

Two types of temporal adverbial clauses in Cantonese

Ka-Fai Yip
Yale University

The typology of adverbial clauses

Adverbial clauses, according to their internal and external syntax, may be dichotomized into two groups: central and peripheral adverbial clauses (Haegeman 2003, 2010 *i.a.*). Temporal adverbial clauses (TACs) belong to central adverbial clauses and are assumed to have operator movement (e.g. *when*) and a lower attachment site to the main clause (Geis 1970, Larson 1987, Haegeman 2009). In Cantonese, TACs may be headed by either *hai* ‘at’ in (1) or *dong* ‘at, while’ in (2):

- (1) *Hai Aafan fan-gan gaau gozan, Aaming lai wan keoi* (hai-TACs)
at Fan sleep-PROG nap that.time Ming come find 3SG
‘M. came find F. when she was sleeping.’
- (2) *Dong Aafan fan-gan gaau gozan, Aaming lai wan keoi* (dong-TACs)
while Fan sleep-PROG nap that.time Ming come find 3SG
‘M. came find F. while she was sleeping.’

However, it is observed that *hai*-TACs and *dong*-TACs behave differently in both internal and external syntax. Specifically, while *hai*-TACs act like central adverbial clauses, *dong*-TACs do not. This suggests that temporal adverbial clauses, classified by a *semantic* label, may not be a homogeneous *syntactic* class.

Proposal

I propose that both types of TACs contain a null temporal operator comparable to *when* (hereafter OP_{temp}) but they differ in the position of the operator. In *hai*-TACs, OP_{temp} is base-generated in the TP domain and undergoes operator movement to CP to form an adverbial clause, schematized in (3). In *dong*-TACs, in contrast, OP_{temp} is base-generated higher at CP and does not require further movement as in (4).

- (3) *Hai*-TACs with operator movement: (4) *Dong*-TACs with operator base-generated at CP
hai [CP $\overbrace{OP_{temp}}$ [C ... [TP ... *t* ...]]] *dong* [CP $\overbrace{OP_{temp}}$ [C ... [TP ...]]]

I show how this proposal may capture the internal syntax of the two types of TACs by locality restrictions and minimality effects associated with the operator movement. Further evidence for the existence of OP_{temp} comes from an agreement marker *-haa*. I also discuss how the proposal may relate the internal and external syntax of TACs in terms of the height of operator generation sites and attachment sites to main clauses.

High-low reading and locality

First, *hai*-TACs are ambiguous between a ‘high’ reading and a ‘low’ reading when they further embed a CP (*cf.* English as Larson 1987 & Mandarin as Liou 2003). (5) contains an odd ‘high’ reading that I am alive for thousands of years. Yet, it also allows for a felicitous ‘low’ reading that I am alive in 2012, the foretold year of apocalypse.

- (5) *Hai*_{[CP Maangaa jan jyujin [CP saigaai wui waimit]] gozan, ngo zung saangngaungau.}
 at Maya people foretell world will destroy that.time 1SG still alive
 i. #‘I’m still alive at the time when Maya people made the apocalyptic prophecy.’ (high read.)
 ii. ‘I’m still alive at the time when Maya people predicted to be the end of the world.’ (low read.)

Notably, the ‘low’ reading disappears when the lower CP is contained in an NP:

- (6) #*Hai* [Maangaajan gong_{[NP [CP saigaai wui waimit] ge jyujin]] gozan, ngo zung saangngaungau.}
 at Maya ppl. say world will destroy MODprophecy that.time 1SG still alive
 #‘I’m still alive at the time of Maya people making the apocalyptic prophecy.’ (only high r.)

Under (3), the (non-)availability of the ‘low’ reading can be explained by long distance movement of OP_{temp} from the lower CP to the higher CP which is barred from a complex NP island. Contrarily, *dong*-TACs can only be interpreted ‘high’ and they lack a ‘low’ reading as in (7):

- (7) #*Dong* [CP Maangaajan jyujin [CP saigaai wui waimit]] gozan, ngo zung saangngaungau.
 while Maya ppl. foretell world will destroy that.time 1SG still alive
 #‘I’m still alive at the time when Maya people made the apocalyptic prophecy.’ (only high r.)

(7)’s reading follows directly from (4) where OP_{temp} is merged directly to the (higher) CP without movement.

Quantificational elements and minimality effects

Second, occurrence of identificational focus marked by *hai* ‘be’ (bears a different tone with *hai* ‘at’) is disallowed in *hai*-TACs yet is allowed in *dong*-TACs, contrasted in (8). The contrast carries over to ‘only’ focus *dak* and epistemic modal *jinggoi* ‘should’ etc.

- (8) **Hai*^{OK}*dong* [*hai-Aaming* fangaau] gozan, lousi zau faatnau.
 at while be-Ming sleep that.time teacher thenbecome.mad
 ‘The teacher became mad *when/^{OK}while it was MING (but not someone else) that fell asleep.’

The ban on focus (and modals) could be explained by Rizzi’s feature-based Relativized Minimality (2001, 2004), where a Qu(antificational) element may disrupt a syntactic dependency like *wh*-movement. Both focus and modals are classified as Qu elements and they also block ‘why’ and A-not-A dependencies in Chinese (Law 2001, Soh 2005, Hagstrom 2006, Tsai & Yang 2015). Hence, the contrast in (8) can be accounted for if *hai*-TACs involve operator movement while *dong*-TACs do not. Qu elements induce minimality effects and disrupt OP_{temp} movement in *hai*-TACs but not in *dong*-TACs, diagrammed below.

- (9) Minimality effects in *hai*-TACs: (10) Lack of minimality effects in *dong*-TACs
 **hai* [CP OP_{temp} [C ... Z_[+Qu] [TP ... t ...]]] *dong* [CP OP_{temp} [C ... Z_[+Qu] [TP ...]]]

Note that only Qu elements *higher* than TP would block the movement in (9). Deontic modals, for example, are lower than TP (Tsai 2015) and may occur in *hai*-TACs. These low Qu elements can only induce minimality effects if OP_{temp} originates *lower* than them, e.g. in an embedded CP. Hence, a *hai*-TAC with a deontic modal is predicted to lack a ‘low reading’. The prediction is borne out:

- (11) #*Hai*[_{CP} *Maangaa jan* hoji *juujin* [_{CP} *saigaai wui waimit*]] *gozan, ngo zung saangngaungau.*
 at Maya people can foretell world will destroy that.time 1SG still alive
 #‘I’m still alive at the time when Maya people could make the apocalyptic prophecy.’ (only high r.)
- (12) *hai* [_{CP} **OP_{temp}** [C ... [TP *t_{high}* ... Modal^{Deontic}[+Qu]]]]] [_{CP} ... *t_{low}*]]]] (minimality blocks long-d. mvt.)
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Temporal agreement marker -*haa*

The existence of null *OP_{temp}* in TACs receives further support from *-haa*, a progressive suffix on reduplicated verbs (Matthews & Yip 1994). Clauses with *-haa* lose clausal independency and must attach to a main clause (= (13)). While it may be reminiscent of English participle *-ing*, the subordinate clause in (13) differ from *-ing* in bearing only temporal reading (i.e. they are TACs), resisting of conditional, causal or concessive interpretation even if the respective subordinators are added.

- (13) *Aafan fanfan-haa gaau, *(Aaminglai wankeoi)*
 Fan RED.sleep-HAA nap Ming come find 3SG
 ‘Ming came find Fan when she was sleeping.’

The obligatory TAC formation by *-haa* can be explained if we assume that it establishes an agreement relation with the temporal operator. One argument comes from the ban on *low* Qu elements in TACs with *-haa*. Negation is disallowed in (14), which can be made grammatical by replacing *haa* with another progressive suffix *-gan*. The same is true for *lin* ‘even’-focus, deontic modals and quantificational adverb ‘often’, etc. Crucially, they are also banned in *hai*-TACs and *dong*-TACs once *-haa* is present.

- (14) * (*Hai/dong*) [*Aafan* m-hai *fanfan-haa gaau*] *gozan, Aaming lai wankeoi*
 at while Fan NEG-be RED.sleep-HAA nap that.time Ming come find 3SG
 Int.: ‘Ming came find Fan when she wasn’t sleeping.’

The surprising constraint on low Qu elements in *hai/dong*-TACs with *-haa* supports an agreement analysis, where the syntactic dependency between *-haa* and *OP_{temp}* may be disrupted by minimality effects:

- (15) ‘Extra’ minimality effects in *hai*-TACs and *dong*-TACs with *-haa*:
 hai/dong* [_{CP} **OP_{temp} [C ... [TP (*t*) ... Z[+Qu] ... [AspP *-haa*_[temp] ... [_{vP} ...]]]]]] (agree blocked)
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Internal syntax correlates with external syntax

Apart from internal syntax, *hai*-TACs and *dong*-TACs are also different in external syntax. Only *hai*-TACs, but not *dong*-TACs, may follow a main clause subject (also attested in Mandarin, see Wang & Feng 2015):

- (16) *Aaming* [^{OK}*hai*/**dong* [*Aafan fan-gan gaau*] *gozan*] *lai wan keoi*
 Ming at while Fan sleep-PROG nap that.time come find 3SG = (1)/(2)

(16) is indicative of their attachment sites to main clauses: while *hai*-TACs may occur *within* a TP and follow a subject (presumably at Spec,TP), *dong*-TACs must occur *outside* a TP, i.e. it attaches

to a CP. Together with their generation sites of OP_{temp} , a correlation between internal and external syntax can be drawn: If the operator originates from TP, the TACs (i.e. *hai*-TACs) may attach to a TP; whereas if the operator base-generates higher at CP, the TACs (i.e. *dong*-TACs) will attach to a bigger clause CP rather than TP. The height of operator sites seems to determine the attachment sites (*cf.* Endo & Haegeman 2019).

Implications

- (a)** Temporal adverbial clauses, at least in Cantonese, are not uniformly central adverbial clauses and differ in their base-generation sites of temporal operators and attachment sites to main clauses. The distinction may extend to Mandarin, or even other languages like English where *while*-clauses are reported to lack a ‘low’ reading, unlike *when*-clauses (Larson 1990).
- (b)** Cantonese TACs lend potential support to Endo & Haegeman (2019)’s claim that the internal syntax of adverbial clauses determines their external syntax.

Selected references

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Ka-Fai Yip: kafai.yip@yale.edu