Morphological evidence for a movement analysis of adverbial clauses

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1 Introduction

Beginning with Geis (1970), several authors have suggested that the internal syntax of adverbial clauses may be amenable to a movement analysis. If movement is indeed involved in the derivation of these clauses, we may ask several questions, including what moves, where this moved element originates, where it lands, and how adverbial clauses should be classified to account for variation in answers to these questions. This paper contributes to this line of inquiry by examining morphological evidence from the Bantu language Akɔɔse regarding extraction sites in the derivation of adverbial clauses.

Akɔɔse [bss] (A15C), spoken in southwest Cameroon, exhibits wh-agreement; that is, its verbs are marked with respect to whether an element has been extracted to the left periphery (the CP layer). This morphological reflex of movement encodes whether the extracted element originated above or below v. In addition to the canonical wh-movement contexts (Chomsky 1977), this extraction morphology is present in temporal and conditional adverbial clauses. We thus have a way to identify the path of movement in these clauses.

The Akɔɔse wh-agreement data show that temporal and conditional clauses may be distinguished syntactically by their locus of extraction, but central and peripheral (Haegeman 2003) are the relevant categories for determining whether the derivation of a given adverbial clause involves movement or not, as argued by Haegeman (2007, 2009a, 2009b, 2010a, 2010b). As shown by the examples in (1), central adverbial clauses modify the event or state of affairs in the main clause.

(1) 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.

Peripheral adverbial clauses, on the other hand, provide discourse background for the main clause, are anchored directly to the speaker or speech time, and may contain epistemic modality expressions (Haegeman 2007:285–286). Examples are given in (2).

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Peripheral adverbial clauses

a. The solution seems straightforward, [although I never would have come up with it myself].

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

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

The paper begins in §2 with a brief summary of some of the arguments that have been presented in favor of a movement analysis of temporal and conditional adverbial clauses. Next, we turn to Akoose, laying out the facts of wh-agreement in §3 before showing in §4 how this extraction morphology points to and helps refine a movement analysis of adverbial clauses. Finally, in §5 we see the impact of this study and suggestions for future research.

2 Movement analyses of adverbial clauses

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, 2009b, 2010a, 2010b). We will review a few of the main arguments here, but see Haegeman 2007, 2010a for further discussion.

Some have argued that temporal clauses involve movement while conditional clauses do not, but recent work has called this into question, suggesting that central temporal and central conditional clauses both involve movement, but peripheral clauses do not. We will examine these claims here and then later see that the Akoose wh-agreement data support the latter conclusion.

2.1 Are conditional clauses derived via movement?

Several researchers have argued for a movement analysis of temporal adverbial clauses (Geis 1970; Larson 1987, 1990; Dubinsky & Williams 1995; Demirdache & Uribe-Etxebarria 2004; Haegeman 2007, 2009a, 2010a; among others). The original claim stems from the observation that there is ambiguity in the interpretation of some temporal adverbial clauses, like the one in (3). In the first reading, the recommendation letter is on time; in the second reading, it is late.

(3) Ambiguity in temporal clauses (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.

   \[ [PP \text{ after } [CP \text{ OP}_1 [IP \text{ he said } [CP [IP \text{ he needed it } t_1 ]]]]] \]

b. Low: The professor wrote the letter after the deadline.

   \[ [PP \text{ after } [CP \text{ OP}_1 [IP \text{ he said } [CP [IP \text{ he needed it } t_1 ]]]]] \]

As Geis (1970) and Larson (1987, 1990) point out, this ambiguity is expected if there is a temporal operator that moves in the derivation of the adverbial clause. If
this moved element is extracted from the lowest clause, the reading in (3b) results; if it is extracted from the second lowest clause, we get the reading in (3a).\(^1\)

However, the low construal reading is unavailable for conditional clauses, as demonstrated in example (4). For the speaker to buy the car, it is necessary that the addressee consider it to be a good deal; it is not sufficient for it to be a good deal in anyone else’s estimation.

(4) *No ambiguity in conditional clauses*

I’ll buy this car [if you think it’s a good deal].

a. High: My buying this car is conditional upon your evaluation.

b. *Low: My buying this car is conditional upon its value.

This lack of low construal casts doubt on a movement analysis for conditionals, as pointed out by Geis (1970), Iatridou (1991), and Citko (2000).

Other evidence suggests, however, that movement is involved even for conditionals (Bhatt & Pancheva 2006; Arsenijević 2009; Tomaszewicz 2009; Haegeman 2007, 2009b, 2010a, 2010b), as we will see below.\(^2\) Haegeman (2009b, 2010b) argues that the unavailability of low construal is due to the extraction site of the operator; for her, it is an irrealis operator originating in Mood\(_{irrealis}\), high in the IP layer. Like high adverbs, the irrealis operator cannot take part in long movement.

2.2 Argument fronting in English

One of the main arguments in favor of unifying temporal and conditional clauses in terms of a movement-based derivation is that both types of clauses disallow main clause phenomena (Hooper & Thompson 1973; Heycock 2006) including argument fronting in English (Emonds 1970, 1976, 2004; Rutherford 1970; Hooper & Thompson 1973; Adger et al. 2004; Haegeman 2007). As shown in (5), English main clauses allow arguments to be fronted.

(5) **Argument fronting allowed in main clauses**

[\[TopP This book [\[IP you should read this book next summer]]]]

As shown by Haegeman (2003, 2007, 2009a, 2009b, 2010a, 2010b), central adverbial clauses, such as the ones in (6–7), do not allow argument fronting.

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

*[\[CP When [\[TopP this movie [\[IP she saw this movie]]]]], she hated it.]

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1Supporting evidence for movement analyses of temporal adverbial clauses comes from similarities in some languages between temporal conjunctions and interrogatives (like English *when*) or IP-internal adverbs (like Dutch *toen* ‘when/then’), and in some cases we have diachronic evidence that the temporal conjunctions developed from these forms. We would expect that a temporal conjunction derived from an interrogative could continue to move to the left periphery via *wh*-movement, and a shift from using an adverb IP-internally to using it in the left periphery also implies movement. See Haegeman (2007:297–300) for further discussion.

2Just as temporal adverbial clauses have properties that bear resemblance to other movement-driven constructions, conditional clauses in some languages show similarities to relative clauses (French, for instance), and IP-internal adverbs may sometimes introduce conditional clauses. French, English, and Dutch ‘if’ may be related to these adverbs. Haegeman (2007:300–302) discusses these arguments in more depth.
Argument fronting disallowed in central conditional clauses

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

This pattern stands in contrast to the behavior of peripheral adverbial clauses, which act like main clauses in allowing argument fronting, demonstrated in (8).

Argument fronting allowed in peripheral adverbial clauses

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

Haegeman (2007 and following) treats the failure of argument fronting in central adverbial clauses as an intervention effect. Just as subjects cannot be fronted across another fronted argument, temporal or conditional operators cannot move across fronted arguments. Peripheral adverbial clauses do not involve movement, so there is no intervention effect.

With this understanding of approaches to the internal syntax of adverbial clauses, we will examine data from Akko\texttextsl{e} that will provide compelling evidence for a movement analysis of both central temporal and central conditional clauses and shed light on the extraction sites for the moved elements in each type of clause.

3 Akko\texttextsl{e} wh-agreement

3.1 Wh-agreement: a morphological reflex of syntactic movement

The term wh-agreement is used to cover a range of phenomena whereby a language morphologically marks the path of syntactic movement. The most well-known examples include “complementizer agreement” in Irish (McCloskey 1979, 1990, 2001) and “wh-agreement” and “operator-C agreement” in Chamorro (Chung 1982; Chung & Georgopoulos 1988; Chung 1994, 1998).

Early attempts to characterize wh-agreement within generative syntactic theory relied on Binding Theory (Clements 1984; Haïk 1990), but subsequent pre-Minimalist analyses focused on spec-head agreement (Watanabe 1996; Chung 1998). In the Minimalist Program, Chomsky’s (2000, 2001) Agree operation and theory of phases have been used to drive agreement and subsequent movement (Reintges \textit{et al.} 2006; Lahne 2008). Here we will not concern ourselves with the details of the mechanisms by which the syntax is reflected in the morphology; instead, we will use wh-agreement as a morphological indicator for the presence of syntactic movement.

3.2 The Akko\texttextsl{e} data

Akko\texttextsl{e}, a Bantu language spoken in southwest Cameroon, displays a type of wh-agreement in which the verb is morphologically marked when an element in its clause has been extracted to the left periphery. Crucially, extraction of a subject is marked differently from extraction of non-subjects (Hedinger 1985, 2008).\footnote{This is somewhat of a simplification. In fact, the three-way distinction between non-subject, subject, and no extraction is sometimes neutralized to a two-way distinction where either the subject or non-subject extraction forms are syncretic with the no extraction forms. This depends primarily on polarity (all affirmative forms conflate no extraction and subject extraction), and to a certain de-}
Akɔse extraction marking is realized by tonal changes and fusional affixes; refer to Hedinger (1985, 2008:100–150) for a morphophonological description of the system.

Akɔse wh-agreement occurs in canonical wh-constructions, such as constituent questions, relative clauses, and focus constructions, which have been treated in a unified fashion since Chomsky 1977. We will use examples of these constructions to show that wh-agreement is a reliable indicator of movement.

### 3.2.1 Wh-questions

Extraction marking occurs in wh-questions involving movement, as shown in (10–11). The declarative sentence in (9) is given for comparison. These questions are sensitive to syntactic islands, so they do involve movement (Robert Hedinger, pers. comm.). The verb in example (9) is é-pim-έ; this form is not marked for extraction. When the subject is extracted in (10), the verb becomes é-pim-e. The fact that the object is extracted in (11) is reflected in the verb form é-pim-e.

(9) **No extraction**

Mw-ǎn é-pim-έé Ǒ-mbaaŋé.\(^4\)

1-child 1.NEG-throw.out-PFV 10-cocoyam

‘The child didn’t throw out the cocoyams.’

(Hedinger 2008:105 (295))

(10) **Wh-subject**

Ǒ-Nzé ə-pim-e Ǒ-mbaaŋé?

1-who 1.NEG-throw.out-SE.PFV 10-cocoyam

‘Who didn’t throw out the cocoyams?’

(Hedinger 2008:105 (295))

(11) **Wh-non-subject**

Ché mw-ǎn é-pim-έé?

what 1-child 1.NSE.NEG-throw.out-PFV

‘What didn’t the child throw out?’

(Hedinger 2008:106 (297))

\(^4\)The transcription system used for Akɔse follows Hedinger (2008:3–10). The symbols that depart from IPA usage are given here with their IPA equivalents: ch [tʃ], g [ɡ], j [dʒ], mb [m̥b, mb], nd [n̥d, nd], ng [ŋ], ny [ɲ], nz [ɲz, n̥z], y [j], ’ [ʔ]. Low tones are unmarked except in contour tones.

\(^5\)I have occasionally adjusted Hedinger’s glosses and translations for clarity and consistency, following the Leipzig Glossing Rules wherever possible. Abbreviations used include 1SG = 1st person singular, 2PL = 2nd person plural, 3PL = 3rd person plural, 3SG = 3rd person singular, APPL = applicative, CAUS = causative, COMP = complementizer, COP = copula, FUT = future, HORT = hortative, INF = infinitive, IPFV = imperfective, LOC = locative, NEG = negative, NSE = non-subject extraction, PERS = personifier, PFV = perfective, POSS = possessive, 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 Akɔse, most odd-numbered noun classes are singular, while most even-numbered noun classes are plural.
Extraction morphology does not occur in *wh*-in-situ questions like (12), suggesting that Akɔsɛ *wh*-in-situ does not involve movement.⁶

(12) Wh-**non-subject in situ**
    A-n-nyɛn-Ø Ø-nzé?
    1-PST-see-PFV 1-who
    ‘Who(m) did he see?’ (Hedinger 2008:195 (475))

### 3.2.2 Relative clauses

Relative clauses are introduced by relative pronoun agreeing with the head or a clitic attached to the head. As (13–14) illustrate, extraction marking occurs in relative clauses just as it does in *wh*-questions.

(13) **Subject relative**
    mw-ání aw-ɛ ɛ-pim-e Ø-mbaaŋɛ
    1-child 1-REL 1.NEG-throw.out-SE.PFV 10-cocoyam
    ‘the child who didn’t throw out the cocoyams’ (Hedinger 2008:105 (295))

(14) **Non-subject relative**
    Ø-mbaaŋɛ éch-e mw-ání é-pim-ɛɛ
    10-cocoyam 10-REL 1-child 1.NSE.NEG-throw.out-PFV
    ‘the cocoyams that the child didn’t throw out’ (Hedinger 2008:106 (297))

### 3.2.3 Cleft questions

In the cleft question construction, the negative copula brings a phrase into focus (Hedinger 2008:198,210). When the focused phrase is a non-subject, we see non-subject extraction marking, as in (15). Hedinger (2008) does not give any examples where the subject is focused.

(15) **Clefted non-subject**
    Saá áw-ī e’-wɔŋɛ ɛɛ-m-bɛ=ɛɛ
    NEG.COP LOC-3SG.POSS 14-marriage 1SG.NSE.PST-be=Q
    ‘Wasn’t it to him I was married?’ (lit. ‘Isn’t it in his marriage I was?’) (Hedinger 2008:198 (492))

### 3.2.4 Topicalization

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:

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⁶Some languages with *wh*-agreement and *wh*-in-situ do show extraction morphology in *wh*-in-situ; see Reintges *et al.* (2006) for an analysis of such cases.
3.2.5 Extracted temporal adjuncts

Importantly for our discussion of adverbial clauses, when a temporal adjunct is the extracted element in a wh-construction, the verb displays non-subject extraction morphology, as shown in (18–20).

(18) Wh-adjunct
Ø-Póndé e-hée á-pédé hén?
9-time 9-which 1.NSE-arrive.PFV here
‘When did she get here?’ (Hedinger 2008:197 (486))

(19) Relative adjunct
m-bwé=ê³ á-péén-ê mém-ê m-ɔnê wê Ø-kúl-ê
3-day=REL 1.NSE-take-PFV 3.that 3-money to 9-tortoise-PERS
‘the day he took the money to Tortoise’ (Hedinger 2008:59 (156))

(20) Topicalized adjunct
Bɔɔb d-ɔ nyábɔɔ-³dyéé.
now 5-TOP 2PL.3PL.FUT.NSE-eat.PFV.NSE
‘Now you and they will eat.’ (Hedinger 2008:201 (508))

3.3 Syntactic analysis

There are widely divergent analyses of wh-agreement (Zaenen 1983; Clements 1984; Watanabe 1996; Chung 1998; Reintges et al. 2006; Lahne 2008), and we will not entertain the details of these proposals here.\(^7\) It is sufficient to note that the distribution of subject versus non-subject agreement in Akɔse may be attributed to whether the extracted element needs to pass through the edge of vP or not.

When a non-subject is extracted, it must pass through the edge of vP in order to be available to be raised to the left periphery; this is shown for an object in (21).

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\(^7\)However, given the presence of wh-agreement in central adverbial clauses and the independent evidence for movement in those clauses, it seems that movement-based approaches to wh-agreement would be preferable to those relying solely on case binding.
For subject extraction, the subject originates above $v$, so no movement is necessary for it to be available for extraction to the left periphery. This is illustrated in (22).

We may conclude that subject $wh$-agreement morphology indicates that the moved element is extracted from above $v$, while non-subject $wh$-agreement morphology indicates that the moved element is extracted from below $v$.

4 Wh-agreement in adverbial clauses
In addition to occurring in classic $wh$-constructions, Akkoøse extraction morphology appears in certain types of adverbial clauses. This is not unique to Akkoøse (see McCloskey 2001:71,82–87 for Irish), but Akkoøse’s sensitivity to the height of extraction provides additional information that sheds light on where the moved elements originate.
4.1 Temporal adverbial clauses

In Akọse temporal adverbial clauses, the verb receives non-subject extraction morphology, as shown in (23–26).

(23) Áde ‘when’ with non-subject extraction marking
Áde mw-än é-pim-εε Ø-ambaŋgé, ...
when 1-child 1.NSE.NEG-throw.out-PFV 10-cocoyam
‘When the child didn’t throw out the cocoyams, ...’
(Hedinger 2008:106 (297))

(24) Hẹe ‘then’ with non-subject extraction marking
Hẹe an-e mw-än á-tím-é ṣambíd ábwọg∼ábwọg.
then 1-that 1-child 1.NSE-return-PFV back immediately
‘Then that child returned immediately.’
(Hedinger 2008:185 (432))

(25) Ngáne ‘as’ with non-subject extraction marking
Ngáne Ø-nguu é-péd-é hén, ...
as 9-pig 9.NSE-arrive-PFV here
‘As pig arrived here, ...’
(Hedinger 2008:227 (600))

(26) Nẹe ‘as, when, after’ with non-subject extraction marking
Nẹe Ø-sánkala n-hóg n-e mw-ën á-húú ámín,
as 1-big 3-(fruit) 1-that 1-self 1.NSE-return.PFV up
a-bəm-ε Ø-kúl-ε á Ø-mbíd te, toóy.
a-knock-PFV 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))

The presence of extraction morphology in Akọse central temporal clauses makes a strong case for movement in their derivation. We should also consider how the data in (23–26) come to bear on the question of where the temporal operator originates. At least three possibilities have been raised in the literature, shown in (27):

(27) Temporal operator 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)

The non-subject (low) extraction marking in Akọse central temporal clauses suggests that the locus of extraction for the temporal operator is VP-internal, just like objects and the temporal adjuncts in §3.2.5. This supports hypothesis (27c).
4.2 Conditional clauses

Conditional clauses are the only class of adverbial clauses that show “subject” extraction marking in Akọse; examples are given in (28–29).

(28) Nzé ‘if’ with subject extraction marking

Ø-Pọpẹ e-kút-ẹ, nzé ẹ-yọg-e bwǎm.
9-papaya 9-crack.APPL-IPFV if 9.NEG-ripe-SE.PFV well

‘Papaya cracks if it is not fully ripe.’ (Hedinger 2008:237 (657))

(29) Nzé ‘if’ with subject extraction marking

Nzé bẹ-hīd-e éch-ẹ Ĭ-mbẹndé á mbād, ẹ-yāk-ẹ
if 2.NEG-follow-SE.PFV 10-that 10-law LOC 9-back 10-always-PFV
a-bẹ něn mw-ān á-kud Ø-mbēb.
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))

It is clear here that “subject” extraction marking is somewhat of a misnomer; what is moving in these conditional clauses is not the subject but something else, perhaps a possible world operator as in Bhatt & Pancheva 2006 or an irrealis operator as in Haegeman 2009b, 2010b. Hypotheses for where this operator originates are given in (30).

(30) Conditional operator extraction site hypotheses

a. In the VP layer (Bhatt & Pancheva 2006, at least implicitly)
c. In the CP layer, in SpecFinP (Haegeman 2010a:636)

The subject (high) extraction marking in Akọse central conditional clauses suggests that the locus of extraction for the relevant operator is not VP-internal. This supports hypotheses (30b–c).

4.3 Peripheral adverbial clauses

Peripheral adverbial clauses in Akọse have verbs with no extraction morphology:

(31) Kénɛɛ ‘although, even though’ with no extraction marking

Aá á-chọ́g mó m-bọ́j, kénɛɛ Ọ-ngọ́
3SG.QUOT 1-call.HORT.PFV 1 3-nickname although 9-leopard. PERS
ě-hrl-ɛ́ ɪ́mm-ɛ m-bọ́j a-chọ́g.
1.NEG-can-PFV 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))

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.
5 Conclusion

This paper contributes to the line of research investigating the internal syntax of adverbial clauses by highlighting the usefulness of $wh$-agreement in tracing the path of syntactic movement, adding morphological evidence to the syntactic, semantic, and etymological arguments for a movement-based derivation of adverbial clauses. Due to its sensitivity to height of extraction, Akɔsẹ $wh$-agreement lends insight into the question of where the moved elements in adverbial clauses originate, suggesting that the locus of extraction for temporal operators is VP-internal, while the operator in conditional clauses originates in a position above $v$. Temporal and conditional clauses are thus distinguished syntactically by their extraction sites, while central and peripheral adverbial clauses are distinguished syntactically by the presence or absence of movement.

Further research should explore how other languages with $wh$-agreement display this morphology in adverbial clauses. For Akɔsẹ specifically, more work needs to be done to clarify whether some subordinators may introduce both central and peripheral clauses (like while, since, if in English). Few examples were found where the verb in peripheral clauses could be analyzed unambiguously with respect to its extraction morphology, so it would be helpful to elicit more peripheral adverbial clause examples, controlling for the factors conditioning syncretism in the extraction morphology paradigm.

References


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