

Operational opacity at the clausal middlefield

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1 Introduction

- Two types syntactic evidence for the phasehood of CP:

(i) *Operational opacity*

- (1) a. **Abby** seems [_{TP} <Abby> to be home].
b. ***Abby** seems [_{CP} (that) <Abby> is home].

(ii) *Footprints of successive cyclic movement*

Belfast English: Subject-aux inversion in CPs targeted by *wh*-movement

- (2) I asked them [_{CP} **what** had they done <what>]?

- (3) **What** did Mary claim [_{CP} did they steal <what>]? (Henry 1995)

- Evidence for the phasehood of vP (or some other clause internal category) has primarily come from successive cyclicity (i.a. Legate 2003; Aldridge 2008; Bennett et al. 2012; van Urk 2015).

This talk

Evidence from operational opacity for a clause-internal phase in Ndebele.

The operation in question: Subject movement to Spec,TP

- (4) **UZondi**_i u-a-phek-a [_{vP} *t_i* *t_V* inyama].
1Zondi 1-PST-cook-FV 9meat
'Zondi cooked meat.'

- (5) Ku-a-phek-a [_{vP} **uZondi** *t_V* inyama].
15-PST-cook-FV 1Zondi 9meat
'Zondi cooked meat.' (Answers: Who cooked meat?/What happened?)

Claim

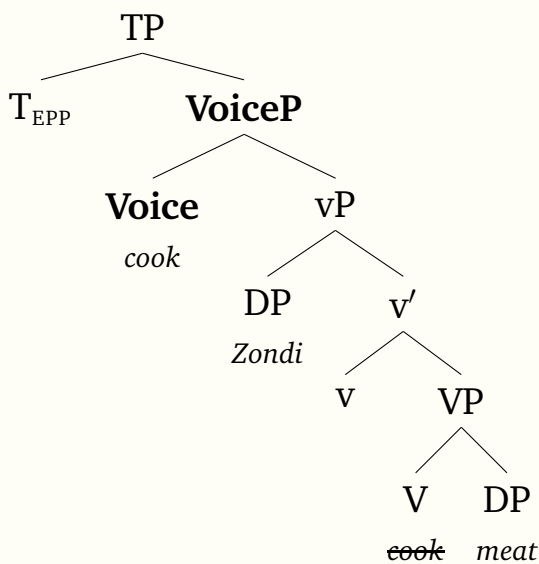
When the subject stays inside vP, it's because T cannot reach it across *phasal VoiceP*.

Overview

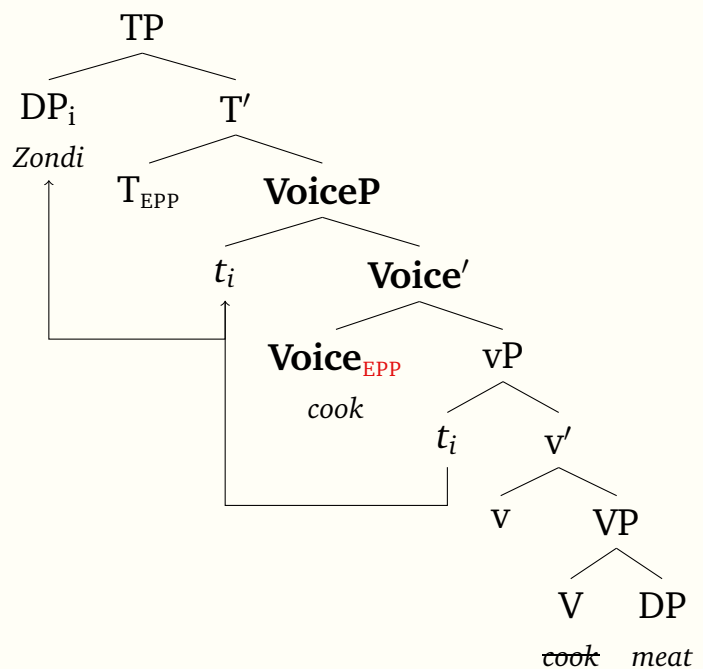
- §2. Proposed account of the optionality of subject movement to Spec,TP
- §3. Supporting evidence
- §4. Alternative accounts of the optionality of subject movement to Spec,TP
 - i) optional EPP in T
 - ii) optional expletive *pro*
 - iii) movement targets an optional feature of DPs
- §5. Summary and implications for successive cyclic movement

2 Proposed account: optional movement to phase edge

(6) No EPP in Voice → VSO



(7) Voice has EPP → SVO



- T always has EPP.¹
- VoiceP, which dominates the entire theta domain, is a phase.²
- Voice has optional EPP
 - its presence feeds subject movement to Spec,TP.
 - its absence bleeds subject movement to Spec,TP.

¹ Satisfying EPP is not necessary for the derivation to converge. This can be implemented as the assumption that features can fail to trigger operations (Preminger 2014) or by last-resort insertion of null expletive when EPP finds no goal in the structure.

² External arguments are generated in Spec,vP. This can be adjusted if we were to further articulate the syntax of the argument structure domain, e.g. by assuming a split-Voice system (see Wurmbrand 2021 and references cited there).

3 Supporting evidence

3.1 A-movement and subject agreement go hand-in-hand

In-situ subjects cannot control agreement on T (class 15 is default agreement):

- (8) **Ku/*U**-a-phek-a [_{VP} uZondi t_V].
15/*1-PST-cook-FV 1Zondi
 ‘Zondi cooked.’

Subjects in Spec,TP obligatorily control agreement on T:

- (9) UZondi_i **u/*ku**-a-phek-a [_{VP} t_i t_V].
 1Zondi **1/*15**-PST-cook-FV
 ‘Zondi cooked.’

In-situ subject is inaccessible to **both** EPP and ϕ in T

- (10) [_{TP} T_{EPP, u ϕ} [_{VoiceP (phase)} Voice cook [_{VP} **Zondi** v [_{VP} t_v]]]]
-

Subject in Spec,VoiceP, is accessible to **both** EPP and ϕ in T

- (11) [_{TP} T_{EPP, u ϕ} [_{VoiceP (phase)} **Zondi** Voice_{EPP} cook [_{VP} t_i v [_{VP} t_v]]]]
-

3.2 All-or-nothing movement and agreement in Aux-V constructions

In Bantu languages, EPP and ϕ appear on other functional heads than T.

(i.a. Carstens 2001; Carstens & Kinyalolo 1989; Baker 2008; Pietraszko 2017)

- (12) [_{TP} **Ubaba** **u**-be [_{PerfP} **e**-se [_{AspP} **e**-si- [_{VoiceP} dla.]]]]
 1father 1-AUX.PST 1-AUX.PRF 1-PROG- eat
 Father had already been eating.

When the subject moves to Spec,TP, it must control agreement on all functional heads:

- (13) **Ubaba** **u/*ku**-be **e/*ku**-se **e/*ku**-si-dla.
 1father 1/*15-AUX.PST 1/*15-AUX.PRF 1/*15-PROG-eat
 Father had already been eating.

When the subject stays in-situ, it cannot control agreement on any head:

- (14) **Ku/*U**-be **ku/*e**-se **ku/*e**-si-dla **ubaba**.
 15/*1-AUX.PST 15/*1-AUX.PRF 15/*1-PROG-eat 1father
 Father had already been eating.

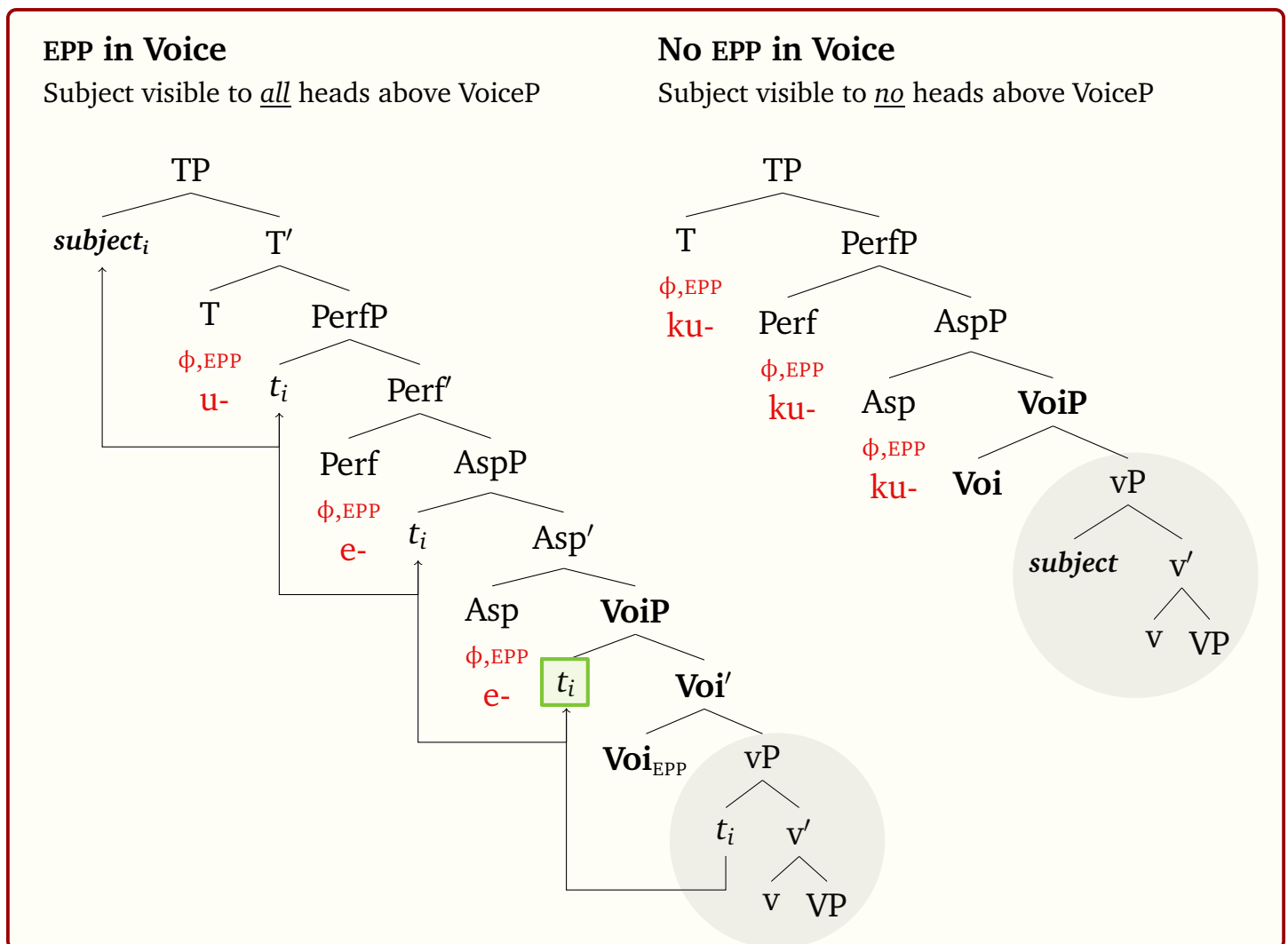
The subject cannot move to an intermediate position, irrespective of agreement:

(15) * $[_{TP}$ U/ku-be $[_{PerfP}$ e/ku-se $[_{AspP}$ **ubaba** e/ku-si- $[_{VoiP}$ dla]]]]
 1/15-AUX.PST 1/15-AUX.PRF 1father 1/15-PROG eat

(16) * $[_{TP}$ U/ku-be $[_{PerfP}$ **ubaba** e/ku-se $[_{AspP}$ e/ku-si- $[_{VoiP}$ dla]]]]
 1/15-AUX.PST 1father 1/15-AUX.PRF 1/15-PROG eat

→ **Aux-V constructions exhibit all-or-nothing movement and agreement**

- The subject either moves all the way to Spec,TP or doesn't move at all.
- Either *all* functional heads agree with the subjects or none do.



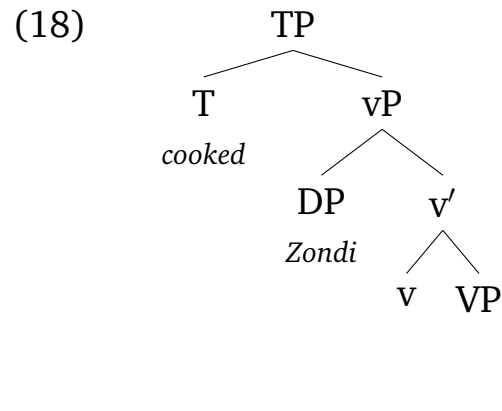
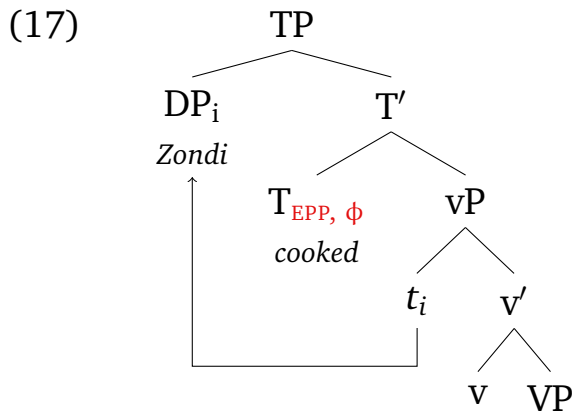
Same explanation as in §3.1:

The subject is visible either to all probes above VoiceP or to none.

4 Alternative accounts

4.1 Alternative 1: Optional EPP in T

Carstens and Mletshe (2015): T in Xhosa optionally lacks the $[EPP, u\phi]$ bundle.



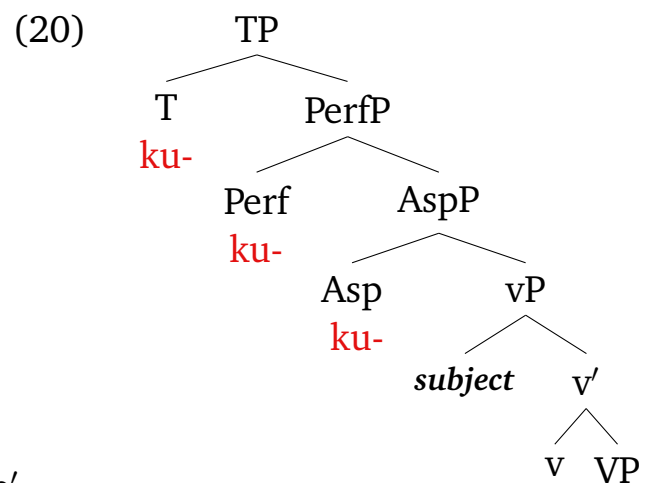
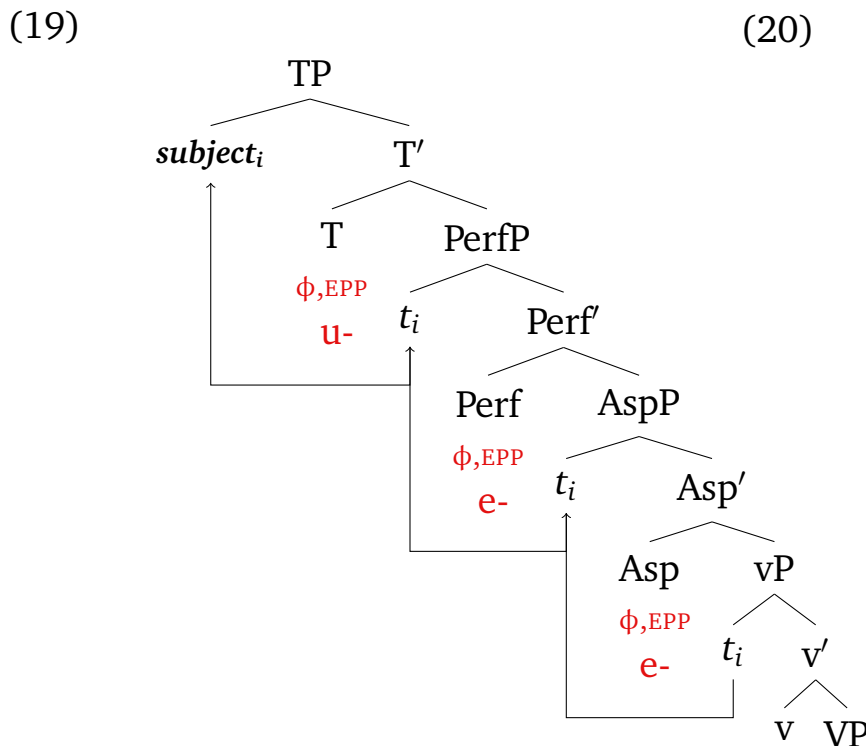
Problem 1: No explanation for agree/mvmt uniformity in Aux-V constructions

Movement & agreement all the way up

All functional heads have $[EPP, \phi]$

No movement or agreement

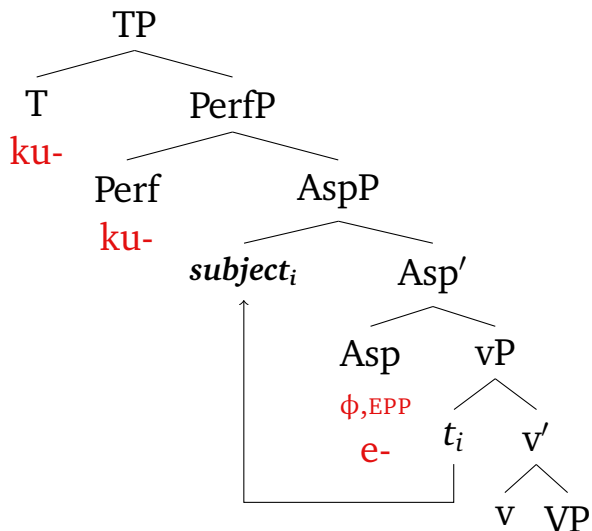
No functional heads have $[EPP, \phi]$



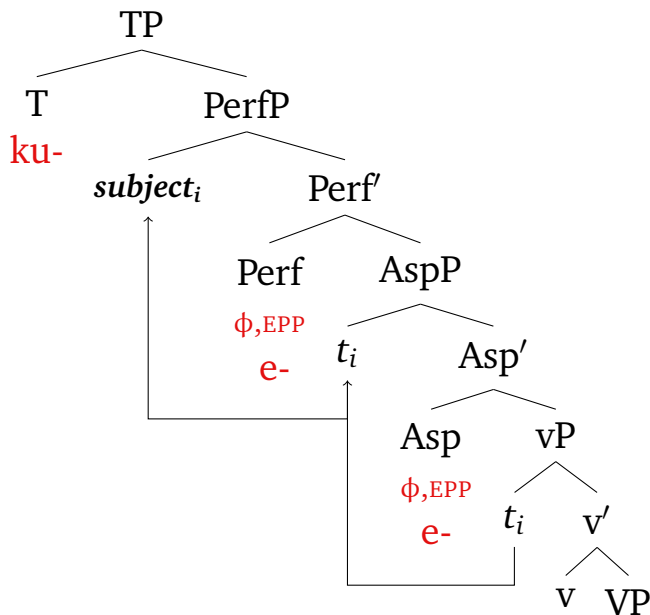
Nothing prevents merging some heads with $[EPP, \phi]$ and some without.

→ Incorrect prediction that movement can terminate in AspP or PerfP (21)-(22).

(21) When only Asp has [EPP, ϕ], movement should terminate in AspP:



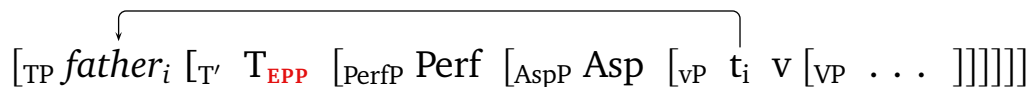
(22) When only Asp and Perf have [EPP, ϕ], movement should terminate in PerfP:



Both predictions are incorrect (15)-(16).

A modification to Carstens & Mletshe (2015) that might solve Problem 1:

(23) *Asp and Perf don't have EPP → either movement to TP or no movement at all*



- A separate explanation is needed for uniform (non-)agreement.
- Evidence from reduced clauses that **Asp does in fact have EPP** (24)

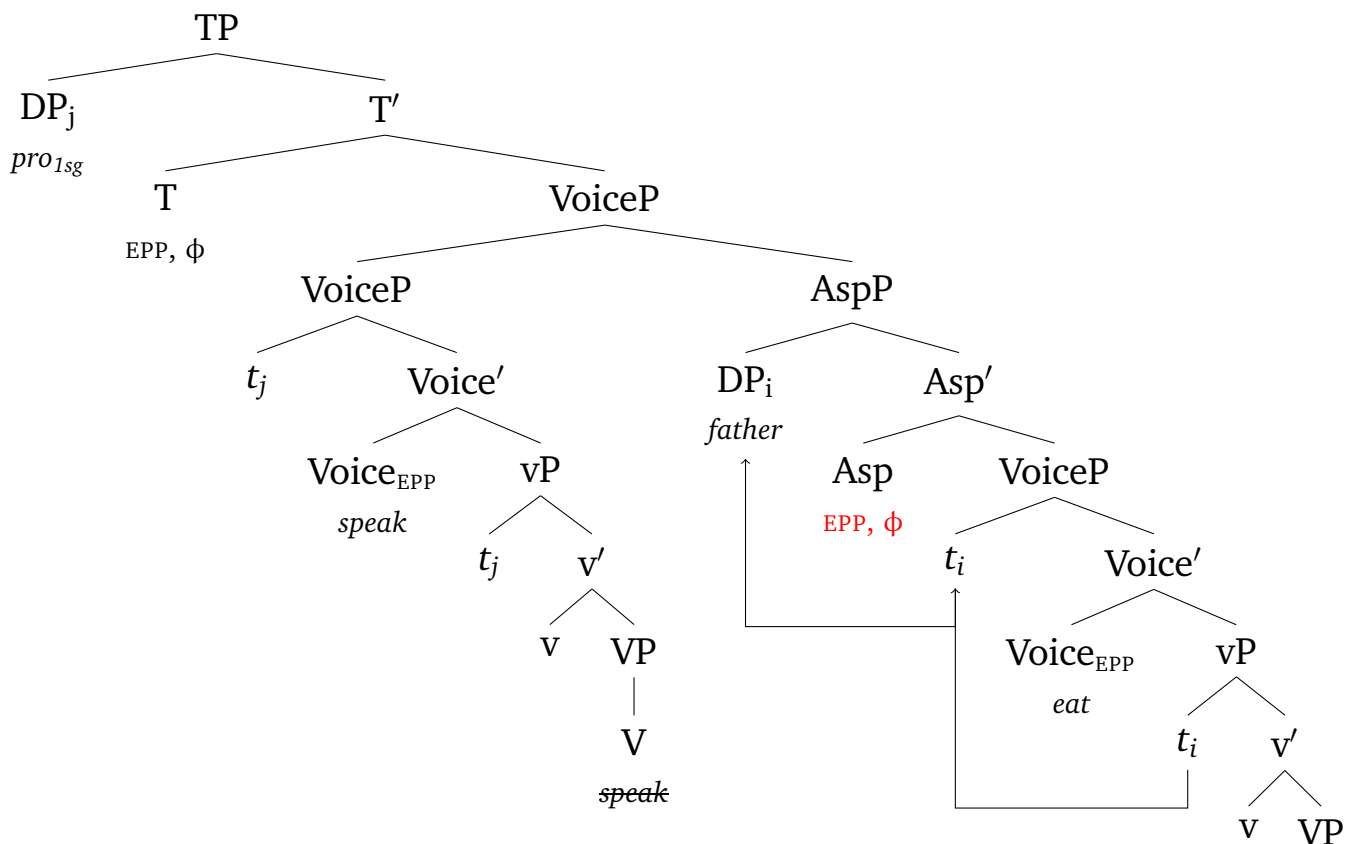
(24) Ngi-khulume [_{AspP} (*ukuthi) ubaba e-si-dla.]
 1sg-speak.PST (*COMP) 1father 1PTCP-IMPf-eat.
 'I spoke while father was eating.' (Lit. I spoke, father eating.)

(25) Ubaba u-*(ya)-dla.
 1father 1-*(PRS)-eat
 'Father is eating.'

(26) *Ubaba e-(ya)-si-dla.
 1father 1PTCP-(PRS)-IMPf-eat
 'Father is eating.'

(27) Ubaba u-be e-si-dla.
 1father 1-AUX 1PTCP-IMPf-eat
 'Father was eating.'

(28)



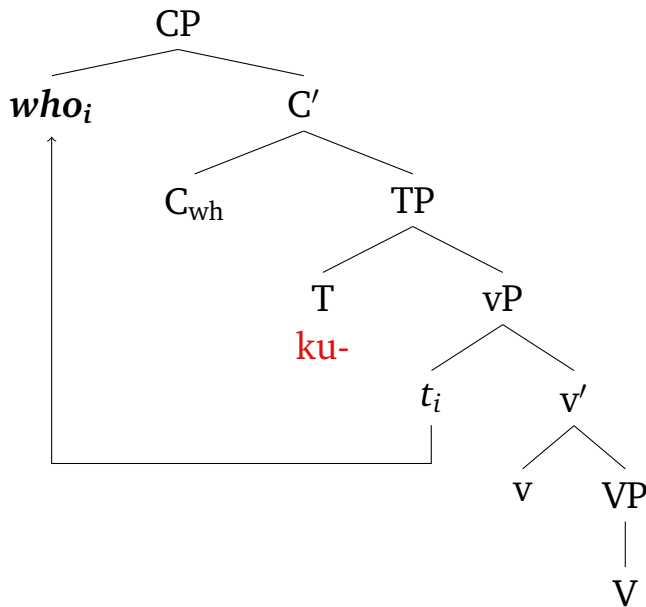
- Subject movement can terminate in Spec,AspP (24).
 → Asp has/can have EPP.
- But when the clause contains a TP, movement must proceed to Spec,TP (15).
 → T *always* has EPP in Ndebele.

Optionality of subject movement cannot be derived from optional EPP in T.

Problem 2: No explanation for obligatory agreement with wh-moved subjects.

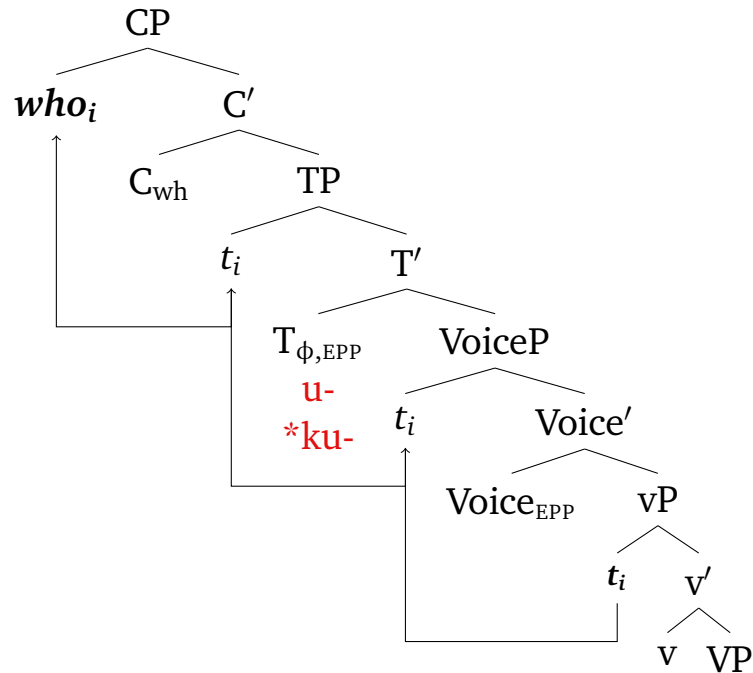
- (29) Ng-ubani a-**{u/*ku}**-za-pheka?
 COP-1who REL-**{1/*15}**-FUT-cook
 ‘Who will cook?’

- (30) The optional $[EPP, \phi]$ account



Movement to Spec,CP shouldn't require $[EPP, \phi]$ on T

- (31) Phasal VoiceP (present account)



Movement to Spec,CP must stop in Spec, VoiceP, exposing the DP to T.

4.2 Alternative 2: Optional expletive *pro*

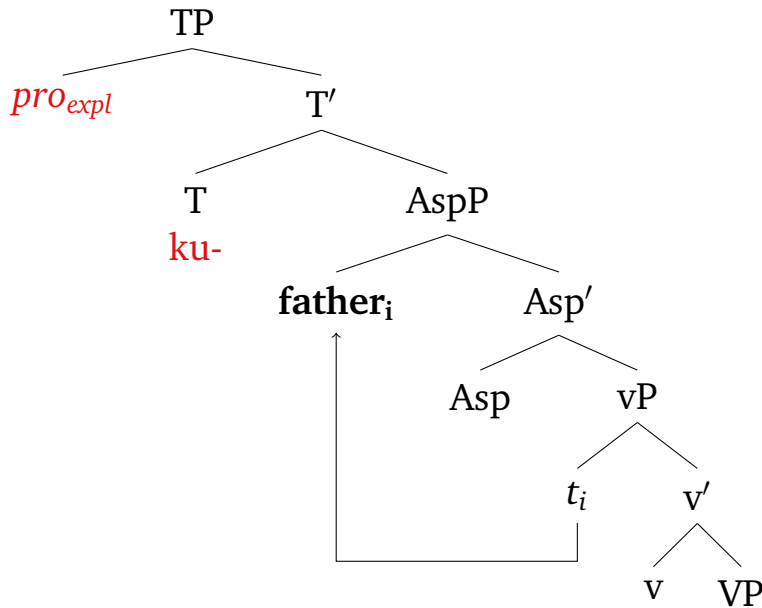
Buell (2005, 2007, 2012) derives VS vs SV in Zulu by proposing that T can freely choose between moving the subject and merging a null expletive of class 15.

- (32) *Two ways to satisfy the EPP in Zulu* (Halpert 2015:257)
- Insert pro_{expl} directly in Spec,TP
 - Search for an argument of the verb and move it to Spec,TP

This account faces the same two problems as Carsten & Mletshe's account:

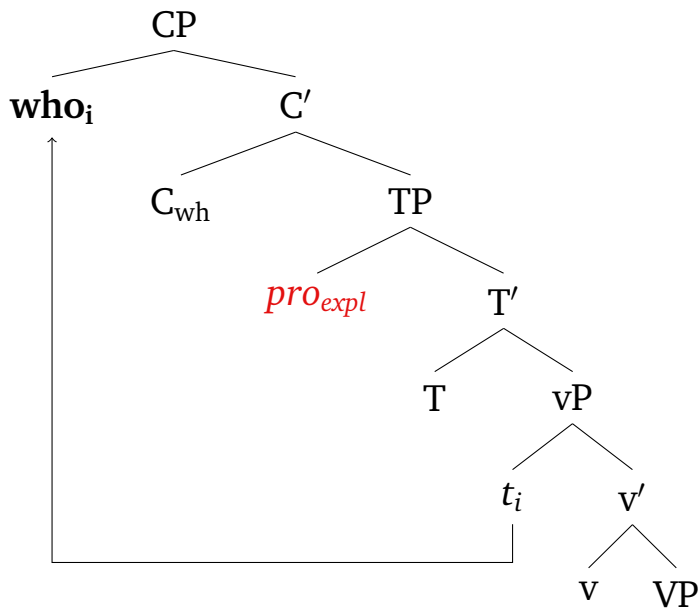
Problem 1: In Aux-V constructions, we expect non-uniform movement/agreement because an expletive in Spec,TP shouldn't preclude movement to Spec,AspP.

- (33) * $[_{TP} \text{ } pro_{expl} \text{ Ku-be } [_{AspP} \text{ } ubaba_i \text{ e-si- } [_{vP} \text{ } t_i \text{ dla }]]]]$
 EXPL 15-AUX.PST 1father 1-PROG eat
 Father was eating.



Problem 2: *wh*-movement should be able to cross an expletive subject, incorrectly allowing class 15 agreement in subject *wh*-questions.

- (34) Ng-ubani a- $\{u/*ku\}$ -za-pheka?
 COP-1who REL- $\{1/*15\}$ -FUT-cook
 'Who will cook?'

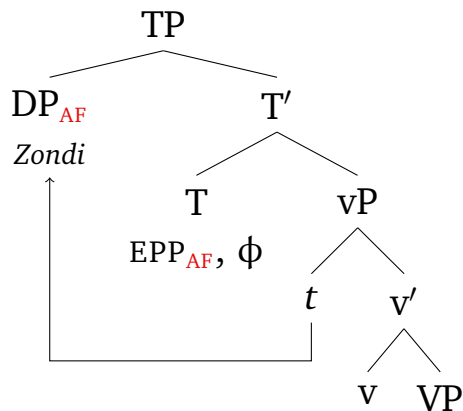


4.3 Alternative 3: Movement targets an optional feature on DPs

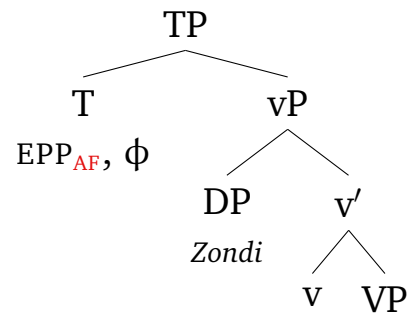
Zeller's (2008; 2015) account of the same facts in Zulu:

- T always has EPP but it only attracts DPs with the Antifocus (AF) feature.
- DPs may lack this feature, in which case they cannot move to Spec,TP.
- Agreement is parasitic on movement.

(35) UZondi u-a-phek-a.
1Zondi 1-PST-cook-FV
'Zondi cooked.'



(36) Ku-a-phek-a uZondi.
15-PST-cook-FV 1Zondi
'Zondi_{Foc} cooked.'



Problem 1: T in Ndebele *can* attract focused DPs (Pietraszko 2021).

Problem 2: T isn't relativized to any optional feature of DPs.

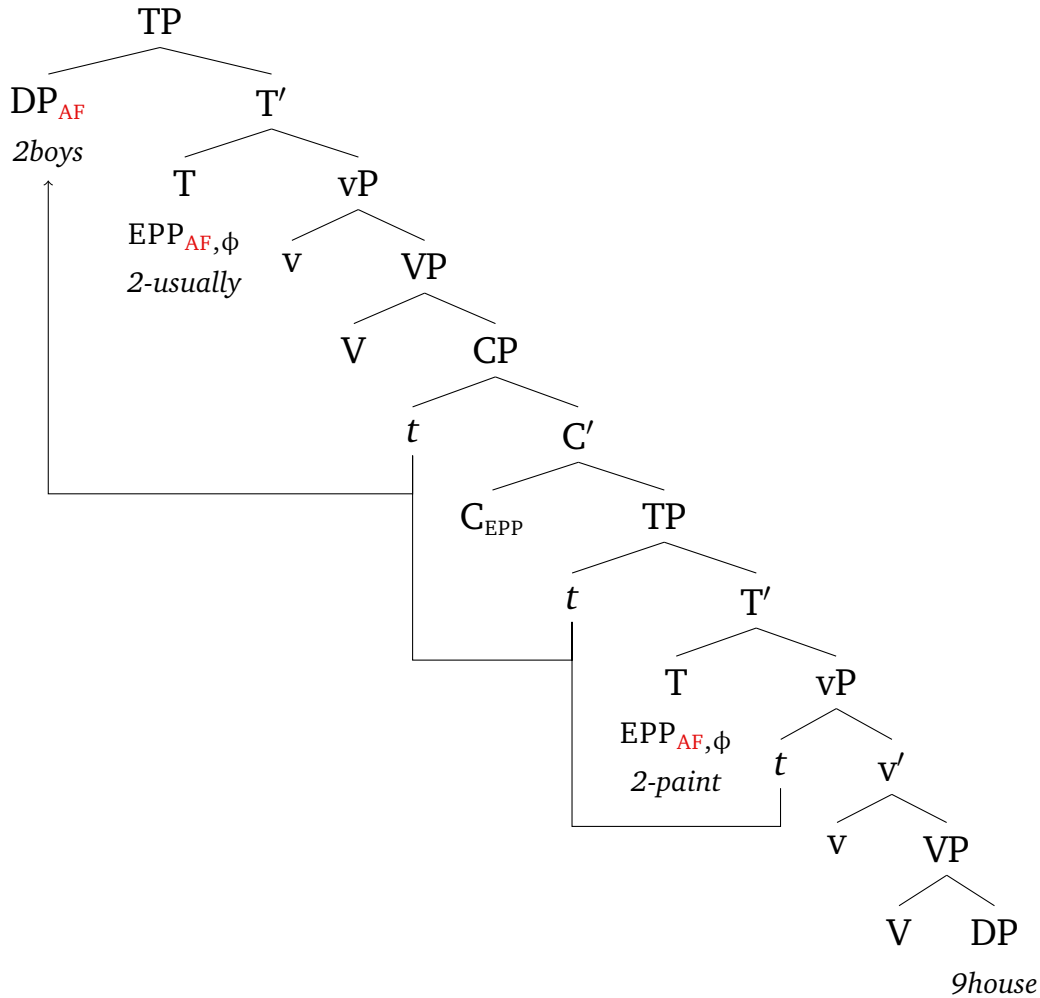
Zeller's account correctly predicts no partial movement:

(37) *_{[TP Ku-be [AspP **ubaba**_{AF} e-si- [vP t dla]]]}
15-AUX.PST 1father 1-PROG eat
(‘Father was eating’).

This account incorrectly extends to raising, which, unlike clause-internal A-movement, can be partial.

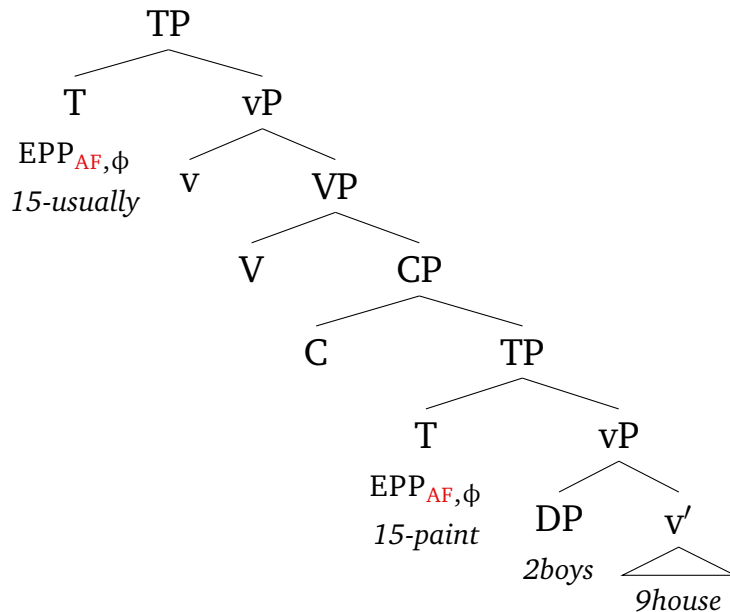
- (38) a. **Abafana**_i **ba**-jaye [CP ukuthi **t**_i **ba**-pende **t**_i indlu.]
2boys 2-usually COMP 2-paint.SBJV 9house
'Usually, the boys paint the house.' ≈
- b. **Indlu**_i **i**-jaye [CP ukuthi **t**_i **i**-pendwe **t**_i ng-abafana.]
9house 9-usually COMP 9-paint.PSV.SBJV by-2boys
'Usually, the house is painted by the boys.'

(39) The subject undergoes A-movement → the subject has AF



(40) **Ku**-yajele [_{CP} ukuthi **ku**-pende **abafana** indlu.]
 15-usually COMP 15-paint.SBJV 2boys 9house
 'Usually, the boys paint the house.'

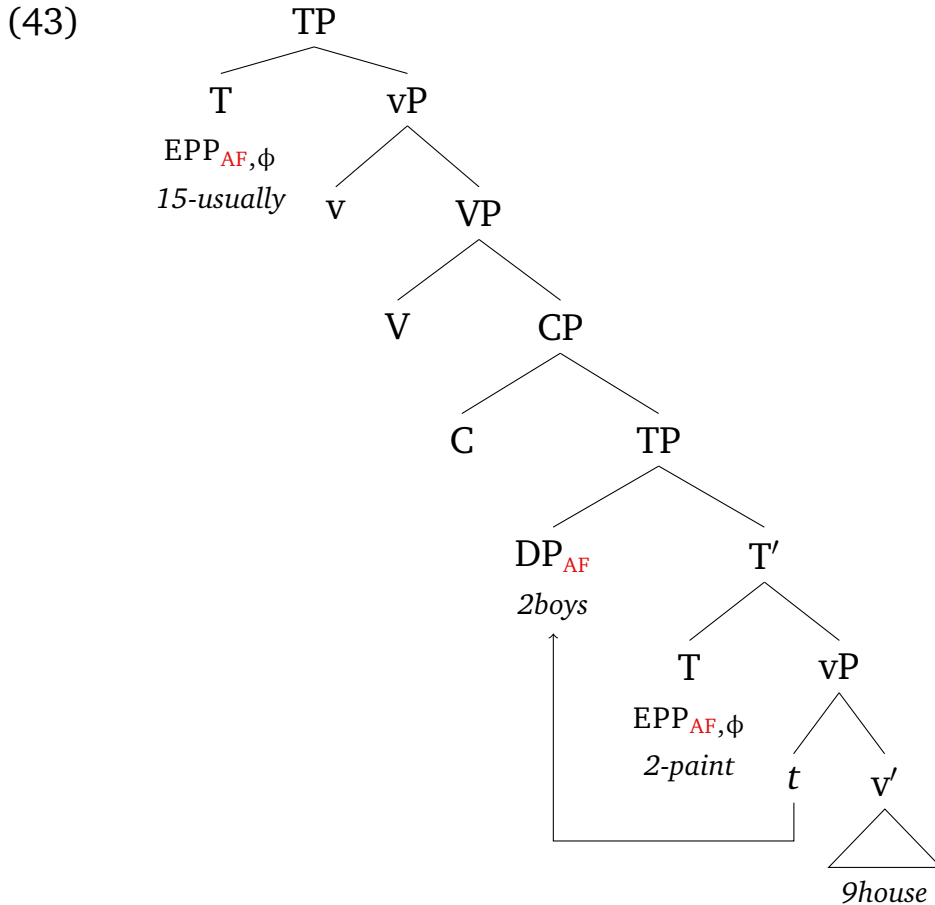
(41) No A-movement of the subject → the subject does not have AF



Intermediate landing site 1: embedded Spec,TP

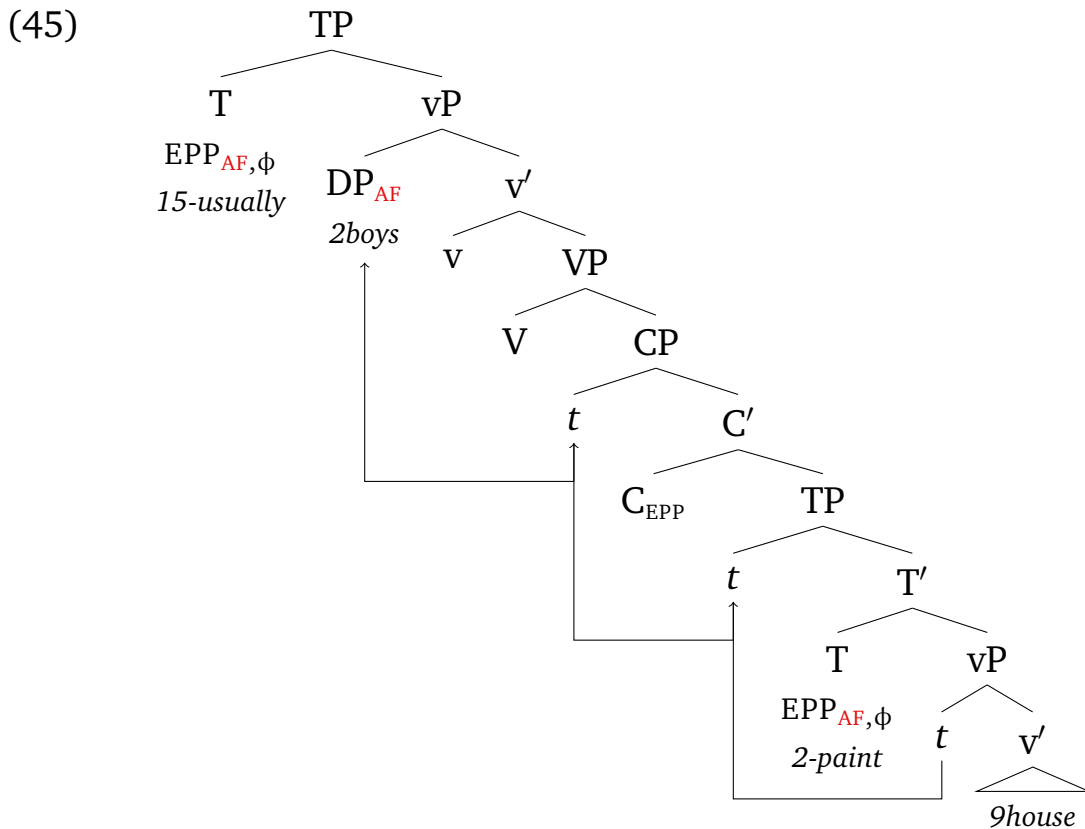
- (42) **Ku**-jayele [_{CP} ukuthi **abafana**_i **ba**-pende t_i indlu.]
 15-usually COMP 2boys 2-paint.SBJV 9house
 ‘Usually, the boys paint the house.’

Possible explanation: While the subject is a matching goal for matrix T, C lacks EPP.

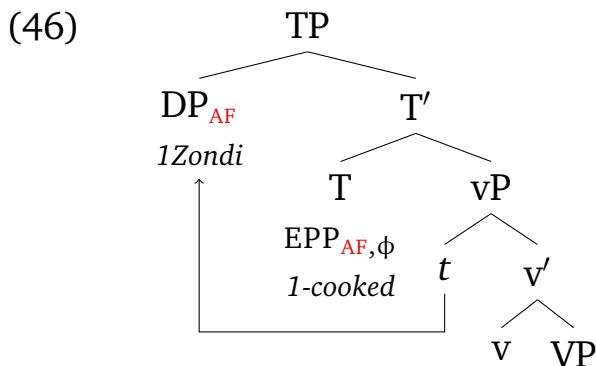


Intermediate landing site 2: matrix vP

- (44) a. **Ku**/***ba**-jayele **abafana**_i [_{CP} ukuthi t_i **ba**-pende t_i indlu.]
 15/*2-usually 2boys COMP 2-paint.SBJV 9house
 ‘Usually, the boys paint the house.’
- b. **Ku**/***i**-jayele **indlu**_i [_{CP} ukuthi t_i **i**-pendwe t_i ng-abafana.]
 15/*9-usually 9house COMP 9-paint.PSV.SBJV by-2boys
 ‘Usually, the boys paint the house.’



Recall monoclausal constructions:



The subject in (45)

- has the **AF** feature
 - is visible to matrix T
- should be attracted by matrix T

Whatever feature T is looking for, the subject in (45) has it.

➡ **The optionality of movement to Spec,TP cannot derive from probing an optional feature of the subject DP.**

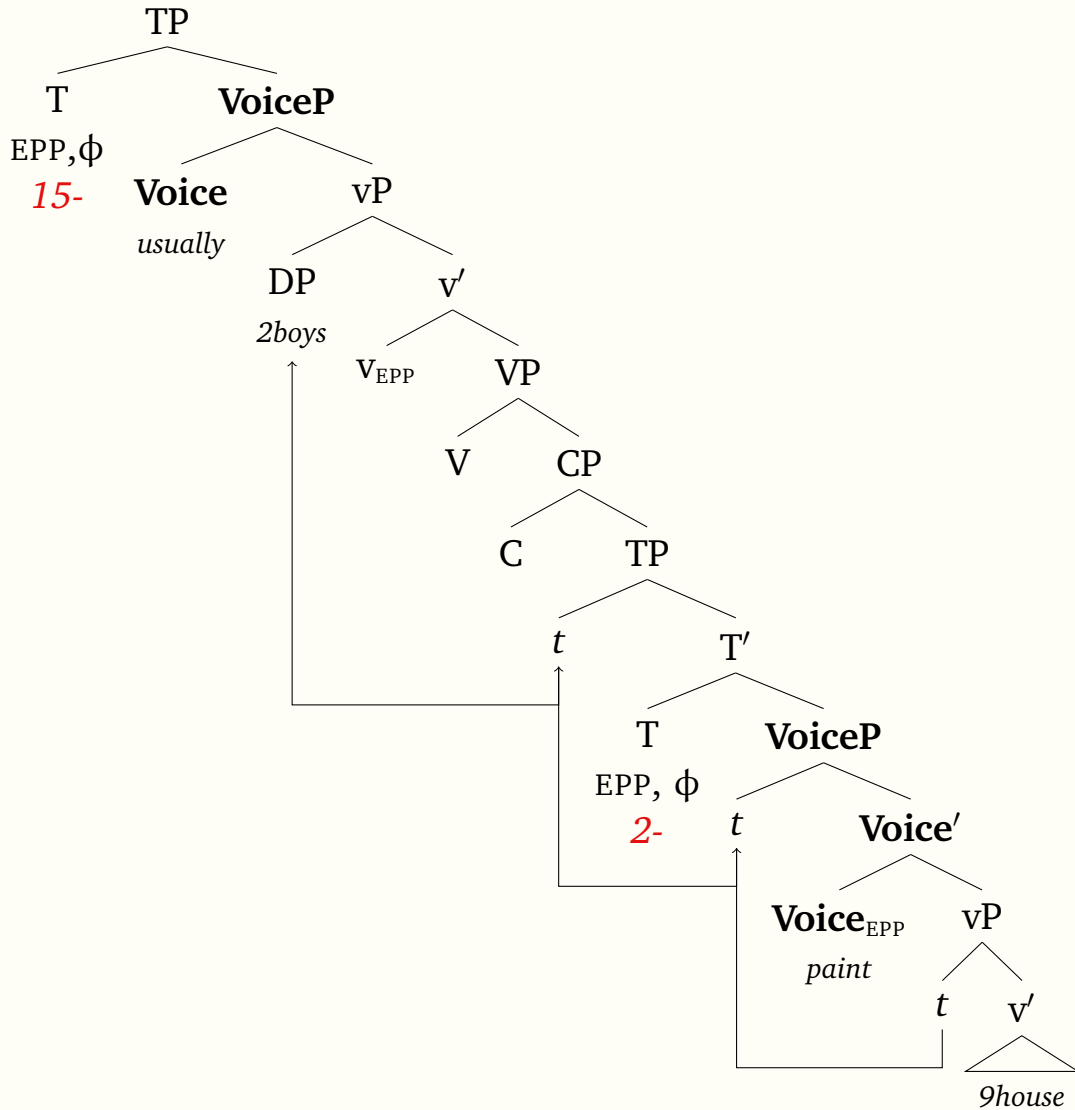
Toward an analysis of hyperraising to vP:

- T always has EPP (§4.1)
 - The DP raised to matrix vP matches the probe in matrix T (§4.3)
- ➡ The matrix T and the DP raised to matrix vP are separated by a phasal boundary.

The phasal VoiceP account allows a derived Spec,vP position:

Movement from matrix vP to matrix TP depends on whether matrix Voice has EPP.

(47)



5 Summary and implications for successive cyclicity

Existing accounts of subject movement optionality make incorrect predictions

- T always has EPP (21), (22), (30).
- An expletive *pro* is not always an option (37), (34).
- A-movement is not relativized to an optional feature of DPs (44).

The optionality of movement to Spec,TP derives from the optionality of successive cyclic movement through the edge of the clause-internal phase.

5.1 Implementing the optionality of successive cyclic movement

- Feature-free movement approach
(i.a. Takahashi 1994, Bošković 2002, 2007; Heck & Müller 2003; Chomsky 2013)
 - no featural trigger for successive cyclic movement
 - movement is free to not apply → optionality of movement
- Feature-triggered movement
(i.a. Chomsky 1995, 2000; McCloskey 2002; Abels 2012; Georgi 2014; van Urk 2015)
 - successive cyclic movement is triggered by a feature on the phase head
 - optional absence of movement feature → optionality of movement

PREDICTION OF THE FEATURE-FREE APPROACH

Since successive cyclic movement is free to apply in (48),

(48) Probe_F ... [*Phase* ... Goal_F]

it should always be possible in this configuration.

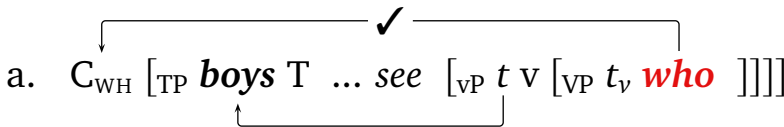
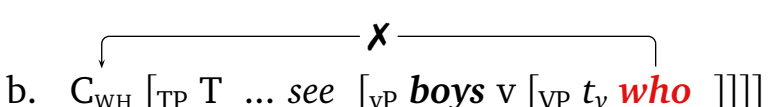
→ *incorrect*

Like A-movement, A-bar movement is optional:

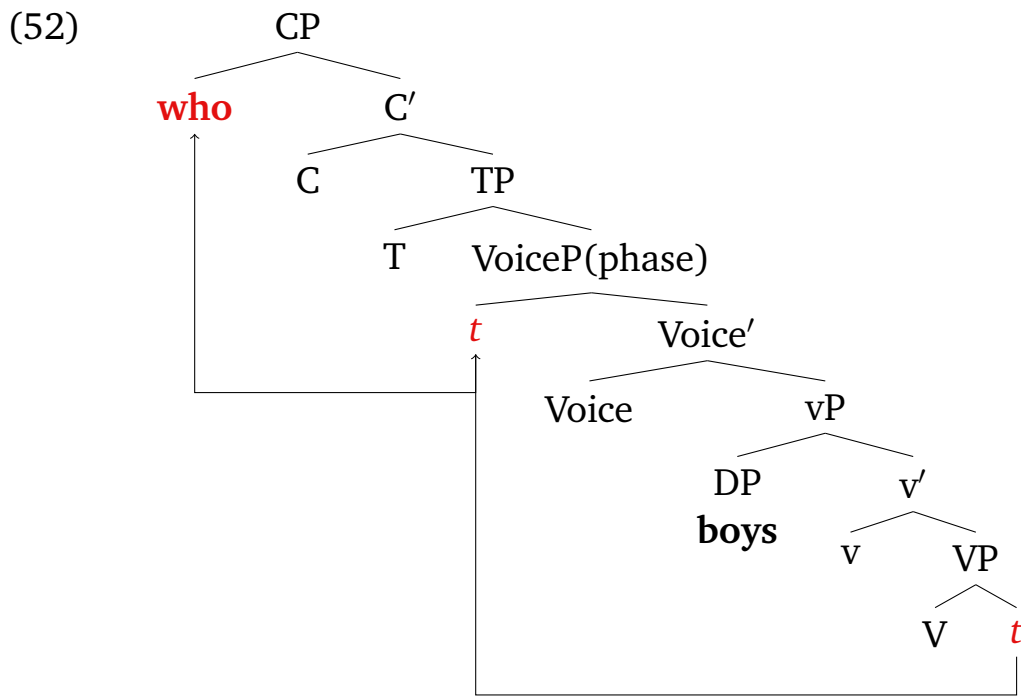
- (49) a. **Abafana**_j ba-bona [_{VP} t_j **ubani**]?
 2boys 2-see 1who
 ‘Who do the boys see?’
- b. **Ng-ubani**_i [_{TP} **abafana**_j a-ba-m-bonayo [_{VP} t_j t_i]]?
 COP-1who 2boys REL-2-1o-see
 ‘Who do the boys see?’

But when the subject stays in situ, A-bar movement of the object is impossible:

- (50) ***Ng-ubani**_i o-ku-(m)-bona [_{VP} **abafana** t_i]?
 COP-1who REL-15-(1o)-cook 2boys
 ‘Who do the boys see?’

- (51) a.  C_{WH} [_{TP} **boys** T ... see [_{VP} t V [_{VP} t_v **who**]]]
- b.  C_{WH} [_{TP} T ... see [_{VP} **boys** v [_{VP} t_v **who**]]]

The feature-free approach incorrectly predicts (50) to be grammatical:



The only scenario where the object can't move to Spec, VoiceP is when the subject doesn't move either, i.e. **when Voice lacks EPP**.

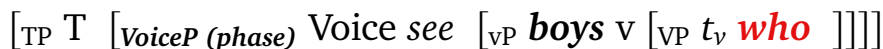
A FEATURE-BASED ANALYSIS

All movement through VoiceP is licensed by a single feature/property of Voice

(53) Voice has EPP and both DPs use the edge (49-b)



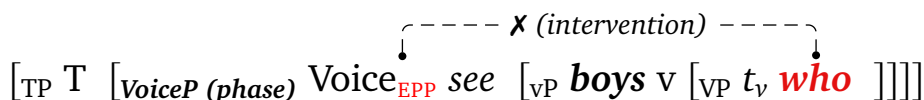
(54) Voice has no EPP → neither DP can move (echo question)



(55) Voice has EPP but only the subject uses the edge (49-a)



(56) Impossible: The EPP on Voice skips the subject (50)



5.2 Non-*wh* intervention in *wh*-movement

A-movement intervention:

(57) ***This book_i** seems [TP **Abby** to have read **t_i**].

A non-*wh* phrase does not intervene in *wh*-movement:

(58) **Which book_i** did **Abby** read **t_i**.

Intervention depends on the features the probe is relativized to:

- A-movement is triggered by EPP_{ϕ}
- A-bar movement is triggered EPP_{wh}

Voice has a generalized EPP feature

- Movement to Spec,VoiceP is neither A nor A'-movement → it feeds both
- *Wh* and non-*wh* DPs are equally matching goals

Movement to VoiceP is *not* relativized to *wh* → the subject is an intervener:

(59) ***Ng-ubani_i** o-ku-(m)-bona [VoiceP **t_i** [vP **abafana t_i**]]?
 COP-1who REL-15-(1o)-cook 2boys
 'Who do the boys see?'

Movement to CP is relativized to *wh* → no intervention by the subject:

(60) **Ng-ubani_i** [TP **abafana_j** a-ba-m-bonayo [VoiceP **t_j t_i** [vP **t_j t_i**]]?
 COP-1who 2boys REL-2-1o-see
 'Who do the boys see?'

(61) *Proposed properties of phase heads in Ndebele*

- Indicative C has EPP_{wh}
→ Allows only A'-movement to pass through
- Subjunctive C can have either EPP_{wh} or EPP
→ Allows either both A- and A'-movement or A'-movement only
- Voice has EPP
→ No distinction between movement types

What regulates the distribution of different types of EPP features?

- A lg in which Voice/v always has EPP_{wh} would only have A'-movement
- A lg in which C always has EPP_{ϕ} would allow hyperraising but not LD wh-movement

General tendency: If A-movement can cross XP, so can A'-movement.

(62) *Movement relativization hypothesis*

Movement to HP can be relativized only to features probed by H via Agree.

By assumption:

- i. uWh probes are a property of the left periphery
- ii. $u\phi$ probes are a property of the TAM domain
- iii. No such probes for the Theta domain

Consequences for phase-transparency:

- C can have either EPP_{wh} or EPP
- VoiceP/vP can only have EPP
 - ➔ VoiceP/vP can be crossed by a larger set of XPs than CP
 - ➔ In effect, VoiceP is more permeable than CP.

5.3 Conclusion

Criticism of the clause internal phase hypothesis based on asymmetries with CP:

- i. **Movement through Spec,XP doesn't mean XP a phase.**
 - ➔ Intermediate movement is not the only type of evidence for phasal vP/VoiceP. Operational opacity is likewise observed.
- ii. **CPs are opaque to syntactic operations in a way that vPs are not.**
 - ➔ C is lexically specified to look for a narrower set goals.
The question of why CP is less permeable reduces to the question why Q-features are a property of the left-peripheral heads.

References

- Abels, K. (2012). *Phases: An essay on cyclicity in syntax*. Number 543 in *Linguistische Arbeiten*. Berlin: de Gruyter.
- Aldridge, E. (2008). Phase-based account of extraction in Indonesian. *Lingua*, 118(10), 1440–1469.
- Baker, M. (2008). *The Syntax of Agreement and Concord*. Cambridge University Press.
- Bennett, W. G., Akinlabi, A., & Connell, B. (2012). Two subject asymmetries in defaka focus constructions. In *Proceedings of the 29th West Coast Conference on Formal Linguistics (WCCFL 29)* (pp. 294–302). MA: Cascadilla Press.
- Bošković, Ž. (2002). A-movement and the EPP. *Syntax*, 5(3), 167–218.
- Bošković, Ž. (2007). On the locality and motivation of Move and Agree: An even more minimal theory. *Linguistic Inquiry*, 38(4), 589–644.
- Buell, L. (2007). Semantic and formal locatives: Implications for the bantu locative inversion typology. *SOAS Working Papers in Linguistics*, 15, 105–120.
- Buell, L. (2012). Class 17 as a non-locative noun class in zulu. *Journal of African Languages and Linguistics*, 33, 1–35.
- Buell, L. C. (2005). *Issues in Zulu Verbal Morphosyntax*. PhD thesis, University of California Los Angeles.
- Carstens, V. (2001). Multiple Agreement and Case Deletion: Against φ -incompleteness. *Syntax*, 4(3), 147–163.
- Carstens, V. & Kinyalolo, K. (1989). On IP structure: Tense, aspect, and agreement. *Ms., Cornell University*.
- Chomsky, N. (1995). *The Minimalist Program*. Current Studies in Linguistics. Cambridge, MA: MIT Press.
- Chomsky, N. (2000). Minimalist inquiries: The framework. In R. Martin, D. Michaels, & J. Uriagereka (Eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik* (pp. 89–155). Cambridge, MA: MIT Press.
- Chomsky, N. (2013). Problems of projection. *Lingua*, 130, 33–49.
- Georgi, D. (2014). *Opaque interactions of Merge and Agree: On the nature and order of elementary operations*. PhD thesis, University College London.
- Halpert, C. (2015). *Argument licensing and agreement*. Oxford: Oxford University Press.
- Heck, F. & Müller, G. (2003). Derivational optimization of wh-movement. *Linguistic Analysis*, 33, 97–148.
- Henry, A. (1995). *Belfast English and standard English: Dialect variation and parameter setting*. Oxford: Oxford University Press.
- Legate, J. A. (2003). Some interface properties of the phase. *Linguistic Inquiry*, 34(3), 506–516.
- McCloskey, J. (2002). Resumption, successive cyclicity, and the locality of operations.

- In S. D. Epstein & T. D. Seely (Eds.), *Derivation and explanation in the Minimalist Program* (pp. 184–226). Oxford: Blackwell Publishers.
- Pietraszko, A. (2017). *Inflectional Dependencies: A study of complex verbal expressions in Ndebele*. PhD thesis, The University of Chicago.
- Pietraszko, A. (2021). The coming apart of case and focus in Bantu. *Natural Language & Linguistic Theory*, 39, 579–599.
- Preminger, O. (2014). *Agreement and its failures*. Cambridge, MA: MIT Press.
- van Urk, C. (2015). *A uniform syntax for phrasal movement: A case study of Dinka Bor*. PhD thesis, MIT.
- Wurmbrand, S. (2021). The components of voice. Talk given at *Wiener Sprachgesellschaft* in June 2021.
- Zeller, J. (2008). The subject marker in Bantu as an antifocus marker. *Stellenbosch Papers in Linguistics*, 38, 221–254.
- Zeller, J. (2015). Argument prominence and agreement: Explaining an unexpected object asymmetry in zulu. *Lingua*, 156, 17–39.