

Background: Cross-linguistic variation in the interpretation of embedded tense has been documented and analyzed in a range of linguistic studies (e.g. Ogihara 1989,1995,1996; Kusumoto 1999; von Stechow & Grønn 2013a,b). A particularly well-known observation is that in English, past tense in a complement clause embedded under a past-marked attitude verb is ambiguous between a shifted (1-a) and a simultaneous (1-b) interpretation. The availability of the simultaneous reading (often referred to as “sequence of tense” (SOT)) is, however, unattested in many other languages (e.g. Japanese, Hebrew). Formal analyses commonly account for this cross-linguistic difference by proposing variation in one component of the grammar, which is responsible for the interpretation of embedded tenses as semantically fixed or contextually resolved. For instance, Altshuler & Schwarzschild (2013) propose that the shifted reading results from a *cessation implicature* based on pragmatic competition between past and present tense in the embedded clause. They conjecture that the simultaneous reading in (1-b) can be reduced to “the perception of the absence of a cessation implicature”. The reason that the implicature is suspended in English is that the present tense is indexical and does therefore not constitute an alternative way of expressing the simultaneous reading, unlike in non-SOT languages with a relative present tense (see Gennari 2003; Kubota et al. 2009 for similar ideas).

A broader view: We argue that this view on cross-linguistic variation is too restricted in its focus on languages with obligatory tense marking and therefore misses some important points of variation. We contribute data from original fieldwork on four typologically unrelated, under-researched languages, showing that there is in fact wider variation in how the grammar constrains temporal interpretation in complement clauses. Our sample includes two languages that morphologically mark aspect, but not tense: Hausa (Chadic), which allows for simultaneous readings in complement clauses (2) and Samoan (Polynesian), which does not (3). We propose that this contrast originates in different perfective aspect semantics in the two languages, as shown in (4). Hausa has a perfective that only encodes a temporal inclusion relation between the eventuality time and the reference time (Klein 1994; Kratzer 1998). Thus, the temporal reference of the embedded clause is semantically unrestricted and pragmatically resolved. The Samoan perfective imposes an additional presupposition of temporal precedence (i.e., a past meaning component), which excludes the simultaneous reading. We also present data from two languages with optional tense marking, which differ in the availability of SOT as well. Past-under-past in Medumba (Grassfields Bantu) invariably yields the shifted reading illustrated in (5). A temporally unmarked complement clause is required to express the simultaneous reading, as shown in (6). In Washo (language isolate), by contrast, embedding of optional past under past *does* allow for a simultaneous reading (7-a), although the unmarked option is also available (7-b). Interestingly, however, a simultaneous reading with embedded past is only possible if the matrix clause also contains a past marker, otherwise the embedded past forces a shifted interpretation (7-c). This contrast in optional tense languages, we argue, resists a pragmatic account which assumes that (the lack of) an implicature is at the heart of SOT phenomena, since it is unclear why a cessation implicature would arise in past-under-past sentences in Medumba but not in Washo. Instead, the pattern observed in Washo is straightforwardly accounted for by the SOT rule in (8), which is not part of the grammar of Medumba.

Conclusion: We contribute the insight that variation in the temporal interpretation of complement clauses is not restricted to languages with obligatory tense marking, but also occurs in languages that mark tense optionally or not at all. Investigation of these languages results in a broader cross-linguistic picture suggesting that SOT readings in complement clauses are not just a peculiarity of English that can be explained away on pragmatic grounds. Rather, a variety of grammatical factors seem to lead to the observed variation. The languages we considered differ in i) whether or not they fuse aspect and tense semantics in the aspectual paradigm (Hausa vs. Samoan), and ii) whether or not they have an SOT rule in their grammar (Washo vs. Medumba). On a more general note, our study demonstrates the importance of surface variation for accounts that refer to pragmatic competition to explain cross-linguistic differences.

- (1) Mary said [that John was sick].
 a. Mary said: “John was sick.” (shift)
 b. Mary said: “John is sick.” (sim)
- (2) Context 1 (sim): Audu, you met Binta and Hawwa **yesterday**, how were they doing?
 Context 2 (shifted): Audu, you met Binta and Hawwa **yesterday**. Did they tell you why they were in such a bad mood **last week**?
 Hàwwa dà Binta **sun** cê [sun gàji]. (Hausa, sim + shift)
 Hawwa and Binta 3PL.PFV say 3PL.PFV tired
 “Hawwa and Binta said that they were tired.”
- (3) **Na** iloa e Tigilau **sā** nofo Sina i Apia. (Samoan, only shift)
 PFV know ERG Tigilau PFV stay/live Sina in Apia
 “Tigilau knew that Sina (had) stayed/lived in Apia.”
 Speaker comment: “Sina has gone back already.”
- (4) a. $[[\text{Pfv}_{\text{Hausa}}]] = \lambda P_{\langle l,t \rangle} . \lambda t . \exists e [p(e) \ \& \ \tau(e) \subseteq t]$
 b. $[[\text{Pfv}_{\text{Samoan}}]] = \lambda t' . \lambda P_{\langle l,t \rangle} . \lambda t : t' < t . \exists e [p(e) \ \& \ \tau(e) \subseteq t]$
- (5) Context (shift): You went to visit Louise and Marie **a week ago**, right? Did they tell you why they were in such a bad mood **two weeks ago**?
 Bú **ná'** cúb [mbə bú **ná'** búút]. (Medumba, shift reading with past)
 they PST say that they PST tired
 “They said that they were tired.”
- (6) Context (sim): You went to visit Louise and Marie **a week ago**, right? Did they tell you why they were in such a bad mood **that day**?
 Bú **ná'** cúb [mbə bú (**#ná'**) búút]. (Medumba, no sim reading with past)
 they PST say that they PST tired
 “They said that they were tired.”
- (7) Context (sim): You see a man in the street and say “Hi Tim!” He tells you his name isn't Tim. You apologize and say:
 a. [Tim de-gum-di?ye? M-e?-**uñil**-a?] di-hamu-**uñil**-i (Washo)
 Tim NMLZ-REFL-name 2-COP-PST-DEP a-think-PST-IND
 “I thought your name was Tim.”
 b. [Tim de-gum-di?ye? M-e?-a?] di-hamu-**uñil**-i
 Tim NMLZ-REFL-name 2-COP-DEP a-think-PST-IND
 “I thought your name was Tim.”
 c. $\#[\text{Tim de-gum-di?ye? M-e?}-\mathbf{uñil}\text{-a?}]$ di-hamu-i
 Tim NMLZ-REFL-name 2-COP-PST-DEP a-think-IND
 Intended: “I thought your name was Tim.”
- (8) **SOT rule:** A tense morpheme α can be deleted if and only if α is locally c-commanded by a tense morpheme β [...], and α and β are occurrences of the past tense morpheme. (Ogihara 1995, p.673)

Selected references: Altshuler, D. & R. Schwarzschild (2013). Moment of change, cessation implicatures and simultaneous readings. *Proceedings of SuB* 17, 45–62. Gennari, S. (2003). Tense meaning and temporal interpretation. *JoS* 20, 35–71. Kratzer, A. (1998). More structural analogies between pronouns and tenses. *Proceedings of SALT* 8, 92–110. Kubota, Y, J. Lee, A. Smirnova & J. Tonhauser (2009). The cross-linguistic interpretation of embedded tenses. *Proceedings of SuB* 13, 307–320. Kusumoto, K. (1999). Tense in embedded contexts. UMass dissertation. Ogihara, T. (1995). The semantics of tense in embedded clauses. *LI* 26, 663–679. von Stechow, A. & A. Grønn (2013a). Tense in adjuncts part 1: Relative clauses. *Language and Linguistics Compass* 7, 295–310. von Stechow, A. & A. Grønn (2013b). Tense in adjuncts part 2: Temporal adverbial clauses. *Language and Linguistics Compass* 7, 311–327.