. In this case the automatic parser cannot identify which variant is present in the clause.

The verb under investigation appears 157 times in the corpus with or without a verbal modifier. The number of the different supplement types can be seen in the first line of Table 1 (showing only the potential arguments).

Of course, manual annotation can determine which variants the clauses in the corpus belong to, this way the data can be provided for the different variants as well. This is what we can see in the lines below the first one in Table 1. At the same time, manual annotation is what we want to substitute with an automatic procedure. For us it served as a basis of comparison in checking the precision of the method presented here.

	n	NOM	ACC	INE	SUBL	INST
bízik	157	64	59	82	40	23
$bízik_1$	83	38	0	73	1	0
$bízik_2$	43	12	32	4	37	1
$bízik_3$	28	13	24	5	2	22
$bízik_4$	3	1	3	0	0	0

Table 1. The occurrence numbers of the variants of the verb *bízik* ('trust') and its frequent supplements

Based on the data in Table 1 we can determine the cumulated argument structure vector of the verb, shown in the first line of Table 2. The frequency of the individual variants compared with the other variants can also be calculated as shown in the column under f_{Vi} (the frequency of variant i), together with the argument structure vectors of these individual variants, which appear in the lines below the first line showing the cumulated vector, after the f_{Vi} column.

	f_{Vi}	NOM	ACC	INE	SUBL	INST
bízik		0.41	0.38	0.53	0.25	0.15
bízik$_1$	0.53	0.46	0.00	0.88	0.01	0.00
bízik$_2$	0.27	0.28	0.74	0.09	0.86	0.02
bízik$_3$	0.18	0.46	0.86	0.18	0.07	0.79
bízik$_4$	0.02	0.33	1.00	0.00	0.00	0.00

Table 2. The relative frequency and argument structure vector of the variants of the verb *bízik* ('trust')

The variant *bízik*$_1$ has a frequency of 0.53 in the corpus (f_{var1}). In the same clause, the frequency of the nominative supplement is 0.46 (f_{1NOM}), that of the accusative 0.00 (f_{1ACC}), etc. The argument structure vector of the variant *bízik*$_1$ is therefore $\bar{v}_1$ = [0.46; 0.0; 0.88; 0.01; 0.0], while the cumulated vector of the verb *bízik* counting in all the variants is $\bar{v}$ = [0.41; 0.38; 0.53; 0.25; 0.15].

The relationship between the cumulated vector and the vectors of the individual variants is captured by the equation in (2), stating that the cumulated vector is the weighted sum of the vectors of the variants (assuming *k* variants):

(2) $\quad \bar{v} = \sum_{i=1}^{k} f_{var_i} \cdot \bar{v}_i$

Figure 3 is a visual representation of the argument structure vectors of the variants (without the fourth, idiomatic variant with a very low occurrence number in the corpus).
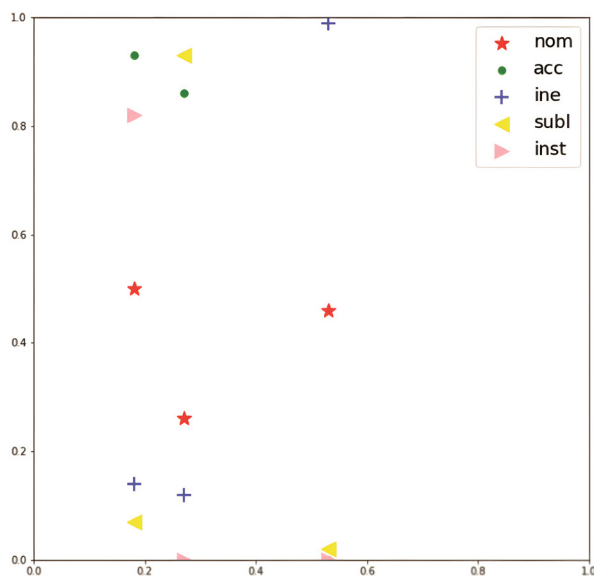

Figure 3. The argument structure vectors of three variants of the verb *bízik* ('trust')

In Figure 3 the individual argument structure vectors can be identified as the symbols forming a column. The distance of the columns from the vertical axis shows the relative frequency of the variant (f_{vari}). The distance of the symbols from the horizontal axis shows the frequency of the supplements (f_{iX}), with the different symbols associated with different supplement types.

4.2 Supplement Combinations

Our task now is providing an automatic method to determine the argument structure vectors of the individual variants as well as the relative frequency of this variants from the corpus data. The method presented in the previous section can only be used to determine the cumulative vector. However, other data can also be extracted from the corpus: there is information available on the combination of the supplements appearing in a clause. This shows which combinations of supplements are frequent or rare, which correlates with the argument structure vectors of the variants: the frequent combinations are the ones which function as the arguments of the variants.

As a first step we count how many times the different supplement combinations appear in the corpus. Although earlier we distinguished 29 supplement types, we consider only the supplements frequently combining with verbs, always contingent on the target verb – these are the potential arguments of the verb – in order to avoid having to work with 2^{29} possible combinations. In Table 3 below we consider the 8 possible combinations of the 3 frequent supplements of the verb *bízik* 'trust'.

combinations		ACC	INE	SUBL	n	frequencies
V+0					16	$f_{V+0} = 0.10$
V+ACC		+			24	$f_{V+ACC} = 0.15$
V+INE			+		72	$f_{V+INE} = 0.46$
V+SUBL				+	9	$f_{V+SUBL} = 0.06$
V+ACC+INE		+	+		5	$f_{V+ACC+INE} = 0.03$
V+ACC+SUBL		+		+	26	$f_{V+ACC+SUBL} = 0.17$
V+INE+SUBL			+	+	1	$f_{V+INE+SUBL} = 0.01$
V+ACC+INE+SUBL		+	+	+	4	$f_{V+ACC+INE+SUBL} = 0.03$
	n	59	82	40	157	
	v̄	0.38	0.53	0.25		

Table 3. Combinations of first 3 most frequent supplements of the verb *bízik* ('trust')

The rows of Table 3 present the data of the different supplement combinations. The column marked *n* shows the occurrence number of the given supplement combination, the last column is information on the relative frequencies of the combinations.

The last two rows of the table show the cumulative sum of the supplement types from which the frequency values, that is, the cumulative argument structure vector, can be calculated.

The cumulative frequency of the supplement types (f_{ACC}, f_{INE}, f_{SUBL}), and the frequency of the supplement combinations (f_{V+0}, f_{V+ACC}, f_{V+INE}, $f_{V+ACC+INE}$ etc.) can be extracted from the corpus. What we

would like to know are the data that we determined through manual annotation in Table 2, that is, the number of the variants (k), their relative probabilities (p_{var1}, p_{var2}, ... p_{vark}), and the probablities of the supplement types in the variants, that is, the individual argument structure vectors themselves (p_{1ACC}, p_{1INE}, p_{1SUBL}, p_{2ACC}, p_{2INE}, p_{2SUBL}, ... p_{kACC}, p_{kINE}, p_{kSUBL}). With k=2 variants and 3 supplement types it means 2+2x3=8 unknown probability values.

Since we don't know these values, we try to estimate them as a probability values. These estimated probabilities will then serve as a model for us, with which we can predict the known or observed frequencies. If the model is accurate, the predicted probabilities converge to the observed frequencies.

The task, therefore, is creating a probability model that is able to predict the observed frequency values (obtained by manual annotation) with maximum accuracy. The connection between the probability model and the frequency values observed is expressed by the equations in (4).

(4)
$$p_{ACC} = \sum_{i=1}^{k} p_{var_i} \cdot p_{iACC} \qquad p_{INE} = \sum_{i=1}^{k} p_{var_i} \cdot p_{iINE} \qquad p_{SUBL} = \sum_{i=1}^{k} p_{var_i} \cdot p_{iSUBL}$$

$$p_{V+0} = \sum_{i=1}^{k} p_{var_i}(1 - p_{iACC}) \cdot (1 - p_{iINE}) \cdot (1 - p_{iSUBL})$$

$$p_{V+ACC} = \sum_{i=1}^{k} p_{var_i}(\quad p_{iACC}) \cdot (1 - p_{iINE}) \cdot (1 - p_{iSUBL})$$

$$p_{V+INE} = \sum_{i=1}^{k} p_{var_i}(1 - p_{iACC}) \cdot (\quad p_{iINE}) \cdot (1 - p_{iSUBL})$$

$$p_{V+SUBL} = \sum_{i=1}^{k} p_{var_i}(1 - p_{iACC}) \cdot (1 - p_{iINE}) \cdot (\quad p_{iSUBL})$$

$$p_{V+ACC+INE} = \sum_{i=1}^{k} p_{var_i}(\quad p_{iACC}) \cdot (\quad p_{iINE}) \cdot (1 - p_{iSUBL})$$

$$p_{V+ACC+SUBL} = \sum_{i=1}^{k} p_{var_i}(\quad p_{iACC}) \cdot (1 - p_{iINE}) \cdot (\quad p_{iSUBL})$$

$$p_{V+INE+SUBL} = \sum_{i=1}^{k} p_{var_i}(1 - p_{iACC}) \cdot (\quad p_{iINE}) \cdot (\quad p_{iSUBL})$$

$$p_{V+ACC+INE+SUBL} = \sum_{i=1}^{k} p_{var_i}(\quad p_{iACC}) \cdot (\quad p_{iINE}) \cdot (\quad p_{iSUBL})$$

The *p* values on the left of the equations are the probability values calculated based on the model, which, in an accurate model, correspond to the frequency values *f* in Table 3. The number of probability values derived from the model (found on the right side of the equations) is $(k+1) \cdot t$ for *k* variants and *t* supplement types. The number of equations, i.e., the number of frequency values obtained from the corpus, is $2^t + t$. Since these two numbers are not equal, the probabilities of the model cannot be calculated solving the equation system in (4).

4.3 Probability Model Obtained by Optimization

In order to determine the unknown probability values of the probability model and to identify the argument structure vectors of the individual variants of the verb *bízik* 'trust', we used the Hill-climbing local search optimization algorithm (Russell and Norvig 2010, 122–25). The program used for optimization and the data used can be found in the https://github.com/szecsenyi/Olinco23 repository.

The optimization process starts with randomly selected probability values and proceeds by modifying these in small steps so that the p values predicted by the model approximate the f values of the corpus as much as possible. The distance between the manually annotated f values and the predicted p values was calculated with the Squared Euclidean distance method, which determines the error of the model based on the formula in (3).

(5) $\quad error = \sum_{i} (p_i - f_i)^2$

The aim of the optimization process is to choose model probabilities in a way that the distance between the predicted probabilities and the observed frequencies is as small as possible, minimizing the error. Ideally it should be 0, however, the algorithm cannot provide a model as optimal as that.

Since the algorithm starts with a random value, the results of the optimization process differ each time it is executed. For this reason, the algorithm was run repeatedly with different initial values, recursively modifying the probability values of the model to decrease the error. This step of the optimization was performed hundreds of times, eventually selecting the 20 models with the smallest error.

When determining the argument structure variants of the verb *bízik* 'trust' we could rely on our native speaker intuitions, and identify three major variants, but this sort of knowledge is of course not granted during the optimization experiments. For this reason, we carried out different optimizations assuming 2, 3, or 4 potential variants, during which we worked with the 6 most frequent supplement types of the verb: nominative, accusative, inessive, sublative, instrumental, and *that*-clause. To recap, the model was expected to predict the frequency values of the 6 supplements and the frequency values of the $2^6=64$ supplement combinations that we obtained by manual annotation. The number of probability values for 2, 3 and 4 variants was 16, 24, and 32, respectively ((k+1)·t for k variants and t supplement types). We carried out the optimizations 100 times for all the three variants, taking into consideration the 20 with the smallest error. The argument structure vectors determined this way assuming two variants are shown in Figure 4 in an arrangement similar to that in Figure 3.
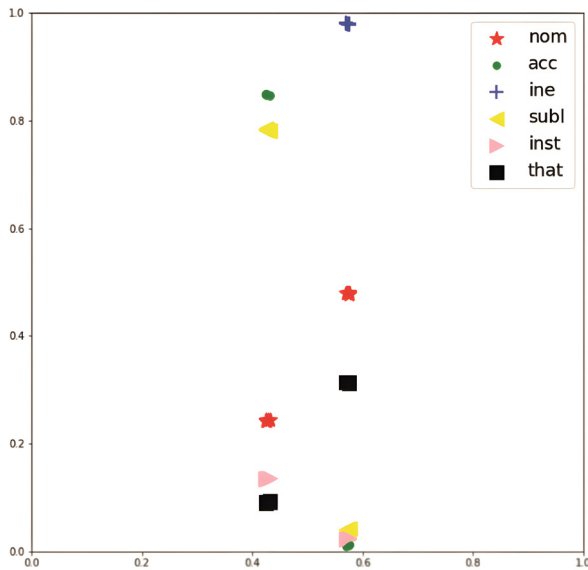
Figure 4. Argument structure vectors of the verb *bízik* ('trust') assuming 2 variants

Although the symbols showing the frequencies of the different supplement types do not fully overlap, two variants can be easily distinguished, the models converge to the same argument structure vectors during the process of optimization. The vector on the right maps onto that of the $bízik_1$ variant, with the one on the left being the cumulated vector of the other variants.
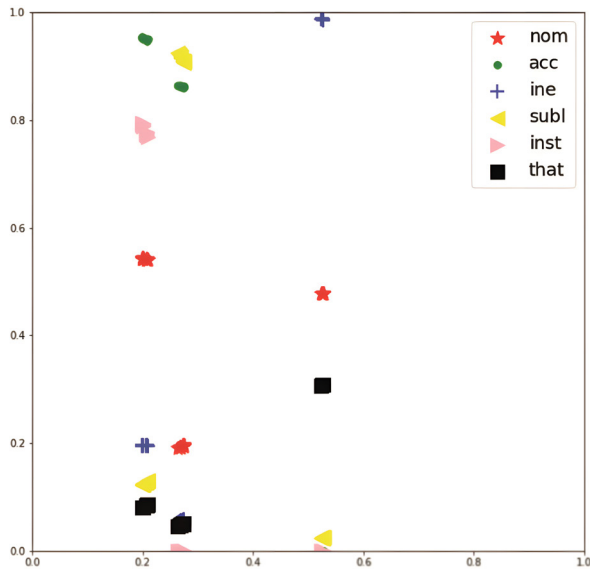
Figure 5. Argument structure vectors of the verb *bízik* ('trust') in case of 3 variants

The optimization process gives the best results assuming 3 variants: the 3 variants can be distinguished easily, and their probability values can be determined with a high degree of accuracy. The values in Figure 5 closely approximate the values of the 3 argument structure vectors in Figure 3 obtained by manual annotation, both in terms of the relative frequencies of the variants (horizontal positions) and the frequencies of the individual supplement types (vertical positions).
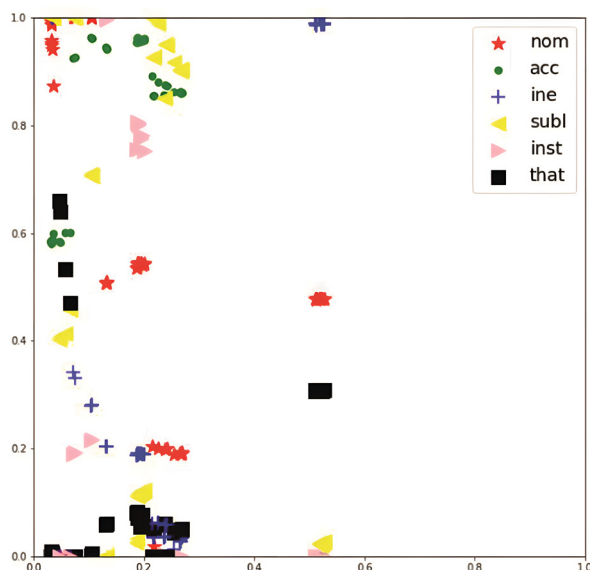
Figure 6. The argument structure vectors of the verb *bízik* ('trust') with 4 variants

DETERMINING ARGUMENT STRUCTURE VARIANTS

In Figure 6, which shows the results of the optimization process assuming 4 variants, the models do not converge, there is more noise in the representations. The first variant appearing on the right can be distinguished easily, but the vectors for the second variant end up somewhat blurred. The third and the fourth, that is, the less frequent variants cannot be distinguished at all, and the probability values of the supplement types are not easily identifiable either.

What these data show is that the optimization algorithm that we have used can identify three argument structure variants of the verb *bízik* 'trust' with high accuracy, which by and large matches the results of the manual annotation. The argument structure values of the three vectors closely approximate those of the manual annotation as well. Although during the manual annotation process a fourth vector was also found, its frequency of occurrence was so low that the automated tool could not detect it.

5.   Conclusion

The proposed method to extract argument structure-related information automatically from a corpus has been proven to be successful in determining argument structure and argument structure variation solely based on morphological and syntactic properties. What follows from this is that the argument structure of predicates can be determined by a corpus-driven method without any information on the meaning of the constituents making up the clause, with the results of the method closely approximating the precision of the manual annotation.

The scalar vector representation method can be used to detect correlations between different predicates or variants of the same predicate, leading to linguistically relevant insights such as identifying the systematic effects of argument structure changing operations, detecting arguments missing due to pro-drop or ellipsis, establishing verb taxonomies based on different verbs associated with similar vectors, or identifying corpus- or user-specific effects including language deficits. A direct outcome of the optimization method proposed here is a scalar approach to arguments and adjuncts based on probability values: arguments are associated with probability values higher than a threshold specified in the context of a given predicate, while adjuncts have lower threshold levels. However, determining these threshold values was not part of our current objectives, and setting the correct thresholds requires further research.

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Distinguishing Compositional and Non-Compositional Verbal Complexes: A Corpus-Based Approach

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Abstract: In this study we present research focusing on the argument structure of non-compositional verbs modified by verbal modifiers, using data obtained from a corpus and an asemantic version of the principle of compositionality. We examine the compositionality of the meanings of complex expressions from a syntactic perspective, focusing on their formal features and formal behavior instead of their semantic properties. Our main question is whether it is possible to predict, solely using syntactic methods, whether the meaning of these expressions is compositional or the verb modified by a verbal modifier has a non-compositional reading. We propose that systematic changes in the argument structure of the verb in the presence of a verbal modifier result in a compositional reading, while non-systematic ones give a non-compositional reading. In this paper, we present a method that makes this information automatically retrievable from the corpus without any need for semantics.

Keywords: compositionality; corpus-based; argument structure, verbal modifier; Hungarian

1.   Compositionality and Idiomacity: Asemantic Compositionality

The Fregean Compositionality Principle can be formulated in various ways; differences in formulations are discussed in detail in works such as Zoltán Gendler Szabó (2000; 2012; 2017). For now, let's start with Partee's simple formulation (Partee 2004, 153):

(1)   The meaning of an expression is a function of the meanings of its parts and of the way they are syntactically combined.

The Compositionality Principle ensures that speakers of natural languages can understand each other, despite the fact that these languages contain an infinite number of linguistic expressions and sentences. Therefore, in the interest of mutual intelligibility, we consider the Compositionality Principle to hold for every multi-word expression in every natural language, with no exception: expressions in natural languages are compositional. We highlight two components of the Compositionality Principle here: 1. "the meaning of the parts" and 2. "the way of combination".

However, in natural language, the meaning of some expressions is not compositional but rather idiomatic.

(2)   a.   hot dog
       b.   the apple of someone's eye
       c.   someone kicks the bucket

In the examples in (2), even though we understand the meanings of the individual words and how they are combined, we cannot determine the meaning of the entire expression. However, since we assume the universality and exceptionlessness of the Compositionality Principle, we must conclude that in these expressions, the way the parts are combined is unique, or that the parts themselves have unique meanings within these expressions.

1.1 Idiomaticity as Lexical Ambiguity

If we consider the way the components are combined in the examples in (2) to be unique, implying that idiomatic expressions have unique structures, we can attribute a unique meaning to these unique structures. However, we cannot fully explain why idiomatic expressions do not differ more from compositional expressions. Idiomatic expressions almost always have a literal meaning as well, and, even under the idiomatic reading, some of the idioms have their own internal syntax: some words, such as *someone* in examples (2b–c) are modifiable. Other components of idioms are fixed and can only be specific words. If the structure is unique, why is there a need for the components to be fixed?

Another way to define the meaning of idioms according to the Compositionality Principle is to consider the meaning of (some of) the words appearing in them as unique. Since the meanings of words are always unique and rely solely on convention, we can say that the words in idiomatic expressions appear as separate lexical items in the lexicon. In the example in (2c), the verb *kick* has two distinct lexical representations: $kick_1$ provides the "conventional", compositional meaning, and $kick_2$ represents the idiomatic meaning found in the example:

(3) $kick_1$:
          form   *kick*
          category   V
          argument structure $\langle NP[nom]_i, NP[acc]_j \rangle$
          meaning $'(i)$ *strike or propel forcibly* (j) *with the foot'*

(4) $kick_2$:
          form   *kick*
          category   V
          argument structure $\langle NP[nom]_i, NP[form: the\ bucket]_j \rangle$
          meaning $'(i)$ *die'*

In the lexical entry in (3), where the word *kick* has its compositional meaning, the meaning description references the roles of the subject (i) and the object (j) in the situation described by the verb. However, in (4), the lexical entry provides the entire idiomatic meaning of the word, with only the subject (i) indicated as the variable participant. The two lexical descriptions differ not only in how they describe meaning but also in detailing argument structure. Both the compositional and idiomatic uses of the verb have two arguments. However, while the compositional *kick* imposes only syntactic restrictions on its object, the idiomatic usage also imposes constraints on the phonological form, i.e., the lexical content of the object. Specifically, only the object *the bucket* can co-occur with it in the sentence. Another distinction lies in the fact that the compositional verb utilizes the meaning descriptions of both its arguments to define the verb's meaning, whereas the idiomatic verb completely disregards the compositional meaning of the object.

For idiomatic expressions containing lexical elements, we do not calculate with the meaning of all the lexical expressions when determining the meaning of the entire expression (as it would be the case in accordance with the Compositionality Principle). Therefore, we can consider expressions idiomatic

if they contain a component whose meaning is disregarded but whose presence is obligatory, with the meaning of the whole expression being lexically determined.

1.2 Functional Categories in Idioms

Idiomatic expressions can also contain functional elements such as the verbal modifiers under investigation in the present paper. In this case, it becomes even more challenging to determine what makes the expression idiomatic. At times functional expressions are difficult to assign basic or compositional meanings.

Example (5) is a good illustration of the compositional behavior of a verbal modifier in Hungarian. One of the most common uses of the Hungarian verbal modifier *be* ('into') occurs with verbs that describe the movement of something. The *be* ('into') verbal modifier is used when we also specify the endpoint of this movement in the sentence, and this endpoint is located inside some space. The endpoint of the movement is expressed as an illative (*-ba*) phrase, and the *be* verbal modifier functions as a kind of clitic.

(5) a. Péter   rúgott   egy   labdá-t.
         Peter   kicked   a   ball-ACC
         'Peter kicked a ball.'

     b. Péter   be   rúgott   egy   labdá-t   a   kapu-ba.
         Peter   into   kicked   a   vall-ACC the   goal-ILL
         'Peter kicked the ball into the goal.'

Sentence (5b) is entirely compositional, and we can replace the verb, the object, and the illative complement with other expressions.

However, the verbal modifier *be* ('into') and the verb *rúg* 'kick' can be associated not only with the meaning seen in (5b) but also with another, idiomatic meaning:

(6) Péter   be   rúgott   a   sör-től.
     Peter   into   kicked   the   beer-ABL
     'Peter got drunk from the beer.'

In sentence (6), neither *be* 'into' nor *rúg* 'kick' are used with their original, compositional meanings ('move into a place' and 'strike or propel something with the foot forcibly', respectively). The *be + rúg* construction is an idiomatic expression here, where the verbal modifier *be* can only be interpreted in conjunction with the *rúg* verb as 'get drunk', and conversely, the verb *rúg* only conveys this meaning in the presence of this verbal modifier.

Two important differences can be observed between the idiomatic sentence in (6) and the idiomatic expressions in (2). One is that the idioms in (2), the idiomaticity of which relies exclusively on lexical expressions, can be interpreted not only idiomatically but also literally. In the case of sentence (6), however, there is no literal reading; they are purely idiomatic.

The other difference is that in sentence (6) the expressions within the idiomatic construction not only change in meaning when used idiomatically compared with their compositional usage but also in other properties. As seen in the examples in (5), the verb *rúg* 'kick' takes an accusative complement, and the verbal modifier *be* ('into') takes an illative one. However, in the idiomatic construction in sentence (6), neither of these is present, but optionally there can be a modifier in ablative case. Idiomaticity, therefore, entails not only uniqueness of meaning but also changes in other properties such as argument structure, as seen in the lexical descriptions in (3)–(4).

1.3 Asemantic Compositionality

In identifying idioms, we have relied on native language intuition so far: an expression is considered idiomatic when its meaning is not identical to the literal meaning. However, this presupposes that expressions have a literal meaning, precisely one, and any other meanings deviating from that are idiomatic. Some expressions, though, lack a literal meaning (as seen in (6)), while others have multiple meanings that we do not want to identify as idiomatic. The challenge therefore is determining the meanings of expressions, whether they are literal or idiomatic.

Identifying idiomatic expressions may prove highly subjective. Our aim is to present a method for identifying a subset of idioms without relying on native speaker intuition or the meanings of expressions. Primarily, we demonstrate a method for the identification of idiomatic verbal modifier + verb constructions which does not involve a qualitative analysis of individual sentences or constructions but is solely based on quantitative analysis. We obtain the necessary amount of linguistic data from a pre-parsed linguistic corpus with morphological and syntactic features, and, rather than relying on the meaning of words and expressions, we consider the way they are used.

In the process of idiom identification, we rely on the previously mentioned observation that idiomatic expressions differ from compositional ones not only in meaning but also in other properties. In our case, we focus on the observation that verbal modifiers can change the argument structure of the verb. We infer the idiomaticity of the verbal modifier + verb construction from the uniqueness of the argument structure changing ability of verbal modifiers. Naturally, this allows us to identify only those idiomatic expressions in which the verbal modifier triggers a unique change in argument structure and not those where, in addition to the idiomatic reading, there is also a literal reading.

Since this way of differentiating between compositional and idiomatic constructions does not take into account the meaning of the expressions, we are essentially using an alternative, extended formulation of the Compositionality Principle. If we replace *meaning* with *properties*, meaning essentially becomes just one of the properties falling within the scope of the principle. This way, we obtain a Compositionality Principle that can be applied without reference to meaning, creating an Asemantic Compositionality Principle:

(7)   The properties of an expression are a function of the properties of its parts and of the way they are syntactically combined.

Before demonstrating the applicability of asemantic compositionality to verbal modifier + verb constructions in Section 1.5, we review the basic properties of verbal modifiers in Section 1.4 below.

1.4 About Verbal Modifiers

Most of the verbal modifiers form a closed class with their primary function being indicating direction or creating a new, idiomatic meaning: *be* 'into', *ki* 'out', *le* 'down', *fel* 'up', *el* 'away', át 'over', *rá* 'on', *ide* 'here', *oda* 'there', *szét* 'apart', össze 'together', *vissza* 'back'. One of the most commonly used verbal modifiers, *meg*, however, does not have such a directional meaning; instead, it changes the aspect of the verb, making it telic.

With the basic verbal modifiers, we can observe that the verbal modifier duplicates and appears on the argument of the verb as a case suffix, too, as we have seen in example (5b), as well as in sentence (8) below.

(8)   Péter **rá** rakja a könyv-et az asztal-**ra**
      Peter on put the book-ACC the table-SUBL
      'Peter puts the book on the table.'

As seen above, the verbal modifier *rá* 'on' appears before the verb but is also linked to the argument of the verb with the help of the sublative suffix.

Directional markings are considered the primary function of verbal modifiers; in these cases, they form a compositional structure with the verb. There are additional functions of the verbal modifiers in Hungarian like marking telicity.

1.4.1   Telicity in Hungarian

Verbal modifiers generally mark telicity, and not the outer aspect of perfectivity, nor specific Aktionsarten. As stated in Kardos' (2016) study, many elements in the Hungarian language indicate telicity, including the verb, its arguments, and potentially the pragmatic context. In this article, Kardos compares Hungarian with the English language: "Hungarian verbal particles and resultative/locative expressions mark telicity by directly placing bounds on events by virtue of serving an event maximalizing function, whereas the English counterparts of these elements do not have such direct event-bounding effects." (Kardos 2016, 1). Her study highlights cross-linguistic differences in connection with the aspectual role of verbal particles and resultative/locative expressions and the referential properties of telic verbal predicates. In her article, she uses the Hungarian variant of in/for X time unit test to probe for telicity. As discussed in the study of É. Kiss (2008, 1), telic and resultative VMs are the ones with telic function: "Resultative particles mark telic sentences describing an inherently delimited change of state, by denoting the resultant state of the individual undergoing the change. Terminative particles mark telic sentences describing an inherently delimited change of location, by denoting the end location of the moving individual."

1.4.2   Word-forming Function

The other additional function of verbal modifiers is the word-forming function. They can attach to verbs and create a new word. As a result, we either get a semantically compositional new meaning that also expresses direction, or we get a new, idiomatic meaning that is non-compositional. In the examples in Table 1, we can observe the second scenario, with new, idiomatic meanings.

VM	VERB	NEW VERB	MEANING
be 'into'	*jár* 'to walk'	*bejár*	to attend
el 'away'	*jár* 'to walk'	*eljár*	to proceed
meg 'PERF'	*jár* 'to walk'	*megjár*	he/she/it was bad for him/her; it's acceptable
össze 'together'	*jár* 'to walk'	összejár	to gather, to meet habitually

Table 1. The word-forming functions of verbal modifiers.

1.5 The Compositionality of Verbal Modifiers

Applying the concept of the asemantic compositionality presented in the previous section, the compositionality of verbs modified by a verbal modifier can be studied as follows: if the behavior of the verb modified by the verbal modifier can be predicted based on the independent, unique properties of the verb (e.g. in terms of the case of their arguments), then the verb can be considered compositional. However, in case the typical properties of the verb and the verbal modifier cannot explain the presence or absence of a complement, it can be considered idiomatic. We cannot forget about the so called half-compositional construction in Hungarian, such as *fel + nő* 'grow up'. Despite the other, semantically non-compositional meaning of the verbal complex (*fel + nő* + allative case 'grow up to the task'), we stress that semantic and syntactic compositionality are different. When we talk about *fel + nő* 'grow up', we consider the VM+V complex syntactically compositional because the VM *fel* 'up' causes telicity.

As already discussed above, in this study we apply the so-called asemantic compositionality principle in (7). Therefore, we consider idiomacity as a change in the argument structure of the verb, not as a change in the meaning of the verbal complex, like the original Fregean compositionality principle. With this modified compositionality principle our aim is to characterize the behavior of verbal modifiers using purely syntactic methods.

One of the many functions of verbal modifiers is the earlier mentioned word-forming function. However, this way not only the meaning of the new verbal complex can be observed, but the argument structure of the verb may also change. According to Gyulai (2019), the verbal modifier can change the verb's argument structure in one or more of five ways. The appearance of a verbal modifier can:

- increase the frequency of a certain argument type,
- decrease the frequency of a certain argument type,
- cause the appearance of a new argument type,
- forbid the appearance of a certain argument type, or
- require the appearance of a certain argument type.

These changes can appear alone but also mixed, for example, the appearance of the verbal modifier increases the frequency of one argument type that was already in the argument structure and decreases the one that was frequent before the verbal modifier appeared.

In this study it was also shown that the different argument structure changing effects of verbal modifiers work as follows: there are changes which can be observed by a group of verbs in the corpus, but there are also unique changes that affect only one verb. In our theoretical framework, this contrast is exploited to distinguish compositional verbal complexes from non-compositional ones: systematic changes affecting larger groups of verbs are compositional, while the verbal complex is non-compositional if the change is unique to it.

In what follows, we demonstrate the method used to extract the argument structure properties of verbs and verbal modifier + verb constructions from the corpus in Chapter 2. In Chapter 3, we outline the details of the method by which we distinguish compositional and idiomatic verbal modifier + verb constructions from each other.

2. Argument Structure Representation with Vectors of Scalar Frequency Values

Our aim is to determine the asemantic compositionality or idiomacity of verbal modifier + verb structures based on the observations presented at the end of the previous chapter. To do this, we need to examine the changes in their argument structure. For this, we need to know the argument structure of verbs with and without a verbal modifier so that we can identify their argument structure changing effects. If the same effect can be observed with multiple verbs for a particular verbal modifier, we say that the verbal modifier is in a compositional relation with the verb. If it only occurs with one or a few verbs, we consider it idiomatic.

To characterize the argument structure-changing ability of the verbal modifier, it is not sufficient to specify the argument structure of the verb by listing its arguments, as the verbal modifier often changes only the frequency of occurrence of the arguments. However, determining the frequency of occurrence of individual arguments can only be achieved through quantitative methods, by examining corpus data. A potential difficulty for now is that determining which constituent is an argument of the verb and which is an adjunct requires manual annotation.

Sentence (9) lacks the subject (due to pro-drop), but it includes an inessive case complement (*Péter-ben*) and an adjunct in the same case form (*január-ban*). The position of the constituents cannot be used as

a diagnostic for distinguishing complements from adjuncts because Hungarian is a free word order language, and *Péterben még nem bíztam januárban* (with the same meaning) is also a grammatical sentence.

(9) Január-ban   még   nem   bíztam   Péter-ben.
    January-INE   yet   not   trusted.1SG   Peter-INE
    'In January, I didn't trust Péter yet.'

Following the methodology described detailed (Szécsényi 2019) or this volume (Szécsényi and Szécsényi 2024), we use an argument structure representation in our analysis where we do not distinguish between arguments and adjuncts, but treat them uniformly: we refer to both arguments and adjuncts collectively as *supplements*. Furthermore, we characterize the supplement types of the verb based on the frequency values determined from corpus data: we specify how frequently each type of supplement appears in the corpus in the same clause as the verb. For each verb, we specify the argument structure with the frequency values associated with all possible supplement types: if one type of supplement never appears with the verb in a clause, its frequency is 0.0; if another appears in 80% of cases, its frequency is 0.8, and so on. Thus, we characterize each verb with the same number of probability values, that is, a probability vector.

We represented the constituents found in the clauses with one of their characteristic morpho-syntactic features. For the constituents whose morphological case was specified (nouns, adjectives, pronouns, etc.), we used their case form (one of 21 different types). For constituents with a verbal head, we differentiated between *that*-clauses, indicative, imperative, and conditional clauses, and infinitival clauses (5 types). Furthermore, we utilized the types of adpositions, adverbials, and verbal modifiers, which sums up to a total of 29 different types, therefore, the argument structure vectors of verbs are 29-dimensional.

From the manually annotated Szeged Dependency Treebank reference corpus (Vincze et al. 2010) containing 1,200,000 tokens, we determined the argument structure vectors of all verbs (13,556), a part of which is shown in Figure 1. Verbs were considered together with their verbal modifiers, as the verbal modifier can influence the argument structure of the verb. (Gyulai 2019; 2021).

pvform	lemma	pvv	moo	cau	pot	n	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL
0	korlátoz	0+korlátoz	ind	-	-	41	0,68	0,93	0,00	0,17	0,07	0,15	0,02	0,12	0,00	0,00
0	terhel	0+terhel	ind	-	-	41	0,88	0,88	0,00	0,17	0,07	0,07	0,10	0,00	0,00	0,02
0	távozik	0+távozik	ind	-	-	41	0,59	0,00	0,00	0,10	0,27	0,05	0,17	0,15	0,00	0,29
0	ugrik	0+ugrik	ind	-	-	41	0,63	0,10	0,05	0,05	0,07	0,39	0,10	0,05	0,17	0,10
0	vágyik	0+vágyik	ind	-	-	41	0,27	0,00	0,00	0,02	0,02	0,85	0,00	0,02	0,05	0,00
be	ül	be+ül	ind	-	-	41	0,32	0,00	0,00	0,02	0,02	0,02	0,10	0,05	0,88	0,00
el	felejt	el+felejt	inf	-	-	41	0,00	0,22	0,00	0,00	0,00	0,02	0,00	0,00	0,00	0,00
el	jár	el+jár	ind	-	-	41	0,63	0,00	0,00	0,39	0,12	0,07	0,07	0,27	0,00	0,02
haza	megy	haza+megy	inf	-	-	41	0,02	0,00	0,02	0,00	0,00	0,05	0,00	0,00	0,00	0,00
meg	indul	meg+indul	ind	-	-	41	0,85	0,00	0,02	0,12	0,07	0,12	0,15	0,05	0,00	0,07
0	alakít	0+alakít	ind	-	-	40	0,60	0,93	0,00	0,18	0,28	0,08	0,08	0,10	0,00	0,00
0	bízik	0+bízik	ind	-	-	40	0,45	0,00	0,00	0,88	0,00	0,00	0,00	0,08	0,05	0,00
0	ellenőriz	0+ellenőriz	ind	-	-	40	0,55	0,75	0,03	0,18	0,08	0,00	0,05	0,08	0,00	0,00
0	emlékezik	0+emlékez	ind	-	-	40	0,38	0,00	0,00	0,03	0,00	0,95	0,00	0,15	0,00	0,00
0	növekedik	0+növeked	ind	-	-	40	0,88	0,03	0,00	0,30	0,18	0,15	0,33	0,18	0,00	0,05
0	válik	0+válik	ind	-	+	40	0,80	0,00	0,03	0,20	0,05	0,08	0,18	0,10	0,00	0,00
be	állít	be+állít	inf	-	-	40	0,00	0,50	0,00	0,05	0,05	0,03	0,03	0,03	0,00	0,00
ki	lép	ki+lép	ind	-	-	40	0,35	0,00	0,00	0,08	0,28	0,15	0,08	0,08	0,03	0,00
meg	fogalmaz	meg+fogal	ind	-	-	40	0,83	0,85	0,00	0,18	0,05	0,05	0,05	0,13	0,00	0,08
meg	követel	meg+köve	ind	-	-	40	0,75	0,70	0,00	0,10	0,05	0,03	0,00	0,20	0,00	0,00

Figure 1. A partial view of the argument structure vectors for verbs.

Columns A–F display the characteristics of the verbs: Verbs were considered separately for different morphosyntactic categories (conditional, imperative, indicative, and infinitive) and various derived forms. Column G shows the frequency of the verb's occurrence, and the following 29 columns present the probabilities of different supplement types occurring alongside that verb (only 10 are visible in the figure). For example, the verb *bízik* ('trust') without a particle occurred 40 times in the corpus, with a 0.45 probability of having a nominative supplement, 0.0 probability of an accusative or dative supplement, and 0.88 probability of an inessive supplement, and so on. (Apart from the nominative, accusative, and dative supplements, the supplement types are indicated by the actual case markers.) For easier interpretation, probability values have been color-coded: the darker the red in a cell, the higher the probability of that supplement type.

Earlier studies have also examined the semantic change of words from a historical perspective using word vector representations (Hamilton, Leskovec, and Jurafsky 2016; Giulianelli, Kutuzov, and Pivovarova 2022). However, in those works, the vector representations assigned to words were based on word embeddings (Mikolov et al. 2013), which were primarily used to describe word meanings directly. The vector representation we use, on the other hand, is purely morphological and syntactic in nature.

3. Identifying the Effect of Verbal Modifiers on Argument Structure

The research we present in this study is about the automatic determination of the argument structure changing effects of verbal modifiers based on corpus data. The initial hypothesis is that there is a syntactic relationship between the verbs with and without verbal modifiers: the verbal modifier causes the same change in the argument structure of many verbs, this is what we call asemantic compositionality. The theoretical framework we are using is the earlier mentioned argument structure representation with scalar vectors (Szécsényi 2019). Our hypothesis is that we can observe the changes caused by the verbal modifier in the appearance of different supplement types if we compare the argument structures (vectors) of a certain verb with and without a verbal modifier.

3.1 The Corpus

The corpus used for this research is the Hungarian National Corpus 2 (Oravecz, Váradi, and Sass 2014) and we examine the verbal modifiers: *el* 'away' and *ki* 'out'. We studied the 100 verbs the most frequently associated with these verbal modifiers based on the Hungarian National Corpus 2.

We had to exclude auxiliaries and verbs that never occurred, or did so only very infrequently, without a verbal modifier, therefore we have 93 verbs with *el* 'away' and 87 with *ki* 'out'.

3.2 Data Processing

The data processing was carried out as follows: The data was retrieved using CQL from the Hungarian National Corpus 2 (Oravecz, Váradi, and Sass 2014). We searched for sentences containing verbal complexes written together, verbal modifiers separated from the verb by a maximum of +/- 5 tokens, and verbs without verbal modifiers. For each verbal modifier, a random sample of up to 10,000 sentences was retrieved. The sentences were saved in .txt files, with a subsequent analysis by the Hungarian NLP tool 'magyarlanc' (Zsibrita, Vincze, and Farkas 2013). This NLP tool performs a dependency analysis of the sentences. This was followed by sentence segmentation into clauses and maximal XPs and the aggregation of argument structure vectors for each verb.

3.3 Method

The output of data processing is 3 tables. The first table contains all the verbs under investigation, that is, the ones connected to *el* 'away' and the ones connected to *ki* 'out', this time without verbal modifiers.

pvform	lemma	pvv	mood	cau	pot	n	HKM	inf	nom	acc	dat	BAN
0	ad	0+ad	ind	-	+	6604	0,12	0,00	0,51	0,89	0,26	0,09
0	ad	0+ad	ind	-	-	6832	0,11	0,02	0,51	0,85	0,22	0,09
0	akadályoz	0+akadály	ind	-	-	3846	0,13	0,00	0,58	0,77	0,01	0,14
0	alakít	0+alakít	ind	-	+	1632	0,02	0,00	0,53	0,88	0,00	0,16
0	alakít	0+alakít	ind	-	-	7627	0,03	0,00	0,64	0,83	0,00	0,18
0	alakul	0+alakul	ind	-	+	1869	0,04	0,00	0,85	0,01	0,00	0,20
0	alakul	0+alakul	ind	-	-	4928	0,02	0,00	0,86	0,00	0,01	0,15
0	állapít	0+állapít	ind	-	-	18	0,06	0,00	0,67	0,50	0,06	0,28
0	állít	0+állít	ind	-	-	7785	0,34	0,01	0,61	0,22	0,04	0,08

Figure 2. Result of data processing. Verbs without verbal modifiers.

In Figure 2 'pvform' zero means that there is no verbal modifier attached to the word in the sentences. The columns contain the frequency of different supplement types in the corpus. The rows, as mentioned earlier, define the argument structure vector of the particular verbs. The highlighted row above means that with the verb *ad* 'to give' without a verbal modifier we have 6,832 sentences, and the unified argument structure vector is as follows: the frequency of the nominative supplement type beside this verb in the analyzed sentences is 0.51, the frequency of the accusative supplement type is 0.85, etc.

pvform	lemma	pvv	mood	cau	pot	n	HKM	inf	nom	acc	dat	BAN
el	ad	el+ad	ind	-	-	5973	0,03	0,00	0,34	0,73	0,19	0,17
el	áll	el+áll	ind	-	-	5119	0,06	0,01	0,61	0,14	0,02	0,07
el	árul	el+árul	ind	-	-	6350	0,38	0,00	0,53	0,29	0,06	0,06
el	bírál	el+bírál	ind	-	-	1927	0,04	0,00	0,43	0,74	0,01	0,13
el	bír	el+bír	ind	-	-	3035	0,06	0,01	0,64	0,54	0,00	0,03
el	bocsát	el+bocsát	ind	-	-	5960	0,03	0,00	0,24	0,66	0,00	0,13
el	dől	el+dől	ind	-	-	5991	0,31	0,00	0,49	0,01	0,00	0,21
el	dönt	el+dönt	ind	-	+	3990	0,51	0,01	0,54	0,18	0,00	0,11

Figure 3. Result of data processing. Verbs with the verbal modifier *el* 'away'.

In Figure 3 we see the same information when the verb appears with the verbal modifier *el* 'away'. The question is how we can identify the effect of verbal modifiers on argument structure based on these tables. How is it possible to identify the changes caused by the presence of verbal modifiers in the argument structure compared to occurrences without verbal modifiers? We claim that by calculating the difference between the argument structure vectors, we can determine how much the frequency of a certain supplement type has increased or decreased with the appearance of the verbal modifier compared to the argument structure of verbs without a verbal modifier.

3.4 Systematic and Unsystematic Changes

We assume that there are systematic changes in the argument structure which occur in many verbs only when a certain verbal modifier appears. Some unsystematic, unique changes affect only one verb. The systematic and unsystematic changes can be used as a diagnostic based on the notion of asemantic compositionality introduced in 1.3. A [verbal modifier + verb] complex expression is asemantically compositional if the change effected by the verbal modifier is systematic. But it is asemantically non-compositional if the change is unique, unsystematic. It is also important to remark that verbal modifiers have various compositional effects, with their function and behavior differing depending on the verbs they are connected to (Gyulai 2021).

3.5 DBSCAN Algorithm

To highlight unique changes, the non-compositional verbal complexes, we used DBSCAN. DBSCAN is a density-based clustering algorithm that works on the assumption that clusters are dense regions in space separated by regions of lower density. It groups 'densely grouped' data points into a single

cluster. Our hypothesis was that if we group our verbs with DBSCAN, the verbs that are clearly far from a certain group will be the ones in which the change caused by the verbal modifier is unique. This way these can be identified, leaving the rest of the verbs where the change effected by the verbal modifier is systematic. Figure 4 illustrates how DBSCAN works.
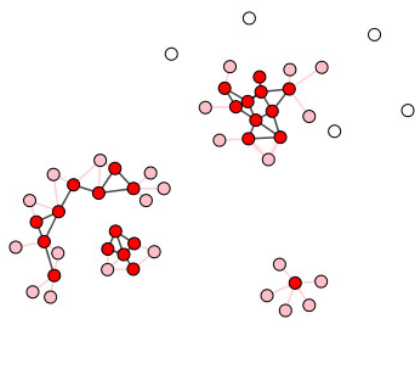

Figure 4. Example of the result of DBSCAN algorithm.

This algorithm finds those points that have enough neighbors within a range, the red points in Figure 4. These are the central points of the groups. Those points that have at least one central neighbor are the pink ones. These belong to the same group as their central neighbors. The rest of the points are considered "outliers", the white ones. These outliers can be identified as non-compositional verbs. As outliers we can list e.g. *tölt* 'fill, load' – *el+tölt* 'spend time', árul 'sell' – *el+*árul 'betray', *tűnik* 'it seems' – *ki+tűnik* 'stands out', *merül* 'sink, dive' – *ki+merül* 'be exhausted'. These verbal complexes are clearly both syntactically and semantically non-compositional because the change in their argument structure caused by the VM is unique and their meaning becomes idiomatic. Once we exclude the outliers, we can classify the rest of our verbs, looking for similarities between them. In the next chapter, we introduce the clustering method we used for this process.

3.6 K-means Clustering

After identifying all the verbal complexes modified by a verbal modifier in which the argument structure changing effect of the verbal modifier is unique, we used the K-means clustering algorithm for the rest of the verbal complexes. The K-means cluster analysis groups multi-dimensional vectors into K clusters in such a way that each element is assigned to the cluster whose center (mean) is the closest to it, based on Euclidean distance. This way verbs that exhibit similar changes when the verbal modifier is added could automatically be grouped together.

The input for the program was provided by the table that contains the difference of the verb's scalar vectors. In the case of K-means clustering, we need to specify how many clusters we want to create. In this experiment, the number of clusters ranged from 2 to 20: since we didn't know how many different argument structure changing effects the phrasal particle could have, we needed to try various possibilities. The output of the program is a table that combines all the clusters (2 groups, 3 groups, 4 groups, and so on) attached to the input file. After transferring the data to an Excel file, we can manually analyze the clusters suggested by the clustering tool.

Our hypothesis regarding K-means clustering is that after excluding verbs where the VM caused a unique change, the remaining ones can be classified with the following output: clear classes with easily detectable changes and homogeneous classes without clear changes. In the next section, we will take a closer look at some outputs of the clustering.

3.7 Results

3.7.1   Asemantically Compositional

In this section, we analyze the results of the K-means clustering. Since the cluster analysis works as described above, we must decide which grouping is the most ideal. Based on intuition and the manual analysis of the data we decided to go with clustering the data into seven groups.

Some of the resulting tables can be seen in Figures 5–9. All the tables and the software used are available in the https://github.com/szecsenyi/Szecsenyi-Gyulai-2024 GitHub repository. In the tables red cells indicate an increase in the frequency of supplement type, and blue cells mark a decrease. The darker red the cell, the bigger the increase, with darker blue cells indicating a higher level of decrease.

According to our hypothesis, there are "clear" classes where the argument structure changing effect is obvious. First, we show two classes of the table of *ki* 'out'. Verb group 0 shown in Figure 5, has 4 elements, and for all the four of them we can see an increase in the column BÓL 'from'. It is the expected, compositional behavior of this verbal modifier.

pvform	lemm	pvv	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	ADP	ADV	FRON	IN	TO	7
ki	lóg	ki+lóg	0,02	0,00	0,00	0,03	-0,01	-0,19	-0,31	0,00	-0,01	-0,01	-0,04	-0,04	0,00	0,53	0,01	0,01	0,54	-0,52	-0,05	0
ki	marad	ki+marad	0,00	0,00	0,13	0,00	-0,01	-0,23	-0,14	-0,01	-0,03	0,09	0,00	0,01	0,00	0,51	-0,15	-0,16	0,52	-0,44	-0,12	0
ki	marad	ki+marad	-0,01	-0,01	-0,06	0,00	-0,02	-0,14	-0,06	-0,01	-0,02	0,00	0,00	0,01	0,00	0,49	-0,05	-0,13	0,49	-0,28	-0,06	0
ki	olvas	ki+olvas	0,08	0,00	0,05	-0,04	0,00	-0,08	-0,03	0,00	-0,01	-0,03	0,00	-0,02	0,00	0,49	0,02	-0,12	0,47	-0,10	0,00	0

Figure 5. K-means clustering, *ki* 'out' group 0.

Group 1 in Figure 6 has 6 elements, and for all 6 of them, we can see an increase in the accusative form. The explanation of this effect is that in case the verbal modifier appears with these verbs, the result of the action they express also appears, in the form of an accusative. This is due to the telic function of the verbal modifier *ki* 'out'. Of course, this does not mean that the verbal modifier serves a telic function in all the verbal modifier + verb constructions listed here. Among them, there may be semantically idiomatic constructions that share the argument structure-changing capability with telic verbal modifiers.

pvform	lemm	pvv	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	ADP	ADV	FRON	IN	TO	7
ki	állít	ki+állít	-0,31	-0,01	-0,22	0,52	-0,01	0,19	0,14	0,00	0,02	0,00	-0,04	0,04	0,00	0,02	0,05	0,08	0,08	0,33	-0,08	1
ki	gondol	ki+gondol	0,34	0,01	0,12	0,32	0,00	0,04	0,04	0,04	0,02	0,02	0,00	0,01	0,00	0,00	0,05	0,13	0,01	0,09	0,02	1
ki	hallgat	ki+hallgat	-0,03	0,00	0,02	0,32	0,00	0,14	0,14	-0,13	-0,01	-0,06	0,00	-0,04	0,00	-0,01	0,16	-0,04	-0,05	0,27	-0,11	1
ki	kér	ki+kér	-0,13	-0,01	0,10	0,18	0,00	0,11	0,01	-0,01	-0,01	0,01	-0,01	0,05	0,00	0,00	0,05	0,08	0,01	0,15	-0,01	1
ki	mond	ki+mond	0,04	0,00	0,10	0,26	0,00	0,09	0,03	0,00	0,01	0,05	0,00	-0,01	0,00	0,00	0,03	-0,05	-0,01	0,12	0,00	1
ki	sorsol	ki+sorsol	0,01	0,00	0,05	0,27	0,01	0,00	-0,04	0,03	0,00	-0,02	-0,12	0,00	-0,03	0,06	0,31	-0,19	0,05	0,21	-0,14	1

Figure 6. K-means clustering, *ki* 'out' group 1.

We also assumed that there would be groups in which there would be no change, the homogenous group. With these verbs the appearance of the verbal modifier did not change much, this is also due to a compositional effect of the verbal modifier.

pvform	lemm	pvv	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	ADP	ADV	FRON	IN	TO	7
ki	ad	ki+ad	-0,07	-0,01	0,02	-0,10	-0,13	0,09	0,07	-0,04	0,02	-0,01	-0,03	-0,01	-0,02	0,01	0,06	0,02	-0,01	0,15	-0,08	4
ki	alakít	ki+alakít	0,04	0,00	-0,31	0,07	0,01	0,03	0,10	0,03	0,06	0,00	0,00	0,02	0,00	0,03	0,08	0,02	0,05	0,18	0,03	4
ki	alakul	ki+alakul	0,05	0,00	0,05	0,00	0,01	0,07	0,07	0,02	0,01	-0,06	0,00	0,01	0,00	0,02	-0,25	-0,18	0,04	-0,05	0,02	4
ki	bontakozik	ki+bontak	0,00	-0,01	0,04	0,00	0,01	0,05	0,07	0,00	-0,01	-0,08	-0,02	0,03	0,00	0,04	0,17	-0,02	0,07	0,19	-0,05	4
ki	egészít	ki+egészít	0,00	0,00	-0,09	0,10	-0,03	0,07	-0,01	0,00	0,11	0,03	0,00	0,01	0,00	-0,05	0,02	0,06	-0,07	0,04	0,01	4
ki	épít	ki+épít	0,00	0,00	-0,02	0,17	0,01	0,07	0,02	-0,17	0,06	0,02	-0,02	0,00	0,00	-0,02	0,04	0,00	-0,02	0,14	-0,18	4
ki	fejlődik	ki+fejlődik	0,00	0,00	0,10	0,00	0,01	0,04	0,04	0,01	-0,01	-0,20	-0,01	-0,01	0,00	0,18	0,07	-0,05	0,18	0,15	-0,01	4
ki	fejt	ki+fejt	0,19	0,00	0,14	0,04	0,01	0,12	0,03	0,02	-0,02	0,08	-0,07	0,02	-0,01	0,00	0,04	-0,06	0,02	0,17	-0,06	4
ki	fizet	ki+fizet	-0,01	0,00	-0,08	0,17	0,04	0,04	0,01	0,00	-0,02	-0,01	-0,01	0,00	0,00	0,00	0,03	0,01	-0,03	0,02	0,02	0,01	4
ki	hirdet	ki+hirdet	-0,03	0,00	-0,09	0,09	0,01	0,07	0,12	-0,03	-0,03	0,00	0,00	0,00	0,00	0,00	-0,01	0,01	0,02	-0,02	0,18	-0,04	4
ki	jelöl	ki+jelöl	0,02	0,00	-0,11	0,07	-0,03	0,01	0,05	0,10	-0,08	0,03	-0,03	0,00	0,00	0,00	0,08	-0,03	0,00	0,06	0,09	4
ki	jön	ki+jön	0,02	0,00	-0,12	0,01	0,00	0,01	0,04	0,02	0,04	0,03	-0,04	0,00	0,00	0,16	0,01	0,03	0,16	0,04	-0,01	4
ki	kíván	ki+kíván	-0,02	0,00	-0,17	-0,25	0,02	0,16	-0,02	-0,04	-0,04	0,00	-0,01	-0,02	-0,02	-0,01	-0,03	-0,06	0,00	0,13	-0,08	4
ki	küld	ki+küld	0,04	0,01	-0,04	-0,06	0,01	0,03	0,03	-0,03	0,00	-0,02	-0,09	-0,02	0,00	0,04	0,00	0,02	0,02	0,05	-0,12	4
ki	lát	ki+lát	-0,22	-0,02	-0,09	-0,28	-0,05	-0,09	0,08	0,11	-0,01	0,00	0,04	0,00	0,00	0,18	0,08	-0,04	0,22	-0,01	0,17	4
ki	mutat	ki+mutat	0,06	0,00	-0,10	0,01	-0,02	0,17	0,05	-0,02	0,00	-0,01	-0,02	0,01	0,00	0,01	-0,02	-0,07	0,02	0,24	-0,04	4
ki	nevez	ki+nevez	-0,02	0,00	0,15	0,18	-0,61	0,07	0,06	0,20	0,03	0,00	0,03	0,00	0,01	0,00	-0,07	-0,07	0,00	0,16	0,24	4
ki	oszt	ki+oszt	-0,06	-0,01	-0,11	0,12	0,07	0,11	0,12	-0,12	0,02	0,00	-0,02	-0,01	0,00	0,01	0,12	0,07	0,00	0,26	-0,12	4
ki	rajzolódik	ki+rajzoló	0,06	-0,01	-0,03	0,01	0,00	0,01	0,10	-0,22	-0,05	0,10	-0,03	0,01	0,00	0,09	0,04	0,01	0,07	0,17	-0,31	4
ki	szab	ki+szab	-0,06	0,00	-0,02	0,07	-0,35	0,06	0,07	-0,14	-0,06	-0,08	-0,01	0,00	-0,03	-0,01	0,07	0,04	0,04	0,13	-0,13	4
ki	szab	ki+szab	-0,09	0,00	-0,09	0,05	-0,34	0,13	0,09	0,21	0,01	-0,05	0,00	0,00	-0,06	0,00	0,16	0,00	0,00	0,21	0,17	4
ki	szállít	ki+szállít	0,01	0,00	-0,19	-0,07	-0,02	0,04	-0,01	-0,01	-0,04	-0,01	-0,04	-0,01	0,00	0,09	-0,04	0,02	0,06	0,01	-0,05	4
ki	szolgál	ki+szolgál	-0,09	0,00	-0,12	0,26	-0,03	0,03	0,04	-0,15	0,00	-0,01	0,00	0,00	-0,02	0,01	0,02	0,05	0,01	0,09	-0,15	4
ki	választ	ki+választ	0,02	-0,01	0,05	-0,05	-0,02	0,01	0,09	0,00	0,03	-0,03	0,00	0,00	0,00	0,06	0,07	-0,08	0,06	0,10	0,00	4
ki	vet	ki+vet	-0,10	0,00	0,05	0,06	-0,21	0,03	0,03	0,03	-0,03	0,00	-0,09	0,00	0,00	0,03	0,00	-0,01	0,04	0,07	-0,09	4

Figure 7. K-means clustering, *ki* 'out' group 4.

Moving to the tables with the verbal modifier *el* 'away', we see an increase in the column TÓL 'away from', which is due to the compositional behavior of *el* 'away'.

pvform	lemm	pw	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	TÓL	ADP	ADV	FRON	IN	TO	7
el	áll	el+áll	-0,01	-0,02	-0,05	0,11	-0,01	-0,23	-0,13	-0,09	-0,07	-0,04	-0,01	0,00	-0,03	-0,09	0,41	-0,12	0,02	0,33	-0,44	-0,10	0
el	marad	el+marad	-0,03	-0,01	0,08	0,00	-0,02	-0,06	-0,04	-0,03	0,10	0,00	0,00	0,00	0,00	0,00	0,31	0,01	-0,07	0,31	-0,17	-0,08	0
el	vár	el+vár	0,31	0,00	-0,10	-0,29	0,00	-0,07	-0,04	-0,12	0,07	-0,02	0,01	-0,02	0,00	-0,03	0,20	-0,02	0,01	0,14	-0,11	-0,14	0
el	vár	el+vár	0,27	0,00	-0,11	-0,25	0,00	-0,05	-0,07	-0,19	-0,05	-0,02	0,00	0,00	0,00	-0,01	0,19	-0,03	-0,04	0,18	-0,13	-0,21	0
el	vesz	el+vesz	0,00	0,00	0,21	0,24	-0,02	0,21	0,21	0,03	0,03	0,05	-0,35	0,00	0,01	0,01	0,16	0,06	-0,05	0,17	0,41	0,38	0
el	vesz	el+vesz	0,01	0,00	-0,30	-0,21	0,00	-0,30	-0,24	0,00	-0,01	-0,02	-0,14	-0,01	0,00	0,03	0,18	-0,03	0,00	0,21	-0,49	-0,15	0

Figure 8. K-means clustering, *el* 'away' group 0.

In group 1 all the elements show an increase in the accusative supplement type, which shows the telic function of *el* 'away'.

pvform	lemm	pw	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	TÓL	ADP	ADV	FRON	IN	TO	7
el	dönt	el+dönt	0,25	0,00	-0,15	0,15	0,00	-0,08	-0,07	0,00	-0,01	-0,04	-0,02	-0,37	0,00	0,00	0,00	-0,09	-0,12	-0,37	-0,17	-0,01	1
el	dönt	el+dönt	0,23	0,00	-0,07	0,22	0,00	-0,05	-0,08	0,00	0,01	-0,04	-0,01	-0,37	0,00	0,00	0,00	-0,07	-0,18	-0,37	-0,17	-0,01	1
el	ér	el+ér	-0,01	0,00	-0,25	0,76	-0,02	0,01	0,00	0,02	0,06	0,00	-0,05	0,00	-0,01	0,00	0,00	0,04	-0,01	0,01	0,03	-0,05	1
el	ír	el+ír	-0,09	0,00	-0,30	0,27	-0,01	-0,04	0,01	-0,02	-0,01	0,02	-0,01	-0,07	-0,01	0,00	0,00	0,00	0,01	-0,06	-0,02	-0,04	1
el	követ	el+követ	0,07	0,00	-0,30	0,23	0,00	0,06	-0,02	0,01	-0,04	-0,04	0,00	-0,01	0,00	-0,01	-0,01	0,12	-0,05	-0,03	0,07	0,00	1
el	mesél	el+mesél	0,15	0,00	-0,11	0,28	0,03	0,02	0,00	0,00	0,00	0,00	0,00	-0,24	0,00	0,01	0,00	0,01	0,01	-0,23	0,03	0,01	1
el	olvas	el+olvas	-0,01	0,00	0,07	0,28	0,00	-0,16	0,07	0,00	0,00	-0,19	0,00	-0,33	0,00	0,00	0,00	-0,01	-0,08	-0,33	-0,19	0,01	1
el	veszít	el+veszít	0,00	0,00	0,11	0,47	0,00	0,03	0,03	0,02	0,02	0,04	0,00	0,00	0,00	0,25	0,00	0,02	0,02	0,25	0,02	0,03	1

Figure 9. K-means clustering, *el* 'away' group 1.

According to our hypothesis, we got three kinds of groups:
1. the primary function of the verbal modifier appears
2. clear argument structure changing effect of the verbal modifier – compositional behavior of the verbal modifier, additional functions such as telicity also identified
3. no clear change, homogenous groups – compositional behavior of the verbal modifier, not always compositional meaning.

3.7.2 Asemantically Non-Compositional

Apart from the results presented above, we would also like to report on the argument structure of non-compositional VM+V constructions selected by DBSCAN. Through some examples, we demonstrate how the asemantic non-compositionality manifests within the theoretical framework we employ.

pvform	lemm	pw	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	TÓL	NÁL	VÁ	ADP	ADV	FRON	IN	TO
ki	kap	ki+kap	-0,04	0,00	0,11	-0,84	0,00	0,25	0,20	0,26	0,06	0,00	-0,02	-0,01	-0,02	-0,01	0,40	-0,01	0,00	0,00	-0,01	0,38	0,35	0,20

Figure 10. Argument structure of *kikap* 'is scolded'.

As previously detailed, the examples presented above are compositionally asemantic, meaning that the appearance of the VM leads to similar changes in the verbal argument structure for multiple verbs. In contrast, in asemantic non-compositional VM+V constructions, such as *ki+kap* 'is scolded' in Figure 10, the change caused by the VM is unpredictable and unique. Examining the example of *ki+kap* 'is scolded', we can see that prior to the appearance of the VM, the accusative supplement type had a high frequency of occurrence. However, with the appearance of the VM *ki* 'out', this supplement type disappears from the argument structure, and most commonly, the supplement type TÓL 'away from stg' appears, referring to the person causing the scolding.

pvform	lemm	pw	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	TÓL	NÁL	VÁ	ADP	ADV	FRON	IN	TO
ki	köt	ki+köt	0,13	0,00	-0,07	-0,60	0,00	0,30	0,15	-0,05	-0,14	-0,01	-0,02	-0,01	-0,31	0,00	0,00	0,10	0,00	0,05	0,17	-0,01	0,53	-0,39

Figure 11. Argument structure of *ki+köt* 'sb. ends up in a certain situation'.

The example in Figure 11 is also a combination with the VM *ki* 'out'. The basic meaning of the verb *köt* is 'to tie sth.'. The accusative supplement type decreases significantly with the appearance of the VM, and we observe the emergence of a new supplement type, BAN 'in'. Nevertheless, the appearance of

this supplement type brings along a new meaning, as now the verb *ki+köt* carries the meaning of 'sb. ends up in a certain situation' or requires the appearance of a subordinative clause with the meaning 'insist on doing sth.'. Thus, the unique argument structure changing effect of the VM is not only non-compositional in an asemantic sense but also semantically.

pvform	lemm	pvv	HKM	inf	nom	acc	dat	BAN	ON	RA	VAL	UL	BA	RÓL	HOZ	BÓL	TÓL	NÁL	ADP	ADV	FRON	IN	TO
el	választ	el+választ	0,02	-0,01	0,35	-0,26	-0,03	-0,02	-0,03	-0,06	0,01	-0,06	-0,01	0,00	-0,01	-0,02	0,48	0,00	-0,09	-0,12	0,45	-0,04	-0,07

Figure 12. Argument structure of *el+választ* 'to separate'.

In Fig. 12, the argument structure of the verb *el+választ* 'to separate' can be seen. The verb *választ* 'to choose' without the VM generally means 'to choose' and usually appears with an accusative supplement type in a sentence, as evidenced by the decrease in the occurrence frequency of the accusative supplement type. In contrast, the meaning of the verb *el+választ* means 'to separate', and the complement type TÓL 'away from sth.' comes to the forefront, expressing what or whom we are separating the subject of the sentence from.

4. Summary

In this study, we presented a new method for the identification of non-compositional [verbal modifier + verb] complexes in Hungarian. In the first section, we introduced a modified version of the Fregean compositionality principle, which we call asemantic compositionality. According to this principle, the properties of an expression are a function of the properties of its parts and of the way they are syntactically combined. In the second section, we discussed the closed class of verbal modifiers in Hungarian and their primary and additional functions. We discussed the word-forming function of verbal modifiers and the non-compositional verbal complexes through the example of *rúg* 'kick' combined with the verbal modifier *be* 'into'. Then we presented how to represent argument types with scalar vectors. Instead of the binary argument-adjunct distinction we proposed a scalar characterization of argumenthood: each expression that can occur with the verb is characterized by a probability value based on the frequency of their occurrence in the corpus. The argument structure representation is a list of scalar values, which is a scalar vector. To distinguish compositional and non-compositional verbal complexes in Hungarian we studied [verbal modifier + verb] complexes. Our aim was to identify these complexes with the help of automatic methods and computational linguistic tools. Our hypothesis was that if we compare the argument structures of a certain verb with and without a verbal modifier, we can observe the changes caused by the verbal modifier in the appearance of different types of supplements. The corpus we used is the Hungarian National Corpus 2 (Oravecz, Váradi, and Sass 2014). After analyzing the data, we used two clustering algorithms: DBSCAN and K-means clustering. DBSCAN was used to exclude the outliers, the idiomatic verbal complexes and the rest of the words were clustered by the K-means clustering algorithm, which shows the systematic changes the addition of a verbal modifier triggers.

In the final chapter, we not only discussed asemantically compositional constructs but also showed the argument structure of non-compositional VM+V constructs, demonstrating the changes caused by the appearance of verb particles in the verbal argument structure.

The vector-based representation of argument structure facilitates the differentiation of various (compositional) uses of verbal modifiers, as well as some non-compositional uses.

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