Movement in adverbial clauses: Evidence from Akɔɔse *wh*-agreement*

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1 Introduction

(1) **Theoretical questions:**

a. Does the derivation of adverbial clauses involve movement? If so,
b. What moves?
c. What is the site of extraction for the moved element?
d. What is the landing site for the moved element?
e. How should we classify adverbial clauses to account for variation in answers to these questions?

(2) **Empirical domain:**

a. *Wh*-agreement in Akɔɔse [bss] (A15C), a Bantu language from southwest Cameroon (Hedinger 1985, 2008)

i. *No extraction*

Mw-ăn ě-pim-ɛ́ɛ́ Ø-mbaaŋgé.[1]
1-child 1.NEG-throw.out-PRF.IRR 10-cocoyam[2,3]

'The child didn't throw out the cocoyams.'
(Hedinger 2008: 105 (295))

ii. Wh-*subject*

Ø-Nzɛ́ ě-pim-e-**Ø** Ø-mbaaŋgé?
1-who 1.NEG-throw.out-PRF-**SE** 10-cocoyam

'Who didn't throw out the cocoyams?' (Hedinger 2008: 105 (295))

iii. Wh-*non-subject*

Chě mw-ăn **é**-pim-ɛ́ɛ́?
what 1-child **NSE**.1.NEG-throw.out-PRF.IRR

'What didn't the child throw out?' (Hedinger 2008: 106 (297))

b. In Akɔɔse, *wh*-agreement takes place in adverbial clauses as well as the canonical *wh*-movement contexts (Chomsky 1977).
c. Crucially, Akɔɔse *wh*-agreement shows a subject/non-subject asymmetry, and different types of adverbial clauses pattern differently with respect to this asymmetry.

(3) **Aims:**

a. Give morphological evidence that central temporal and central conditional clauses involve movement, but peripheral adverbial clauses do not (answering (1a,e))
b. Provide a novel morphosyntactic analysis for Akɔɔse *wh*-agreement
c. Use this analysis to pinpoint the extraction sites for the operators in central temporal and central conditional clauses (answering (1c,e))

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[1]The transcription system used for Akɔɔse follows Hedinger (2008: 3–10). The symbols that depart from IPA usage are given here with their IPA equivalents: ch [tʃ], g [g], j [dʒ], mb [ᵐb, mb], nd [ⁿd, nd], ng [ᵑg], ny [ɲ], nz [ⁿz, nz], y [j]. Following Hedinger (1985) but deviating from Hedinger (2008), <ʔ> is retained instead of being replaced by an apostrophe. Syllables with level low tones are left unmarked.

[2]Abbreviations used include 1SG = 1st person singular, 2PL = 2nd person plural, 3PL = 3rd person plural, 3SG = 3rd person singular, APPL = applicative, COMP = complementizer, FUT = future, HORT = hortative, INF = infinitive, IPFV = imperfective, IRR = irrealis, LOC = locative, NEG = negative, NSE = non-subject extraction, PERS = personifier, PFV = perfective, POSS = possessive, PRF = perfect, PST = past, Q = question particle, QUOT = quotative, REL = relative, SE = subject extraction, TOP = topic. Bare numerals in glosses indicate noun class, encoding both number and gender features. In Akɔɔse, most odd-numbered noun classes are singular, while most even-numbered noun classes are plural.

[3]I have occasionally adjusted Hedinger's glosses and translations for clarity and consistency. These adjustments involve adding morpheme boundaries that were not given in the example cited but are evident from other parts of Hedinger 2008, standardizing abbreviations and punctuation to match the Leipzig Glossing Rules, adding noun class prefixes in examples where they were omitted, changing O 'object' to NSE 'non-subject extraction', changing SF 'non-specific verbal suffix' to either NSE 'non-subject extraction' or IRR 'irrealis' depending on context, and changing S 'subject' to SE 'subject extraction'. Examples (2a), (20)–(22), (24)–(25), (28)–(29), and (33) did not have interlinear glosses in the original source; I have added glosses for these examples following Hedinger (2008), but note that IRR 'irrealis' is a consequence of my analysis and does not appear in his work.

(4) **Roadmap:**

a. Background on free relative approaches to the internal syntax of adverbial clauses

b. Akɔɔse *wh*-agreement data, showing both canonical *wh*-movement contexts and central adverbial clauses

c. Morphosyntactic analysis of Akɔɔse *wh*-agreement

d. Sites of extraction in central adverbial clauses

(5) *Classification of adverbial clauses* (Haegeman 2007: 285–286)

	Central	Peripheral
Modify event or state of affairs in main clause	✓	✗
Provide discourse background for main clause	✗	✓
Anchored directly to speaker or speech time	✗	✓
May contain epistemic modality expressions	✗	✓

(6) *Central adverbial clauses*

a. Peter heard the news [**when** he arrived at the office].

b. Jayne fell asleep [**while** she rode the bus home].

c. [**If** you find that paper helpful], let me know.

(7) *Peripheral adverbial clauses*

a. The solution seems straightforward, [**although** I never would have thought of it].

b. [**While** some might question his methods], his claims cannot be ignored.

c. [**If** Clara's caustic remark was provoked], it still was unprofessional.

2 Internal syntax of adverbial clauses

(8) Several authors have provided **syntactic, semantic,** and even **etymological** arguments for a derivation of adverbial clauses that involves movement (Geis 1970; Larson 1987, 1990; Dubinsky & Williams 1995; Demirdache & Uribe-Etxebarria 2004; Bhatt & Pancheva 2006; Haegeman 2007, 2009a,b, 2010a,b; Arsenijević 2009; Tomaszewicz 2009).

2.1 Ambiguity in temporal clauses

(9) *Ambiguity in temporal clauses* (modeled after Geis 1970; Larson 1987, 1990)

The professor wrote a recommendation letter for Mark [**after** he said he needed it].

a. High: The professor wrote the letter after being asked.
[$_{PP}$ after [$_{CP}$ OP$_i$ [$_{IP}$ he *said* [$_{CP}$ [$_{IP}$ he needed it]] t_i]]][4]

b. Low: The professor wrote the letter after the deadline.
[$_{PP}$ after [$_{CP}$ OP$_i$ [$_{IP}$ he said [$_{CP}$ [$_{IP}$ he *needed* it t_i]]]]]

(10) **However,** the low construal reading is unavailable for conditional clauses, casting doubt on a movement derivation for conditionals (Geis 1970; Iatridou 1991; Citko 2000).

(11) *No ambiguity in conditional clauses* (modeled after Bhatt & Pancheva 2006)

I'll bet on this horse [**if** you say it will win].

a. High: In situations s, you say that the horse will win (in situations s').
I'll bet on the horse in those situations s.

b. *Low: You say that in situations s', the horse will win.
I'll bet on the horse in those situations s'.

2.2 Argument fronting in English

(12) Both central temporal and conditional clauses disallow argument fronting, a main clause phenomenon (Haegeman 2003, 2007, 2009a,b, 2010a,b).

(13) *Argument fronting allowed in main clauses*

[$_{TopP}$ This book [$_{IP}$ you should read ~~this book~~ next summer]]

(14) *Argument fronting disallowed in central temporal clauses*

*[$_{CP}$ When [$_{TopP}$ this movie [$_{IP}$ she saw ~~this movie~~]]], she hated it.

[4]The choice to represent the adverbial clause as a PP is not crucial for our purposes.

(15) *Argument fronting disallowed in central conditional clauses*

* [$_{CP}$ If [$_{TopP}$ that paper [$_{IP}$ you find ~~that paper~~ helpful]]], let me know.

(16) *Argument fronting allowed in peripheral adverbial clauses*

[$_{CP}$ While [$_{TopP}$ his methods [$_{IP}$ some might question ~~his methods~~]]], his claims cannot be ignored.

(17) Haegeman (2007 and following) treats the failure of argument fronting in central adverbial clauses as an **intervention effect**. The availability of argument fronting in peripheral adverbial clauses suggests that there is no intervention effect in those clauses, so they must not involve movement.

3 Akɔɔse *wh*-agreement

(18) ***Wh*-agreement:** Morphological marking of the path of syntactic movement (Chung 1982; Chung & Georgopoulos 1988; Chung 1994, 1998; Clements 1984; Georgopoulos 1985, 1991; Haïk 1990; Lahne 2008; McCloskey 1979, 1990, 2001; Watanabe 1996; see Reintges et al. 2006 for a typological profile)

(19) Akɔɔse marks its verbs with respect to whether an element has been extracted to the left periphery. Crucially, extracted subjects trigger different verbal morphology from extracted non-subjects.

3.1 *Wh*-questions

(20) *No extraction* (repeated from (2a.i))

Mw-ăn ĕ-pim-ɛ́ɛ́ Ø-mbaaŋgé.
1-child 1.NEG-throw.out-PRF.IRR 10-cocoyam
'The child didn't throw out the cocoyams.' (Hedinger 2008: 105 (295))

(21) Wh-*subject* (repeated from (2a.ii))

Ø-Nzɛ́ ĕ-pim-e-**Ø** Ø-mbaaŋgé?
1-who 1.NEG-throw.out-PRF-**SE** 10-cocoyam
'Who didn't throw out the cocoyams?' (Hedinger 2008: 105 (295))

(22) Wh-*object* (repeated from (2a.iii))

Chĕ mw-ăn **é**-pim-ɛ́ɛ́?
what 1-child **NSE**.1.NEG-throw.out-PRF.IRR
'What didn't the child throw out?' (Hedinger 2008: 106 (297))

(23) Wh-*adjunct*

Ø-Póndé e-héé **á**-pédé hɛ́n?
9-time 9-which **NSE**.1-arrive.PRF here
'When did she get here?' (Hedinger 2008: 197 (486))

3.2 Relative clauses

(24) *Subject relative*

mw-ăn aw-ĕ ĕ-pim-e-**Ø** Ø-mbaaŋgé
1-child 1-REL 1.NEG-throw.out-PRF-**SE** 10-cocoyam
'the child who didn't throw out the cocoyams'
(Hedinger 2008: 105 (295))

(25) *Object relative*

Ø-mbaaŋgé éch-e mw-ăn **é**-pim-ɛ́ɛ́
10-cocoyam 10-REL 1-child **NSE**.1.NEG-throw.out-PRF.IRR
'the cocoyams that the child didn't throw out'
(Hedinger 2008: 106 (297))

(26) *Adjunct relative*

m-bwɛ́=ɛ́ɛ̄ **á**-pɛ́ɛ́n-é ḿm-é m-ɔnɛ́ wê Ø-kúl-ɛ
3-day=REL **NSE**.1-take-PRF 3-that 3-money to 9-tortoise-PERS
'the day he took the money to Tortoise' (Hedinger 2008: 59 (156))

3.3 Cleft questions

(27) *Clefted non-subject*

Saá áw-í e?-wóŋgé **mé**-m-bɛ́=ɛ?
is.it.not LOC-3SG.POSS 14-marriage **NSE**.1SG-PST-be=Q
'Wasn't it to him I was married?' (lit. 'Isn't it in his marriage I was?')
(Hedinger 2008: 198 (492))

3.4 Topicalization[5]

(28) *Topicalized subject*

Mw-ăn m-ô ě-pim-e-**Ø** Ø-mbaaŋgé.
1-child 1-TOP 1.NEG-throw.out-PRF-**SE** 10-cocoyam
'It is the child who didn't throw out the cocoyams.'
(Hedinger 2008: 105 (295))

(29) *Topicalized non-subject*

Ø-Mbaaŋgé ch-ô mw-ăn **é**-pim-ɛ́ɛ́.
10-cocoyam 10-TOP 1-child **NSE**.1.NEG-throw.out-PRF.IRR
'It is the cocoyams that the child didn't throw out.'
(Hedinger 2008: 106 (297))

(30) *Topicalized adjunct*

Bɔɔb d-ô **nyábə́ə̄**-ʻdyɛ́-**ɛ́**.
now 5-TOP **NSE**.2PL.3PL.FUT-eat-**NSE**
'Now you and they will eat.' (Hedinger 2008: 201 (508))

4 *Wh*-agreement in adverbial clauses

(31) *Wh*-agreement in adverbial clauses is not unique to Akɔɔse (see McCloskey 2001: 71, 82–87 for Irish), but Akɔɔse's sensitivity to the height of extraction allows us to probe the question of where the moved elements originate.

4.1 Temporal adverbial clauses

(32) Central temporal clauses in Akɔɔse have verbs with **non-subject** extraction morphology.

[5]Hedinger (2008: §7.3) describes a construction that he calls topicalization, comprised of an extracted element followed by an agreeing topic marker or a reduced non-agreeing clitic. In his English translations of the sentences, he uses *it*-clefts, which typically introduce focus, not topic, material. Hedinger (pers. comm.) acknowledges that further investigation is necessary to determine whether these are topic or focus constructions, but regardless of the information status of this construction, it employs extraction marking for subjects and non-subjects.

(33) Áde *'when' with non-subject extraction marking*

[Áde mw-ăn **é**-pim-ɛ́ɛ́ Ø-mbaaŋgé,] …
[when 1-child **NSE**.1.NEG-throw.out-PRF.IRR 10-cocoyam]
'When the child didn't throw out the cocoyams, …'
(Hedinger 2008: 106 (297))

(34) Hɛ́ɛ *'then' with non-subject extraction marking*

[Hɛ́ɛ an-e mw-ăn **á**-tím-é ámbīd ábwɔ̄g∼ábwɔ̄g.]
[then 1-that 1-child **NSE**.1-return-PRF back immediately]
'Then that child returned immediately.' (Hedinger 2008: 185 (432))

(35) Ngáne *'as' with non-subject extraction marking*

[Ngáne Ø-nguu **é**-pédé hɛ́n,] …
[as 9-pig **NSE**.9-arrive.PRF here]
'As pig arrived here, …' (Hedinger 2008: 227 (600))

(36) Nɛ́ɛ *'as, when, after' with non-subject extraction marking*

[Nɛ́ɛ Ø-sánkala n-hág n-e mw-ěn **á**-húú ámīn,]
[as 1-big 3-(fruit) 1-that 1-self **NSE**.1-return.PRF up]
a-bɔm-é Ø-kúl-ɛ á Ø-mbíd te, toóy.
1-knock-PRF 9-tortoise-PERS LOC 9-back in boom
'As a huge *nheg* fruit came down, it knocked Tortoise on the back, boom.' (Hedinger 2008: 277 (TD054))

(37) The presence of *wh*-agreement morphology suggests that these clauses are derived via movement.

4.2 Conditional clauses

(38) Central conditional clauses in Akɔɔse have verbs with **subject** extraction morphology.

(39) Nzé *'if' with subject extraction marking*

Ø-Pɔpé e-kút-ɛʔ, [nzé ě-yəg-e-**Ø** bwăm].
9-papaya 9-crack.APPL--IPFV [if 9.NEG-ripe-PRF-**SE** well]
'Papaya cracks if it is not fully ripe.' (Hedinger 2008: 237 (657))

(40) Nzé *'if' with subject extraction marking*

[Nzé bé-hīd-e-**Ø** éch-ê Ø-mbéndé á Ø-mbīd,]
[if 2.NEG-follow-PRF-**SE** 10-that 10-law LOC 9-back]
é-yɔ́k-é a-bɛ́ nɛ́n mw-ǎn á-kud Ø-mbéb.
10-always-PRF INF-be COMP 1-child INF-get 9-bad
'If they don't follow the laws, bad will always happen to the child.'
(Hedinger 2008: 237 (656))

(41) The presence of *wh*-agreement morphology suggests that these clauses are derived via movement.

4.3 Peripheral adverbial clauses

(42) Peripheral adverbial clauses in Akɔɔse have verbs with **no** extraction morphology.

(43) Kénɛ́ɛ *'although, even though' with no extraction marking*

Aá á-chəg mɔ́ m-bəŋ, [kénɛ́ɛ Ø-ngəə
1.QUOT 1-call.HORT 1 3-nickname [although 9-leopard.PERS
ě-hɛl-ɛɛ́ ḿm-ê m-bəŋ a-chəg.]
1.NEG-can-PRF.IRR 3-that 3-nickname INF-call]
'He said that he should call him names, even though Leopard wasn't able to do it.' (Hedinger 2008: 235 (644))

(44) The absence of extraction marking in these clauses supports Haegeman's (2007, 2010a) claim that movement is not involved in the derivation of peripheral adverbial clauses.[6]

[6] Another possibility is that peripheral adverbial clauses might have a silent 'it is the case that' between the subordinator and the rest of the clause (Haegeman 2010b: 616–617; Richard Kayne (p.c.)); this unpronounced upper clause could have operator movement (and silent *wh*-agreement in Akɔɔse), unifying the analysis of central and peripheral adverbial clauses. As far as I can tell, the data presented here are consistent with either analysis.

5 Morphosyntactic analysis

(45) In order to investigate the operators' extraction sites, we need to have a fuller understanding of the morphosyntactic details of Akɔɔse *wh*-agreement.

(46) There are widely divergent analyses of *wh*-agreement (Zaenen 1983; Clements 1984; Watanabe 1996; Chung 1998; Reintges et al. 2006; Lahne 2008).

(47) Here, I propose a novel syntactic account for the distribution of Akɔɔse *wh*-agreement morphology.

5.1 Morphological facts

(48) *Underlying affixes in the (present) imperfective paradigm* (gleaned from Hedinger 1985: 38–39)

	NE		**SE**		**NSE**		
Affirmative	SM-	-ɛʔ	SM-	-ɛʔ	Ḥ- SM-	-ɛʔ	-ʔɛ́
Negative	SM-e-	-ɛʔ -ʔɛ́	SM-e-	-ɛʔ	Ḥ- SM-e-	-ɛʔ	-ʔɛ́

(49) *Morphological generalizations*

a. The **non-subject** extraction forms all have **Ḥ-** (Hedinger 1985, 2008).
b. In **subject** extraction forms, the polarity contrast in suffixes is neutralized in the direction of the **affirmative**.
c. In **non-subject** extraction forms, the polarity contrast in suffixes is neutralized in the direction of the **negative**.

(50) *Extraction morphemes*

a. **-ʔɛ́:** An **irrealis** suffix. It tends to occur in negative contexts (Hedinger 1985: 15), and there may be a relationship between irrealis morphology and extraction (Haïk 1990; Georgopoulos 1985, 1991; Schneider-Zioga 2007).
b. **Ḥ-:** A ***wh*-agreement** prefix. It is licensed via agreement with a *wh*-element that is also irrealis.

5.2 Syntactic account

(51) *Representational assumptions*

a. **Cartographic** approach: Each of the three layers of the clause (CP, IP, VP) is articulated (Cinque 1999; Larson 1988; Rizzi 1997).

b. Following Julien (2002), Bantu verbal **suffixes** are generated as heads and attach to the root via **head movement**, so they surface in mirror order of their original positions (Baker 1985). Bantu verbal **prefixes** are generated as heads but are **spelled out in their original positions**, so they surface in order.

c.

operators	SpecCP
overt subject DPs	SpecFinP
H̥-	Fin
subject agreement	AgrS
negative prefix	Neg
tense prefixes	T
-ʔɛ́	$\text{Mood}_{\text{irrealis}}$
aspect suffixes	Asp
verb root	V

(52) *Principles constraining derivations*

a. **Locality Condition on Movement:** In a chain created by movement, neighboring links must not be in non-neighboring layers of the clause. The highest projections of the VP, IP, and CP layers are *v*, AgrS, and C, respectively; these form the boundaries between layers (cf. Subjacency (Chomsky 1973)).

b. ***Wh*-agreement Licensing:** H̥- is licensed under upward agreement (Baker 2008) with a DP that is [+*wh*] and [+irrealis].

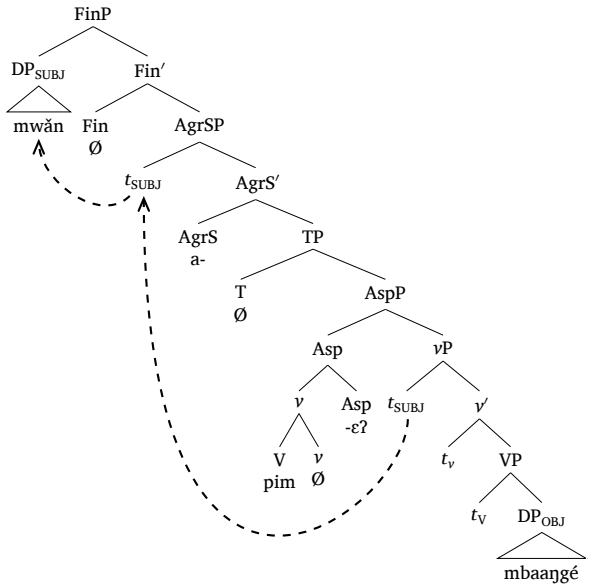
c. **Economy Condition on Operator Movement:** Operator chains must have as few links as possible (cf. Grimshaw's (1997) STAY), subject to (52a–52b).

d. **Irrealis Licensing:** *-ʔɛ́* is licensed by a specifier that is [+irrealis] (cf. the first clause of the Neg Criterion (Haegeman & Zanuttini 1991)), subject to (52c).

(53) *Affirmative no extraction*

a. Mw-ăn a-pim-ɛʔ Ø-mbaaŋgé.
1-child 1-throw.out-IPFV 10-cocoyam
'The child is throwing out the cocoyams.'

b. *Structure*[7]



c. The verb stem is built via head movement into *v* and Asp.

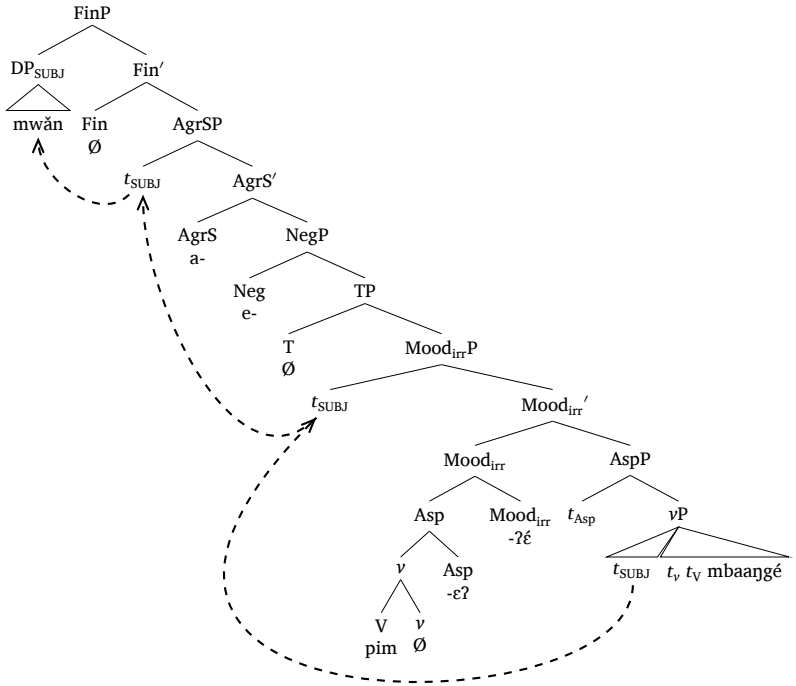
d. On its way to SpecFinP, the subject moves through AgrS, licensing subject agreement and satisfying the Locality Condition.

(54) *Negative no extraction*

a. Mw-ăn ĕ-pim-ɛ́ɛ́ Ø-mbaaŋgé.
1-child 1-throw.out-IPFV.IRR 10-cocoyam
'The child isn't throwing out the cocoyams.'

[7] In the trees that follow, arrows with solid lines indicate operator movement, while arrows with dashed lines indicate non-operator movement.

b. *Structure*



c. The irrealis suffix is selected by Neg, but Irrealis Licensing requires there to be a specifier of Mood$_{irrealis}$P, so the subject stops in Spec Mood$_{irrealis}$P on its way to SpecAgrS. Because the subject is not an operator, it is not subject to the Economy Condition, so this extra stop in the IP layer is licit.

d. Although the subject is [+irrealis] (required in order to license *-ʔɛ́*), it is not [+*wh*], so *Wh*-agreement Licensing is not met, and Ḥ- does not appear.

(55) *Affirmative subject extraction*

a. Ø-Nzɛ́ a-pim-ɛʔ-**Ø** Ø-mbaaŋgé.
1-who 1-throw.out-IPFV-**SE** 10-cocoyam
'Who is throwing out the cocoyams?'

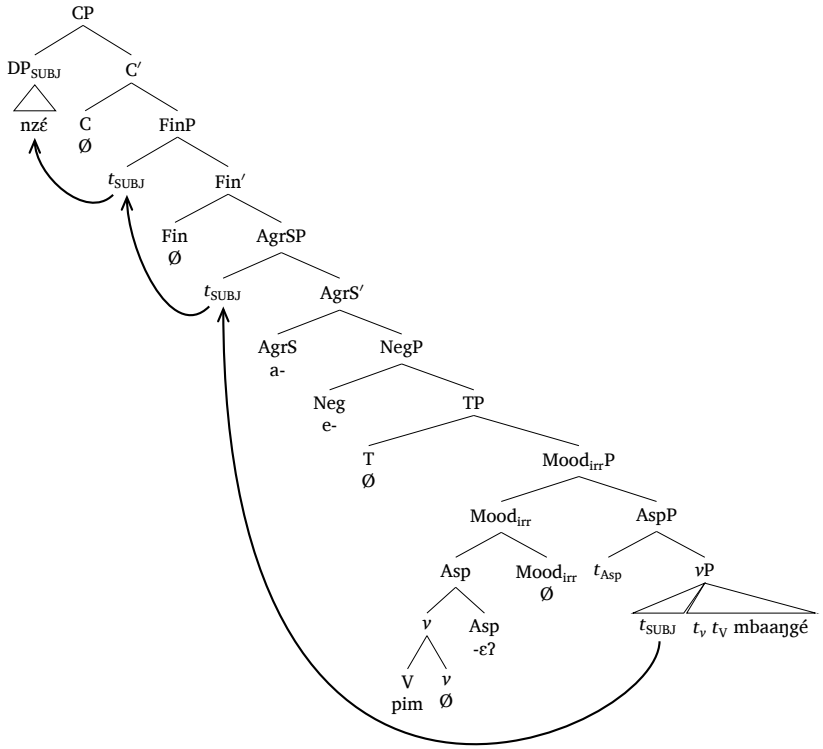
b. The derivation proceeds as in (53), except that the subject is a [+*wh*] operator that continues up to SpecCP.

c. Although the subject is a [+*wh*], it is not [+irrealis], so *Wh*-agreement Licensing is not met, and Ḥ- does not appear.

(56) *Negative subject extraction*

a. Ø-Nzɛ́ ě-ˈpím-ɛ́ʔ-**Ø** Ø-mbaaŋgé.
1-who 1.NEG-throw.out-IPFV-**SE** 10-cocoyam
'Who isn't throwing out the cocoyams?'

b. *Structure*



c. Mood$_{irrealis}$ is selected by Neg, but Irrealis Licensing requires there to

be a specifier of $\text{Mood}_{\text{irrealis}}$P.

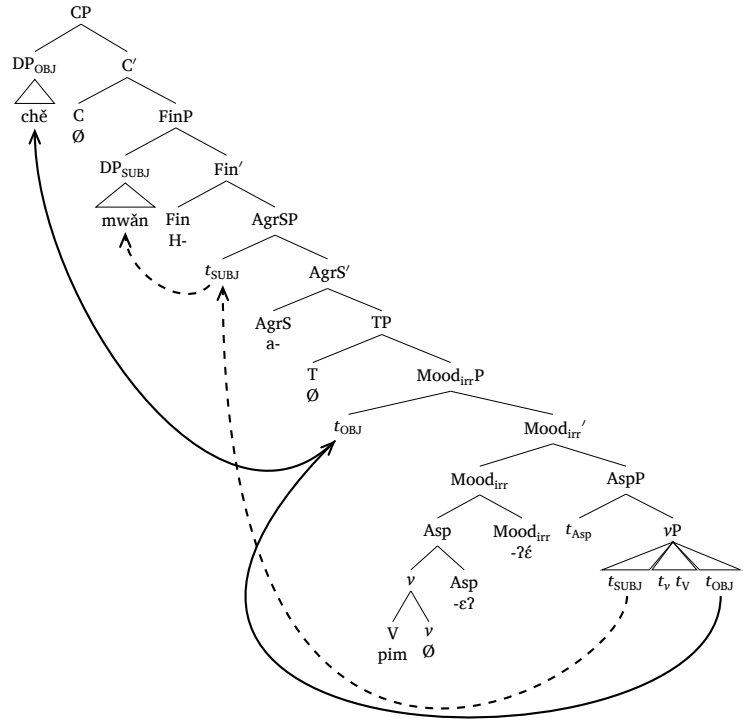
d. However, Irrealis Licensing is subject to the Economy Condition on Operator Movement, so because the subject is a [+*wh*] operator, it cannot make an extra stop in $\text{SpecMood}_{\text{irrealis}}$P, so *-ʔɛ́* does not appear.

e. Although the subject is [+*wh*], it is not [+irrealis], so *Wh*-agreement Licensing is not met, and Ḥ- does not appear.

(57) *Affirmative non-subject extraction*

a. Chě mw-ăn **á**-pim-**ɛ́ɛ́**?
what 1-child **NSE**.1-throw.out-IPFV.**NSE**
'What is the child throwing out?'

b. *Structure*



c. The [+*wh*] object cannot skip the IP layer on its way to SpecCP because of the Locality Condition on Movement, so it lands in $\text{SpecMood}_{\text{irrealis}}$P. This licenses *-ʔɛ́* even though it is an affirmative context. The Economy Condition on Operator Movement is subject to the Locality Condition, so this extra link is licit.

d. The object is both [+*wh*] and [+irrealis],[8] so it licenses Ḥ- via upward agreement, according to *Wh*-agreement Licensing.

(58) *Negative non-subject extraction*

a. Chě mw-ăn **é**-pim-ɛ́ɛ́?
what 1-child **NSE**.1-throw.out-IPFV.IRR
'What isn't the child throwing out?'

b. The derivation proceeds as in (57).

(59) Ultimately, the Ḥ- prefix is the only instance of **true *wh*-agreement**, where an element agrees with a *wh*-element. The suffixes effectively mark extraction, not because of an agreement relation between any suffix and the *wh*-element, but rather due to the interaction of the principles in (52).

6 Extraction sites in central adverbial clauses

(60) The analysis of Akɔɔse *wh*-agreement presented above allows us to narrow the field of possible extraction sites for the relativizing operators in central adverbial clauses.

6.1 Central temporal clauses

(61) **Extraction site hypotheses:**

a. In the IP layer, in SpecAspP (Demirdache & Uribe-Etxebarria 2004)

b. In the IP layer, in a temporal projection (Haegeman 2007: 293)

c. In the VP layer, as a PP-type adjunct (Larson 1987, 1990)

[8] We know the object is [+irrealis] because it licenses *-ʔɛ́*; I will remain agnostic as to whether it must be [+irrealis] in the numeration or whether it becomes [+irrealis] when it lands in $\text{SpecMood}_{\text{irrealis}}$P.

(62) The **non-subject** extraction marking in Akɔɔse central temporal clauses suggests that the locus of extraction for the temporal operator is **VP-internal**, just like objects and the temporal adjuncts that trigger non-subject extraction marking. This conclusion supports hypothesis (61c).

(63) a. Above $\text{Mood}_{\text{irrealis}}$P: Could not move through $\text{SpecMood}_{\text{irrealis}}$P, which is necessary to license the irrealis suffix.
b. In $\text{SpecMood}_{\text{irrealis}}$P: Derivation works, but why should a temporal operator be generated here?
c. In the IP layer below $\text{SpecMood}_{\text{irrealis}}$P: Would not need to move through $\text{SpecMood}_{\text{irrealis}}$P before going to SpecCP.
d. **In the VP layer:** Derivation works.

6.2 Central conditional clauses

(64) **Extraction site hypotheses:**
a. In the VP layer (Bhatt & Pancheva 2006, at least implicitly)
b. In the IP layer, in $\text{SpecMood}_{\text{irrealis}}$P (Haegeman 2007: 302–303, 2009b: 39–42, 2010b: 608–609)
c. In the CP layer, in SpecFinP (Haegeman 2010a: 636)

(65) The subject extraction marking in Akɔɔse central conditional clauses suggests that the relevant operator originates **above $\text{Mood}_{\text{irrealis}}$P** or **in the IP layer, below $\text{Mood}_{\text{irrealis}}$**. This is compatible with hypothesis (64c).

(66) a. **Above $\text{Mood}_{\text{irrealis}}$P:** Derivation works.
b. In $\text{SpecMood}_{\text{irrealis}}$P: Would license *-ʔɛ́*, but this does not appear.
c. **In the IP layer below $\text{SpecMood}_{\text{irrealis}}$P:** Derivation works.
d. In the VP layer: Would pattern like non-subjects and the temporal operator, stopping in $\text{SpecMood}_{\text{irrealis}}$P and triggering non-subject extraction morphology.

7 Conclusion

(67) *Wh*-agreement provides compelling morphological evidence for a movement-based derivation of adverbial clauses.

(68) Due to its sensitivity to the operator status and structural position of moved elements, Akɔɔse *wh*-agreement (in the broad sense) lends insight into the question of where the moved elements originate.

(69) **Theoretical questions:**
a. Does the derivation of adverbial clauses involve movement?
- Yes (central)
- No (peripheral)

c. What is the site of extraction for the moved element?
- Somewhere in the VP layer (temporal)
- Somewhere above $\text{Mood}_{\text{irrealis}}$P or below $\text{Mood}_{\text{irrealis}}$ within the IP layer (conditional)

e. How should we classify types of adverbial clauses to account for variation in answers to these questions?
- Central vs. peripheral
- Temporal vs. conditional

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