Sequence of optional tense **M. Ryan Bochnak - University of Konstanz**

In this paper, I use data on past interpretations of attitude complements in optional tense languages to argue for a syntactic sequence of tense (SOT) rule, and against a pragmatic explanation for apparent SOT effects. In at least some optional tense languages, such as Washo (Bochnak, 2016) and Tlingit (Cable, To appear), an embedded past under a matrix past may receive a so-called "simultaneous" reading, as in (1) for Washo. The interpretation of embedded tense in Washo provides a novel argument for an SOT rule that optionally deletes an embedded semantic tense which is c-commanded by an identical matrix tense (e.g., Ogihara 1989; LF in (2)). The effect of applying the rule is that the reference time (RT) of the embedded clause is bound by the attitude verb, resulting in a simultaneous reading. I argue that such an account can better handle the data than a pragmatic account of simultaneous readings (Altshuler, 2016; Altshuler & Schwarzschild, 2012).

(1) a. Context: When you were a child, you thought that Reno was a really big city. But since then, you've visited Sacramento and San Francisco, which are both much bigger, so you now know that Reno isn't that big after all.

b. *di-meːhu-aʔ liːnu t'iːyeliʔ k'-eʔ**-uŋil**-aʔ di-hamu**-uŋil**-i*
1-boy-DEP Reno big 3-be**-PAST**-DEP 1-think**-PAST**-IND
'When I was a boy, I thought Reno was big.'
= 'When I was a boy, I had the thought: "Reno is big."' (simultaneous)

(2) [PAST I think [that ~~PAST~~ Reno be big]] (SOT schematic)

(Un)available readings. In Washo, finite clauses with past temporal reference may be marked with a past tense (*-uŋil*), or be tenseless/unmarked (Bochnak, 2016). Unmarked clauses in most contexts can have either past or present temporal reference. Given that past marking is optional, there are four possible configurations for past interpretations of attitude verbs and their complements. Overt past marking may appear on the attitude verb, the embedded verb, both, or neither, as shown in (3). Both simultaneous and back-shifted readings are available for all configurations, except when a past tense is embedded under a tenseless clause. In this case, speakers only accept a back-shifted reading; see summary in (4), where "bare" = tenseless clause.

(3) a. Context A: You see a man in the street and say 'Hi Tim!' He tells you his name isn't Tim. You apologize, and say . . .
Context B: You run into your old friend. His name used to be Tim, but you heard that he changed his name since you last saw him.

b. *Tim de-gum-diʔyeʔ M-eʔ(**-uŋil**)-aʔ di-hamu(**-uŋil**)-i*
Tim NMLZ-REFL-name 2-be(**-PAST**)-DEP 1-think(**-PAST**)-IND
'I thought your name was Tim.'
Context A: 'I had the thought: "Your name is Tim."' (simultaneous)
Context B: 'I had the thought: "Your name used to be Tim."' (back-shifted)

(4)

	past-under-past	bare-under-past	bare-under-bare	past-under-bare
simultaneous	✓	✓	✓	#
back-shifted	✓	✓	✓	✓

Past under past. I assume a standard modal semantics of attitude verbs as in (5). The past tense in (6) combines first with a predicate of times, then a temporal pronoun denoting RT. In matrix contexts, the evaluation time (ET) j is equated with the speech time (ST). I use the notation $\text{PAST}_{i,j}$ as a shorthand to indicate a past tense with its RT (i) and ET (j) indices.

(5) $[\![\textit{hamu}]\!] = \lambda P_{\langle i,\langle s,t\rangle\rangle}\lambda x\lambda t\lambda w.\forall\langle w',t'\rangle \in \text{Dox}_x(t)(w) \rightarrow P(t')(w')$

(6) $[\![\text{PAST}_{i,j}]\!] = \lambda P_{\langle i,st\rangle}\lambda i\lambda j\lambda w.P(i)(w) \wedge i < j$ (adapted from Klecha 2016)

Applying the SOT rule to the past-under-past version of (3b) results in the LF in (7). With the embedded $\text{PAST}_{i,j}$ deleted, the embedded clause denotes a predicate of times directly. The attitude verb thus gets (8) as an argument, and the result is a bound RT, i.e., a simultaneous reading.

(7) **LF for PAST under PAST, SOT rule applied:**
[$\text{PAST}_{1,0}$ I think [~~$\text{PAST}_{i,j}$~~ you be named Tim]]

(8) $\lambda i\lambda w.\textbf{name}(tim)(add)(i)(w)$

In case the SOT rule does not apply – as it is optional – we get the LF in (9). In this case, the RT variable is existentially bound (following Ogihara & Sharvit 2012), which derives a predicate of times in (10), whereby the ET is bound by the attitude verb, deriving a back-shifted reading.

(9) **LF for PAST under PAST, SOT not applied:**
[$\text{PAST}_{1,0}$ I think [$\exists i$ [$\text{PAST}_{i,j}$ you be named Tim]]]

(10) $\lambda j\lambda w.\exists i[\textbf{name}(tim)(add)(i)(w) \wedge i < j]$

Embedded tenseless clauses. I assume that morphologically tenseless clauses in both embedded and matrix contexts contain no semantic tense (Tonhauser, 2011; Bochnak, 2016). In the absence of tense, the embedded clause directly denotes a predicate of times, as in (8). The RT variable is bound by the attitude verb, deriving a simultaneous reading. To obtain the back-shifted reading, the RT variable needs to be existentially bound, and an ET variable λ-bound. This binding, however, is vacuous, since no expression in a tenseless clause introduces an ET variable – it's simply needed to give the attitude verb an argument of type $\langle i, st\rangle$. The final translation is given in (11), where $g(1)$ is the matrix RT. With a matrix past tense, $g(1)$ is restricted to times in the past of ST; for tenseless matrix clauses, this condition is absent. An Upper Limit Constraint or similar (Abusch, 1997) is needed to prevent the embedded RT from denoting a time in the future of the attitude holder's now.

(11) $\lambda w.\forall\langle w',t'\rangle \in \text{Dox}_{sp}(g(1))(w) \rightarrow \exists i[\textbf{name}(tim)(add)(i)(w')]\ (\wedge\ g(1) < ST)$

Past under tenseless clauses. The only LF available for such a configuration is one like in (9), except that there is no matrix tense. Because the SOT rule only applies if there is a c-commanding tense of the same type, the embedded $\text{PAST}_{i,j}$ cannot be deleted. This results in a semantics for the embedded clause like (10), i.e., a back-shifted reading.

Pragmatic competition? Recent work by Altshuler (2016); Altshuler & Schwarzschild (2012) argues that apparent SOT effects can be captured pragmatically, without recourse to a deletion rule. The idea is that past-marked states carry a cessation implicature in many contexts based on competition with a present tense form. In embedded contexts in English, the present tense retains its deictic flavor, and so isn't an appropriate competitor for a past-marked clause. Thus, a cessation implicature is not calculated, and the absence of the implicature yields the apparent simultaneous reading. In languages like Japanese and Hebrew, the present tense is relative, and can be used in embedded contexts to deliver a simultaneous interpretation, so an embedded past always gets a back-shifted reading in these languages. This line of reasoning is not available for optional tense languages. The optional past tense does not compete with a present tense, but with a tenseless variant. That a simultaneous reading is available for a past under past is surprising, since the semantics in (8) is equivalent to the one delivered automatically by having a tenseless embedded clause. That is, there is no pragmatic reason why a past under past should have a simultaneous reading. Furthermore, there is cross-linguistic variation in whether optional tense languages derive a simultaneous reading for past under past. While Washo and Tlingit allow it, Mucha (2016) shows that embedded optional pasts in Medumba only have a back-shifted reading. These facts can easily be explained by invoking the SOT rule, which is active in Washo and Tlingit, but not in Medumba.

References

Abusch, Dorit. 1997. Sequence of tense and temporal de re. *Linguistics and Philosophy* 20(1). 1–50. doi:10.1023/A:1005331423820.

Altshuler, Daniel. 2016. *Events, states, and times: An essay on narrative discourse in English*. Berlin: De Gruyter Open.

Altshuler, Daniel & Roger Schwarzschild. 2012. Moment of change, cessation implicatures and simultaneous readings. In Emmanuel Chemla, Vincent Homer & Grégoire Winterstein (eds.), *Proceedings of Sinn und Bedeutung 17*, 45–62. Available online at http://semanticsarchive.net/sub2012.

Bochnak, M. Ryan. 2016. Past time reference in a language with optional tense. *Linguistics and Philosophy* 39. 247–294.

Cable, Seth. To appear. The implicatures of optional past tense in Tlingit and the implications for 'discontinuous past'. To appear in *Natural Language and Linguistic Theory*.

Klecha, Peter. 2016. Modality and embedded temporal operators. *Semantics and Pragmatics* Article 9. 1–55.

Mucha, Anne. 2016. Past interpretation and graded tense in Medumba. *Natural Language Semantics* .

Ogihara, Toshiyuki. 1989. *Temporal reference in English and Japanese*. Austin: University of Texas dissertation.

Ogihara, Toshiyuki & Yael Sharvit. 2012. Embedded tenses. In Robert Binnick (ed.), *The Oxford Handbook of Tense and Aspect*, 638–668. Oxford: Oxford University Press.

Tonhauser, Judith. 2011. Temporal reference in Paraguayan Guaraní, a tenseless language. *Linguistics and Philosophy* 34(3). 257–303. doi:10.1007/s10988-011-9097-2.