Deriving the order of operations from unordered features

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1 The big picture: limits on the lexicon

- Chomsky (1995): inputs to the combinatorial system are lexical items, which specify their syntactic (and semantic, phonological) properties/requirements.
  - Captures idiosyncrasy in verb-argument selection:

    (1) Verbs in different contexts
    a. Jo enjoys fruit. (DP object)
    b. Amy turned blue. (AP object)
    c. Beth depends on Lauri. (PP object)
    d. Meg wants to go camping. (TP object)
    e. Jo thinks that Marmie likes carrots. (CP object)
    f. Meg introduced Jo to Lauri. (DP+PP objects)
    g. Amy told Beth that Marmie likes carrots. (DP+CP objects)

- **Puzzle**: there are limits on the structures of VPs.
  - Newman (2024) considers certain lexical gaps:

    (2) Imaginable but unattested selectional patterns
    a. V selects for 4 arguments
    b. V selects for 3 PPs
    c. V selects for DP headed by *every*
    d. ...

  - **Implication:** there must be some restrictions on the lexicon (e.g. no lexical items with the unattested subcat. requirements).

- **A second issue**: restrictions on the order of Merge
  - Example: verbs that select for a DP and a non-DP always merge the non-DP first.
  - Where do such restrictions come from?
    - They used to come from phrase structure rules.
    - A strategy I've been pursuing: deriving these restrictions from the inventory of features available to lexical items.

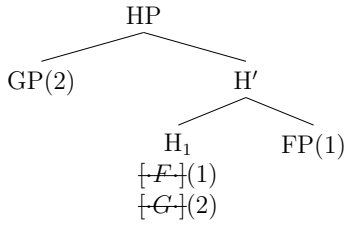
1.1 From lexical requirements to structure

- **How does limiting in the inventory of structure-building features help constrain the order of operations?**
  - First, let's examine how lexical requirements project to structure.
  - Imagine two lexical items, H_1 and H_2, with the same requirements.

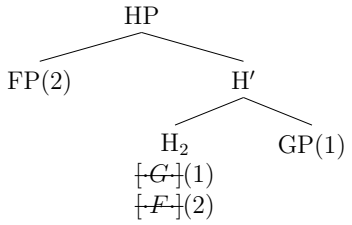
    (3) a. H_1: selects for FP and GP
        b. H_2: selects for FP and GP

  - Can these heads impose additional requirements on their structural environments, besides specifying *what* they want to merge with?
  - Two options:
    1. Option 1: **Yes**, lexical items can also specify the *order of operations* as well as the type.
       - Explored most explicitly in theories with *stacked* feature bundles, where operations are discharged in a lexically/parametrically specified order (Heck and Müller, 2007; Müller, 2010; Georgi and Müller, 2010; Georgi, 2014, 2017; Martinović, 2015, 2023; Ershova, 2019, 2024).
       - Only features at the top of the stack are accessible for checking/valuation at each step of the derivation.

       (4) H_1 and H_2 specify different orders of Merge
           a. H_1 checks F before G $\rightarrow$ FP is a complement



b. H_2 checks G before F → GP is a complement

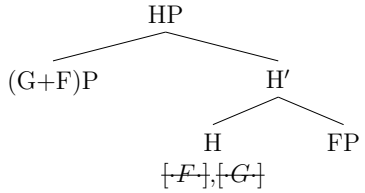


2. Option 2: **No**, lexical items cannot specify the order of operations, only the type: H_1 and H_2 both necessarily have the same options for projecting to an HP.
   - Explored most explicitly in frameworks with *unordered* bundles of features (see e.g. Longenbaugh 2019 for a proposal that argues this clearly in these terms).
   - Every feature is simultaneously available for checking/valuation, where other principles determine the order of operations (or there is optionality).

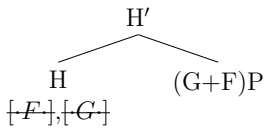
– **Important note**: this talk isn't so much about the stacked features vs. unordered features debate, but about whether the order of operations is controlled by *lexical* or *general* factors.
   - I think this is easiest to highlight by comparing these two frameworks, but what I argue for might not actually distinguish these two frameworks.

- My plan:
  – Explore Option 2: H1 and H2 are indistinguishable (syntax-wise), and the order of operations is predictable from other rules.
  – A hope: wherever you can predict the order of Merge/Agree from general principles rather than lexical distinctions, it is more explanatory to do so.
    - This framing also echoes the *intrinsic* vs. *extrinsic* rule ordering debate in syntax, but as Georgi (2014) discusses at length, those terms are a bit vague so I will avoid them.

- **Summary of Proposal**: the identity of features and economy conditions like Free Rider are jointly responsible for predicting possible orders of operations.
  - **Assumption**: operations are induced by syntactic features on heads
    (5) $[\cdot\alpha\cdot]$ = an instruction to Merge with an element bearing $[\alpha]$ (Heck and Müller, 2007; Müller, 2010)
    * The identity of the syntactic feature determines what sorts of elements may satisfy it.
    * The type of syntactic feature determines what sort of operation it induces: Merge or Agree
  - **Proposal**: these features are unordered on heads, such that they are all accessible for checking/valuation simultaneously
    * Some elements can check/value more of a head's features than others: e.g. (G+F)P can check more features than FP.
    * The order of operations may therefore determine how many elements get to Merge/Agree.
      (6) H checks its features with either one or two instances of Merge
        a. H checks $[\cdot F\cdot]$ against FP first → $[\cdot G\cdot]$ can license (G+F)P second



        b. (G+F)P checks both $[\cdot F\cdot]$ and $[\cdot G\cdot]$ first → FP cannot merge



  - Any condition that requires the presence of FP enforces the counterbleeding order of Merge → **order of operations implicitly constrained by identity of features**.

- **Case studies**:
  1. The distribution of DPs vs. non-DPs: non-DPs tend to be complements.

2. The position of VP within vP: VP fronting occurs when v takes a non-VP complement.
3. Subject/object asymmetries in wh-questions: wh-objects have an asymmetric ability to bleed introduction of the subject – object wh-questions are morphosyntactically less flexible than subject wh-questions.

2 Notes from Agreement

- **An idea from Chomsky (1995)**: sometimes, a goal for one probe can simultaneously satisfy other requirements of the same head.

  (7) **Free Rider condition**
  "It is the feature F itself that must enter into the checking relation, by (29); other features of FF[F] may also enter into checking relations as "free riders," carried along in the derivative chain ..." (Chomsky, 1995, p.246)

- An example of the Free Rider condition at work in Chomsky (1995):
  - Movement to satisfy T's EPP property simultaneously checks case and φ-agreement requirements.
    - Suppose EPP is specified to check category feature D: case and φ are checked/valued as free riders.

- Many theories of agreement have used the free rider condition to predict which elements control agreement in different contexts: e.g. Béjar and Rezac (2009).

2.1 φ and Part

- **The data**: the prefixal agreement morpheme in Basque agrees with different arguments in different contexts.

  (8) *Basque* (Béjar and Rezac, 2009, ex.2)
  a. ikusi z-in-t-u-da-n
  seen 2-x-PL-have-1-PAST
  'I saw you.'
  b. ikusi n-ind-u-en
  seen 1-x-have-PAST
  'He saw me.'

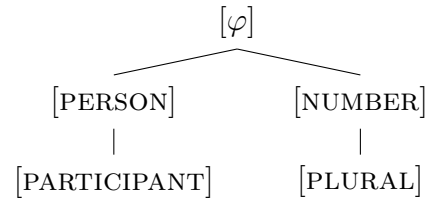
c. ikusi n-ind-u-zu-n
seen 1-x-have-2-PAST
'You saw me.'

d. ikusi n-u-en
seen 1-have-PAST
'I saw him.'

- **Generalization**:
  - The prefix agrees with the object unless the object is third person and the subject is a participant.

- **Their proposal**: leverages the idea that participants have a superset of the properties that non-participants have.

(9) A simplified φ-feature geometry from Harley and Ritter (2002) for Basque



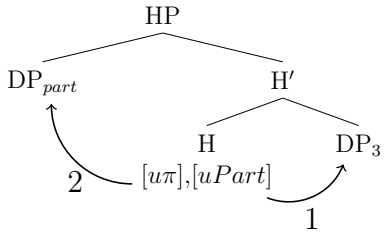
(10)

3rd person	[π]
1st/2nd person	[π] [PART]

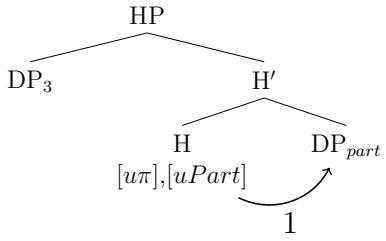
- **Second part of their proposal**: agreeing head has two probes, which look at the object before the subject

(11) H satisfies $[u\pi]$ and $[uPart]$ with either one or two instances of Agree

a. H values $[u\pi]$ by probing DP_3 first → $[uPart]$ probes again for DP_{part}



b. DP_{part} values both $[u\pi]$ and $[uPart]$ first → DP_3 is never probed



- **The point**: because of the Free Rider condition, regardless of which probe searches first, the features of the first goal can value the other probe on the head simultaneously, as free riders.
  - The identities of the features and the syntactic structure are all we need to predict which elements get agreed with.
    - If the first goal is 3rd person, agreement happens twice.
    - If the first goal is a participant, agreement happens once.

2.1.1 A chink in the armor

- Béjar and Rezac's (2009) analysis is one of the canonical examples of subset-hood in φ-features determining agreement outcomes.
  - The logic is neat and works, but it is not clear how crucial the $[u\pi]$ probe is to the analysis.

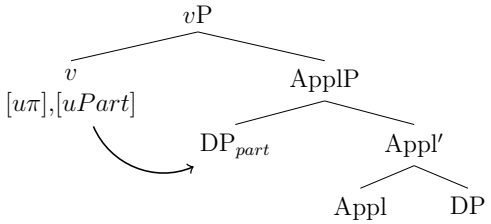
(12) Basque absolutive "person" agreement: (Preminger, 2009, Table 2)

1sg	na
2sg	ha
3sg	
1pl	ga
2pl	za
3pl	

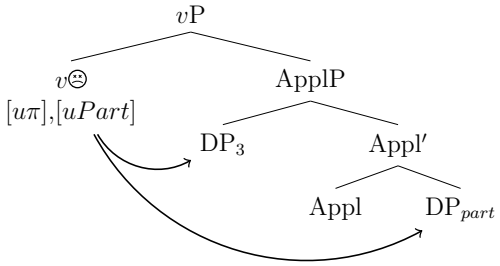
- An analysis that makes more crucial use of the $[\pi]$ probe is Coon and Keine's (2021) feature gluttony approach to the Person Case Constraint (PCC) in e.g. Basque ditransitives, Icelandic dative-nominative constructions, and German copula constructions.

(13) Agreeing once vs. twice matters:

a. ✓Agreeing once: a probe that copies one feature bundle knows how to instruct the morphology



b. *Agreeing twice: a probe that copies two distinct feature bundles doesn't know how to instruct the morphology



- So far, these cases have illustrated how the Free Rider condition works in agreement and how it interacts with the identity of features.
  - These cases highlight how these two components of the grammar conspire to predict how many elements get agreed with in different syntactic configurations.
  - Now we will extend the approach to Merge.

3 Extending to Merge

- The identity of features and the Free Rider condition predict which elements get agreed with.

  - Extending the logic to Merge would predict which elements get to Move/Merge.
  - We will see that, when applied to external Merge, this has consequences for the order of operations.
    - Some orders of Merge have bleeding.
    - Others have counterbleeding.

– Any principles of grammar that require something to Merge would thus enforce the counterbleeding order.

- **Framework considerations**:

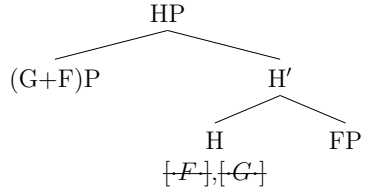
(14) Merge is feature-driven

(15) **Last Resort** (Chomsky, 2000, 2001)
α can only target K if a feature of either α or K is checked by the operation

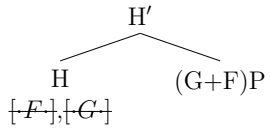
(16) **Feature Maximality** condition (extending Free Rider to Merge):
Given a head H with features $[F_1]...[F_n]$, if XP discharges $[F_i]$, XP must also discharge each $[F_j]$ that it is capable of (Chomsky, 1995; Pesetsky and Torrego, 2001; Rezac, 2013; van Urk and Richards, 2015; Longenbaugh, 2019).

(17) H checks its features with either one or two instances of Merge

a. H checks $[\cdot F \cdot]$ against FP first → $[\cdot G \cdot]$ can license (G+F)P second



b. (G+F)P checks both $[\cdot F \cdot]$ and $[\cdot G \cdot]$ first → FP cannot merge



- What follows: some illustrations of how feature maximality/free rider can help us understand the order of operations.

3.1 Merge/Merge interactions

- **Observation**: DPs are often proposed to be either complements or specifiers; non-DPs are rarely proposed to be specifiers.

(18) DP, non-DP pairs of internal arguments

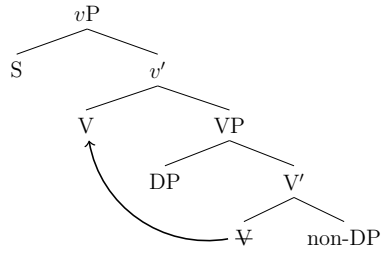
a. Wallace put [the cheese]$_{DP}$ [in the cupboard]$_{PP}$.

b. Gromit bet [5 dollars]$_{DP}$ [that Wendy wouldn't like cheese]$_{CP}$.

c. Wallace persuaded [Gromit]$_{DP}$ [to go on a trip to the moon]$_{TP}$.

d. Gromit pulled [the branch]$_{DP}$ [free]$_{AP}$.

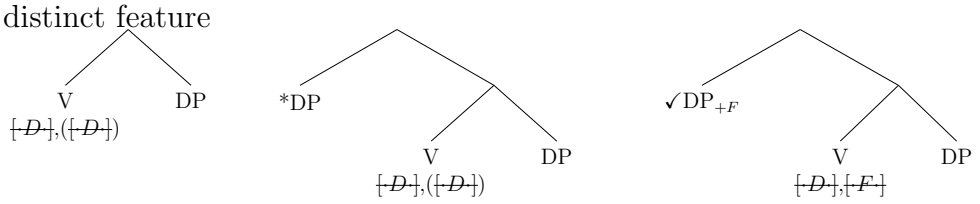
(19) The structure of these ditransitive vPs



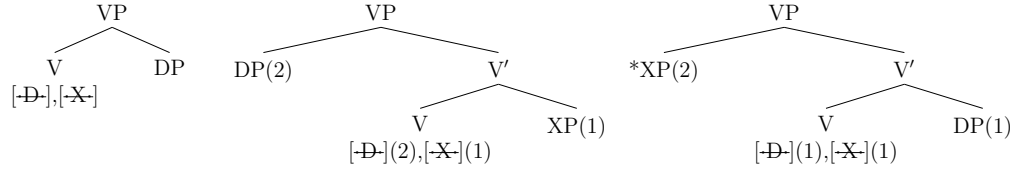
- Stowell (1981): DPs are subject to the Case Filter, satisfied by adjacency with V
  - Issues: head-final languages show the same tendency, and theories of case assignment have largely moved away from licensing by adjacency (agree or dependent case not sensitive to adjacency)

- **Proposal**: limit the inventory of Merge-inducing features
  - **Taking inspiration from the literature on c-selection**:
    - DPs are c-selected; introduced by [·D·]
    - non-DPs are not c-selected (but are rather s- or l-selected); introduced by non-specific [·X·]
  - **Key**: DPs check a superset of features that non-DPs can check

(20) Consequence: Only one DP per phrase, unless another DP licensed by a distinct feature



(21) *The non-DP first theorem*: if V merges with a non-DP, the non-DP must merge first. (Newman, 2024)



3.1.1 The debate about c-selection

- **Proposal**: the inventory of Merge-inducing features assigned to heads is partially constrained by the kinds of c-selectional relationships that exist
  - Category selecting features: [·D·], [·V·], but not [·P·], [·C·]

- To the extent that we need c-selection, it's usually to regulate the distribution of DPs and VPs.
  - Grimshaw (1979): selection for DP distinguishes classes of verbs

(22) *Ask* selects for Q(uestion), satisfied by CP, DP, PP
  a. John asked [$_{CP}$what the time was].
  b. John asked [$_{DP}$the time].
  c. John asked [$_{PP}$about the time].

(23) V s-selects Q, satisfied by CP but not DP
  a. John wondered [$_{CP}$what the time was].
  b. *John wondered [$_{DP}$the time].
  c. John wondered [$_{PP}$about the time].
  d. Bill inquired [$_{CP}$how old I was].
  e. *Bill inquired [$_{DP}$my age].
  f. Bill inquired [$_{PP}$about the time].

- Pesetsky (1982): maybe we never need c-selection beyond DP-selection
  - Verbs that select for PP arguments either care about the meaning or the lexical P: hallmark of s-selection or l-selection

    (24) David depended **on**/*at/*with/*for Jane for help.

- It isn't obvious that there are any verbs that select for the categories P or C, as such.
  - Selection for CPs and PPs governed by lexical and semantic considerations.
  - Pesetsky suggests maybe we don't need category selection at all, if just to account for DPs, but I will take up [·D·] as a limited example of c-selection.
  - One example of the grammar caring about DP vs. non-DP: meta-restrictions on selection

3.1.2 Meta-restrictions on selection

- **Observation**: The number of arguments in the verbal domain is limited to at most four (Hale and Keyser, 1993, 2002; Marelj, 2002; Juarros, 2003).
- Of the maximally four arguments, there are restrictions on their categorial composition:
  - At most two can be DPs. (adding a third DP requires the addition of functional structure)
  - At most two can be non-DPs.

    (25) (DP) V (DP) (XP) (XP)

- **Conclusion**: the distinction between DPs and non-DPs is important to the factors that constrain verbal phrase structure.
  - Distinctions among non-DP categories are not important to the factors that constrain verbal phrase structure.

(26) Clauses with more than 2 DPs need extra functional structure:
  a. Amy gave [$_{ApplP}$ Jo] a book. (2 DPs + 1 ApplP)
  b. Beth showed the painting to Laurie. (2DPs + 1 PP)
  c. Meg wants Amy to eat carrots. (2 DPs + 1 TP)
  d. Amy told Beth that Marmie likes carrots. (2 DPs + 1 CP)

- The normal verbal structure allotted to clauses (V+v) is enough to license at most two DPs.
- Additional DPs require additional functional structure. (Baker, 1988; Larson, 1988; den Dikken, 1991; McGinnis, 2001; Pylkkänen, 2008)

- **Observation**: the additional functional structure that one can add also has limits
  - At most two non-DP arguments can be selected by a single verb.

(27) Some clauses with 2 non-DPs:
  a. Jo relies on Laurie for support. (1 DP + 2 PPs)
  b. Meg counted on Jo to help. (1 DP + 1 PP, 1 TP)

c. Amy heard from Beth that Marmie likes carrots. (1 DP + 1 PP, 1 CP)

d. Jo bet against Laurie for a new bike. (1 DP + 2 PPs)

e. Laurie bet [$_{ApplP}$ Jo] his allowance that Amy would want to come. (2 DPs + 1 ApplP, 1 CP)

(28) Can't have 3 (or more) non-DPs

a. *Meg counted on Jo for support to help.
intended reading: Meg counted on Jo for support and help

b. *Lauri bet against Jo for a new bike that Amy would want to come.
intended reading: Laurie bet Jo a new bike that...

- Strikingly, these restrictions seem to be *categorial* rather than semantic.
  - **Justification**: Thematic roles are not uniquely tied to particular categories.

(29) Prepositional 'direct objects'

a. Meg objected to Amy's mischief.
cf. *Meg denounced Amy's mischief.*

b. Beth complied with Marmie's orders.
cf. *Beth followed Marmie's orders*.

(30) Thematic roles realized as multiple categories

a. Agent: DP or *by*-phrase
   i. Sue ate a strawberry.
   ii. The strawberry was eaten by Sue.

b. Propositional arguments: CP or DP
   i. Laurie said that Amy likes carrots.
   ii. Laurie said something.

c. Recipient: *to*-phrase or ApplP
   i. Meg gave Marmie a present.
   ii. Meg gave a present to Marmie.

  - *Bet* can clearly assign three internal argument theta-roles, where those roles can sometimes alternate between DP/non-DP formats.
  - ...but the arguments can't all take their non-DP forms at the same time.

- **Conclusion**: the category D is important for understanding restrictions on the number and types of arguments
  - Other categories, like P and C, are not.

– What does this mean for the features driving Merge?

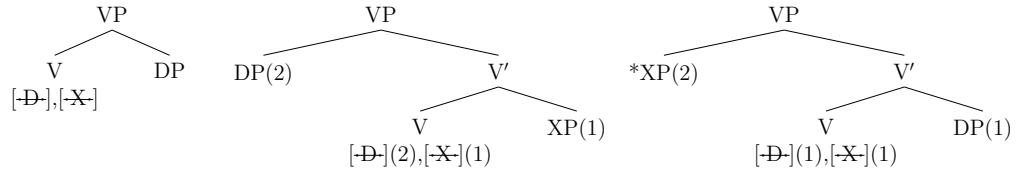
* Last Resort requires Merge to be licensed by a feature, but my proposal is that the identities of features need to be motivated by selection.
* **Proposal**: categories that are not c-selected are merged in response to a non-specific feature [·X·].

– When we take into account the Free Rider/Feature Maximality condition, the introduction of [·X·] to introduce non-DPs has consequences for the order of operations:

* If DP merges first, it checks both [·D·] and [·X·].
* If non-DP merges first, it checks only [·X·].

– A desire to satisfy selectional requirements of heads/empty the numeration can enforce the order in which non-DP gets to Merge – constrains the order of operations!

(31) Interactions between [·D·] and [·X·] given Free Rider/Feature Maximality: non-DPs must merge first or not at all



3.2 v and its complement

- So far, we have looked V's features and how they conspire to predict which phrase is V's complement vs. specifier.
  - Now we address the same issue for v.
    * v likely has an additional feature for merging VP: [·V·]
    * How do we know?
- The logic of the relationship between v and V is one of c-selection:
  - A v that is positively specified to introduce an external argument can merge with a range of VPs:

(32) Verbs that take external arguments with a variety of internal structures/roots

a. Wallace laughed. (VP = [laugh])

b. Wallace saw Gromit. (VP = [see Gromit])
c. Wallace depended on Gromit. (VP = [depend on Gromit])
d. ...

– Similarly, a v head that does not take an external argument can merge with a variety of VPs.

(33) Verbs that don't take external arguments with a variety of internal structures/roots
a. Weather verbs (VP = [V])
b. Unaccusatives (VP = [V DP])
c. Ditransitive unaccusatives (VP = [V DP PP/CP])

- To describe the selectional properties of any v head, we can't be more specific than "VP" – a characteristic of c-selection.

- This is no surprise, given the literature on c-selection.

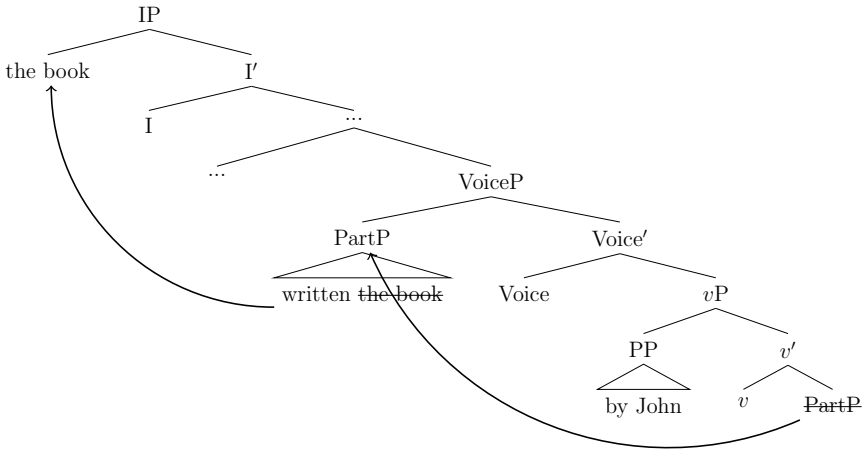
  – Odijk (1997) argues the c-selection for VP exists, based on the selection patterns of modals, e.g., as an argument against reducing all c-selection to other properties of the grammar.

- **Observation**: v takes VP as its complement except for when it doesn't.

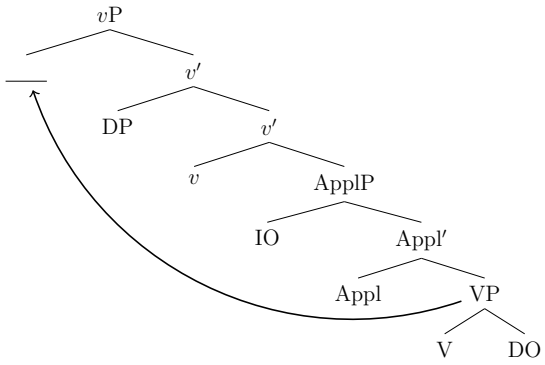
  – Sometimes v takes other phrases as its complement: ApplP, PartP, nP, etc.

  – In these cases, many researchers observe VP-fronting, or *smuggling*.

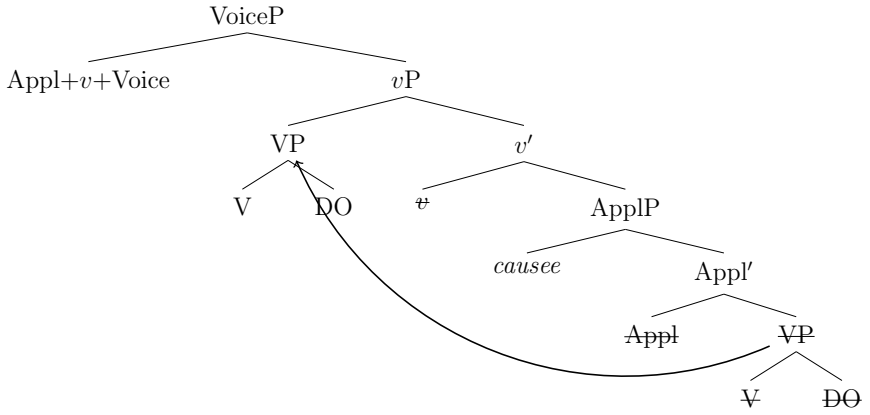
(34) Collins (2005, 2024): Smuggling derived by movement



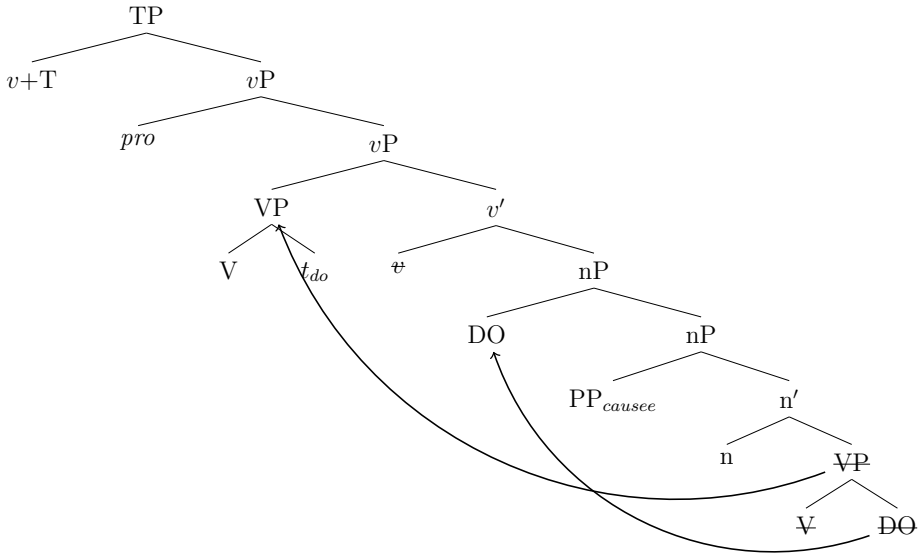
(35) VP smuggling in a ditransitive Collins (2024)



(36) A smuggling approach to Romance *faire* causatives (Pitteroff and Campanini, 2013, 227, with adjusted notation)



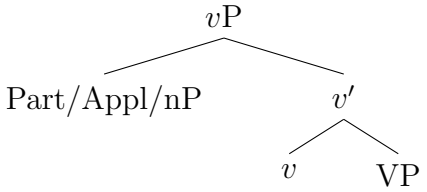
(37) Smuggling out of a nominalized VP in French/Italian/RP Spanish *faire-par* infinitives (Sheehan and Cyrino, 2016, ex. 22)



(38) Se hicieron [construir una casa (por un grupo de arquitectors)].
SE made.3PL build a house by a group of architects
'They had a house built by a group of architects.' *Spanish* (Sheehan and Cyrino, 2016, ex. 1e)

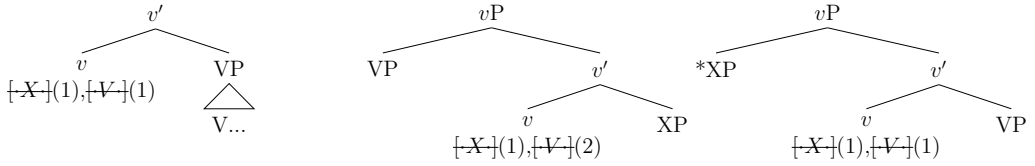
- What is the theoretical motivation for smuggling/VP-fronting in these cases?
  - The empirical motivation comes from word order and binding/scope facts.
  - But why should things merge/move in this way?
    - I.e. why should Part/Appl/nP merge as a complement and VP as a specifier?
    - If v has requirements to merge with both phrase types, they could have merged another way.

(39) Checking [·V·] and [·Part/Appl/n·] differently



- Two ways to enforce the smuggling order:
  1. If Part/Appl/n happen to have [·V·] as well, that would go unsatisfied in (39), or
  2. If the feature that introduces other phrases (Part/Appl/n) is [·X·], merging VP first would bleed the possibility of merging Part/Appl/nP.

(40) vPs: a non-VP must merge first → makes VP a specifier.

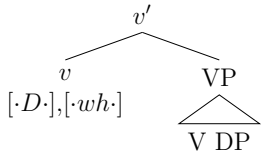


- On the assumption that Part/Appl/n are not c-selected (some of these aren't even categories), then they must be introduced by [·X·].
  - If they don't merge first, they don't merge at all → enforces counterbleeding order.

3.3 v and its specifier

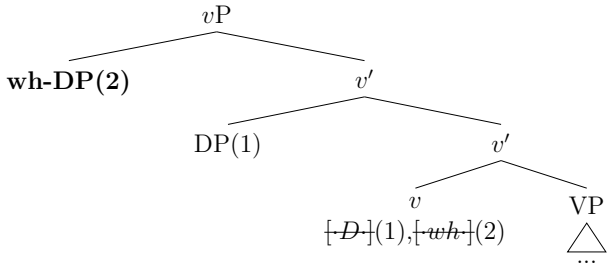
- v has [·V·] and [·X·] for licensing its various kinds of complements (except when VP becomes a specifier).
  - v also hosts various kinds of specifiers, including the external argument and successive-cyclically moved Ā-phrases.
  - v therefore needs features to license those elements too.

(41) v can minimally host a DP specifier and a wh-marked specifier.

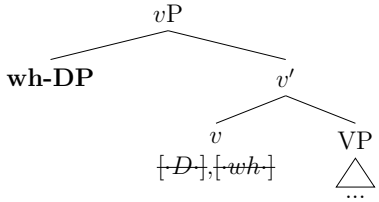


- One could think about the Ā-feature in different ways.
  - Specific Ā/wh-feature vs. generalized *edge*-feature (Chomsky, 2005; Müller, 2010).
  - Feature Maximality restricts the choice somewhat: an external argument should be able to check a generalized edge feature, bleeding Ā-movement.
  - A specified Ā-feature won't have this issue.
- [·D·] and [·wh·] on v interact the way [·D·] and [·X·] did, whenever there is a wh-DP present.

(42) If a DP merges before a wh-DP merges → v has two specifiers



(43) If a wh-DP merges first, it satisfies both features → v has one specifier



- If the wh-DP is an internal argument, the order of operations has consequences for transitivity.
  - Result: transitive object questions require [·D·]-checking before [·wh·]-checking

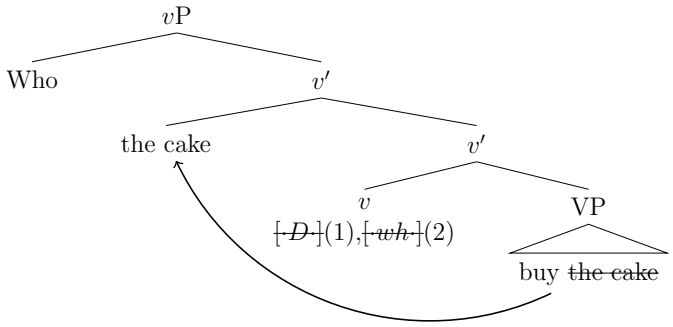
    (44) What did Sue buy?
    requires derivation (42)

(45) a. If wh-DP in (42) is an internal argument → transitive clause.
b. If wh-DP in (43) is an internal argument → intransitive clause; subject can't Merge.

- When wh-DP is an external argument, the order of operations doesn't affect transitivity in the same way – the external argument always gets to merge.
  - I.e. subject wh-phrases have no consequences for theta-role assignment/argument selection.

    (46) Who ate the cake?
    derivable from (42) or (43)

(47) a. If wh-DP in (42) is an external argument → transitive clause.



b. If wh-DP in (43) is an external argument → transitive clause.

- One order of operations allows the object to A-move, however.
  - **Consequence:** subject wh-questions can be derived from multiple orders of operations.
    - In one derivation, the clause looks identical to when the subject is not a wh-phrase.
    - In another, the clause contains exceptional A-movement of the object → consequences for morphosyntax?
- How is the choice made between these two orders?

  - Option 1: true optionality
  - Option 2: parametrically – some languages choose A-movement derivation and others don't.
    * Evidence: languages with the Ergative Extraction Restriction have intransitive-looking subject questions, possibly derived by A-movement of the object (Newman, 2024).
    * Other languages have transitive-looking subject questions, derived by joint [·D·] and [·wh·]-checking by the subject.

- Expectation: subject questions should be morphosyntactically more diverse across languages than object questions.
  - Questions for the future: DP-VP interactions
    * Are transitive clauses always derived with VP complements and DP specifiers?
    * Or do languages ever merge DP as the complement and VP as the specifier?
    * A thought: maybe different case alignments follow from different choices.
  - Putting it all together: DP-VP-whP-XP interactions in vP
    * Newman (2024) looks at some cases of such interactions and suggests an economy condition might help resolve certain types of optionality, but we don't have time to explore that here.

4 Conclusion

- Constraints on the order of operations can come from many sources:
  - I've highlighted two factors:
    1. the identity of features
    2. the Free Rider condition
  - These two factors cover several scenarios where we might have wanted to posit lexical restrictions on the order of operations.
    * The logic being: when one element checks a subset of the features that another element checks, it had better merge/agree first or not at all.

- **A hope**: maybe we can outsource *all* ordering restrictions to independent factors, and constrain the lexical distinctions available to a grammar.
  - **A challenge**: we expect true optionality in cases where elements don't have overlapping features.

- E.g. when a wh-PP and DP both want to merge in Spec vP, nothing enforces one order over the other.
- Maybe this is right? It's not clear whether morphosyntactic factors would be able to distinguish different specifier orders of DPs and wh-PPs...

References

Baker, Mark. 1988. *Incorporation: a theory of grammatical function changing*. University of Chicago Press.

Bobaljik, Jonathan D. 2008. Where's phi? Agreement as a post-syntactic operation. In *Phi theory*. Oxford: Oxford University Press.

Béjar, Susana, and Milan Rezac. 2009. Cyclic agree. *Linguistic Inquiry* 40:35–73.

Chomsky, Noam. 1965. *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.

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

Chomsky, Noam. 2000. Minimalist inquiries: The framework. In *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, ed. R. Martin, D. Michaels, and J. Uriagereka, 89–155. MIT Press.

Chomsky, Noam. 2001. Derivation by phase. In *Ken Hale: A life in language*, ed. Michael Kenstowicz, 1–52. Cambridge, MA: MIT Press.

Chomsky, Noam. 2005. Three factors in language design. *Linguistic Inquiry* 36:1–22.

Collins, Chris. 2005. A smuggling approach to the passive in English. *Syntax (Oxford, England)* 8(2):81–120.

Collins, Chris. 2024. *Principles of argument structure: A Merge-based approach*. Linguistic Inquiry Monographs. Cambridge, MA: MIT Press.

Coon, Jessica, and Stefan Keine. 2021. Feature gluttony. *Linguistic Inquiry* 52:655–710.

den Dikken, Marcel. 1991. Particles and the dative alternation. In *Leiden Conference of Junior Linguists 2 Proceedings*.

Ershova, Ksenia. 2019. Syntactic ergativity in West Circassian. PhD, University of Chicago.

Ershova, Ksenia. 2024. Phasehood as defective intervention: Possessor extraction and selective DP islandhood in West Circassian. *Syntax* 1–46.

Georgi, Doreen. 2014. Opaque interactions of Merge and Agree: on the nature and order of elementary operations. PhD, Leipzig University.

Georgi, Doreen. 2017. Patterns of movement reflexes as the result of the order of Merge and Agree. *Linguistic Inquiry* 48:585–626.

Georgi, Doreen, and Gereon Müller. 2010. Noun phrase structure by reprojection. *Syntax* 13:1–36.

Grimshaw, Jane. 1979. Complement selection and the lexicon. *Linguistic Inquiry* 10:279–326.

Hale, K., and S. J. Keyser. 1993. On argument structure and the lexical expression of syntactic relations. In *The view from Building 20: Essays in honor of Sylvain Bromberger*, ed. K. Hale and S. J. Keyser. Cambridge, MA: MIT Press.

Hale, Ken, and Samuel Jay Keyser. 2002. *Prolegomenon to a Theory of Argument Structure*. Cambridge, MA: The MIT Press.

Harley, Heidi, and Elizabeth Ritter. 2002. Person and number in pronouns: A feature-geometric analysis. *Language* 78:482–526. Publisher: Linguistic Society of America.

Heck, Fabian, and Gereon Müller. 2007. Extremely local optimization. In *Proceedings of WECOL34*, ed. Erin Bainbridge and Brian Agbayani, 170–182. California State University, Fresno.

Juarros, Eva. 2003. Argument structure and the lexicon/syntax interface. PhD Thesis, University of Massachusetts Amherst.

Larson, Richard. 1988. On the Double Object Construction. *Linguistic Inquiry* 19:335–392.

Longenbaugh, Nicholas. 2019. On expletives and the agreement-movement correlation. PhD Thesis, MIT, Cambridge, MA.

Marelj, Marijana. 2002. Rules that govern the cooccurences of theta-clusters in the 'Theta-System'. *Theoretical Linguistics* 28(3):357–373.

Martinović, Martina. 2015. Feature geometry and head-splitting: Evidence from the Wolof clausal periphery. PhD, University of Chicago.

Martinović, Martina. 2023. Feature geometry and head splitting in the Wolof clausal periphery. *Linguistic Inquiry* 54:79–116.

McGinnis, Martha. 2001. Phases and the syntax of applicatives. In *Nels 31*, ed. Minjoo Kim and Uri Strauss, 333–349. Amherst: University of Massachusetts, GLSA.

Müller, G. 2010. On deriving CED effects from the PIC. *Linguistic Inquiry* 41(1):35–82.

Newman, Elise. 2024. *When arguments merge*. Linguistic Inquiry Monographs. Cambridge, MA: MIT Press.

Odijk, Jan. 1997. C-selection and s-selection. *Linguistic Inquiry* 365–371.

Pesetsky, David, and Esther Torrego. 2001. T-to-C movement: Causes and consequences. In *Ken Hale: A life in language*, ed. Michael Kenstowicz, 355–426. Cambridge, MA: MIT Press.

Pesetsky, David Michael. 1982. Paths and categories. PhD Thesis, MIT, Cambridge, MA.

Pitteroff, Marcel, and Cinzia Campanini. 2013. Variation in analytic causative constructions: a view on German and Romance. *Journal of Comparative German Linguistics* 16:209–230.

Preminger, Omer. 2009. Breaking agreements: Distinguishing agreement and clitic doubling by their failures. *Linguistic Inquiry* 40(4):619–666.

Preminger, Omer. 2014. *Agreement and its failures*. The MIT Press.

Pylkkänen, Liina. 2008. *Introducing arguments*. The MIT Press.

Rezac, Milan. 2013. Case and licensing: evidence from ECM+DOC. *Linguistic Inquiry* 44(2):299–319.

Sheehan, Michelle, and Sonia Cyrino. 2016. Variation and change in the faire-par causative. In *Romance Languages and Linguistic Theory*, ed. E. Carrilho, A. Fieis, M. Lobo, and S. Pereira, 279–304. John Benjamins.

Stowell, Timothy Angus. 1981. Origins of phrase structure. PhD Thesis, MIT, Cambridge, MA.

van Urk, Coppe, and Norvin Richards. 2015. Two components of long-distance extraction: Successive cyclicity in Dinka. *Linguistic Inquiry* 46(1):113–155.

A Merge/Agree interactions

- Where we started: Agree/Agree interactions.
  - What we've just seen Merge/Merge interactions
  - What about Agree/Merge interactions?

- If operations are really not lexically ordered, how do we derive movement/agreement correlations?
  - An advertisement: Longenbaugh (2019) has an interesting perspective on this issue.
    - Proposal: Agree and Merge are not lexically ordered
    - But they can feed/bleed each other, so order has consequences for phenomena like Romance Past Participal Agreement (PPA):
      1. Agree before Merge → PPA
      2. Merge before Agree → transitive clause, no PPA

- Longenbaugh follows the Heck and Müller (2007) approach to separate the features driving Merge and Agree, instead of wrapping them into EPP features.
  - This view suggests that there is *no relationship between Merge and Agree.*
    - Merge induced by $[\cdot\alpha\cdot]$ features
    - Agree applies at a distance, induced by $[u\alpha]$

- **Puzzle**: then how do we account for movement/Agreement correlations? i.e. how do we ensure that the thing that agrees is also the thing that moves and vice versa?
  - Romance past participle agreement: object doesn't control agreement unless it A-moves.

(48) Participle never agrees with in situ transitive objects

a. Ho mangiat-**o**/*a **la mela**.
have.1.SG eaten-M.SG/*F.SG the apple
'I have eaten the apple.'
(D'Allessandro & Roberts 2008) *Standard Italian*

b. Jean n'a jamais fait-(***es**) **ces sottises**.
Jean NEG.have.3SG never done-M.SG/*F.SG these stupid.things.F.PL
'Jean has never done these stupid things.'
(Belletti 2006) *French*

(49) Participle always agrees with raised internal argument, as in passives/unaccusatives

a. **Due ladri** sono entrat-**i/*o** dalla finestra.
two robbers are entered-M.PL/*M.SG from the window
'Two robbers entered from the window.'
(Belletti 2006: ex. 34c) *Standard Italian*

b. **Alcuni sindaci** sono stati arrestat-**i/*o**.
some.M.PL mayors.M.PL are.PL been.M.PL arrested.M.PL/*SG
'Some mayors were arrested.'
(Longenbaugh 2019: ex. 33b) *Standard Italian*

c. **Trois erreurs** ont été fait-*(**es**).
three errors have.PL been made.F.PL
'Three errors have been made.'
(Longenbaugh 2019: ex. 22b) *French*

d. **Trois sauterelles** sont mort-*(**es**).
three grasshoppers be.PL dead.PL
'Three grasshoppers died.'
(Longenbaugh 2019: ex. 23b) *French*

- This kind of pattern used to be an argument that Merge and Agree were tightly connected: one fed the other
  - Except that we know that Merge can occur without Agree, and Agree can occur without Merge.
- Longenbaugh's observation: it's not just movement and agreement that look correlated here
  - Agreement and case are also correlated.

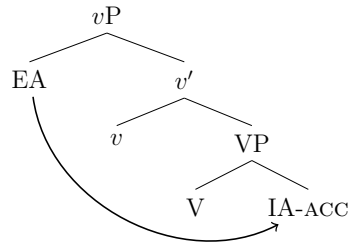
∗ Agreement only targets nominative arguments, not accusative ones.

- Longenbaugh's solution: playing with the order of operations
  - He suggests that case assignment is impacted by the order of Merge, and the order of Merge can be impacted by the timing of Agree.

1. External Merge feeds accusative case assignment, due to a dependent case algorithm.
2. Accusative case assignment bleeds agreement due to case discrimination.
3. Agree bleeds external Merge because of Feature Maximality: the DP that controls agreement also checks [·D·].

– Different choices of when to Agree/Merge lead to different case/agreement outcomes due to bleeding effects.

(50) Dependent Case valuation (ex. 11, p. 28)
Transitive clause: Merge EX, value Case on IA:



- Takeaway: external Merge feeds accusative case assignment.

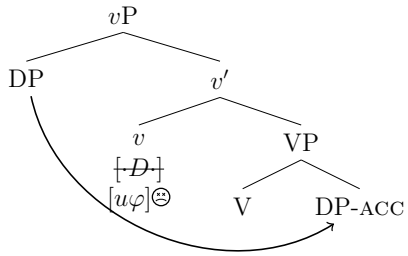
- Longenbaugh's proposal:

(51) Feature makeup of v:
a. $[u\varphi]$: for controlling PPA
b. $[\cdot D\cdot]$: for introducing the external argument

- Putting it together:

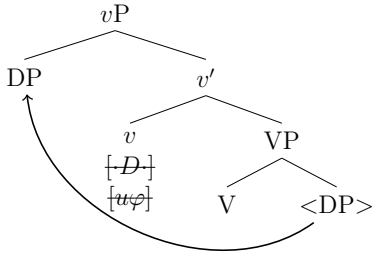
– If external Merge precedes Agree, it bleeds Agree by making the object accusative.

(52) Merge before Agree: no Agree



- We saw what happens when Merge precedes Agree: bleeding
  - What would happen if the internal argument moved/agreed first?

(53) Movement/Agreement bleeds transitivity



- Takeaway: two kinds of bleeding effects
  1. External Merge bleeds Agree
  2. Agree bleeds external Merge
- Result: we only observe past participle agreement when no external Merge takes place → movement/agreement correlation follows

- Summary: here again, there is no extrinsic ordering of operations.
  - But the logic of feature maximality makes it so that different orders have different outcomes regarding which elements get to Merge/Agree.
  - Thus, permitting optionality in the derivation rather than imposing an order allows for all of the attested outcomes.