The Perfect Time Span and temporal remoteness marking in Chuj

Introduction. This project presents the first formal analysis of the semantics of remoteness markers in Chuj (Mayan). Carolan (2015) identifies a remoteness distinction seen in Chuj markers *x* and ∅, which she analyzes as hodiernal and pre-hodiernal past perfectives, respectively. My data, collected via acceptability judgement tasks (Bochnak & Matthewson 2015), confirms the use of these markers as hodiernal and pre-hodiernal but points toward a tenseless analysis of Chuj's aspect markers (Author 2025). Additionally, the aspectual reference of these markers is more adequately analyzed as a combination of perfect and perfective. This project expands on my previous work by presenting a more fine-grained analysis of these two markers, informing our understanding of aspectual and remoteness marking cross-linguistically.

My analysis is couched in a Neo-Reichenbachian framework (Reichenbach 1947; Klein 1994), in which temporal reference (TR) is the relationship between topic time (TT), the time being talked about, and utterance time (UT). Tense is the grammatical expression of TR. Aspectual reference is the relationship between TT and event time (ET), and aspect is the grammatical expression of aspectual reference.

Proposal. Instead of marking a relationship between TT and UT as proposed in Carolan (2015), I analyze *x* and ∅ in Chuj as relating TT and ET. The two markers combine properties of perfects and perfectives, similar to Atayal *wal* (Chen 2017). Because these markers permit universal and experiential readings, I adopt a Perfect Time Span analysis (Iatridou et al. 2001; a. o.).

Evidence. The examples in (1) demonstrate the remoteness distinction exhibited by *x* and ∅; (1a) and (1b) show that only *x* is compatible with a hodiernal reading, as *x* is felicitous in an utterance about an event occurring on the day of UT (1a), while ∅ is infelicitous in this environment (1b). (1c) and (1d) show that only ∅ is compatible with a pre-hodiernal reading, since the utterance describes an event occurring the day before UT, and while ∅ is felicitous, *x* is not. Next, the data also shows that both markers are compatible with past-time temporal adverbials and utterances that answer when an event occurred. Both of these properties are generally associated with perfectives rather than perfects or existential pasts (Bertrand et al. 2022).

(1) Context: You moved to Alabama. Your friend calls you at 9pm and asks you what time you arrived there.

a. **X**-in-jaw a 5 yemxkual.
   X-B1S-arrive PREP 5 afternoon
   'I arrived (today) at 5pm.'

b. #(∅) Jaw-in a 5 yemxkual.
   ∅ arrive-B1S PREP 5 afternoon
   Intended: 'I arrived (today) at 5pm.'

c. (∅) Jaw-in ewi a 5 yemxkual.
   ∅ arrive-B1S yesterday PREP 5 afternoon
   'I arrived at 5pm yesterday.'

d. #**X**-in-jaw ewi a 5 yemxkual.
   X-B1S-arrive yesterday PREP 5 afternoon
   Intended: 'I arrived at 5pm yesterday.'

Next, examples (2) and (3) show first that these markers do not encode tense, as both markers are compatible with future TR. Second, these two examples demonstrate the anterior perfect readings of these markers, as they locate the matrix clause ET before the ET of the *when*-clause. *X* and ∅ are compatible with other readings, including the experiential (4) and universal

(5), associated with the perfect, and narrative progression (6), associated with perfective aspect.

(2) Context: You told your brother you need to put together some furniture. He's arriving at your house tonight, so he asked you if you need any help.
Ma'ay, to **x**-lajw in-b'oni yik ya **x**-a-jawi.
no COMP X-finish A1S-do when ADV X-A2S-come
'No, I will have finished when you come.'

(3) Context: Will you start building your house in 5 years?
Ma'ay, to (**Ø**) lajw in-b'on-ok ayti (**Ø**) s-k'ochi o'e ab'il.
no COMP Ø finish A1S-do-IRR when Ø A3S-arrive five year
'No, I will have finished building (it) when 5 years pass.'

(4) ¿Ay x-ajtil to-x **x**-ach-xit'k a Xela ach?
EXIS X-where COMP-already X-B2S-go PREP Xela PRON.2S
'Have you ever gone to Xela?'

(5) Context: You arrive at home and your mom is cleaning. Your sister tells you:
X-mes ix xon a sk'inhb'ial.
X-clean CLF since PREP morning
'She has been cleaning since this morning.'

(6) Context: What did you do yesterday?
(**Ø**) K'ewa'an-in, (**Ø**) wa'-in, (**Ø**) mesw-in, lajwcha (**Ø**) at-in a in-munjel.
Ø wake.up-B1S Ø eat-B1S Ø clean-B1S then Ø go-B1S PREP A1S-work
'I woke up, ate, did some cleaning, and then I went to work.'

Analysis. The data presented thus far demonstrates that *x* and Ø express properties of perfect and perfective aspects, similar to Atayal *wal* (Chen 2017), while also expressing a hodiernal/pre-hodiernal distinction. The universal and experiential readings in particular point towards a Perfect Time Span (PTS) analysis of *x* and Ø (Iatridou et al. 2001, 2003; Pancheva 2003). The truth conditions of the PTS are provided in (7), and the lexical entries for *x* and Ø are given in (8) and (9). The remoteness distinction is accounted for with the *day-of* functions, which take an interval and return the day surrounding it. For *x*, the day of the event must overlap with the day of the right boundary of the PTS (today, in the case of present TR), and for Ø, the day of the event must precede the day of the right boundary of the PTS.

(7) PTS(t', t) = 1 iff t is a final subinterval of t' (Iatridou et al. 2001, 2003; Pancheva 2003)

(8) $[\![x]\!]^{g,c} = \lambda P_{\langle l,st\rangle}.\ \lambda t.\ \lambda w.\ \exists t'\ \exists e\ [\tau(e) \subset t' \wedge PTS(t', t) \wedge P(e)(w) \wedge day\text{-}of(\tau(e)) = day\text{-}of(t)]$

(9) $[\![\emptyset]\!]^{g,c} = \lambda P_{\langle l,st\rangle}.\ \lambda t.\ \lambda w.\ \exists t'\ \exists e\ [\tau(e) \subset t' \wedge PTS(t', t) \wedge P(e)(w) \wedge day\text{-}of(\tau(e)) < day\text{-}of(t)]$

Bertrand et al. (2022) show that other languages have perfects that are compatible with definite temporal adverbials, meaning that this property of Chuj *x* and Ø does not rule out a perfect aspect analysis. Narrative progression can be accounted for by pragmatic mechanisms, as suggested in Toosarvandani & Anand (2018).

Conclusion. This paper argues that Chuj remoteness markers express perfect and perfective aspect and contributes the first formal semantic analysis of these markers. My data provides additional cross-linguistic evidence of aspect markers combining properties of perfect and perfective aspects, while showing that remoteness distinctions may combine with the Perfect Time Span. Remoteness marking has shown significant variation cross-linguistically in the type of relationships markers encode and whether they behave more tense- or aspect-like (Cable 2013; Bochnak & Klecha 2018; a. o.), and thus Chuj's *x* and Ø provide an additional example, informing our understanding of cross-linguistic variation in temporal expression.

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