The syntax and semantics of Voice restructuring

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1 In a nutshell

- A range of languages and constructions display (apparent) obligatory control dependencies, arguably without a syntactic argument such as PRO.
- Some additionally involve long object A-promotion [LOP]: promotion of an embedded argument to matrix subject (diagnosed by Case, agreement, language specific A-movement properties).
- Three core subcases:
  - Long passive/patient voice [**LP**] (1a): matrix (implicit) agent controls embedded understood agent + LOP.
  - Crossed control [**CC**] (1b): embedded (implicit) agent controls matrix understood agent + LOP.
  - Backward control [**BC**] (1c): embedded overt agent controls matrix understood agent.

(1) a. DP.NOM/SUBJECT AGENT V.MATRIX: PASS/PV [U.AGENT V.EMBEDDED ~~DP.OBJ~~] **[LP]**
    b. DP.NOM/SUBJECT U.AGENT V.MATRIX [AGENT V.EMBEDDED: PASS/PV ~~DP.OBJ~~] **[CC]**
    c. U.AGENT V.MATRIX [DP.AGENT V.EMBEDDED] **[BC]**

Main contributions

- Unified approach to **LP, CC, BC** in terms of Voice restructuring
  - Derives the shared semantic restrictions (i.e., obligatory argument sharing) and the morphosyntactic variation
  - Core syntactic concepts (feeding into morphology and semantics): bidirectional Agree (Baker 2008, Carstens 2016) and feature sharing (Pesetsky and Torrego 2007)
  - Feature-based typology of Voice
  - Extends to forward control [**FC**], at least in certain highly reduced complements

	Exhaustive control		Raising (set aside here)
	Down-VR	Up-VR	
Matrix subject	thematic	thematic	non-thematic
Argument sharing	yes	yes	N/A
LOP	LP	CC	embedded passive / unaccusative
No LOP	FC	BC	embedded external argument

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2 Phenomena

2.1 Main configurations

- **Long passive or patient voice (PV) [LP]**: German, Norwegian, Croatian, Czech, Serbian, Slovenian, European Portuguese, Italian, Spanish, Japanese, Acehnese, Takibakha Bunun, Kannada, ...

(2) *dass der Traktor und der Lastwagen zu reparieren versucht wurd-en*
that the tractor and the truck.NOM to repair tried AUX-PL
lit. 'that the tractor and the truck were tried to repair'
'that they tried to repair the tractor and the truck' [German LP; Wurmbrand 2001: 19]

(3) *'asa'-u =ku a 'iskán=di$_i$ [ma-baliv t$_i$].*
want-PV =1SG.OBL ABS fish=this$_i$ [AV-buy t$_i$]
'I want to buy this fish.' [Takibakha Bunun LP; Shih 2014: 19, (43b)]

- **Crossed control [CC]**: Indonesian, Madurese, Sundanese, Swedish

(4) *Dia di-coba di-bunuh (oleh) teman-nya.*
3SG PASS-try PASS-kill by friend-3POSS
'His friend(s) tried to kill him.' [Indonesian CC; Arka 2012: 29]

(5) *Anak$_i$ mau [kamu ø-peluk t$_i$].*
child$_i$ want [2.SG PV-hug t$_i$]
'You want to hug the child.' [Indonesian CC; Berger 2019: 62, (9)]

- **Backward control [BC]**: Ndebele, Tsez, Malagasy, Telugu, Omani Arabic, Romanian, Greek

(6) *Ku-zam-e [uku-pheka uZodwa].*
15-try-PST [INF-cook 1Zodwa]
'Zodwa tried to cook.' [Ndebele BC; Pietraszko 2021: (2)]

2.2 Commonalities and differences

- A control(-like) relation between a matrix and embedded agent, at least one of which is covert.
  - **LP**: matrix (implicit) agent controls embedded understood agent (7a).
  - **CC**: embedded (implicit) agent controls matrix understood agent (7b).
  - **BC**: embedded overt agent controls matrix understood agent (7b).
  - Extension to forward control [**FC**] (at least in certain highly reduced complements): matrix overt argument controls embedded understood agent (7a).

(7) a. CONTROLLER V.MATRIX [CONTROLLEE V.EMBEDDED] **[LP, FC]**
b. CONTROLLEE V.MATRIX [CONTROLLER V.EMBEDDED] **[CC, BC]**

- Long object promotion [LOP] in **LP** and **CC** (but not **BC**).

(8) a. DP.NOM CONTROLLER V.MATRIX [CONTROLLEE V.EMBEDDED ~~DP.OBJ~~] **[LP]**
b. DP.NOM CONTROLLEE V.MATRIX [CONTROLLER V.EMBEDDED ~~DP.OBJ~~] **[CC]**

- Matching or non-matching verb morphology in the part of the clause containing the controllee.

(9) a. AGENT V.MATRIX:PASS [AGENT V.EMBEDDED:PASS] [Matching **LP/CC**]
b. AGENT V.MATRIX:PASS [AGENT V.EMBEDDED] [Non-matching **LP**]
c. AGENT V.MATRIX [AGENT V.EMBEDDED:PASS] [Non-matching **CC**]

2.3 Main questions

- How does the argument sharing relation arise? Section 3.2
- How does LOP follow (in **LP** and **CC**)? Section 3.3
- How do the different morphosyntactic patterns (matching vs. non-matching) arise? Section 3.4

Prior work

- Long object promotion [LOP] in **LP** and **CC** has been treated as a clause union/restructuring phenomenon.
- **LP**: Among many others, Aissen and Perlmutter (1976, 1983), Wurmbrand (2001, 2014a), Keine and Bhatt (2016), Wurmbrand and Shimamura (2017).
- **CC**: Accounts differ in frameworks and details, but the common property is also that it involves restructuring and LOP, with some mechanism to unify the argument structures:
  - semantic argument sharing (Polinsky and Potsdam 2008)
  - (covert) incorporation (Sato and Kitada 2012)
  - reverse Voice restructuring (Berger 2019, following Wurmbrand and Shimamura 2017)
  - complex predicate formation (Kroeger and Frazier 2020).
- To derive LOP, often a bare VP embedded clause is assumed (e.g., Wurmbrand 2001, Polinsky and Potsdam 2008).
  - The embedded clause lacks the functional domain to license an external argument and structural case.
  - The embedded object becomes licensing dependent on the matrix predicate.

(10) V.PASS/PV *try*, *manage*, *want* [$_{VP}$ V DP.OBJ]

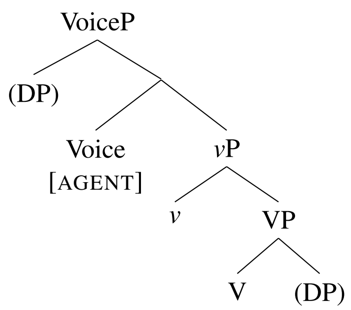
- Simple VP complementation approaches are insufficient.
  - The differences between matching and non-matching Voice are difficult to model.
  - **LP**, **CC**, and **BC** require different mechanisms.
  - The obligatory argument sharing interpretation is not straightforwardly derived.
  - Incompatibility of **LP** with unaccusative embedded predicates goes unexplained (see Wurmbrand et al. 2021).

3 A combined syntactic and semantic approach

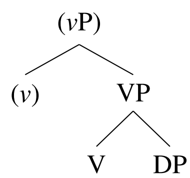
3.1 Voice: the basics

- Split Voice domain
  - The Voice domain is split into several functional heads: Voice, *v*, Caus, Applicative, possibly others.
  - See, among others, Bowers (2002), Pylkkänen (2002, 2008), Folli and Harley (2005), Alexiadou et al. (2006), Marantz (2008), Schäfer (2008), Harley (2009, 2017), Pitteroff and Alexiadou (2012), Pitteroff (2014).
  - Voice introduces an Agent in transitive/unergative/passive and is absent from unaccusative/anti-causative.

(11) Transitive, unergative, passive



Unaccusative, anti-causative



- Features on Voice:
  - Index [ID]: a numerical value that tracks event participants in the course of the derivation.
  - Morphological verbal feature [F]: determines PF spellout (PASS, PAST, etc.) of verbal elements (see, for instance, the uninterpretable T-feature in Pesetsky and Torrego 2007 or the uninterpretable V-feature in Wurmbrand 2014b); see Section 3.4.
  - Possibly others: e.g., phi-features (Legate 2014, Wurmbrand and Shimamura 2017, Kovač to appear, i.a.).

- Semantics of Voice:
  - Active Voice, Patient Voice: $[\![\text{Voice [ID=n]}]\!]^{g,c} = \lambda P.\lambda x : g(n) = x.\lambda e.[\text{P}(e) \wedge \text{Ag}(x)(e)]$
    * Voice combines with the lower verbal projection (vP or VP) of type <vt> via *Functional Application*.
    * ID is interpreted as a presupposition on the referent of the DP in Spec,VoiceP.
  - Passive Voice: $[\![\text{Voice [ID=n]}]\!]^{g,c} = \lambda P.\lambda e.[\text{P}(e) \wedge \text{Ag}(x_n)(e)]$
    * Voice combines with the lower verbal projection (vP or VP) of type <vt> via *Functional Application* .
    * Building on Pietraszko (2021), ID fills the Agent slot, no specifier necessary.
    * x_n is a semantic variable, which may be either free or bound (Chierchia 1995, Reuland 2011). If free, it receives its interpretation from the assignment function.

3.2 Voice restructuring and its interpretation

3.2.1 Syntax

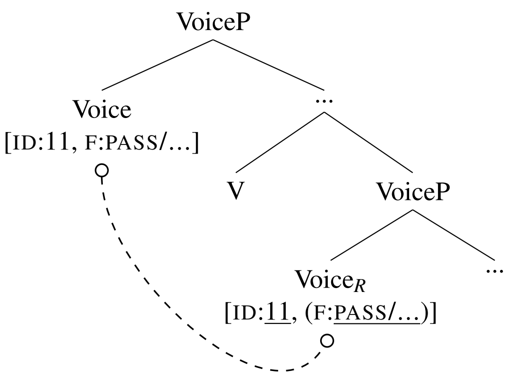
- Voice restructuring [**VR**] (based on Wurmbrand and Shimamura 2017)

  a. Regular Voice: [ID:7, F:PASS/PV/...] ⇝ (11)
  b. Restructuring Voice: [ID:__, (F:__)] ⇝ (13) — see Section 3.4

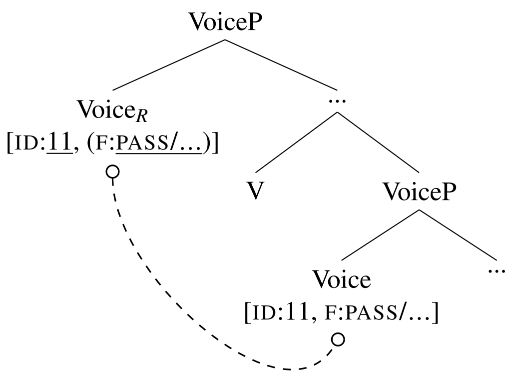
- Agree-based dependency between a restructuring Voice head [**Voice**$_R$] and a fully specified Voice head.[1]
  - Agree is bidirectional (Baker 2008, Carstens 2016).
  - Agree in either direction is constrained by locality (see Section 3.4).
  - Agree results in feature sharing (Pesetsky and Torrego 2007), and ultimately valuation of the features on **Voice**$_R$ (feature values transmitted via Agree chains are underlined).

(12) a. Voice: ID, F [$_{embedded}$ Voice$_R$: ___] down-**VR** (**LP**)
b. Voice$_R$: ___ [$_{embedded}$ (DP) Voice: ID, F] up-**VR** (**CC/BC**)

(13) a. Down-**VR** (**LP**)



b. Up-**VR** (**CC,BC**)



[1] See Appendix 5.2 for a dependency with Appl in constructions with *gelingen* ‘manage’ in German.

3.2.2 Semantics

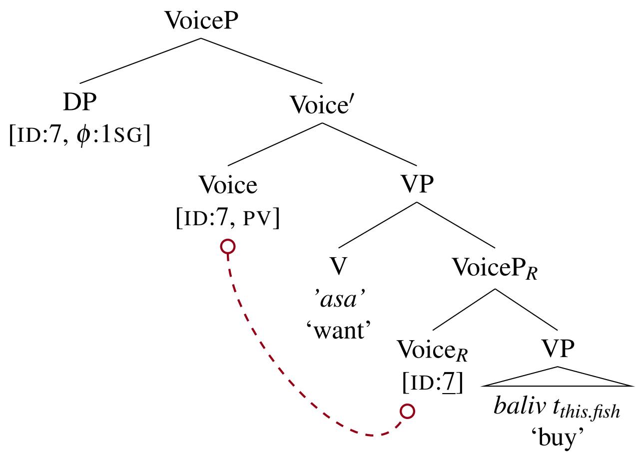
- Restructuring Voice: $[\![\text{Voice}_R\ [\text{ID=n}]]\!]^{g,c} = \lambda P.\lambda e.[\text{P}(e) \wedge \text{Ag}(x_n)(e)]$
  - Same denotation as Passive Voice: ID fills the Agent slot, no specifier argument necessary.
  - Agree ensures that the ID on **Voice**$_R$ is the same as the ID on the higher/lower fully specified Voice and, hence, that the matrix and embedded Agents are the same.
- Down-**VR** (**LP**) and up-**VR** (**CC/BC**) have essentially the same semantics: the only difference is the source of the ID feature in the syntax (matrix vs. embedded Voice).
- Note: we ignore the F-feature on Voice (and V) here; see Section 3.4.

*Down-**VR** derivation*

- **LP**: **Voice**$_R$ in the embedded clause, ID originates upstairs.

(14) *'asa'-u =ku a 'iskán=di$_i$* [*ma-baliv t$_i$*].
want-[PV] =1SG.OBL ABS fish=this$_i$ [AV-buy t$_i$]
'I want to buy this fish.' [Takibakha Bunun LP; Shih 2014: 19, (43b)]

(15)



(16) Terminal nodes
$[\![\text{1SG}]\!]^{g,c}$ = speaker in c (as in Kratzer 2009: 220, (70a))
$[\![\textit{'asa'}]\!] = \lambda P_{vt}.\lambda e.[\text{want}(P)(e)]$
$[\![\text{Voice}_R\ [\text{ID=n}]]\!]^{g,c} = \lambda P.\lambda e.[\text{P}(e) \wedge \text{Ag}(x_n)(e)]$
$[\![\text{Voice}_{PV}\,[\text{ID=n}]]\!]^{g,c} = \lambda P.\lambda x : g(n) = x.\lambda e.[\text{P}(e) \wedge \text{Ag}(x)(e)]$

(17) Node by node (bottom-up)
$[\![\text{VoiceP}_{emb}]\!]^{g,c} = \lambda e.[\text{buy}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x_7)(e)]$ Functional Application
$[\![\text{VP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{want}(\lambda e.[\text{buy}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x_7)(e)])(e')]$ Functional Application
$[\![\text{Voice}'_{matrix}]\!]^{g,c} = \lambda y : g(7) = y.\lambda e'.[\text{want}(\lambda e.[\text{buy}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x_7)(e)])(e') \wedge \text{Ag}(y)(e')]$ Func. Appl.
$[\![\text{VoiceP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{want}(\lambda e.[\text{buy}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x_7)(e)])(e') \wedge \text{Ag}([\text{1SG}])(e')]$ Func. Appl.

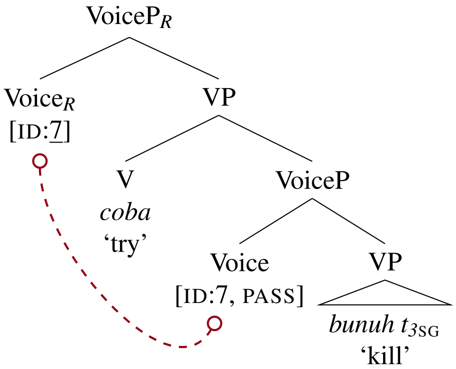
- Note that g(7) = speaker in c (ensured by the presupposition on matrix Voice).

*Up-**VR** derivation*

- **CC**: **Voice**$_R$ in the matrix clause, ID originates downstairs.

(18) *Dia di-coba di-bunuh (oleh teman-nya).*
3SG [PASS]-try [PASS]-kill by friend-3POSS
'His friend(s) tried to kill him.' [Indonesian CC; Arka 2012: 29]

(19)



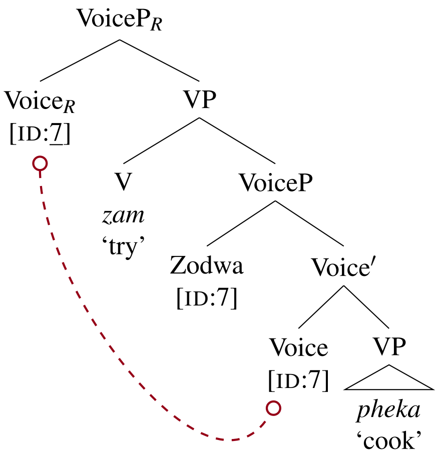
(20) Terminal nodes
$[\![7]\!]^{g,c}$ = g(7)
$[\![coba]\!] = \lambda P_{vt}.\lambda e.[\text{try}(P)(e)]$
$[\![\text{Voice}_R\ [\text{ID=n}]]\!]^{g,c} = \lambda P.\lambda e.[\text{P}(e) \wedge \text{Ag}(x_n)(e)]$
$[\![\text{Voice}_{PASS}\ [\text{ID=n}]]\!]^{g,c} = \lambda P.\lambda e.[\text{P}(e) \wedge \text{Ag}(x_n)(e)]$

(21) Node by node (bottom-up)
$[\![\text{VoiceP}_{emb}]\!]^{g,c} = \lambda e.[\text{kill}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x_7)(e)]$ Functional Application
$[\![\text{VP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{try}(\lambda e.[\text{kill}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x_7)(e)])(e')]$ Functional Application
$[\![\text{VoiceP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{try}(\lambda e.[\text{kill}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x_7)(e)])(e') \wedge \text{Ag}(y_7)(e')]$ Functional Application

- If left unspecified, g(7) refers to *someone*.
- **BC**: **Voice$_R$** in the matrix clause, ID originates downstairs.

(22) *Ku-zam-e* [*uku-pheka uZodwa*].
15-try-PST [INF-cook 1Zodwa]
'Zodwa tried to cook.' [Ndebele BC; Pietraszko 2021: (2)]

(23)



(24) Terminal nodes
$[\![7]\!]^{g,c}$ = g(7)
$[\![zam]\!] = \lambda P_{vt}.\lambda e.[\text{try}(P)(e)]$
$[\![\text{Voice}_R\ [\text{ID=n}]]\!]^{g,c} = \lambda P.\lambda e.[\text{P}(e) \wedge \text{Ag}(x_n)(e)]$
$[\![\text{Voice}_{Act}[\text{ID=n}]]\!]^{g,c} = \lambda P.\lambda x : g(n) = x.\lambda e.[\text{P}(e) \wedge \text{Ag}(x)(e)]$

(25) Node by node (bottom-up)
$[\![\text{Voice'}_{emb}]\!]^{g,c} = \lambda x : g(7) = x.\lambda e.[\text{cook}(e) \wedge \text{Ag}(x)(e)]$ Functional Application
$[\![\text{VoiceP}_{emb}]\!]^{g,c} = \lambda e.[\text{cook}(e) \wedge \text{Ag}(\text{Zodwa}_7)(e)]$ Functional Application

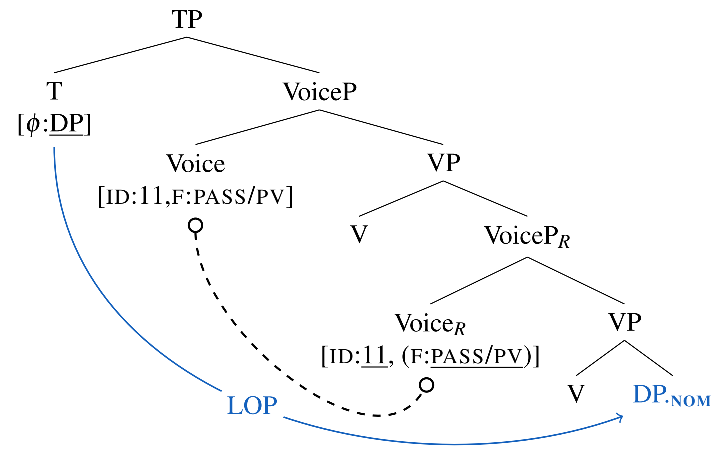
$[\![\text{VP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{try}(\lambda e.[\text{cook}(e) \wedge \text{Ag}(\text{Zodwa}_7)(e)])(e')]$ Functional Application
$[\![\text{VoiceP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{try}(\lambda e.[\text{cook}(e) \wedge \text{Ag}(\text{Zodwa}_7)(e)])(e') \wedge \text{Ag}(x_7)(e')]$ Functional Application

- Semantic binding (via λ-operator) is absent from in both up-**VR** and down-**VR**. Co-construal is enforced entirely in the syntax by ID sharing via Agree.[2]
- No Condition C violation is predicted in the absence of a semantic binder.

3.3 Long object promotion

- Follows naturally from Voice restructuring.
  - The lack of a specifier (such as PRO) in VoiceP$_R$ goes hand in hand with the lack of object case in the complement (Burzio's Generalization) and the resulting promotion of the object to matrix subject.
  - LOP in Austronesian PV configurations may be compatible with a Voice specifier, exactly like in simple PV contexts in these languages.

(26)



3.4 Morphosyntax of Voice restructuring

- **LP**: the underspecified embedded predicate either matches the Voice feature of the matrix predicate or is realized as morphological default.

(27) Default vs. matching **LP** (PASS)

a. *dass der Traktor und der Lastwagen zu reparieren versucht wurd-en*
that the tractor and the truck.NOM to repair tried AUX-PL
lit. 'that the tractor and the truck were tried to repair'
'that they tried to repair the tractor and the truck' [German LP; Wurmbrand 2001: 19]

b. ?*1950-nen-goro hambaagaa-ga nihon-de tabe-rare-hajime-rare-ta*
1950-year-about hamburger-NOM Japan-in eat-[PASS]-begin-[PASS]-PST
'They began to eat hamburgers around 1950 in Japan.'
[Japanese LP; Wurmbrand and Shimamura 2017: 203, fn. 20]]

(28) Default vs. matching **LP** (PV)

a. *'asa'-u =ku a 'iskán=di$_i$* [*ma-baliv t$_i$*].
want-[PV] =1SG.OBL ABS fish=this$_i$ [AV-buy t$_i$]
'I want to buy this fish.' [Takibakha Bunun LP; Shih 2014: 19, (43b)]

b. *Iliskin-un-ku bunbun-a tu baliv-un.*
want-[PV]-1.SG.ACC banana-that.NOM TU buy-[PV]
Lit. 'The bananas are wanted to be bought by me.'
'I wanted to buy the bananas.' [Isbukun Bunun LP; Wu 2013: 40, (10b)]

[2] See Appendix 5.3 for an alternative with semantic binding.

- **CC/BC**: the underspecified matrix predicate either matches the Voice feature of the embedded predicate (**CC**, possibly **BC**) or realizes no Voice but only the verbal inflection of the matrix TMA domain (**CC/BC**).

(29) Matching **CC** (PASS & PV)

a. *Pära tafan-ma-chägi ma-na'fanätuk ni lalahi siha.*
FUT 1PL.IR.IN-PASS-try NPL.RL.IN.PASS-hide OBL men PL
'The men will try to hide all of us.' [Chamorro CC; Chung 2004: 204, (6a)]

b. *Kaca rèya è-cacak è-pa-pessa bi' bu Yus ng-angghuy bâto.*
glass this PV-try PV-CS-break by bu Yus AV-use rock
'Bu Yus tried to break the glass with a rock.' [Madurese CC; Davies 2014: 371, (6b)]

(30) Non-matching **BC** & **CC** with regular matrix TMA morphology

a. *Ku-zam-e [uku-pheka uZodwa].*
15-try-PST [INF-cook 1Zodwa]
'Zodwa tried to cook.' [Ndebele BC; Pietraszko 2021: (2)]

b. *Nu ska lasten försöka bärgas.*
now shall cargo.DEF try salvage.INF.PASS
'There will now be an attempt to salvage the cargo.' [Swedish CC; Engdahl 2022: (72)]

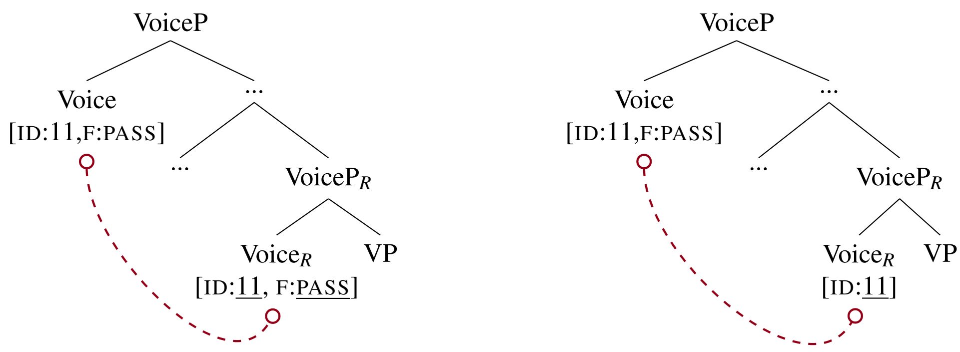
- Note: true default forms (e.g., AV) do not seem to exist in **CC**, but in some **CC** contexts in Indonesian, certain matrix verbs occur without any marking (31). Paul et al. (2021) suggest that these bare forms are not default morphology but lexically restricted forms.

(31) *Anak$_i$ mau [kamu ø-peluk t$_i$].*
child$_i$ want [2.SG PV-hug t$_i$]
'You want to hug the child.' [Indonesian CC; Berger 2019: 62, (9)]

The proposal: main ingredients

- Ingredient #1: difference in feature inventory of Voice
  - Matching languages: **Voice**$_R$ [ID:__, F:__] ⇝ (32a)
  - Non-matching languages: **Voice**$_R$ [ID:__] ⇝ (32b)

(32) a. Matching b. Non-matching

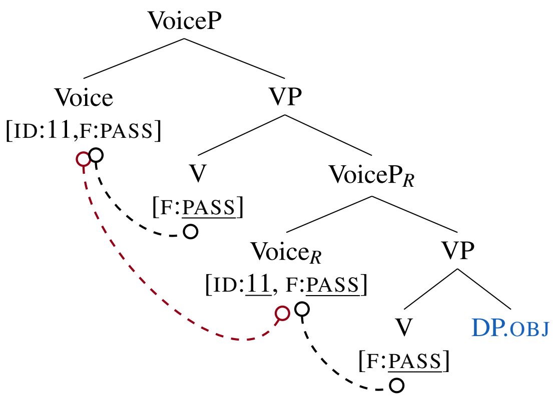


- Ingredient #2: verbal [F:__] feature on V
- Ingredient #3: properties of Agree (selection)
  - Bidirectional (Baker 2008, Carstens 2016)
  - Agree with the closest matching feature (Chomsky 1995), whether valued or not (Pesetsky and Torrego 2007).
  - Agree can fail (Preminger 2009, 2014): probes are not "derivational time-bombs".

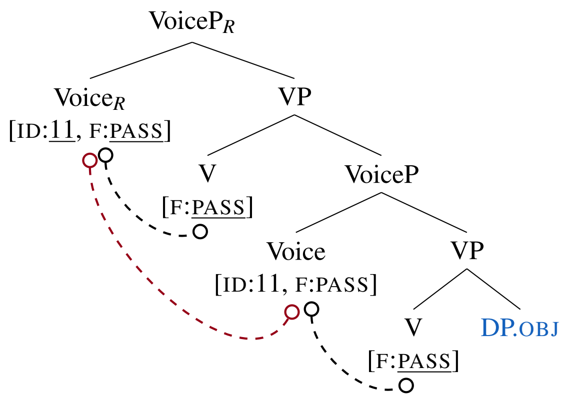
Deriving matching and non-matching

- Matching **LP** (33a):
  - [F:__] on embedded V Agrees with (unvalued) [F:__] on Voice$_R$.
  - Voice$_R$ Agrees with matrix Voice, which also Agrees with the matrix V.
  - Once the value for matrix Voice comes in, it is automatically shared with all heads in these Agree dependencies (Pesetsky and Torrego 2007).
- Matching **CC** (33b):
  - [F:__] on matrix V Agrees with (unvalued) [F:__] on Voice$_R$, and the value gets copied from downstairs Voice after Voice$_R$ has Agreed with it.

(33) a. Matching **LP** (down-**VR**):

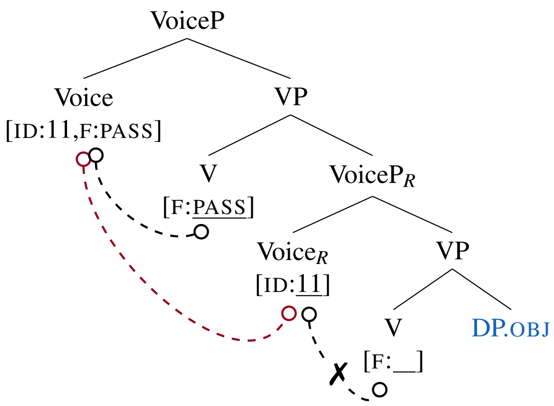


b. Matching **CC** (up-**VR**):

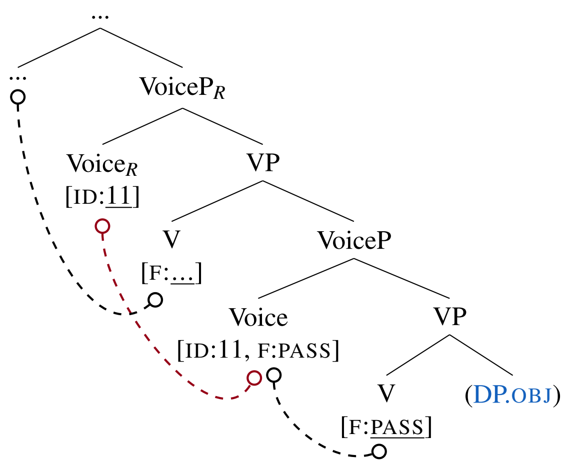


- Non-matching **LP** (34a):
  - [F:__] on embedded V fails to find a goal in its search domain and is spelled out as default.
- Non-matching **BC/CC** (34b):
  - There is no [F] feature on matrix Voice, but [F:__] on matrix V Agrees with the next closest [F] it finds and is spelled out with corresponding TMA morphology (see below on locality).

(34) a. Non-matching **LP** (down-**VR**):



b. Non-matching **CC/BC** (up-**VR**):



- The Agree search domain—insights about locality:
  - Probes on Voice can look up/down until the next Voice head (cf. Keine 2020's *horizons*).

  - Probes on V are more restricted: they are bound to their own extended projection (which can extend beyond VoiceP, but not beyond a new lexical V).
    * In matching **LP/CC**, V finds an [F] feature within its extended projection (on Voice_R) ⇝ matching.
    * In non-matching **LP**, embedded V finds no [F] feature within its extended projection (VoiceP_R) ⇝ default.
    * In non-matching **CC/BC**, matrix V finds an [F] feature within its extended projection ⇝ TMA morphology.
  - There can be no morphological default in **CC/BC** (up-**VR**) because matrix clauses are never truncated.

- Austronesian bare forms: matching in the syntax (33b), but certain verbs cannot spell out Voice (or other) morphology (Paul et al. 2021).
  - Support: true default forms (e.g., AV) do not seem to exist in **CC** and matching is possible with some verbs in the same languages (Paul et al. 2021).
  - This follows from our system: default arises when there is no [F:__] on Voice and none within the extended projection of the verb.
  - This is only possible in truncated restructuring complements—matrix clauses always have (at least some) expended projections above VoiceP.

- The Norwegian **LP** puzzle: on the surface, both default and matching morphology in the embedded clause are possible (but matching is more common; see Lødrup 2014) ⇝ several analytical options.

(35) *Slike ting forsøkes ofte å gjøre(-s).*
such things try.PRES.PASS often to do.INF(-PASS)
'One often tries to do such things.' [Lødrup 2014: 371, (12),(13)]

Morphosyntax of Voice restructuring: summary

Syntax:	Voice_R: [ID:__]	Voice_R: [ID:__, F:__]
LP	Morphology: default	Morphology: matching
Passive	German (27a), Japanese, Kannada, Spanish, Croatian, European Portuguese, Italian, ...	Japanese (27b), Norwegian?
PV	Takibakha Bunun (28a), Matu'uwal Atayal, Acehnese	Isbukun Bunun? (28b), Saisiyat, Tsou
CC/BC	Morphology: matrix TMA	Morphology: matching
CC passive	Swedish (30b)	Chamorro (29a), Indonesian
CC PV	?	Indonesian (31), Madurese (29b), Sundanese
BC	Ndebele (39), Greek, Tsez...	

4 Conclusions & Extensions

Main contributions

- Argument sharing via Voice restructuring and ID-sharing ⇝ control-like interpretations do not require PRO.
- Inventory of Voice features—towards a typology of Voice (see below for *let*-passive):

	Active, passive	PV, PASS, (AV)	Voice_R default	Voice_R matching	*let*-passive	?
ID	7	7	__	__	7	__
F	__	PASS/PV	Ø	__	Ø	PASS/PV

- Bidirectional Agree for Voice sharing and verbal morphology
- Domain for verbal morphology: extended projection of V

Extensions

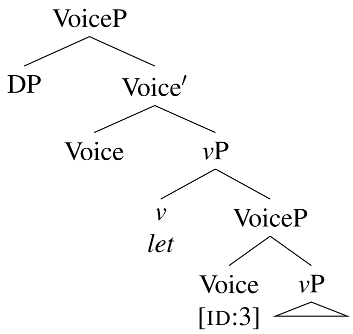
- Extension to forward control, at least with certain highly reduced restructuring complements

- Extension to causative (*let*) passive
  - The embedded infinitive is syntactically passive (Pitteroff 2014, Den Dikken 2020).
  - LOP possible for some speakers of Dutch (Coopmans 1985).
  - No argument sharing (causatives are not control verbs): two *by*-phrases in *let*-LOP.

(36) *Er ließ die Fensterscheibe putzen.*
he let the window.glass clean
'He let/made someone clean the window.' [German *let*-passive; Pitteroff 2014: 223, (4a)]

(37) *De ramen zijn door mijn ouders door een nieuw bedrijf laten schoonmaken.*
the windows are by my parents by a new company let clean
'My parents had a new company clean the windows.' [Dutch *let*-LOP; G. Schoenmakers, p.c.]

(38)



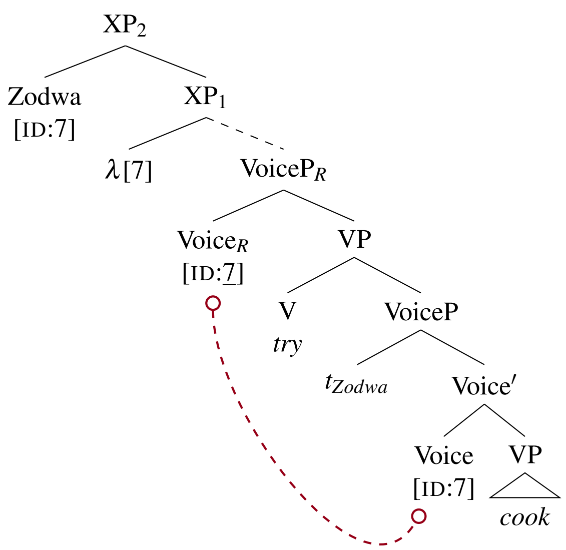
5 Appendices

5.1 Backward control with quantificational controllers

- Controllers of type ⟨⟨e,t⟩,t⟩: quantificational DPs/generalized quantifiers (see, e.g., Pietraszko 2021: (15)), also applicable to proper names if treated as GQs.

(39) *Ku-zam-e [uku-pheka uZodwa].*
15-try-PST [INF-cook 1Zodwa]
'Zodwa tried to cook.' [Ndebele BC; Pietraszko 2021: (2)]

(40)



(41) Node-by-node (bottom up)

$[\![\text{Voice}'_{emb}]\!]^{g,c} = \lambda x: g(7) = x.\lambda e.[\text{cook}(e) \wedge \text{Ag}(x)(e)]$ Functional Application

$[\![\text{VoiceP}_{emb}]\!]^{g,c} = \lambda e.[\text{cook}(e) \wedge Ag(t_7)(e)]$ Functional Application

$[\![\text{VP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{try}(\lambda e.[\text{cook}(e) \wedge Ag(t_7)(e)](e')]$ Functional Application

$[\![\text{VoiceP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{try}(\lambda e.[\text{cook}(e) \wedge Ag(t_7)(e)](e') \wedge Ag(y_7)(e')]$ Functional Application

$[\![\text{XP}_1]\!]^{g,c} = \lambda x.\exists e'.[\text{try}(\lambda e.[\text{cook}(e) \wedge Ag(x)(e)](e') \wedge Ag(x)(e')]$ Lambda Abstraction

$[\![\text{XP}_2]\!]^{g,c} = \exists e'.[\text{try}(\lambda e.[\text{cook}(e) \wedge Ag(\text{Zodwa})(e)](e') \wedge Ag(\text{Zodwa})(e')]$ Functional Application

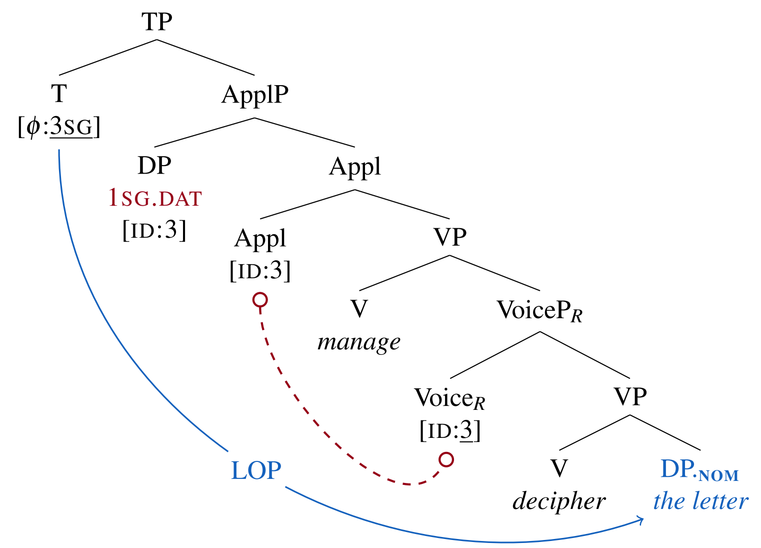
- We assume closure over event variable applies below the landing site of QR.
- No crossover effects: possibly because the QP does not cross overt coindexed elements (cf. Safir 1984).

5.2 Voice restructuring with unaccusatives

- German *gelingen* 'manage': the matrix dative argument is interpreted as the embedded agent.
- Proposal: embedded Voice_R gets its value from matrix Appl, which bears the same ID as the dative argument.

(42) *weil mir der Brief$_i$ auf Anhieb t_i zu entziffern gelungen ist*
since I.DAT the.NOM letter straightaway to decipher managed is
'since I managed straightaway to decipher the letter' [Wurmbrand 2001: (13a)]

(43)



5.3 Semantic binding: an alternative

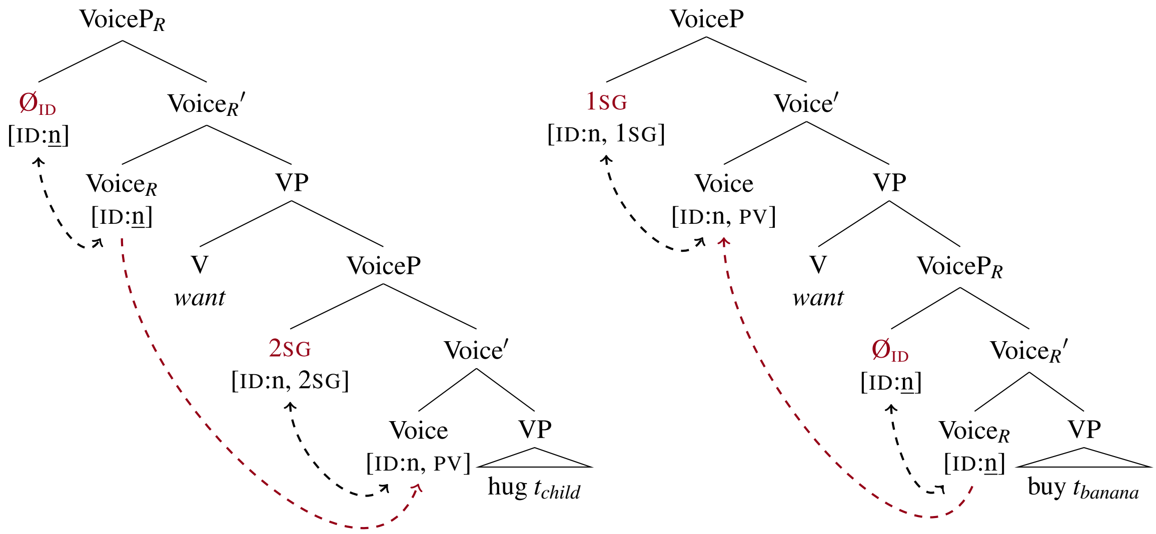
- Alternative with minimal pronoun in specifier + semantic binding
  - All Voice heads (including Passive Voice and Voice_R) project a specifier.
  - The specifier of $\text{Voice}_{PASS/R}$ is filled by minimal pronoun in the sense of Kratzer (2009) comprising only an ID feature.
  - Spec-head agreement ensures that ID (and phi-features) are shared between Voice and its specifier, while Agree under **VR** ensures that these features are shared across Voice heads.
  - Building on Kratzer (2009), ID on Voice with value n is parsed as a λ-operator whenever another occurrence of n occurs in its scope.
    - ∗ [Voice:n [VP]] is parsed as [Voice [[λn] [VP]]]
    - ∗ In both up- and down-VR, after feature valuation, the λ-operator is inserted at matrix Voice and binds the embedded subject, resulting in semantic argument sharing.

(44) a. $DP_{n,\phi}$ Voice: n, PASS/PV, ϕ $\lambda[n]$ $[_{emb}\ \varnothing_n$ $Voice_R$: n, PASS/PV, ϕ] down-VR

b. $\varnothing_{n,\phi}$ $Voice_R$: n, PASS/PV, ϕ $\lambda[n]$ $[_{emb}\ (DP)_n$ Voice: n, PASS/PV, ϕ] up-VR

(45) *Anak$_i$ mau [kamu ϕ-peluk t$_i$].*
child$_i$ want [2.SG PV-hug t$_i$]
'You want to hug the child.'
[Indonesian CC; Berger 2019: 62, (9)]

(46) *Iliskin-un-ku bunbun-a tu baliv-un.*
want-PV-1.SG.ACC banana-that.NOM TU buy-PV
'I wanted to buy the bananas.'
[Isbukun Bunun LP; Wu 2013: 40, (10b)]



(47) $[\![\text{VoiceP}_{emb}]\!]^{g,c} = \lambda e.[\text{V}(t_{\text{OBJ}})(e) \wedge \text{Ag}([n])(e)]$
$[\![\textit{iliskin/mau}]\!]^{g,c} = \lambda P_{vt}.\lambda e.[\text{want}(P)(e)]$
$[\![\text{VP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{want}(\lambda e.[\text{V}(t_{\text{OBJ}})(e) \wedge \text{Ag}([n])(e)])(e')]$
$[\![\lambda[n][\text{VP}_{matrix}]]\!]^{g,c} = \lambda x.\lambda e'.[\text{want}(\lambda e.[\text{V}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x)(e)])(e')]$
$[\![\text{Voice}\ \lambda[n]\ [\text{VP}_{matrix}]]\!]^{g,c} = \lambda x.\lambda e'.[\text{want}(\lambda e.[\text{V}(t_{\text{OBJ}})(e) \wedge \text{Ag}(x)(e)])(e') \wedge \text{Ag}(x)(e')]$
$[\![\text{VoiceP}_{matrix}]\!]^{g,c} = \lambda e'.[\text{want}(\lambda e.[\text{V}(t_{\text{OBJ}})(e) \wedge \text{Ag}([1\text{SG}/2\text{SG}])(e)])(e') \wedge \text{Ag}([1\text{SG}/2\text{SG}])(e')]$

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