

Verbal number is syntactic agreement

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Claim: verbal number is Agree with either a
 DP or an AdvP.

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1 Introduction

- **Verbal number** (Corbett 2000, pp. 243-264) is a grammatical category that quantifies the effects of an action, rather than enumerating entities (nominal number).
- It can refer either to participant number, to event number (similar to aspect: iteration, intensification, distributivity, pluractionality) or to both (see Mattiola (2017) for a recent systematization of its functions).
- Previous analyses: verbal number as *selection* (Durie 1986), *semantic co-occurrence* (Mithun 1988), *feature coincidence* (Tuite 1998) → the verb is born with a number feature.
- I aim at providing a morphosyntactic account of verbal number in Mupun, couched in Distributed Morphology and Minimalist Syntax.
- This is suggested by some examples of mismatches between the number on the verb and the number on the argument.
- Warning: these data come from a grammar and a dictionary of Mupun (Frajzyngier 1991, 1993). The presented analysis can explain the attested patterns and make some predictions to be tested (intervention of other constituents, argument structure of the verbs...).

2 Verbal number in Mupun

- Mupun is an Afro-Asiatic, West Chadic language from Nigeria (Frajzyngier 1993).
- The verb does not agree neither with object, nor with the subject and it does not inflect for tense or aspect.
- “The formation of plural stem is the only morphological change that may affect the verb stem” (Frajzyngier 1993, p. 54).
- Verbal number is a productive category and it can be expressed by different morphological devices (depending on the inflectional classes?):

- (1)
- infix *-a-*:
pī̄n 'crack' - *piā̄n* 'crack (many things)'
pūt 'go out' - *púát* '(many) go out'
 - infix *-r-*:
tēp 'break' - *trèp*, *tráp* 'break (many things)'
gáp 'cut a piece' - *gráp* 'cut pieces'
séet 'buy/sell' - *srép* 'buy/sell (many things)'
 - suffix *-é*:
tù 'kill' - *tùé* 'kill (many people)'
sù 'run away' - *sùé* '(many) run away'
 - suffix *-ep*:
mùut 'die' - *mùrép* '(many) die'

- pét* 'call' - *prép* 'call (many people)'
séet 'buy/sell' - *srép* 'buy/sell (many things)'
- e. suffix *-wat*:
siāη 'abort' - *siwánát* '(many) abort (many times)'
- f. infix or suffix *-k*:
yà 'catch' - *yak* 'catch (many things)'
lóom 'be lost' - *lihàm* '(many) be lost'
- g. suppletion:
dēn 'put' - *lé* 'put (many things)'
tá 'fall down' - *dóη* '(many) fall down'

Here are some examples of the pattern (Frajzyngier 1993, p. 59-62).

- Example (2) involves the suppletive root $\sqrt{\text{HIT}}$: *cīt* hit.SG \sim *nás* hit.PL.

- (2) a. *wu* ***nas*** *mo*
 3M.SG hit.PST.PL 3PL
 'He hit them.'
- b. **wu* ***cīt*** *mo*
 3M.SG hit.PST.SG 3PL
 '*He hit them.'
- c. *wu* ***cīt*** *wur*
 3M.SG hit.PST.SG 3M.SG
 'He hit him.'
- d. *wu* ***nas*** *wur*
 3M.SG hit.PST.PL 3M.SG
 'He hit him many times.'

- In example (3)-(4), verbal number is realized through the suffix *-e* and *-k*.

- (3) a. *n-tu* *joos*
 1.SG-kill.PST.SG rat.SG
 'I killed a rat.'
- b. *n-tu-e* *joos*
 1.SG-kill.PST-PL rat.SG
 'I killed rats.'
- (4) a. *mo ya* *joos*
 3.PL catch.PST.SG rat.SG
 'They caught a rat.'
- b. *mo ya-k* *joos mo*
 3.PL catch.PST.PL rat.SG PL
 'They caught a rat.'

- These examples show that verbal number is independent from the features of the subject.
- Moreover, the marker of plurality *mo* is optional and nouns may not inflect for number \rightarrow the ambiguity between the two functions of number number is increased.

- Unaccusative verbs exhibit verbal number differences, too.

- (5) a. *wu* ***taa*** *yil*
 3.M.SG fall.PST.SG down
 ‘He fell down.’
 b. *mo* ***doŋ*** *yil*
 3.PL fall.PST.PL down
 ‘They fell down.’

- Unergative verbs may show verbal number, too.

- (6) a. *wu* ***su*** *seet*
 3.M.SG run.PST.SG away
 ‘He run away.’
 b. *mo* ***su-e*** *seet*
 3.PL run.PST-PL away
 ‘They ran away.’

- I am assuming that the root $\sqrt{\text{RUN}}$ (and $\sqrt{\text{GO OUT}}$, $\sqrt{\text{ABORT...}}$) is unergative.
- I expect an example such as *wu su-e seet* to be grammatical with the pluriactional meaning “he ran away repeatedly/a lot”, as in (2).
- Example (7) shows that for some verbs, such as *to cut*, the plural form indicates a different type of action, pluralising the result rather than the participants. Moreover, (7-c) shows a plural verb without an overt argument and the preservation of verbal number in non finite clauses.

- (7) a. *wu* ***gap*** *pak lua lusim*
 3.M.SG cut.PST.SG some meat.SG leopard.SG
 ‘He cut a piece of leopard meat.’
 b. *wu* ***grap*** *pak lua lusim*
 3.M.SG cut.PST.PL some meat.SG leopard.SG
 ‘He cut leopard meat into pieces.’
 c. *da a* *sat mo* ***grap***
 go 2.M.SG tell 3.PL cut.PL
 ‘Go and tell them to cut it into pieces.’

- Here the habitual prefix *kə̀* requires the use of the plural form.

- (8) a. **wu* *kə̀-cit* *war*
 3.M.SG HABIT-beat.SG 3.F.SG
 ‘He beats her continuously.’
 b. *wu* *kə̀-nas* *war*
 3.M.SG HABIT-beat.PL 3.F.SG
 ‘He beats her continuously.’

- Empirical generalizations:
 - A plural feature on one argument (object of transitive verbs, subject of intransitive verbs) requires a plural feature on the verb (2-a,b) \rightarrow * V_{sg} DP_{pl}
 - A singular object can be merged with a plural verb too (2-d) \rightarrow V_{pl} DP_{sg}
 - Transitive verbs:

	DP _{obj} [sg]	DP _{obj} [pl]
V[sg]	✓	✗
V[pl]	✓	✓

- Intransitive verbs (same suffixes, cf. *-e* in (3) and (6)):

	DP _{subj} [sg]	DP _{subj} [pl]
V[sg]	✓	✗?
V[pl]	✓?	✓

- The external argument as a trigger for verbal number is unexpected for traditional accounts. Cf. (6), but also Hopi (Kalectaca and Langacker 1978): *Pam wari* 's/he ran' / *puma yuutu* 'They ran'.
- *Ergativity* (Corbett 2000): only the internal argument determines verbal number, whereas regular phi-agreement can express other grammatical relations.

3 Theoretical background

- The analysis is couched in the frameworks of **Minimalist Syntax** (Chomsky (1993), Radford (1997), Adger (2003)) and **Distributed Morphology** (Halle and Marantz (1993), Harley and Noyer (1999)).
- Syntax is a separate module that manipulates abstract morpho-syntactic features through two operations: *Merge* and *Agree*.
- Distributed morphology (DM): division of labor between the components of Grammar (Halle and Marantz 1993).
- The output of syntax is cyclically sent to Spell-out. Now, the phonological exponent of a Vocabulary Item is inserted into a morpheme in a syntactic terminal node according to the Subset Principle (Halle 1999).
- I adopt the **interaction model of Agree** (Deal 2015, 2017):
 - *Interaction*: the probe P interacts with feature F by copying F back to P,
 - *Satisfaction*: the probe P is satisfied by G if copying G makes P stop probing.
 - *Feature specification of the probe P*: INT-[F], SAT[G]

- This model (precedents in [Béjar and Rezac \(2009\)](#); [Preminger \(2014\)](#)) is based on a *feature-geometry* approach to ϕ -features ([Béjar and Rezac 2009](#); [Harley and Ritter 2002](#); [McGinnis 2005](#); [Preminger 2014](#); [Kalin 2017](#)):
 - Feature values are organized in a structure that encodes implicational relations between them.
 - Probes are placeholders for snippets of the feature geometry, rather than for individual features; goals are snippets of the feature geometry.
- Probes are *relativized*: they are containers where it is specified which part of the feature geometry must be copied into it.
- Probes are *omnivorous*: they can agree with multiple goals.
- Agree is subject to cyclic expansion [Béjar and Rezac \(2009\)](#) until its satisfaction condition is met.
- Agree may fail if the probe it is not satisfied into its search domain ([Preminger 2014](#)).

4 Proposal

We shall recall example (2) from Mupun:

- (9)
- | | | | |
|----|--------------------------|-------------------|------------|
| a. | <i>wu</i> | <i>nas</i> | <i>mo</i> |
| | 3M.SG | hit.PST.PL | 3PL |
| | ‘He hit them.’ | | |
| b. | * <i>wu</i> | <i>cit</i> | <i>mo</i> |
| | 3M.SG | hit.PST.SG | 3PL |
| | ‘*He hit them.’ | | |
| c. | <i>wu</i> | <i>cit</i> | <i>wur</i> |
| | 3M.SG | hit.PST.SG | 3M.SG |
| | ‘He hit him.’ | | |
| d. | <i>wu</i> | <i>nas</i> | <i>wur</i> |
| | 3M.SG | hit.PST.PL | 3M.SG |
| | ‘He hit him many times.’ | | |

- Problems for previous analyses:
 - in order to explain (9), either same number feature both on the verb and on the object,
 - or different meaning to the two allomorphs;
 - suppletion vs morphemes;
 - unergative verbs.
- I propose that verbal number is an **Agree relation** between *v* and either a DP or a silent AdvP.

The Agreement

- I claim that the probe v has the following structure:

(10) *Feature specification of Mupun v*
INT- $\#$, SAT $[\phi]$

- The probe is satisfied when it encounters a ϕ projection (person π and gender γ features); then it stops probing. However, it interacts with every $\#$ features that it encounters during the valuation.
- Note that another possible satisfaction feature is the categorical feature D: INT- $\#$, SAT[D]. Such a probe has been proposed by Deal (2017) for Swahili and Chichewa, where v does not agree with the subject when the object does not contain $[\phi]$.
- I treat singular as the absence of number (Puškar (2015); Nevins (2011))
- Why not a simple probe for $\#$? \rightarrow cyclic expansion upwards for unergative verbs, but not for transitive verbs \rightarrow Agree stops when there is an internal argument:

(11) *mo ya joos*
3.PL catch.PST.SG rat.SG
'They caught a rat.'

- An alternative: simple probe for number on v + value *singular* as a number + two number values for nominal (singular and plural) and only one for adverbials (just plural) \rightarrow defective intervention of singular adverbials, but an homogeneous treatment of number is a desiderata.
- Why Multiple Agreement? \rightarrow theoretical possibility + evidence from Mwaghavul ([pl] vs. [pl, pl]) in § 6.

The adverb as a goal

- I claim that Adverbial phrases may bear a $\#$ feature that refers to event number, whereas in the nominal domain the $\#$ feature refers to participant number.

category	number	
[N]	[]	[pl]
[Adv]	[]	[pl]

- The difference between adverbs and nominals is the absence of person features in the adverbial, whereas both can contain a number feature.
- Note that this difference is highlighted by the Agree mechanism: a DP has a full ϕ features geometry, therefore it can satisfy the probe. An adverb has a small subset of ϕ features, only the $\#$ feature, which can interact with the probe but not satisfy it.
- AdvP is merged as an adjunct to VP when the intended meaning to be expressed is '(x times)(VP)'

- Mupun presents some hints of plural number on adverbials. For example, reduplication is used both to inflect adjectives as plural and to derive adverbs from adjectives, nouns or verbs (Frajzyngier 1993, p. 75): *kénkén* ‘fast’ [Adv].
- Often, the adverbial phrase is covert. However, it can be overt, too:
 - Recall example (8): the continuous marker may spell out the Adv morpheme.
 - Here we have an example (Frajzyngier 1993, p. 274) with an overt manner adverbial, low in the structure, derived from the verb *sù* ‘run’ (V_{pl} DP_{sg}):

(12) *wu* ***grəp*** *suep kaa fin* ***səsu***
 3.M.SG cut.PST.PL hair head 3.POSS.M.SG running
 ‘He cut his hair in a hurry.’

Other ϕ -Agree

- This agreement operation is different from verb-object Agree because
 - unergative verbs exhibit verbal number depending on the external argument,
 - when the DP_{obj} is singular, the verb can still be plural.
- It is independent from other types of agreement, which may involve features on T. When a language presents more agreement patterns, then T is responsible for verb-subject Agree, *v* for verbal number and/or for verb-object Agree. Huichol (Comrie 1982):

(13) a. *Wan Maria ma-ti me-neci-mieci.*
 Juan Maria and-SUBJ 3.PL.SUBJ-1.SG.OBJ-kill.SG
 ‘Juan and Maria are killing me.’
 b. *Nee Wan Maria maa-me ne-wa-quiini.*
 1.SG Juan Maria and.OBJ 1.SG.SUBJ-3.PL.OBJ-kill.PL
 ‘I am killing Juan and Maria.’

The semantics

- Under this account, the two functions (event number vs. participant number) are not due to different semantic interpretations of *v*. Instead,
 - the different goals for the probe *v* are responsible for these two interpretations,
 - *v* looks for a # feature that is underspecified. # is underspecified and it refers to *many x*, *x* being either an event or a participant.
- Number: there is only one type of #-features that are part of the complete ϕ -features set. However, they are independent from other ϕ features (π , γ) and can show up in isolation without being embedded in the ϕ hierarchy. These smaller snippets that consist only of # can be hosted by different constituents.
- #-features are not tied to the nominal domain, but may be hosted by other categories and simply indicates that the constituent they scope on has the semantic property [+many].

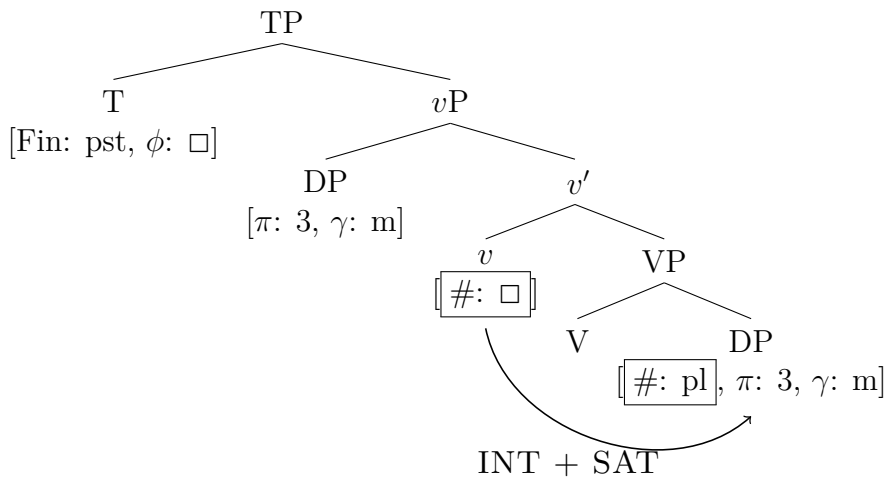
5 Analysis

5.1 Transitive verbs

5.1.1 Plural verb + plural argument

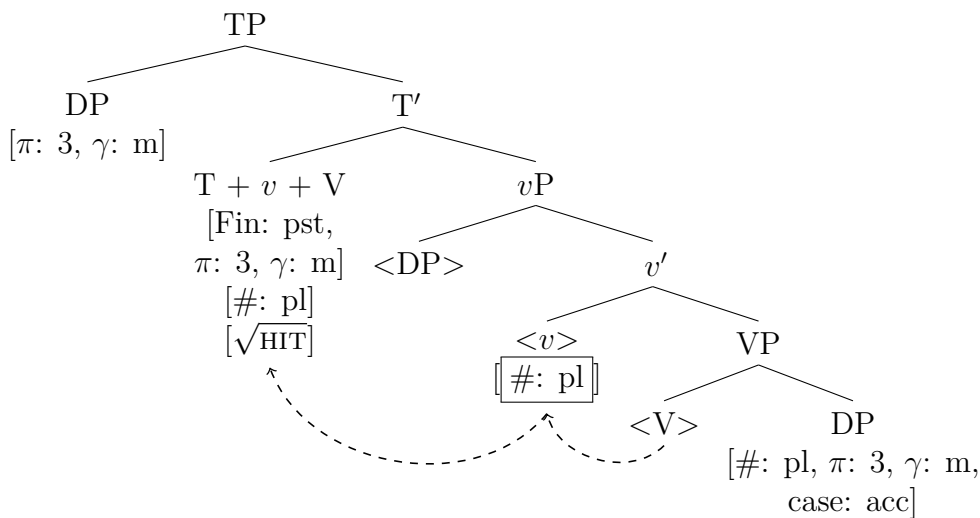
- (14) *wu nas mo*
 3M.SG hit.PST.PL 3PL
 'He hit them.'

Step 1: building the structure

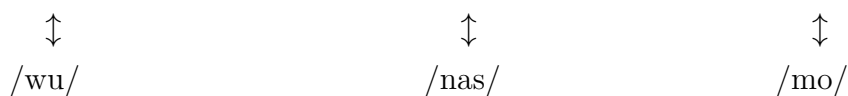


v interacts with # on the DP and it is satisfied by the DP. Agree stops and the probe has copied the value for # from the DP.

Step 2: (a) valuing features, (b) moving heads



Step 3: Vocabulary insertion



For this analysis, I assume the following lexical entries:

- (15)
- $\sqrt{\text{HIT}} \leftrightarrow /nas/ / v[\text{pl}] _$
 - $\sqrt{\text{HIT}} \leftrightarrow /cit/$
 - $v \leftrightarrow \emptyset$
 - $T \leftrightarrow \emptyset$
 - $[3, m] \leftrightarrow /wu/$
 - $[3, m, \text{pl}] \leftrightarrow /mo/$

- A derivation with V_{sg} and DP_{pl} is ruled out

- (16) **wu* ***cit*** *mo*
 3M.SG hit.PST.SG 3PL
 ‘*He hit them.’

because v becomes specified for the value [+plural] through the Agree relation with the DP.

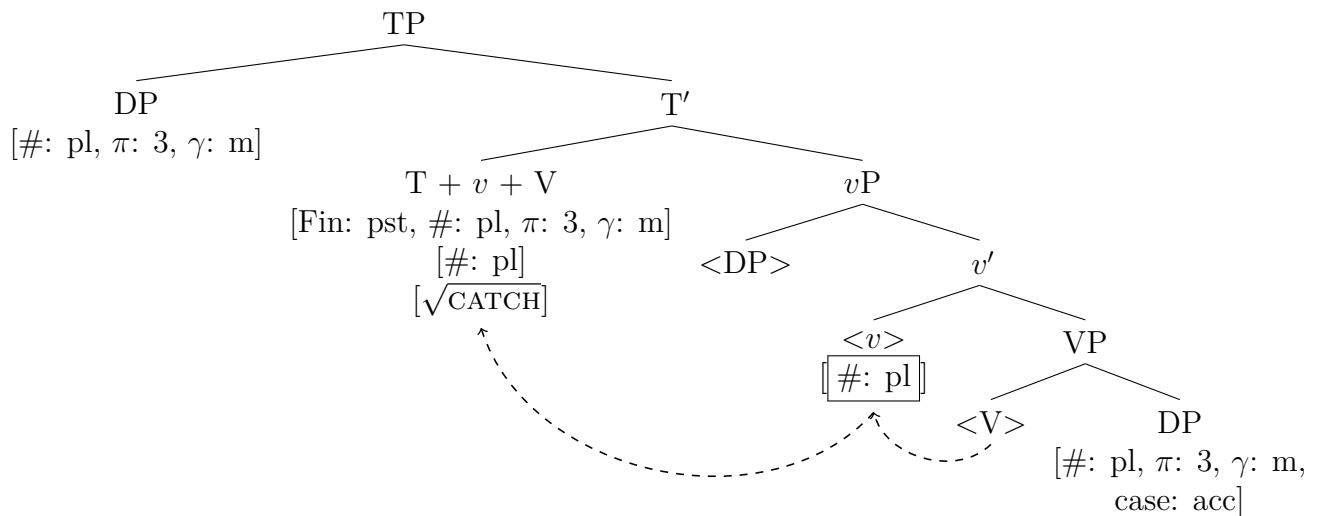
Consequently, the more specific allomorph that is compatible with the context has to be inserted (hence, (15-a) *nas*).

- In case of suppletion, there is a single lexical entry for the bundle of features on the complex head $T+v+V$.
- Difference in Morphology: a separate morpheme spells out the v head, as in the case of the pluractional affixes or of reduplication.

- (17) *mo* ***yak*** *joos* *mo*
 3.PL catch.PST.SG rat.SG PL
 ‘They caught rats.’

Step 1 and 2 are the same as for example (11).

Step 3: Vocabulary insertion



The lexical entries needed for this derivation are the following:



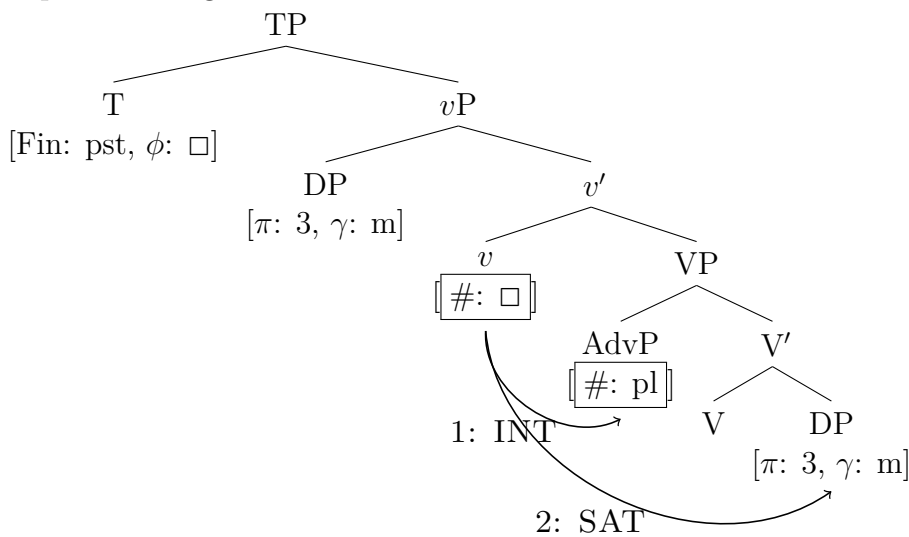
- (18)
- a. $\sqrt{\text{CATCH}} \leftrightarrow /ya/$
 - b. $v[\text{pl}] \leftrightarrow /k/ / \sqrt{\text{CATCH}}$
 - c. $[\text{3}, \text{m}, \text{pl}] \leftrightarrow /mo/$
 - d. $\sqrt{\text{RAT}} \leftrightarrow /joss/$
 - e. $[\text{pl}, \text{D}] \leftrightarrow /mo/$

The syntactic structure is the same. Then, morphology and phonology make the difference, both language-internally and cross-linguistically.

5.1.2 Plural verb + singular argument

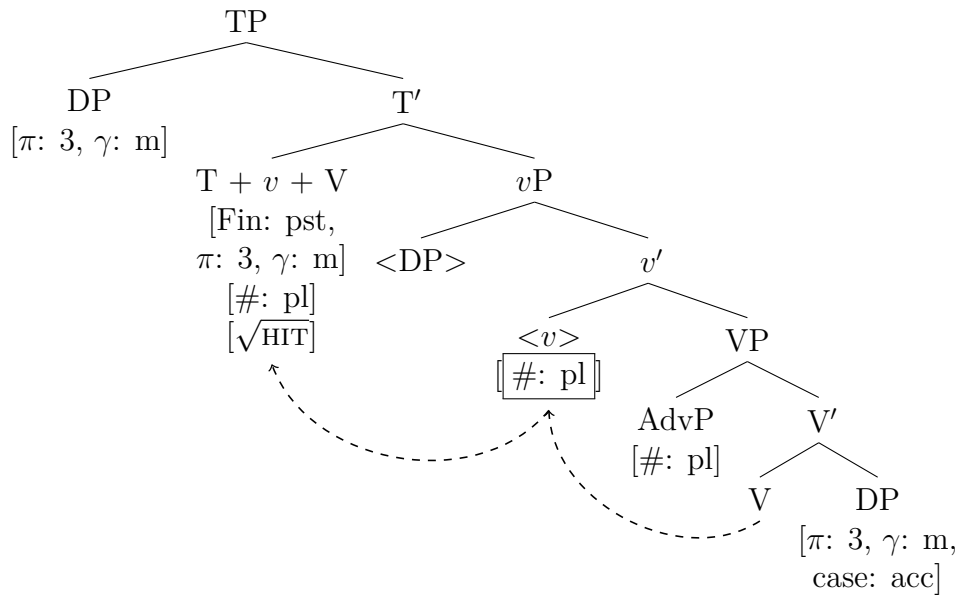
- (19) *wu nas wur*
 3M.SG hit.PST.PL 3M.SG
 ‘He hit him many times.’

Step 1: building the structure

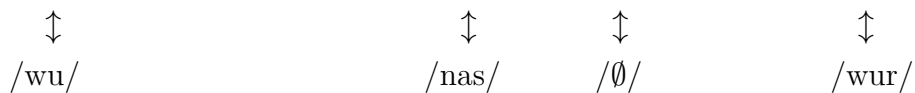


- v interacts with $\#$ on the Adv but it is not satisfied by it, since it does not contain the D projection.
- The valuation goes further until the probe is satisfied by the DP. Agree stops and the probe has copied the value for $\#$ from the Adv
- (and eventually from the DP: not in this case, where the DP is singular. Instead, if the DP is also plural, v copies twice the $\#$ feature).

Step 2: (a) valuing features, (b) moving heads



Step 3: Vocabulary insertion



For this analysis, I shall add these vocabulary items:

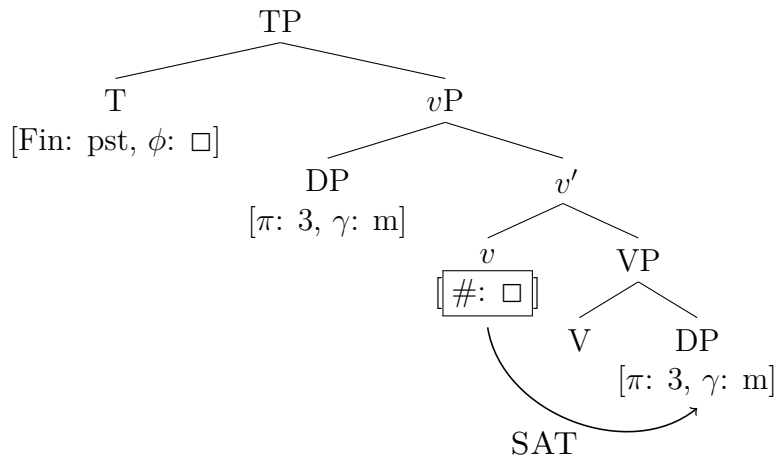
- (20) a. [Adv, pl] ↔ ∅
 b. [3, m, acc] ↔ /wur/

- The feature on v become specified for the value [+plural] through the Agree relation with the AdvP. Consequently, the more specific allomorph that is compatible with the context has to be inserted (hence, (15-a) *nas*).
- This result is independent from the presence of the DP_{sg} in the structure.
- Has the AdvP[#: pl] not be in the structure, the only interaction with #-feature would have been with the internal DP and the verb would have been singular.
- An adverb that is unmarked for #-feature would have been skipped by this Agree operation. This is an argument for Relativized Minimality (Rizzi 1990): a constituent is an intervener for X and Y if it is located between X and Y and if it matches the value for the morphosyntactic features of X.

5.1.3 Singular verb + singular argument

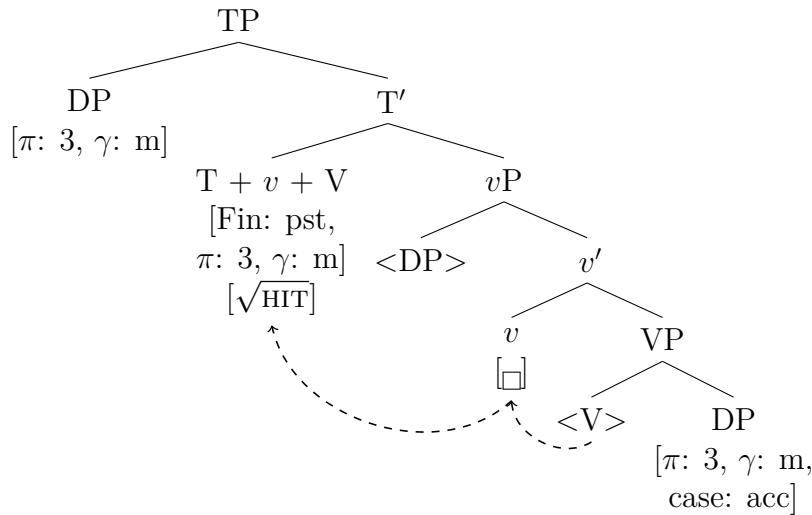
- (21) *wu* *ci* *wur*
 3M.SG hit.PST.SG 3M.SG
 'He hit him.'

Step 1: building the structure



v is satisfied by the DP. Agree stops. However, the probe has not copied the value for #, since it has not interact with any other syntactic position on its way down and the singular DP does not bear a number feature.

Step 2: (a) valuing features, (b) moving heads



Step 3: Vocabulary insertion



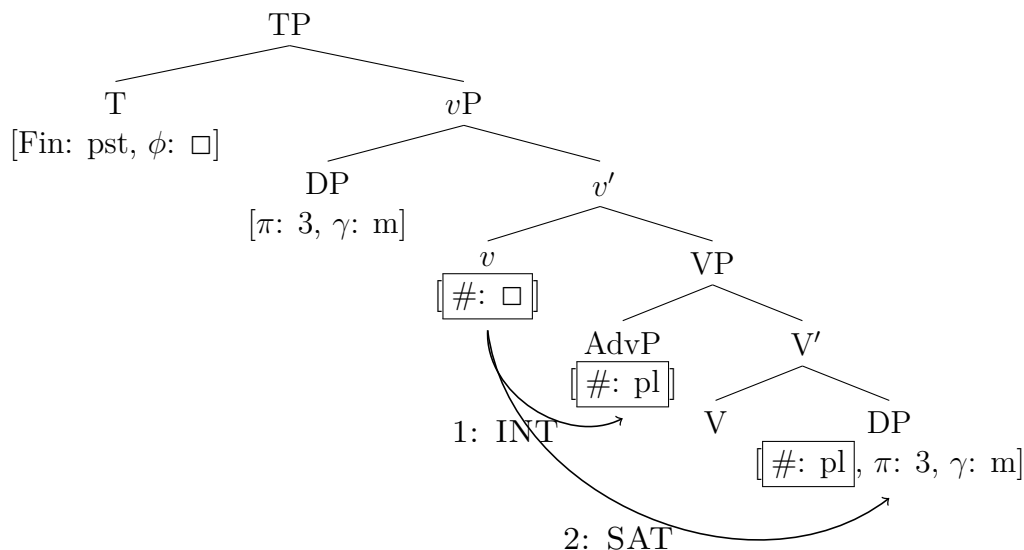
Note that in case of singular object and plural subject (*they hit him*), the verb still remain singular because the probe cannot look until the external argument, since it is satisfied by the internal argument. No plural feature is copied onto the probe.

5.1.4 Plural verb + plural event + plural argument

- (22) *wu nas mo*
 3M.SG hit.PST.PL 3PL

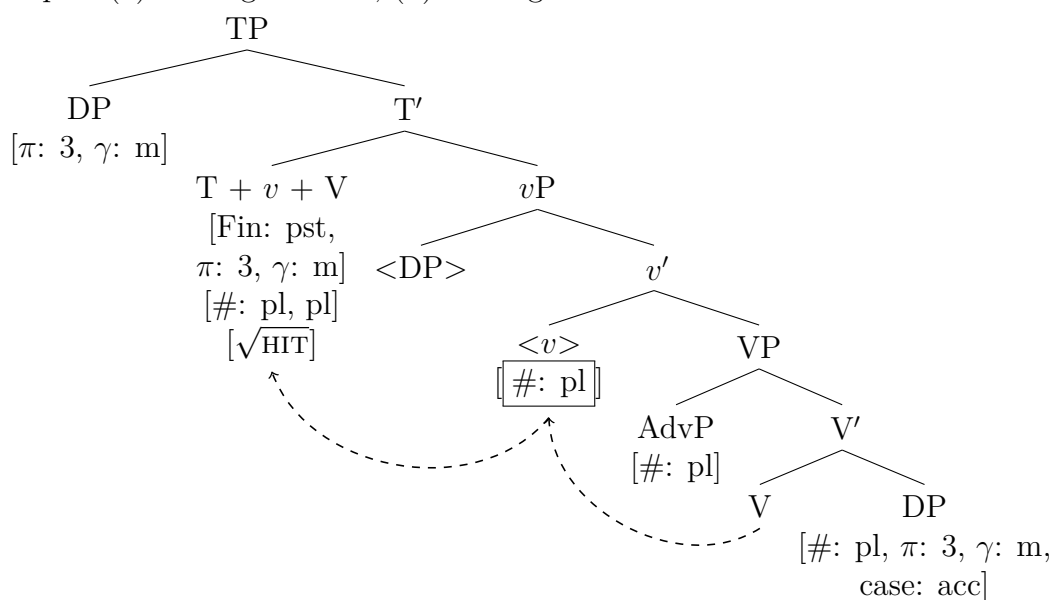
‘He hit them many times.’

Step 1: building the structure

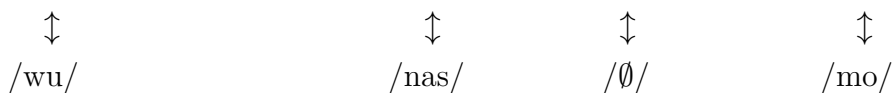


- v interacts with $\#$ on the Adv but it is not satisfied by it, since it does not contain the ϕ projection.
- The valuation goes further until the probe is satisfied by the DP. Agree stops and the probe has copied the value for $\#$ from the Adv and from the DP: v contains twice the $\#$ feature.
- This is a case of Multiple Agreement.

Step 2: (a) valuing features, (b) moving heads



Step 3: Vocabulary insertion



5.1.5 Semantic interpretation

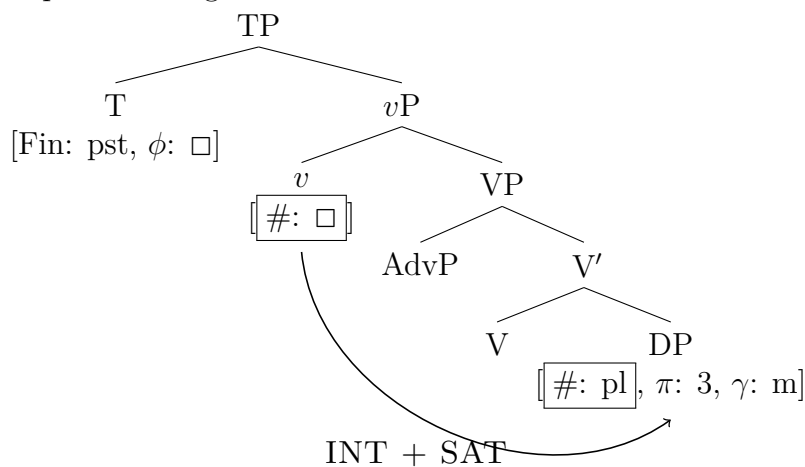
- Mupun seems not to have the possibility to express in the same time plural participant number and plural event number (as in 19). In fact, we did not find in the grammar such a case of cumulativity.
- The sentences (14) and (22) *wu nas mo* are ambiguous on the surface because Mupun does not have enough lexical means to distinguish between the two structures.
- I expect that this meaning is realized at LF, where the plural values are computed both on the DP and on the AdvP.
- There is nothing special about *v* that permits to distinguish between the two interpretations, but it is the distribution of the features in the structure that give rise to one meaning or to the other one ([pl] on AdvP: plural event, [pl] on DP: plural participant, [pl] on AdvP and [pl] on DP: plural event and plural participant).
- More generally, under this account the morphological realization (at PF) is independent from the interpretation (at LF).

5.2 Intransitive verbs

5.2.1 Unaccusative verbs

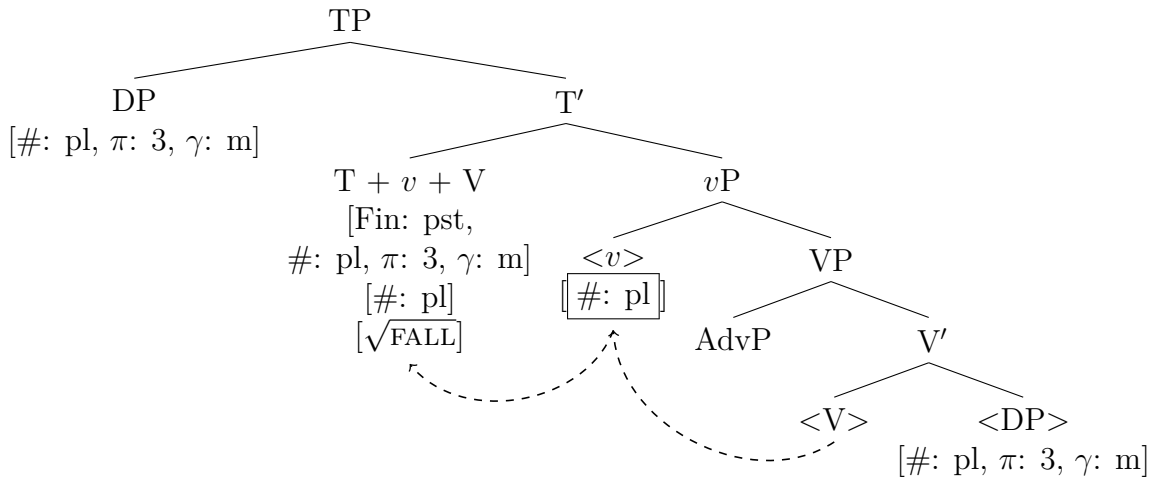
- (23) *mo doŋ yil*
 3.PL fall.PST.PL down
 ‘They fell down.’

Step 1: building the structure



v interacts with # on the DP and it is satisfied by the DP. Agree stops and the probe has copied the value for # from the DP.

Step 2: valuing features, moving heads



Step 3: Vocabulary insertion



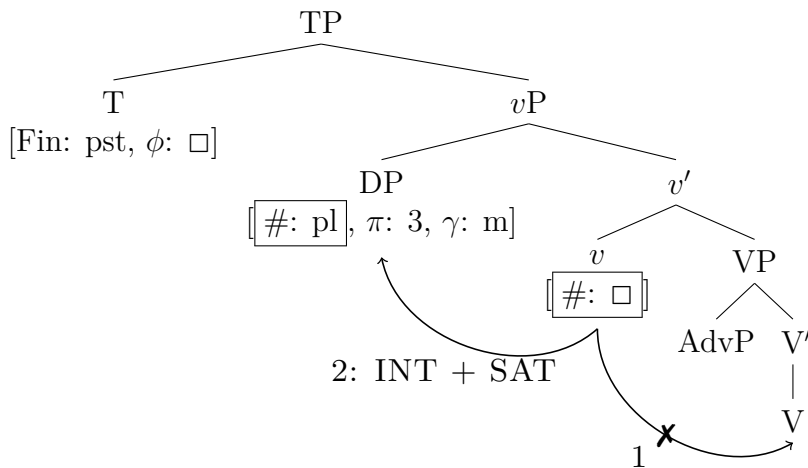
For this analysis, I assume in addition the following lexical entries:

- (24) a. $\sqrt{\text{FALL}} \leftrightarrow /don/ / v[\text{pl}] _$
 b. $\sqrt{\text{FALL}} \leftrightarrow /taa/$
 c. $[\text{Adv}, \sqrt{\text{DOWN}}] \leftrightarrow /yil/$

5.2.2 Unergative verbs

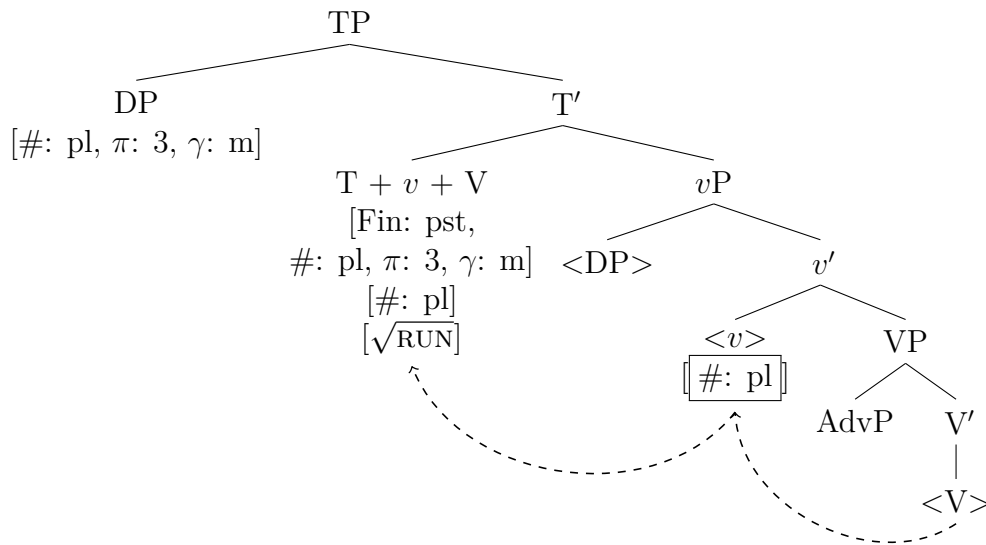
- (25) *mo sue seet*
 3.PL run.PST.PL away
 'They ran away.'

Step 1: building the structure

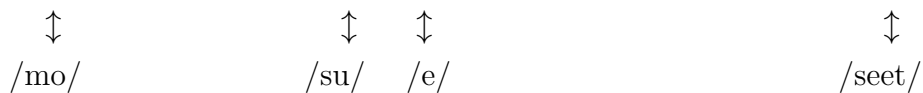


- v starts its search downwards, but it does not find any appropriate snippets of feature geometry.
- Cyclic expansion (Béjar and Rezac 2009) allows the probe to look upwards, since it has not been satisfied yet.
- v interacts with $\#$ on the external DP and it is satisfied by it. Agree stops and the probe has copied the value for $\#$ from the DP.

Step 2: valuing features, moving heads



Step 3: Vocabulary insertion



For this analysis, I assume in addition the following lexical entries:

- (26)
- $\sqrt{\text{RUN}} \leftrightarrow /su/$
 - $v[\text{pl}] \leftrightarrow /e/ \ / \ \sqrt{\text{RUN}}$
 - $[\text{Adv}, \sqrt{\text{AWAY}}] \leftrightarrow /seet/$

- Unergative verbs do not introduce any internal argument.
- The probe v tries to enter in an agreement relation downwards, but there is no matching goal.
- Thus, after the external argument is introduced by v , the probe tries again upwards.
- The DP in the subject position is a proper goal, thus v can match its uninterpretable feature with it.

6 Extending the proposal to other Chadic languages

6.1 Verbal number in Mwaghavul

- Mwaghavul is a West Chadic language, spoken in Central Nigeria (Blench 2011).
- Mupun is sometimes considered as a variety of Mwaghavul.
- The system for verbal number is quite developed. A plural verb can refer both to event or to participant number.
- Therefore, additional nominal number marking can disambiguate the interpretation of the plural verb.
- In (27), multiple people (plural events) are acting on multiple object (plural participants): a plural marker *mo* on the noun is needed in addition to the plural verb *pyan*.

- (27) a. *wán kin **piin** tughul àm ni*
 1.SG have break.SG pot.SG water.SG 3.SG
 'I have broken the pot of water.'
- b. *doghon jépmo teer **pyan** tughul fina ni*
 yesterday child.PL during.the.night break.PL pot.SG POSS.1.SG 3.PL
mo
 PL
 'Children broke my pots last night'

In (28-b) (Blench 2011, p. 62), multiple people (plural events) are acting on a single object; thus, the verb is plural and the reading is pluriactional.

- (28) a. *shààrlek fina wuri **at** an*
 enemy.SG poss.1.SG 3.SG beat.PST.SG 1.SG
 'My enemy bit me.'
- b. *nfùtmo teer **irap** an*
 mosquito.PL during.the.night beat.PST.PL 1.SG
 'Mosquitos bit me many times during the night.'

- Moreover, allomorphs for verbal number may be organized in triplets of roots, with two plural forms linked to a singular one (Blench 2011, p. 61):

lexical meaning	singular	I plural	II plural
'to drink plenty of water'	<i>shwaa</i>	<i>mis</i>	<i>myas</i>
'to break, to snap'	<i>tep</i>	<i>tirep</i>	<i>roghop</i>
'to beat'	<i>nuy</i>	<i>niram</i>	<i>siram</i>

- In case of triplets, a verb in the singular form refers to a single event. If the action involves either multiple events or multiple participants, the first plural form is used.

When the event concerns multiple event and multiple participants, the second plural form is selected (Blench 2011, pp. 63-64).

- In (29), we see the alternations of the root $\sqrt{\text{THROW}}$: *vwèt* ~ *fwo* ~ *car*. The first pluriactional (29-b) is used with a plural object, whereas the second one (29-c) is used with plural objects and plural events:

- (29) a. *wurí tàà vwèt kwàghàzàk firi*
 3.MS.SG on.the.way throw.PST.SG shoe.SG poss.3.MS.SG
 ‘He discarded his shoe on the way’
- b. *wùrá tàà fwo léé fira a ár*
 3.FM.SG on.the.way throw.PST.IPL cloth.PL poss.3.FM.SG on road
mwaan
 go
 ‘She discarded her clothes on the way going on the road.’
- c. *mo nkaa car shak*
 3.PL at discard.IIPL reciprocal
 ‘They are throwing things at one another.’

- In (30), the first plural allomorph (30-b) is used with a pluriactional interpretation, meaning intensity; the second one (30-c) is used with plural objects and plural events:

- (30) a. *jépmo ki tep kam-dàghàr fina mi*
 child.PL have break.PST.SG walking-stick.SG poss.1.SG 3.SG
 ‘The children have broken in two my walking-stick’
- b. *wátmo doghon tirep pò lù fna mi*
 thief.PL yesterday break.PST.IPL door.SG house.SG poss.1.SG 3.SG
 ‘Yesterday, thieves broke down the door of my house.’
- c. *mo teer roghop shwáá an nwát*
 3.PL during.the.night break.PST.IIPL maize.PL poss.1.SG steal
 ‘They broke off and stole many of my maize-cobs during the night.’

6.2 Analysis

- I claim that Mwaghavul has the same probe as Mupun, the only difference being in the morpho-phonology that contains a different inventory of lexical entries.
- The probe *v* can be valued again even if it has already copied the interaction feature: *v* [#: □, □, ...].
- This is a case of Multiple Agree, i.e. agreement between one probe and multiple goals. Cases of Multiple Agree are found in many languages, for instance in Japanese ((Hiraiwa 2001, p. 76), Bjorkman and Zeijlstra (2014)):

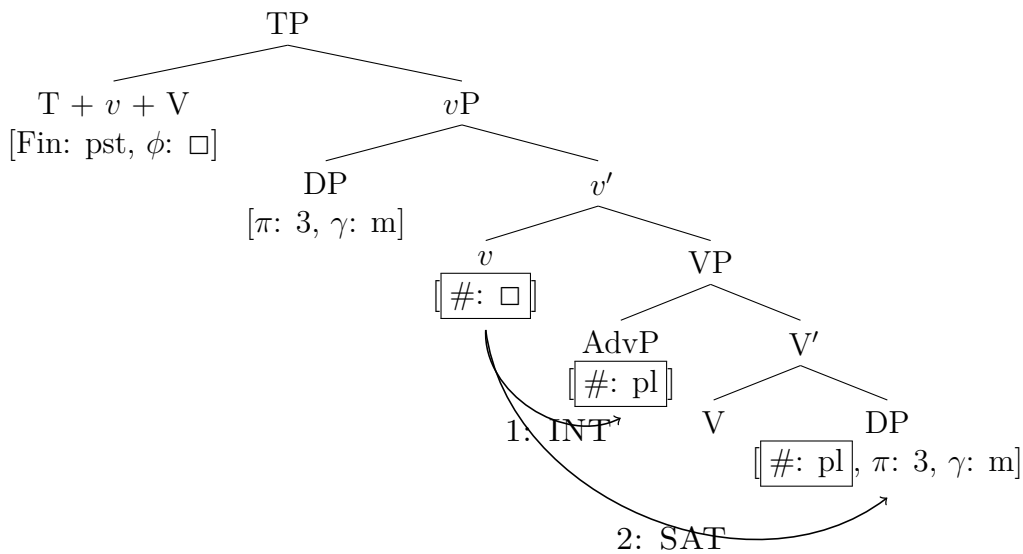
- (31) *ohn-ga [yosouijouni nihonjin-ga eigo-ga hidoku]*
 John.NOM than.expected the.Japanese.NOM English.NOM bad.INF

kanji-ta.

thought

‘It seemed to John that the Japanese are worse at speaking English than he had expected.’

- Mwaghavul can express in the same time plural participant number and plural event number.
- When a verbal root has only a plural form, both functions are simultaneously realized through the plural verb + a plural marker on the DP (cf. 24).
- When two plural forms are available (cf. 25), the first one expresses one function, the second one both.



- *v* interacts with # on the Adv but it is not satisfied by it, since it does not contain the D projection.
- The valuation goes further until the probe is satisfied by the DP. Agree stops and the probe has copied the value for # from the Adv and from the DP: *v* contains twice the # feature.
- The vocabulary items list contains a lexical entry that is specified for *v*[pl, pl], so this can be inserted (Multiple Agree reflected by the Morphology).
- The lexical entries for example (30-c) are as follows:

- (32)
- $\sqrt{\text{DRINK}} \leftrightarrow /fwo/ / v[\text{pl}] _$
 - $\sqrt{\text{DRINK}} \leftrightarrow /car/ / v[\text{pl}, \text{pl}] _$
 - $\sqrt{\text{DRINK}} \leftrightarrow /vwèt/$

- In contrast with Mupun, where Multiple Agree is not visible because the morphophonology of the language does not distinguish between *v*[pl] and *v*[pl, pl], in this language the morphology has two different phonological exponents for these two

morphological specifications and, therefore, it permits to express cases of multiple agreement.

7 Concluding remarks

- I have proposed a morphosyntactic account of verbal number in Mupun (and in other Chadic languages).
- To the best of my knowledge, there is no other syntactic approach to verbal number yet.
- This analysis allows to derive the patterns that are attested in Mupun and to rule out the ungrammatical sentences.
- The syntactic account can explain problematic issues for previous approaches:
 - the realization of verbal number through morphology,
 - the difference between event number and participant number,
 - the external argument of unergative verbs as a goal for verbal number.
- The feature on *v* is the same and the difference between participant number and event number is due to the syntactic structure.
- The number feature may be underspecified: *many x*, *x* being either a participant []/[pl] or an event []/[pl].
- The differences within languages and among languages are located in the morphology and phonology modules rather than in the syntax.
- I make some predictions that are left as testing ground for the theory:
 - plural adverbial phrases should influence the number on unergative verbs,
 - singular (i. e., non plural) adverbial phrases should give raise to defective intervention,
 - for ditransitive verbs, if the indirect object is higher than the direct object, then the indirect object will be the goal for the probe,
 - other DPs, which are introduced by voice morphology (causative, applicative etc.), may intervene as potential goal, depending on their position in the structure.

References

- Adger, David (2003): *Core syntax: A minimalist approach*. Vol. 33, Oxford University Press Oxford.
- Bjorkman, Bronwyn and Hedde Zeijlstra (2014): ‘Upward agree is superior’, *Ms., University of Toronto and Universität Göttingen*.

- Blench, Roger M (2011): Mwaghavul pluractional verbs. In: *Topics in Chadic linguistics VI: Papers from the 5th Biennial International Colloquium on the Chadic Languages*. pp. 51–66.
- Béjar, Susana and Milan Rezac (2009): ‘Cyclic Agree’, *Linguistic Inquiry* **40**, issue 1, 35–73.
- Chomsky, Noam (1993): ‘A minimalist program for linguistic theory. The view from Building 20, ed. by Kenneth Hale and Samuel J. Keyser, 1-52’.
- Comrie, Bernard (1982): ‘Grammatical Relations in Huichol in Studies in Transitivity’, *Syntax and Semantics Ann Arbor, Mich.* **15**, 95–115.
- Corbett, Greville G. (2000): *Number*. Cambridge University Press.
- Deal, Amy Rose (2015): Interaction and satisfaction in φ -agreement. In: *Proceedings of NELS*. Vol. 45.
- Deal, Amy Rose (2017): Interaction and satisfaction: a theory of agreement. Course given at EGG Summer School 2017.
- Durie, Mark (1986): ‘The Grammaticization of Number as a Verbal Category’, *Proceedings of the Twelfth Annual Meeting of the Berkeley Linguistics Society* pp. 355–368.
- Frajzyngier, Zygmunt (1991): *A dictionary of Mupun*. Reimer.
- Frajzyngier, Zygmunt (1993): *Grammar of Mupun*. D. Reimer Verlag.
- Halle, Morris (1999): ‘Distributed morphology: Impoverishment and fission’, *MIT Working Papers in Linguistics 30: Papers at the Interface* p. 425–449.
- Halle, Morris and Alec Marantz (1993): ‘Distributed morphology and the pieces of inflection’.
- Harley, Heidi and Elizabeth Ritter (2002): ‘Person and number in pronouns: A feature-geometric analysis’, *Language* **78**(3), 482–526.
- Harley, Heidi and Rolf Noyer (1999): ‘Distributed Morphology’, *Glott International* **4**, Issue 4.
- Hiraiwa, Ken (2001): ‘Multiple agree and the defective intervention constraint in Japanese’, *MIT working papers in linguistics* **40**(40), 67–80.
- Kalectaca, Milo and Ronald W Langacker (1978): *Lessons in Hopi*. ERIC.
- Kalin, Laura (2017): ‘Nominal licensing is driven by valued (ϕ -) features’.
- Mattiola, Simone (2017): ‘The conceptual space of pluractional constructions’, *Lingue e linguaggio* **xvi.1**, 119–146.
- McGinnis, Martha (2005): ‘On markedness asymmetries in person and number’, *Language* **81**(3), 699–718.
- Mithun, Marianne (1988): ‘Lexical categories and the evolution of number marking’, *Theoretical morphology* pp. 211–234.
- Nevins, Andrew (2011): ‘Multiple agree with clitics: person complementarity vs. omnivorous number’, *Nat Lang Linguist Theory* **29**, 939–971.
- Preminger, Omer (2014): *Agreement and its failures*. Vol. 68, MIT Press.
- Puškar, Zorica (2015): ‘Interactions of gender and number agreement: Evidence from Bosnian/Croatian/Serbian’, *Ms., University of Leipzig*.
- Radford, Andrew (1997): *Syntax: A minimalist introduction*. Cambridge University Press.
- Rizzi, Luigi (1990): *Relativized minimality*. The MIT Press.
- Tuite, Kevin (1998): Kartvelian morphosyntax. Number agreement and morphosyntactic orientation in the south caucasian languages. PhD thesis, Université de Montréal.