An Underspecified Tense in St'át'imcets[1]
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1 Introduction

In some languages, tense marking is obligatory in finite clauses. Examples from English are given in (1a). On the other hand, some languages lack obligatory tense morphology, as shown in (1b) for St'át'imcets (Lillooet Salish).

(1) a.   Helen played / is playing / plays / *play.

      b.   sáy'sez' kw-s   Helen
             play   DET-NOM   Helen
             'Helen played / is playing.'

The first goal of this paper is to determine whether superficially 'tenseless' sentences like (1b) contain a covert tense morpheme; I will argue that they do. The second goal is to determine what the semantics of that tense morpheme is. I will propose that (1b) contains a phonologically null tense morpheme which is lexically underspecified with respect to whether the reference time precedes or overlaps with the utterance time. I will show that this analysis is empirically distinguishable from, and preferable to, an alternative analysis according to which St'át'imcets possesses both a null past and a null present tense morpheme.

The material presented here forms part of a broader research agenda, whose aims are to discover what constraints exist on tense systems cross-linguistically. As a first step toward the broader perspective, I will examine the consequences of my analysis of St'át'imcets for learnability and for cross-linguistic variation.

2 St'át'imcets Tense Data

St'át'imcets (Lillooet) is a Northern Interior Salish language spoken in the southwest interior of British Columbia. As mentioned above, morphological marking of tense is optional in this language. (2) contains sentences without overt tense morphology, which may be interpreted as either past or present.[2]

(2) a. táyt-wit
hungry-3PL
'They were / are hungry.'

b. ít'-em   kw-s   Helen
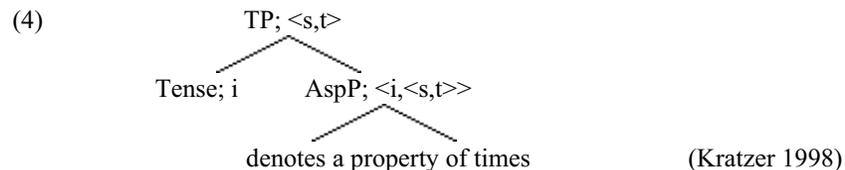sing-INTR   DET-NOM Helen
'Helen sang / is singing.'

The interpretation of superficially 'tenseless' sentences is partially dependent on the aspectual class of the predicate (Aktionsart). For example, states have a default interpretation as present tense, while activities may freely be either present or past. Determiners and demonstratives also have an effect on temporal interpretation. Analysis of these phenomena goes beyond the bounds of this paper; see Demirdache (1997a,b), Matthewson (in prep. a, b), Davis (in prep.) for discussion.

Not all sentences lack overt tense marking. The temporal enclitic *tu7,* illustrated in (3), unambiguously forces a past tense interpretation.

(3) a. táyt-wit   *tu7*
hungry-3PL *PAST*
'They were / *are hungry.'

b. sáy'sez' *tu7*   kw-s   Helen
play   *PAST* DET-NOM Helen
'Helen played / *is playing.'

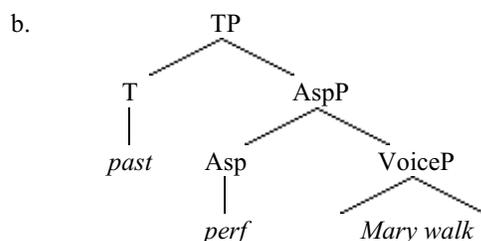## 3 Background Assumptions and Framework

I assume that tense is a relation between the utterance time and the reference time (the time about which a claim is made; see Reichenbach 1947, Klein 1994, etc.). For example, past tense requires that the reference time precedes the utterance time. For concreteness, I adopt Kratzer's (1998) analysis of tense and aspect.[3] The T head is sister to Aspect Phrase, which denotes a property of times. The tense morpheme in T introduces a variable over time intervals (i is the type of time intervals). This time variable corresponds to the reference time, and receives its value from the context:

(4)   TP; $\langle s,t \rangle$

         Tense; i   AspP; $\langle i, \langle s,t \rangle \rangle$

                    denotes a property of times   (Kratzer 1998)

The lexical entries of the tense morphemes place restrictions on the reference time. For example, *past* necessarily picks out a reference time which precedes the utterance time. Kratzer's (1998) lexical entry for *past* is given in (5), and applied to an example in (6) and (7).

(5) $[[past]]^{g,c}$ is only defined if c provides an interval t that precedes t_0 (the utterance time). If defined, then $[[past]]^{g,c}$ = t.   (g an assignment function and c a context index)

(6) a. Mary walked.

   b.
```
                    TP
                  /    \
                T       AspP
                |      /    \
              past   Asp     VoiceP
                     |      /      \
                    perf   Mary walk
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(7) a. $[[TP]]^{g,c}$ = λw ∃e [walk(e)(w) & agent(Mary)(e)(w) & τ(e) ⊆ t] (t a past time provided by c).

   b. There is an event e of Mary walking, whose running time τ is included in the contextually salient past time t.[4]

4 St'át'imcets Possesses a Tense Node

The task now is to determine whether sentences like (1b) or (2a,b) above, which lack any overt temporal information, contain an element in their syntactic representations which introduces a reference time.

  It is a standard assumption within compositional semantics that elements which are not present in the representation fed to the semantics cannot affect the truth conditions. Contextually-supplied information (such as referents for pronouns, quantifier domain restrictions, or modal bases) is mediated via a variable in the syntactic representation, which receives its value from the contextually given assignment function. An example with a pronoun is given in (8). If the assignment function g assigns the value 'Ana' to i, then (8) is true iff Ana sings.

(8) $[[$ *she_i sings* $]]^g$ = 1 iff g(i) sings

  This is exactly how Kratzer's analysis of tense works: There is a variable (under T) for the reference time, which receives its value from the contextually

given assignment function.

If the reference time is <u>not</u> present anywhere in the tree, there are two main possibilities. The first is that there is complete vagueness (i.e., the truth conditions pay no attention to when events take place). The second is that there is existential closure over time intervals. In the remainder of this section I will show that neither of these potential analyses is right.

4.1 Tenseless attempt 1: Complete vagueness

The complete vagueness approach predicts that the truth conditions for a superficially tenseless sentence say absolutely nothing about time; the event(s) can take place at any time whatsoever. This approach can easily be shown to be incorrect. As illustrated in (9), temporal interpretation is restricted in context.

(9) nilh   ts7a   ta   skúl-a
     FOC   here   DET   school-DET
     'Here is the school.'

     (wa7)   alkst lts7a kw-s   Rhonda
     (IMPERF)   work   here   DET-NOM   Rhonda
     'Rhonda works here.' / * 'Rhonda worked here.'

The judgements in these contexts are strong. It is not just that speakers *prefer* to insert the temporal enclitic *tu7* into the second sentence to disambiguate. Rather, (9) is rejected as false if the situation is that Rhonda worked at the school in the past and no longer does. If Rhonda is dead (pragmatically forcing the past-tense interpretation), (9) is rejected.

An example of past tense being forced by context is given in (10).

(10) tsícw-kan   *tu7*   áku7   Amsterdam-a
     go-1SG.SUBJ   *PAST* DEIC   Amsterdam-DET
     'I went to Amsterdam.'

     cw7it   i   qvl-a   sman'c   n-s-mán'c-em
     many   DET.PL   bad-DET   tobacco   1SG.POSS-NOM-smoke-INTR
     'I smoked a lot of pot.' / * 'I smoke a lot of pot.'

The data in (9-10) show that temporal information <u>is</u> part of the truth conditions of sentences which lack overt temporal marking. We can therefore abandon the 'complete vagueness' approach.

4.2 Tenseless attempt 2: Existential closure

If we allow existential closure over times, we predict that sentences without any overt temporal marking will assert that there is <u>some</u> past or present time at

which the relevant situation holds.

  This analysis is incorrect for St'át'imcets. It seems to give correct results for the basic cases, as shown in (11-12).

(11) matq kw-s   Mary
      walk   DET-NOM   Mary
      'Mary walked / is walking.'

(12) a. $[[(11)]]^{g,c} = \lambda w \exists t \exists e$ [walk(e)(w) & agent(Mary)(e)(w) & $\tau(e) \subseteq t$]

      b.   There is an event e of Mary walking, and there is a time t, and the running time of e is included in t.[5]

  However, recall Partee's (1973) 'stove' argument. Partee observes that under the existential closure theory, there are only two readings the sentence in (13) could have, namely those given in (14) and (15). (14) is a very weak assertion, true as long as I have spent any time doing anything which was not turning off the stove. (15) means 'I have never turned off the stove.'

(13) I didn't turn off the stove.

(14) $\lambda w \exists t \neg \exists e$ [turn.off.stove(e)(w) & agent(I)(e)(w) & $\tau(e) \subseteq t$]
      There exists some time at which I did not turn off the stove.

(15) $\lambda w \neg \exists t \exists e$ [turn.off.stove(e)(w) & agent(I)(e)(w) & $\tau(e) \subseteq t$]
      There does not exist a time at which I turned off the stove.

  Neither of these two formulas captures a reading that (13) has, namely that during some particular time interval (e.g., just before we left the house), I failed to turn off the stove. The conclusion is that a purely existential account is inadequate to explain the interpretation of (13).

  The St'át'imcets version of the stove sentence is given in (16), with the possible and impossible readings below the example. We can see that just as in English, the existential analysis is inadequate to account for the interpretations of the St'át'imcets sentence.

(16) ay   t'u7 kw-s   lháp-an'-an   ta   np'ámsten-a
      NEG   just   DET-NOM   put.out-TR-1SG.ERG   DET   stove-DET
      'I didn't turn off the stove.'

      = At some particular time (e.g., after I cooked dinner tonight), I did not turn off the stove.
      ≠ There is some time in my life when I was not engaged in turning the stove off.
      ≠ I have never turned the stove off.

In this section we have seen that the 'complete vagueness' and the existential closure analyses both failed. These were the two options for analysis which do not involve an element in the tree dealing with temporal information. I therefore conclude that there must be an obligatory position in St'át'imcets which introduces temporal information (in our framework, the reference time). Space prevents discussion of the syntax of the position; I will assume that it is T.[6]

5 Analysis

5.1 *Tu7*

My analysis of the temporal enclitic *tu7* is that it introduces a reference time which necessarily precedes the utterance time. This is illustrated and applied to an example in (17-19).

(17) [[*tu7*]]^{g,c} is only defined if c provides an interval t that precedes t_0 (the utterance time). If defined, then [[*tu7*]]^{g,c} = t.

(18) matq   tu7   kw-s   Mary
      walk   PAST DET-NOM   Mary
      'Mary walked / *is walking.'

(19) a.   [[(18)]]^{g,c} = λw ∃e [walk(e)(w) & agent(Mary)(e)(w) & τ(e) ⊆ t]

      b.   There is an event e of Mary walking, whose running time τ is included in the contextually salient past time t.

We saw above that *tu7* is optional when a past time interpretation is intended. The next sub-section addresses the cases where *tu7* does not appear.

5.2 An underspecified tense

It follows from the argumentation in section 4 that St'át'imcets sentences which do not contain *tu7* contain a phonologically null tense morpheme. My claim is that this $Ø_{tense}$ introduces a variable over time intervals which receives its value from the context (just like the English past or St'át'imcets *tu7.)* The difference is that $Ø_{tense}$ does not lexically restrict possible values for the reference time:

(20) [[$Ø_{tense}$]]^{g,c} is only defined if c provides an interval t. If defined, then [[$Ø_{tense}$]]^{g,c} = t.

(21) matq   kw-s   Mary
      walk   DET-NOM   Mary
      'Mary walked / is walking.'

(22) a.

```
                TP
              /    \
            T        AspP
            |       /    \
        Ø_tense   perf matq kws Mary
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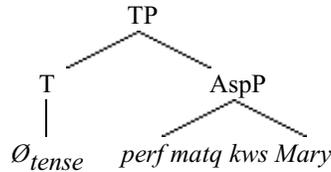
b. $[[\text{TP}]]^{g,c} = \lambda w\ \exists e\ [\text{walk}(e)(w)\ \&\ \text{agent}(Mary)(e)(w)\ \&\ \tau(e) \subseteq t]$.

c.   There is an event e of Mary walking, whose running time τ is included in the contextually salient time t.

The analysis presented here correctly accounts for the fact that there are two ways to express a reference time which precedes the utterance time: *tu7* or $Ø_{tense}$.[7] The $Ø_{tense}$ morpheme is possible whenever there is a contextually salient time, which may be either in the past or the present.

6 Arguments Against a "Null – Null" Analysis

There is a plausible alternative analysis of the St'át'imcets system, which I call the "null – null" theory. According to this alternative, St'át'imcets is like English, except that it has null *present* and null *past.* (This analysis was adopted by Arregui and Matthewson 2001.)

  The "null – null" theory is c onceptually undesirable. Why is the same meaning ('past') expressed by two different morphemes *(tu7 and Ø),* while on the other hand null 'past' contrasts semantically with the morphologically identical null 'present'? This would violate morphological iconicity.

  The "null – null" theory can also be shown to be empirically inadequate. The first piece of evidence comes from sentences with plural subjects but a single main predicate. (23) and (24) show that in such cases, we can have different situation times for each individual in the denotation of the subject.

(23) Context: Your white friends Theresa, Charlie and Marie got drunk at the bar. You are looking after them because you don't drink. Theresa threw up at 10pm; Marie hasn't thrown up at all. Just as Charlie is in the process of throwing up, another friend calls and asks (a); you can answer with (b):

a.   wat'k'   ha   i   snek'wnuk'wa7-lhkálh-a
     vomit   YNQ   DET.PL   friend(PL)-1PL.POSS-DET
     'Our friends throw up?'

b.   wat'k' kw-s   Theresa   múta7   s-Charlie
     vomit   DET-NOM   Theresa   and   NOM-Charlie
     'Theresa and Charlie throw up.'

(24) Context: Your friends Theresa, Charlie and Marie are taking a building class and they wanted to each build a doghouse. Theresa has already finished hers and Charlie is in the middle of his. Marie hasn't started hers yet and she probably won't do it at all. Now another friend calls. She doesn't know what they were planning to build or whether they've done it yet. She asks (a), and you can reply with (b).

    a.   stam' ku   máys-en-as   i   snek'wnuk'wa7-lhkálh-a
        what DET   build-TR-3ERG   DET.PL friend(PL)-1PL.POSS-DET
        'What did our friends build / are our friends building?'

    b.   mays-en-ítas   kw-s   Theresa múta7 s-Charlie   i
        build-TR-3PL.ERG DET-NOM Theresa and   NOM-Charlie DET.PL
          sqax7-álhcw-a,   t'u7   cw7ay   t'u7 kw-s   máys-en-as
          dog-house-DET   but   NEG   but DET-NOM build-TR-3ERG
            ku   stam' kw-s   Marie
            DET   what   DET-NOM   Marie
        'Theresa and Charlie built / are building doghouses, but Marie hasn't built anything.'

There is only one predicate in each of the relevant clauses in (23) and (24); therefore, by assumption, there is only one tense node in each. We see that this single tense morpheme is compatible with both a past-time sub-event and a present-time sub-event, simultaneously. This is impossible in English, as shown by the impossibility of translating (23) and (24) into English using single tensed verbs. This therefore shows that St'át'imcets cannot be a null version of an English-like system with contrasting *present* and *past*.

The underspecified tense analysis accounts for (23-24) quite simply. The reference time provided by the context can be large enough to cover both a stretch of time in the past as well as the time of utterance. The denotation of (23b) is given in (25).[8]

(25) a. $[[\text{TP}]]^{g,c} = \lambda w \,\exists e \,[\text{vomit}(e)(w)\, \&\, \text{agent}(\text{Theresa.and.Charlie})(e)(w)\, \&\, \tau(e) \subseteq t]$.

     b.   There is an event of Theresa and Charlie throwing up, whose running time τ is included in the contextually salient time t.

Further evidence for the underspecified tense analysis comes from the contextual restrictions on interpretation introduced in (9-10) above. The requirement that the reference time be contextually specified correctly predicts the restrictions on the second sentence in each case. Importantly, the English translation with overt contrasting tenses is acceptable (e.g., 'This is the school. Rhonda worked here.'). If St'át'imcets possessed null contrasting tenses, then the past interpretation should be able to be forced (even if it were dispreferred).

Yet recall from above that the effects in (9-10) are strong and not cancelable.

Two final pieces of evidence for the underspecified tense analysis come from interactions between Aktionsart, outer aspect (perfective / imperfective), and tense. The first case concerns activities. Unlike in English, activity predicates in St'át'imcets can be interpreted in the present tense, without needing to be in the imperfective aspect:

(26) sáy'sez' kw-s   Helen
      play   DET-NOM   Helen
      'Helen played / is play*ing*.' (imperfective required in English present)

Let us adopt Bennett and Partee's (1978) idea that the utterance time is an instantaneous moment, and that only predicates which possess the sub-interval property can hold at the utterance time (without needing to be in the imperfective).[9] Let us further assume that activities, unlike states, do not possess the sub-interval property (since they are not entirely homogeneous; see Taylor 1985). This accounts for the English activity data.

Now, since St'át'imcets does not possess a present tense morpheme, there is nothing which would require an instantaneous moment. Our current analysis therefore predicts that in St'át'imcets, activity predicates (which do not possess the subinterval property) can 'fit into' a larger present-time interval, and therefore do not need to be in the imperfective. This accounts for (26); the cross-linguistic difference is thus explained by the absence in St'át'imcets of a present tense morpheme.

A similar idea can also explain a difference with respect to achievement predicates. In English, achievement predicates are not felicitous in the perfective aspect in the present tense, as shown in (27). The explanation for (27) is that the instantaneous moment picked out by the English present tense is smaller than the time it takes to complete an achievement (again, see Taylor 1985).

(27) a. Context: you have been climbing a mountain, and just at the exact moment when you reach the top, you say: * 'I reach the top!'

      b. Context: you are crossing the threshold, and at the exact moment when you enter the room, you say: * 'I arrive!'

In St'át'imcets, there is of course no present tense morpheme, according to my analysis. We therefore predict that achievement predicates will be acceptable in if uttered at the exact moment of culmination. This is correct, as shown in (28). (28a,b) are acceptable in the contexts given in (27a,b) respectively.

(28) a. qáyt-kan
          reach.top-1SG.SUBJ
          'I reach the top!'

b. t'íq-kan
    arrive-1SG.SUBJ
    'I arrive!'

Summarizing the results of this section, I have argued that in clauses with no overt tense morphology, there is a single morpheme which picks out the contextually provided reference time. I have provided several pieces of evidence that the analysis is empirically better than an alternative, according to which there is a phonologically neutralized but semantically contentful ambiguity between *past* and *present.*

7 Universality, learnability and variation

The analysis presented here involves minimal cross-linguistic variation. The analysis of St'át'imcets differs from that of English in two ways: (i) One of the tense morphemes is phonologically null, and (ii) One of the tense morphemes is lexically unrestricted. Both of these constitute minor differences in the lexical entries for tense morphemes. The differences with English which fall out are listed in (29).

(29) i.   The apparent 'optionality' of tense marking in St'át'imcets as opposed to English.
      ii. The ability of sentences with plural subjects to involve two different sub-event situation times, one in the past and one in the present, in St'át'imcets but not in English.
      iii. The necessity, in St'át'imcets but not in English, of keeping the same reference time in a connected discourse (unless some other temporal marking appears).
      iv. The fact that activity predicates, in St'át'imcets but not in English, can be in the present without being in the imperfective.
      v.   The fact that achievement predicates, in St'át'imcets but not in English, can be uttered in the perfective when the event takes place at the utterance time.

Interestingly, most of these (ii, iii, v) are intuitively <u>not learnable</u> from primary linguistic data available to children. This seems to raise a learnability problem, to which I will now sketch a solution.

Suppose that step one is that the child learns that there is a phonologically null tense morpheme. This is presumably easy, since I assume that the child knows that <u>every</u> language has an obligatory position containing tense information.[10] This will mean that any sentence with no overt temporal marking will be evidence for a null morpheme.

Now, step two is for the child to learn that the null morpheme is lexically unrestricted. Suppose that s/he does this by knowing that semantically

contrasting null tense morphemes are not allowed (i.e., that any null tense morpheme must be underspecified). Since there is a null / overt contrast, and since the child can easily learn from primary linguistic data that past reference times do not require *tu7,* then the null morpheme must be lexically unrestricted.

9 Conclusion

I have argued in this paper that St'át'imcets possesses two tense morphemes: the past tense enclitic *tu7,* and $\emptyset_{tense}$, a phonologically null, lexically underspecified tense morpheme whose value is provided by the context. I have argued that this analysis is empirically better than a 'contrasting null tenses' analysis. I then observed that several cross-linguistic differences (obvious and subtle) between St'át'imcets and English fall out from minor lexical differences in the tense morphemes. I claimed that the learnability problem can be solved if the child knows (a) that a position containing tense information is universally present, and (b) that semantically contrasting null tense morphemes are not allowed. A final prediction that this makes is that all else being equal, any language with a null tense morpheme should display the effects listed in (29) for St'át'imcets. Whether this is correct is obviously a task for future research.

Notes

[2] Future interpretations are impossible in (2). My claim will be that 'future' is not a tense, but the issue of the future goes well beyond the bounds of the current paper.
[3] The arguments to be made could be replicated within any of the other available formal approaches, e.g. Enç (1986, 1987), Zagona (1990), Stowell (1993), Kamp and Reyle (1993), Ogihara (1996, 1999), Kusumoto (1999), Demirdache and Uribe-Etxebarria (1997, 2000), etc.
[4] In Kratzer's analysis, the Aspect head mediates between events and times by introducing a running time function. (7a) is in the perfective aspect, which is why the running time of the event must be included within the reference time.
[5] (11) is in the perfective aspect; the apparent imperfectivity of the English translation 'Mary is walking' results from restrictions peculiar to the English present tense. See below for discussion.
[6] Wiltschko (2001, to appear) argues that Halkomelem Salish lacks a T node. Matthewson (in prep.) argues that this proposal is not right for St'át'imcets.
[7] The issue of which is chosen when is independent of the semantics of the morphemes themselves, and goes beyond the bounds of this paper.
[8] The reader may wonder about (24) – how can there be a sub-event of Charlie building a doghouse, when he has not yet completed it? The answer lies in the different lexical properties of accomplishment predicates in St'át'imcets; see Davis and Matthewson (to appear).
[9] If a sentence whose main verb possesses the subinterval property is true at some interval I, 'then

the sentence is true at every subinterval of I including every moment of time in I' (Bennett and Partee 1978:14).

[10] See Matthewson (in prep.) for justification; see also e.g. Déchaine (1993).

References

Arregui, Ana and Lisa Matthewson. 2001. 'A cross-linguistic perspective on the expression of manner', *Proceedings of SALT* XI.

Bennett, M. and Barbara Partee. 1978. *Toward a Logic of Tense and Aspect in English*. Indiana University Linguistics Club.

Davis, Henry. in prep. *A Teaching Grammar of Upper St'át'imcets.*

Davis, Henry and Lisa Matthewson. to appear. 'Quasi Objects in St'át'imcets: The (Semi)-Independence of Agreement and Case', in Andrew Carnie, Heidi Harley and Mary-Ann Willie (eds.), *Formal Approaches to Function: Papers in Honor of Eloise Jelinek.* Oxford: Blackwell.

Déchaine, Rose-Marie. 1993. *Predicates Across Categories.* Amherst, MA: GLSA.

Demirdache, Hamida. 1997a. 'Predication Times in St'át'imcets Salish', *The Syntax and Semantics of Predication*: 73-88. Texas Linguistics Society Forum.

Demirdache, Hamida. 1997b. 'On the Temporal Location of Predication Times: The role of Determiners in Lillooet Salish', In *Proceedings of WCCFL XV:,* 129-144.

Demirdache, Hamida and M. Uribe-Etxebarria. 1997. 'The Syntax of Temporal Relations: A Uniform Approach to Tense and Aspect', *Proceedings of WCCFL XVI:* 145-159.

Demirdache, Hamida and Miriam Uribe-Etxebarria. 2000. 'The Primitives of Temporal Relations', In R. Martin, D. Michaels & J. Uriagereka (eds.), *Papers in Honor of Howard Lasnik*, Cambridge, MA: MIT Press.

Enç, Mürvet. 1986. 'Towards a Referential Analysis of Temporal Expressions', *Linguistics and Philosophy* 9: 405–26.

Enç, Mürvet. 1987. 'Anchoring Conditions for Tense', *Linguistic Inquiry* 18: 633-657.

Kamp, Hans and Uwe Reyle. 1993. *From Discourse to Logic.* Dordrecht: Kluwer.

Klein, Wolfgang. 1994. *Time in Language.* London and New York: Routledge.

Kratzer, Angelika. 1998. 'More Structural Analogies Between Tenses and Pronouns', *Proceedings of SALT VIII.*

Matthewson, Lisa. in prep. 'On the Absence of Tense on Determiners'.

Ogihara, Toshiyuki. 1996. *Tense, Attitudes and Scope.* Dordrecht: Kluwer.

Ogihara, Toshiyuki. 1999. 'The Semantics of Tense and Aspect in Japanese', In Natsuko Tsujimura (ed.), *The Handbook of Japanese Linguistics*, Oxford: Blackwell, 326-348.

Partee, Barbara. 1973. 'Some Structural Analogies Between Tenses and Pronouns', *The Journal of Philosophy* **70**.18: 601-609.

Reichenbach, Hans. 1947. *Elements of Symbolic Logic.* Berkeley: University of California Press.

Stowell, Tim. 1993. 'Syntax of Tense', Ms., University of California, Los Angeles.

Taylor, Barry. 1985. Modes of Occurrence. Oxford: Basil Blackwell.

Wiltschko, Martina. 2001. 'Tense on D and (the Lack of) Nominative Case', *Proceedings of NELS* 31.

Wiltschko, Martina. to appear. 'On the Interpretability of Tense on D and its Consequences for Case Theory', *Lingua.*

Zagona, Karen. 1990. 'Times as Temporal Argument Structure', Ms., U. of Washington.