1. Introduction

"Subject–Verb agreement"

(1) **Infl-origin of \( \varphi \)-probes**

\[
\text{InflP} \\
\text{Infl}_\varphi \quad \text{VP} \\
\vee \\
\text{V}
\]

\( \Rightarrow \) AGR on functional heads

(Chomsky 1981, Pollock 1989)

(2) **Verb-origin of \( \varphi \)-probes**

\[
\text{InflP} \\
\text{Infl} \quad \text{VP} \\
\vee \\
\text{V}_\varphi
\]

\( \Rightarrow \) AGR on the verb

(Iatridou 1990)

The two views are not easy to discern: V and Infl often cooccur in the same word

**Argument from Bantu against Infl-origin (sections 2 & 3)**

The lack of consistent association of functional heads with \( \varphi \)-probes

- Inconsistent loci of \( \varphi \) in simple vs compound tenses (section 2)
- Inconsistent loci of \( \varphi \) in aspectual verb constructions (section 3)

**Proposal: Verb-origin & \( \varphi \)-percolation under V-checking (section 4)**

(3) **\( \varphi \)-probe introduced by V**

\[
\text{InflP} \\
\text{Infl}_{[uV]} \quad \text{VP} \\
\vee \\
\text{V}_{[iV,\varphi]}
\]

(4) **\( \varphi \)-probing from Infl**

\[
\text{InflP} \\
\text{Infl}_{[uV,\varphi]} \quad \text{VP} \\
\vee \\
\text{V}_{[iV,\varphi]}
\]

This account derives the attested variability of \( \varphi \)-probe positions.
2. Inconsistent loci of $\varphi$ in simple vs compound tenses

In Bantu languages, every verb in a clause is fully inflected for subject agreement.

(5) a. **U-∅-be u-phek-ile.**  
    2sg-PST-AUX 2sg-cook-PERF  
    You had cooked.  
    *Ndebele* (Pietraszko 2017)

b. Masunga **ma-kili ma-yik-u-a.**  
    6yam 6s-still 6s-cook-PASS-FS  
    ‘The yams are still being cooked.’  
    *Kilega* (Carstens 2005)

c. **Ni-li-kuwa ni-ngali ni-ki-fanya kazi.**  
    1sg-PST-AUX 1sg-still 1sg-PROG-do work  
    ‘I was still working’.  
    *Swahili* (Carstens 2001)

The Infl-origin approach: multiple $\varphi$-probes in the clause

(6) **A-li-kuwa a-me-fariki.**  
    3sg-PST-AUX 3sg-PERF-die  
    ‘He had died.’  
    *(Swahili; Nurse, 2008)*

- Agr on the auxiliary: $\varphi$ on T
- Agr on the main V: $\varphi$ on Asp


Problem: Asp$_{\text{Perf}}$ does not always have a $\varphi$-probe

Present Perfect: only one $\varphi$

(7) **A-∅-me-fariki.**  
    3sg-PRES-PERF-die  
    ‘He has died.’

Simple Present: T$_{\text{Pres}}$ has $\varphi$

(8) **A-∅-fariki.**  
    3sg-PRES-die  
    ‘He dies/is dying.’

(The overflow pattern of auxiliary use (Bjorkman 2011))

Inconsistent distribution of $\varphi$:  
Asp$_{\text{Perf}}$ has a $\varphi$-probe when T is [Past] but not when it’s [Pres]
3. Inconsistent loci of \( \varphi \) in aspectual verb constructions

Ndebele aspectual auxiliaries – functional verbs with adverbal meanings

(9) U-lokhe u-bála
2sg-still 2sg-read.PROG
‘You are still reading’

(10) U-se u-balile
2sg-already 2sg-read.PERF
‘You have already read’

- As functional verbs, they realize clausal inflectional heads (Cinque 1999 et seq.)
- The inflection on the main verb is licensed by the closest inflectional head

(11) \[ T \ [ \text{Asp}_{\text{Prog}} \ lokhe \ ... \ [\text{V} \ \text{V}_{\text{main}}] ] ]

(12) \[ T \ [ \text{Asp}_{\text{Perf}} \ se \ ... \ [\text{V} \ \text{V}_{\text{main}}] ] ]

Evidence for fixed positions of aspectual auxiliaries

(Further evidence in Pietraszko 2017)

(13) Perfect aspect is higher than Prog:
(Iatridou et al., 2003, Ramchand & Svenonius 2014, a.o.)

\[ T \ [ \text{Asp}_{\text{Perf}} \ se \ ‘already’ \ [ \text{Asp}_{\text{Prog}} \ lokhe \ ‘still’ \ [ \text{Voice} \ ... \ ] ] ] \]

(14) The fixed positions restrict possible ordering of Asp-auxiliaries:

a. U-se u-lokhe u-phéka \( se < lokhe \checkmark \)
2sg-already 2sg-still 2sg-cook.PROG
‘At this point, you are still cooking’

b. *U-lokhe u-se u-phéka/u-phekile. \( *lokhe < se \)
2sg-still 2sg-already 2sg-cook.PROG/2sg-cook.PERF

(15) The fixed positions restrict possible forms of the main verb:

a. U-se u-balile.
2sg-already 2sg-read.PERF
‘You have already read.’

b. U-se u-bála.
2sg-already 2sg-read.PROG
‘You have already been reading’

c. U-lokhe u-bála/*u-balile.
2sg-still 2sg-read.PROG/2sg-read.PERF
‘You are still reading’

1 For accounts of such licensing as agreement see e.g. Adger 2003, Wurmbrand 2011, Bjorkman 2011, Pietraszko 2017.
The distribution of $\varphi$-probes in the inflectional structure

Infl-origin approach to $\varphi$-distribution in Asp-V constructions

(16) \textit{T appears to always have a $\varphi$-probe in Ndebele:}

a. \textit{U-∅-pheka inyama.} \\
2sg-PRES-cook 9meat \textit{‘You cook meat’}

\[ \text{TP} \left[ T_{\varphi,\text{Pres} \ u} \right] \left[ \text{VoiceP} \ pheka \right] \]

b. \textit{U-a-pheka inyama.} \\
2sg-PAST-cook 9meat \textit{‘You cooked meat’}

\[ \text{TP} \left[ T_{\varphi,\text{Past} \ u-a} \right] \left[ \text{VoiceP} \ pheka \right] \]

Inconsistent appearance of $\varphi$ on Voice

(17) \textit{U-lokhe u-phéka} \\
2sg-still 2sg-cook.PROG \textit{‘You are still cooking’}

- Agr on \textit{lokhe}: $\varphi$ on T
- Agr on the main V: $\varphi$ on Voice

\Rightarrow \textit{Voice is an agreeing head in (17) but not in (16).}

Inconsistent appearance of $\varphi$ on Asp\textsubscript{Prog}

(18) \textit{U-se u-lokhe u-phéka} \\
2sg-already 2sg-still 2sg-cook.PROG \textit{‘At this point, you are still cooking’}

- Agr on \textit{se}: $\varphi$ on T
- Agr on \textit{lokhe}: $\varphi$ on Asp\textsubscript{Prog}
- Agr on the main V: $\varphi$ on Voice

\Rightarrow \textit{Asp\textsubscript{Prog} is an agreeing head in (18) but not in (17).}

Summary of the argument:

- The locus of $\varphi$-probes cannot be described in terms of specific functional heads
- Given that, the Infl-origin approach fails to capture the distribution of $\varphi$-probes in Bantu
- One correlation: the number of $\varphi$-probes correlates with the number of verbal elements
4. Deriving the distribution: Verb-origin and feature percolation

### V-checking in the inflectional domain

- V and functional heads in its extended projection are related by feature checking

- Functional heads check their uV against the verb’s iV
  (Cowper 2010, Pietraszko 2017)

(19) Simple tense

(20) Compound tense

one V-chain: \( \langle T, \text{Asp}, \text{Voice}, V \rangle \)

two V-chains: \( \langle T, \text{V-aux} \rangle; \langle \text{Asp}, \text{Voice}, V \rangle \)

(See Cowper 2010, Pietraszko 2016, 2017 for auxiliary insertion as last resort V-checking)

### Feature percolation

- \( \varphi \)-probes are introduced in the inflectional structure on Vs
- They percolate under V-checking to the top of the V-chain
- Probing takes place after percolation

(21) \( \varphi \)-probe introduced in V

(22) \( \varphi \)-probing from Infl
### Agreement in simple vs compound tenses

(23) **Past + Perf ⇒ Aux-V**

   3sg-PST-AUX 3sg-PERF-die
   ‘He had died.’
   $\rightarrow \varphi$ on AspPerf

b. Past Perfect

\[ TP_{Past} \]

\[ T \]

\[ T_{[\varphi, \varphi]} \quad V\text{-aux}_{[iv, \varphi]} \quad \text{Asp}_{[\varphi, \varphi]} \quad \text{Voice}_{[\varphi, \varphi]} \]

\[ \text{Voice}_{[\varphi, \varphi]} \quad VP \]

\[ V_{[iv, \varphi]} \]

Two V-chains: $\langle T, V\text{-aux} \rangle; \langle \text{Asp, Voice, V} \rangle$

$\rightarrow$ $\varphi$-probing from T and Asp

(24) **Pres + Perf ⇒ no Aux-V**

a. A-$\emptyset$-me-fariki.
   3sg-PRES-PERF-die
   ‘He has died.’
   $\rightarrow$ No $\varphi$ on AspPerf

b. Present Perfect

\[ TP_{Pres} \]

\[ T_{[\varphi, \varphi]} \]

\[ \text{Asp}_{[\varphi, \varphi]} \]

\[ \text{Voice}_{[\varphi, \varphi]} \]

\[ VP \]

\[ V_{[iv, \varphi]} \]

One V-chain: $\langle T, \text{Asp, Voice, V} \rangle$

$\rightarrow$ $\varphi$-probing from T

---

**Evidence for $\varphi$-percolation**

i. **Affix order:** AGR affixes are not adjacent to verb stems

ii. **Locality of agreement:**

(25) **Subject-Object Inversion**

a. Imw-ana ka-tula ici-ya.
   1-child 1s-broke 7-pot
   ‘The child broke the pot.’

b. Ici-ya ci-tula imw-ana.
   7-pot 7s-broke 1-child
   ‘The child broke the pot.’
   \((\text{Luguru, Marten \& van der Wal 2014})\)

$\rightarrow$ Which DP controls subject agreement correlates with movement to Spec,TP.
The distribution of \( \varphi \)-probes in the inflectional structure

**Agreement in aspectual-verb constructions**

(26) **Aspectual auxiliaries:**
   a. functional heads with an iV feature (rather than uV)
   b. being verbs, they introduce a \( \varphi \)-probes in the structure

(27) **U-lokhe u-bála**
   2sg-still 2sg-read.PROG
   ‘You are still reading’

(28) **U-se u-lokhe u-phéka**
   2sg-already 2sg-still 2sg-cook.PROG
   ‘At this point, you are still cooking’

(29) The derivation of (27)

(30) The derivation of (28)
5. Conclusion

- Complete severing of ϕ-probes from Vs fails to capture their distribution in Bantu lgs
- ϕ-probes are not a property of individual functional heads, but rather of V-chains
- The size of a V-chain may vary, depending of the syntactic context
- The number of ϕ-probes is determined by the number of Vs, but their exact probing position is determined derivationally.

References