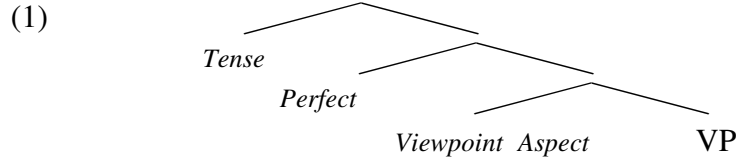## NOTE 3
THE PERFECT CONTINUED

1. THE AUGMENTED XN THEORY

- A version of the XN-theory (McCoard 1978, Dowty 1979), as in Iatridou, Anagnostopoulou and Izvorski 2001 (IAI).

(1)

Tense

Perfect

Viewpoint Aspect   VP

(2)   a. The Perfect introduces a time interval: the "Perfect Time Span" (PTS).
      b. The Right Boundary (RB) of the PTS is set by Tense.
      c. The Left Boundary (LB) of the PTS may be set by adverbials.

(3)   The Universal-Experiential distinction is grammatical and is based on the role of Viewpoint aspect and certain temporal adverbials

- An illustration of the IAI proposal (from von Fintel and Iatridou 2002/2005)

(4)   a. Tony has visited Cape Cod since 1990.

      b. There is a time span (i) whose RB is now/the time of utterance (because of the Present Tense), (ii) whose LB is (some time in) 1990, and (iii) which has a subinterval at which it is true that Tony visits Cape Cod.

(5)   a. Tony has been living on Cape Cod since 1990.

      b. There is a time span (i) whose RB is now/the time of utterance (because of the Present Tense), (ii) whose LB is (some time in) 1990, and (iii) for every subinterval of which it is true that Tony lives on Cape Cod.

- The Resultative reading of the perfect is also grammatically encoded, and it too can be derived in this system through viewpoint aspect (Pancheva (2003))

1.1 IMPLEMENTATION

(6) $[[\text{PERFECT}]] = \lambda p_{<i,t>}. \lambda t_i. \exists t'_i [XN(t',t) \& p(t')]$
        where $XN(t',t)$ iff t is a final subinterval of t'

(7)   a. $[[\text{PERFECTIVE}]] = \lambda P_{<v,t>} . \lambda t_i . \exists e_v [\tau(e) \subseteq t \ \& \ P(e)]$
      b. $[[\text{IMPERFECTIVE}]] = \lambda P_{<v,t>} . \lambda t_i . \exists e_v [t \subset \tau(e) \ \& \ P(e)]$
      c. $[[\text{RESULTATIVE}]] = \lambda P_{<v,t>} . \lambda t_i \ \exists e_{1v} \exists e_{2v} [\ Result(e_2, e_1) \ \& \ t \subseteq \tau(e_2) \ \& \ P(e_1) \ ]$

             $Result(e_2, e_1)$ iff e_1 is a telic event and e_2 is the result state of e_1
             (with "result state" to be understood as Kratzer's 1994 "target state")

(8) $[[\text{VP}]]= \lambda e_v .P(e)$

(9)   a. $[[\text{PAST}]] = \lambda p_{<i,t>}. \exists t_i [t < t_c \ \& \ p(t)]$
      b. $[[\text{PRESENT}]] = \lambda p_{<i,t>}. \exists t_i [t = t_c \ \& \ p(t)]$
                 where t_c is the speech time

(10)   EXPERIENTIAL PERFECT

       a.   Alicia has written a paper.
       b.   [PRESENT [PERFECT [PERFECTIVE [Alicia write a paper]]]] =
            $= \exists t [t = t_c \ \& \ \exists t' [XN(t',t) \ \& \ \exists e [\tau(e) \subseteq t' \ \& \ \text{Alicia-write-a-paper} (e)]]]$

(11)   UNIVERSAL PERFECT

       a.   Alicia has been writing a paper (ever since this morning).
       b.   [PRESENT [PERFECT [IMPERFECTIVE [Alicia write a paper]]]] =
            $= \exists t [t = t_c \ \& \ \exists t' [XN(t',t) \ \& \ \exists e [t' \subset \tau(e) \ \& \ \text{Alicia-write-a-paper} (e)]]]$

(12)   RESULTATIVE PERFECT

       a.   Alicia has written a paper.
       b.   [PRESENT [PERFECT [RESULTATIVE [Alicia write a paper]]]] =
            $= \exists t [t = t_c \ \& \ \exists t' [XN(t',t) \ \& \ \exists e_1 \exists e_2 [Result(e_2, e_1) \ \& \ t' \subseteq \tau(e_2) \ \& \ \text{Alicia-write-a-paper} (e_1)]]]$

1.2 REMAINING QUESTIONS

▪ The progressive in English and the imperfective participle in Bulgarian can be used in the Experiential perfect. But using imperfective viewpoint aspect in the structure above yields the Universal perfect. Something more needs to be said.

(13)   a.   Have you ever been watching TV when the tube exploded? (Comrie1976)
       b.   Have you ever been running when it started to rain so hard you had to stop?
            (von Fintel and Iatridou 2002/2005)

(14)   Maria   e *pristigala*   v polunošt i   predi.   (Bulgarian)
       Maria   is arrive-*IMPERF*-PERFECT   in midnight and before   (Pancheva 2003)
       'Maria has arrived at midnight before as well.'

▪ For the Universal reading to obtain, the imperfective is necessary but not sufficient. Certain adverbials are needed too. (IAI, Kiparsky 2002)

(15) a. He has had brown eyes *(since he was born).   (IAI)
      b. He has always had brown eyes.

(16) a. Maya has been sick (but she is fine now).   (IAI)
      b. Maya has been sick at least since Tuesday (*but she is fine now).

(17) a. I have been cooking (but I am done now).   (IAI)
      b. I have been writing a difficult letter; thank goodness it's finished.   (Mittwoch 1988)

▪   How is the Recent Past reading derived?

2. TEMPORAL ADVERBIALS AND THE PERFECT

▪   Necessary readings

(18) a. Universal: *at least since 1990, ever since 1990, always, for five days now*
      b. Experiential: *before*, *3 times*
      c. Recent Past: *recently, lately, just*

▪   Possible readings

(19) a. Universal and Experiential: *since 1990, for five days*
      b. Resultative and Recent past: *now*

2.1 *SINCE*

▪   *Since* adverbials generally require the perfect

(20) a.   I have been sick since yesterday.   (IAI)
      b. *   I am sick since yesterday.
      c. *   I was sick since 1990.

(21) It is two years since he died   (Mittwoch 1988, see also Iatridou 2004)

▪   *Since* allows both the Universal and the Experiential perfect

(22) Maya has been sick since Tuesday.

▪   *Since* adverbials have "durative" or an "inclusive" interpretation (e.g., Dowty 1979,
    Mittwoch 1988, Vlach 1993, IAI, Pancheva & von Stechow 2004).

(23) a. [[since^E]] = λx. λp. λt. ∃t' [t' ⊆ t & LB(τ (x),t) & p(t')]
      b. [[since^U]] = λx. λp. λt. ∀t' [t' ⊆ t & LB(τ (x),t) → p(t')]

▪ Both (24) and (25), with a *since*[E] adverbial, derive an Experiential reading.

(24) a. [PERFECT *since*[E] *1990* [PERFECTIVE [Alicia write a paper]]]]
     b. $\lambda t. \exists t' [XN(t',t) \& \exists t'' [t'' \subseteq t' \& LB(1990, t') \& \exists e [\tau(e) \subseteq t'' \& \text{Alicia-write-a-paper } (e)]]]$

(25) a. [PERFECT *since*[E] *1990* [IMPERFECTIVE [Alicia write a paper]]]]
     b. $\lambda t. \exists t' [XN(t',t) \& \exists t'' [t'' \subseteq t' \& LB(1990, t') \& \exists e [t'' \subset \tau(e) \& \text{Alicia-write-a-paper } (e)]]]$

▪ (26) derives a non-existent reading; (27) gives us the Universal reading.

(26) a. [PERFECT *since*[U] *1990* [PERFECTIVE [Alicia write a paper]]]]
     b. $\lambda t. \exists t' [XN(t',t) \& \forall t'' [t'' \subseteq t' \& LB(1990, t') \rightarrow \exists e [\tau(e) \subseteq t'' \& \text{Alicia-write-a-paper } (e)]]]$

(27) a. [PERFECT *since*[U] *1990* [IMPERFECTIVE [Alicia write a paper]]]]
     b. $\lambda t. \exists t' [XN(t',t) \& \forall t'' [t'' \subseteq t' \& LB(1990, t') \rightarrow \exists e [t'' \subset \tau(e) \& \text{Alicia-write-a-paper } (e)]]]$

▪ So, we can derive an Experiential reading even with imperfective viewpoint aspect under the perfect, provided we have a suitable adverbial (e.g., *since*[E]).

▪ We can posit a null adverbial with a similar role (see Bennett 1977, Bäuerle 1979, IAI)

(28) [[ONCE]] = $\lambda p. \lambda t. \exists t' [t' \subseteq t \& p(t')]$

(29) a. Alicia has been writing a paper
     a. [PERFECT *ONCE* [IMPERFECTIVE [Alicia write a paper]]]]
     b. $\lambda t. \exists t' [XN(t',t) \& \exists t'' [t'' \subseteq t' \& \exists e [t'' \subset \tau(e) \& \text{Alicia-write-a-paper } (e)]]]$

▪ But now, we can make a more general use of *ONCE* and dispense with the ambiguity of *since*. (see also von Fintel and Iatridou 2002/2005).

(30) [[since]] = $\lambda x. \lambda p. \lambda t. [LB(\tau (x),t) \& p(t)]$

(31) a. since + ONCE + PERFECTIVE   Experiential
     b. since + PERFECTIVE   Experiential (very close to (31a))
     c. since + ONCE + IMPERFECTIVE   Experiential
     d. since + IMPERFECTIVE   Universal

▪ Clausal complements to *since* (von Fintel and Iatridou 2002/2005)

(32) a. Tony has visited Cape Cod two times since Bill insulted him.
     b. Tony has been living on Cape Cod since Bill insulted him.

(33)   since Op λt [$_{TP}$ Past [$_{VP}$ [$_{VP}$ Bill insult Tony] [at t]]].

(34)   a. Tony has been happy since he has been taking Prozac.
       b. Tony has been to the Cape two times since he has been taking Prozac.

(35)   *Tony has been happy since he has visited the Cape.

2.2 *LATELY*

▪   *Lately* modifies the PTS. In its absence, a null anaphoric *lately* is posited

(36)   Maya has been sick lately (but she is fine now).

(37)   A: I haven't seen Mary in a while. Where is she?   (IAI)
       B: She has been sick.

3. THE PRESENT PERFECT PUZZLE

3.1   ILLUSTRATING THE PUZZLE

▪   In English, the present perfect, unlike other perfects, cannot be modified by certain temporal adverbials (Comrie 1976, McCoard 1978, Klein 1992, a.o.). This phenomenon is known as the *present perfect puzzle* (after Klein 1992).

(38)   *Alicia has danced *on Monday / yesterday / on December 31 / at 10*.

(39)   a. Alicia will have danced *on Monday / on December 31 / at 10*.
       b. Alicia had danced *on Monday / yesterday / on December 31 / at 10*.
       c. Alicia must have danced *on Monday / yesterday / on December 31 / at 10*.

(40)   a. Alicia has danced *on a Monday/in the past.*
       b. Alicia has often/never danced *on (a) Monday/ in December*.
       c. Alicia has danced *today*.
       d. Alicia has been dancing *for the past three hours / since this morning*.

▪   The prohibition is against definite temporal adverbials interpreted as past (cf. Heny 1982, Comrie 1995, Klein 1992, Giorgi and Pianesi 1998), often called 'positional'.

▪   Categorization of time adverbials (from McCoard 1978: 135, Dowty 1979: 341).

(41) a. +THEN (or (past) 'positional' adverbials)
           long ago, five years ago, once [=formerly][1], yesterday, the other day, those days, last
           night, in 1900, at 3:00, after the war, no longer

      b. ±THEN (occur with either simple past or present perfect)
           long since, in the past, once [=one time], today, in my life, for three years, today,
           recently, just now, often, always, never, already, before

      c. −THEN (occur with present perfect but not simple past)
           at present, up till now, so far, as yet, not yet, during these five years past/during these
           last five years, herewith, lately, since the war, before now, by now

- The puzzle does not manifest itself in languages such as German, Dutch, Icelandic, or Italian,
  where positional adverbials are accepted in the present perfect. Notably, the perfect in these
  languages does not have the meaning of PAST. (Klein 1992, Giorgi and Pianesi 1998, Musan
  2001).

(42) a. Hans ist *gestern   um   zehn* weggegangen.   German
           Hans is yesterday   at   10   left   (Musan 2001)
           Lit. 'Hans has left yesterday at 10.'

      b. Gianni è   partito *alle   quattro*.   Italian
           Gianni is left   at   4   (Giorgi and Pianesi 1998)
           Lit. 'Gianni has left at 4.'

(43) a. Hans ist   *jetzt*   weggegangen.   German
           Hans is   now   left   (Musan 2001)
           'Hans has now left'

      b. *Adesso*   ho   mangiato   abbastanza.   Italian
           Now   have-1sg   eaten   enough   (Giorgi and Pianesi 1998)
           'Now I have eaten enough.'

- The present perfect puzzle has proved rather difficult to solve, and several different lines
  have been pursued (see McCawley 1971, Dowty 1979, Klein 1992, Giorgi and Pianesi 1998,
  Kiparsky 2002, von Stechow 2002, Katz 2003, a.o.).

3.2   THE ADVERBIALS

- Positional adverbials contain names, or definite descriptions, of intervals. They denote
  (functions from propositions to) predicates of intervals, attributing to intervals the property of
  being contained in a definite time. The non-positional adverbials are, or contain, quantifiers
  over intervals (cf. Pratt and Francez 2001, Mittwoch 1988, von Stechow 2002, a.o.).

(44) $[[\text{ON T}_{\text{def DP}}]] = \lambda p_{<i,t>}.\ \lambda t_i.\ [t \subseteq T\ \&\ p(t)]$ (positional)

---

[1]And not *once [=one time],* which is acceptable in the present perfect.

(45) a. [[yesterday $_{DP}$]] = *the day before the day of t_c* (*yesterday$_c$*)
      b. [[today $_{DP}$]] = *the day of t_c* (*today$_c$*)
      c. [[this morning $_{DP}$]] = *the morning of the day of t_c* (*this$_c$ morning*)
      d. [[(THIS) Monday $_{DP}$]] = *the Monday closest to t_c* (*Monday$_c$*)
      e. [[1990 $_{DP}$]] = *the year 1990*

(46) a. [[yesterday$_{ADV}$]]= [[ON yesterday$_{DP}$]] = $\lambda p_{<i,t>}$. λt_i [t $\subseteq$ *yesterday$_c$* & p(t)]
      b. [[today $_{ADV}$]] = [[ON today $_{DP}$]] = $\lambda p_{<i,t>}$. λt_i [t $\subseteq$ *today$_c$* & p(t)]
      c. [[this morning$_{ADV}$]] = [[ON this morning $_{DP}$]] = $\lambda p_{<i,t>}$. λt_i [t $\subseteq$ *this$_c$ morning* & p(t)]
      d. [[on THIS Monday]] = $\lambda p_{<i,t>}$. λt_i [t $\subseteq$ *Monday$_c$* & p(t)]
      e. [[in 1990]] = $\lambda p_{<i,t>}$. λt_i [t $\subseteq$ *the year 1990* & p(t)]

(47) a   [[on a Monday]] = $\lambda p_{<i,t>}$. λt_i. $\exists t'_i$ [Monday(t') & t' $\subseteq$ t & p(t')]
      b. [[ON every Monday]] = $\lambda p_{<i,t>}$. λt_i. $\forall t'_i$ [Monday(t') & t' $\subseteq$ t $\rightarrow$ p(t')]

(48) a. [[in the past]] = $\lambda p_{<i,t>}$. λt_i. $\exists t'_i$ [t' $\subseteq$ t & t' < t_c & p(t')]
      b. [[for 2 days]] = $\lambda p_{<i,t>}$. λt_i. $\forall t'_i$ [t' $\subseteq$ t & |t| = 2 days $\rightarrow$ p(t')]

3.3 THE XN ACCOUNT

▪ Event time modification is not possible for type reasons

(49) a   [[VP]]= λe_v .P(e)
      b. [[yesterday$_{ADV}$]] = $\lambda p_{<i,t>}$. λt_i [t $\subseteq$ *yesterday$_c$* & p(t)]

(50) *[*yesterday* [VP]]

▪ This leaves us with two possible modification structures for the adverbials: above Viewpoint Aspect (cf. (51b)), which results in XN modification, and above the Perfect (cf. (51c)), which results in R modification

▪ Reference time modification is restricted to present adverbials; XN modification is restricted to the present adverbials too as the XN includes R

(51) a. * Alicia has danced yesterday.

      b. [PRESENT [PERFECT *yesterday* [PERFECTIVE [Alicia dance]]]] =
          = $\exists t$ [**t = t_c** & $\exists t'$ [**XN(t',t) & t' $\subseteq$ yesterday** & $\exists e$ [τ(e) $\subseteq$ t' & Alicia-dance (e)]]]

      c. [PRESENT *yesterday* [PERFECT [PERFECTIVE [Alicia dance]]]]
          = $\exists t$ [**t = t_c** & **t $\subseteq$ yesterday** & $\exists t'$ [XN(t',t) & $\exists e$ [τ(e) $\subseteq$ t' & Alicia-dance (e)]]]

▪ Non-positional adverbials are OK

(52) a. Alicia has danced on a Monday.
      b. [PRESENT [PERFECT *on a Monday* [PERFECTIVE [Alicia dance]]]] =
          = $\exists t$ [t = t_c & $\exists t'$ [XN(t',t) & $\exists t''$ [Monday(t'') & t'' $\subseteq$ t' & $\exists e$ [τ(e) $\subseteq$ t'' & Alicia-dance (e)]]]]

(53) a. Alicia has danced every Monday.
　　　b. [PRESENT [PERFECT *every Monday* [PERFECTIVE [Alicia dance]]]] =
　　　　　= $\exists t$ [$t = t_c$ & $\exists t'$ [XN(t',t) & $\forall t''$ [Monday(t'') & $t'' \subseteq t'$ → $\exists e$ [$\tau(e) \subseteq t''$ & Alicia-dance (e)]]]]

- Reference time modification with past positional adverbials is precluded in the German-type languages as well, and predictably, the relevant interpretation is not available

(54) a. Hans ist *gestern   um   zehn* weggegangen.   German
　　　　 Hans is yesterday   at   10   left   (Musan 2001)
　　　　 Lit. 'Hans has left yesterday at 10.'
　　　　　　≠ Yesterday at 10, Hans had already left.
　　　　　　= Yesterday at 10, Hans' leaving took place.

　　　b. Gianni è partito *alle   quattro*.   Italian
　　　　 Gianni is left   at   4   (Giorgi and Pianesi 1998)
　　　　 Lit. 'Gianni has left at 4.'
　　　　　　≠ At 4, Gianni had already left.
　　　　　　= At 4, Gianni's leaving took place.

- Therefore, the source of the cross-linguistic variation is the modification of the XN interval.

3. ANOTHER PERFECT PUZZLE

3.1 THE PUZZLE ILLUSTRATED

- Another puzzle is exhibited by the interaction of the past perfect and the adverbials that are incompatible with the present perfect. (Pancheva 2004)

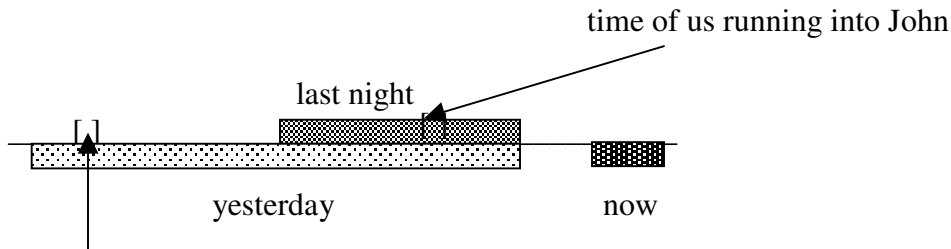- These adverbials can, in principle, appear in a past perfect, seemingly modifying the time of the event.

(55) a. We just ran into John. He had arrived in town *yesterday*…
　　　b. We saw Alicia earlier. She had performed at the Walt Disney Center *on Monday*…
　　　c. We met them on their honeymoon. They had gotten married *on December 31*…

- Yet, sometimes these adverbials are not acceptable.

(56) a. ?? We ran into John *last night*. He had arrived in town *yesterday*...
　　　b. ?? We saw Alicia *Monday night*. She had performed at the Walt Disney Center *on Monday*…
　　　c. ?? We met them *on New Year's Eve*. They had gotten married *on December 31*…

- The events described by the perfects in (56) could have obtained prior to the events in the past sentences, and still fall within the time of the temporal adverbial modifying the perfect.

(57)

time of John's arrival

3.2   THE GENERALIZATION

- Apparently, the reason for the unacceptability of the pairs of sentences in (56) is the fact that the interval denoted by the adverbial modifying the past perfect is a superset of the interval denoted by the adverbial in the first sentence.

(58)   a. *last night* $\subset$ *yesterday*
     b. *Monday night* $\subset$ *Monday*
     c. *New Year's Eve* $\subset$ *December 31*

- When the inclusion problem is removed, the sequences of sentences become acceptable.

(59)   a. We ran into John *this morning*. He had arrived in town *yesterday...*
     b. We saw Alicia *Tuesday night*. She had performed at the Walt Disney Center *on Monday…*
     c. We met them on *New Year's Day/ Valentine's Day*. They had gotten married *on December 31…*

(60)   a. We ran into John *last night*. He had arrived in town *yesterday morning...*
     b. We saw Alicia *Monday night*. She had performed at the Walt Disney Center *Monday morning…*

- Yet, the inclusion itself is not what is causing the unacceptability. No problem arises when the modifying positional adverbial is anaphoric to the reference time (set up by the simple past tense and restricted by the adverbial in that sentence) (see (61)).

(61)   a. We ran into John *last night*. He had arrived *that day/ that same day…*
     b. We saw Alicia *Monday night*. She had performed at the Walt Disney Center *that day…*
     c. We met them *on New Year's Eve*. They had gotten married *that day…*

- Different types of positional adverbials:

(62)   a. *yesterday, last night, this Monday, two days ago*   indexical (t_c-anaphoric)
     b. *on Monday, at 10, that day, two days earlier*   anaphoric (may or may not be t_c-anaphoric)
     c. *in 2003*, *on John's birthday*   referential (non-anaphoric)

▪ Both the indexical and non-anaphoric positional adverbials exhibit the restriction

(63)   indexical vs. (non- t_c) anaphoric (see also (56a)-(59a) vs. (61a).)

    a.   ?? We met John *in December*. He had moved to LA *last year*…
    b.   We met John *this February*. He had moved to LA *last year*…
    c.   We met John *in December*. He had moved to LA *that year*…

    d.   ?? We are going out with John *next Friday*. He will have finished his paper *next week*.
    e.   We are going out with John *in two weeks*. He will have finished his paper *next week*.
    f.   We are going out with John *next Friday*. He will have finished his paper *that week*.

(64) t_c-anaphoric vs. (non- t_c) anaphoric (see also (56b)-(59b) vs. (61b).)

    a.   ?? We ran into John *Friday night*. He had arrived in town *two days ago*... (said on Sunday)
    b.   We ran into John *this morning*. He had arrived in town *two days ago*...
    c.   We ran into John *Friday night*. He had arrived in town *two days earlier/ that day*...

(65)   referential vs. anaphoric

    a.   ?? We met John *exactly a year ago*. He had moved to LA *in 2003*…
    b.   We met John *this January*. He had moved to LA *in 2003*…
    c.   We met John *exactly a year ago*. He had moved to LA *that April/ that spring*… (said in April)

▪ It is also not possible to partially include the reference time in the denotation of the perfect adverbial.

(66)   ?? John and I spent *last winter* together in Quebec *from Thanksgiving to Valentine's Day*. He had moved there *last year*…

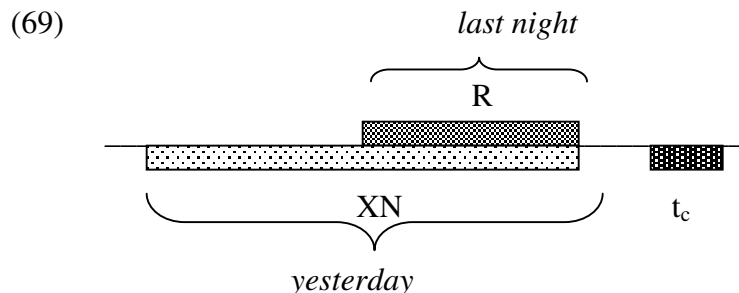▪ The following is a summary of the adverbial modification facts.

(67)   a.   ?? *last night* $\subset$ *yesterday* (indexical)   (cf. (56a))
    b.   ?? *from Thanksgiving to VDay last winter* $\cap$ *last year* (indexical)   (cf. (66))
    c.   √ *this morning* $\not\subset$ *yesterday* (indexical)   (cf. (59a))
    d.   √ *last night* $\subset$ *that day* (anaphoric)   (cf. (61a))
    e.   ?? *a year ago* $\subset$ *in 2003* (non-anaphoric)   (cf. (65a))
    f.   √ *this January* $\not\subset$ *in 2003* (non-anaphoric)   (cf. (65b))

▪ The descriptive generalization in (68) emerges.

(68)   No part of the reference time may be included in a perfect-time modifying positional adverbial, unless the positional adverbial is anaphoric to the reference time.

3.3   HOW THE XN THEORY FARES

- The XN makes exactly the opposite prediction to the new generalization. The XN interval includes the event time and has the reference time as a final subinterval. Thus, adverbials that include the XN interval in their denotation, *should* include XN's final subinterval, as well.

(69)

(70)   expected pattern:

    a. We ran into John *last night*. He had arrived in town *yesterday...*
    b. ?? We ran into John *this morning*. He had arrived in town *yesterday...*

- At this point, we can note that although it is the best theory, the XN theory is not without other problems.

  -- The reading of non-finite perfects under modals is not predicted. These are semantically present, so the XN should not be modifiable by positional adverbials.

(71)   Alicia must have danced *on Monday / yesterday / on December 31.*

    a. $\lambda t_1 \lambda w$ [$\mathbf{t_1 = t_c}$ & $H(t_1)(w) \subseteq \lambda w'\exists t_2[\mathbf{XN(t_2,t_1)}$ & $\mathbf{t_2 \subseteq yesterday}$ & $\exists e$ [$\tau(e) \subset t_2$ & e is a dancing of Alice in w']]]

    b. Roughly: In every world that is compatible with what we believe in the actual world at the speech time, there is an XN contained in yesterday that contains a dancing of Alice.

  -- The XN theory cannot handle apparent violations of the present perfect puzzle (from McCoard 1978).
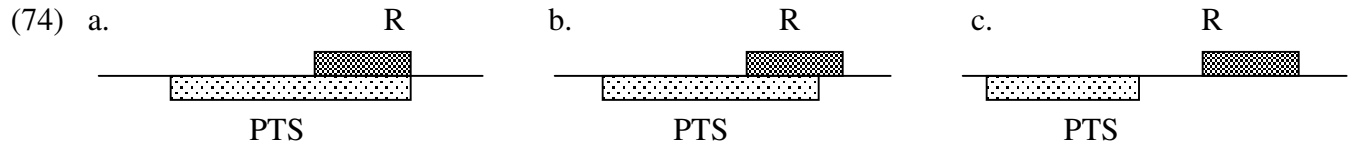
(72)   How has he been occupying himself this week?
Well, he's played golf on Tuesday, ridden horseback on Wednesday, and rested on Thursday.

4. A WEAKER MEANING FOR THE PERFECT

- The semantic contribution of PERFECT is to introduce an interval – the PTS – no part of which may be after the local evaluation time, as in (73) (Pancheva and von Stechow 2004)
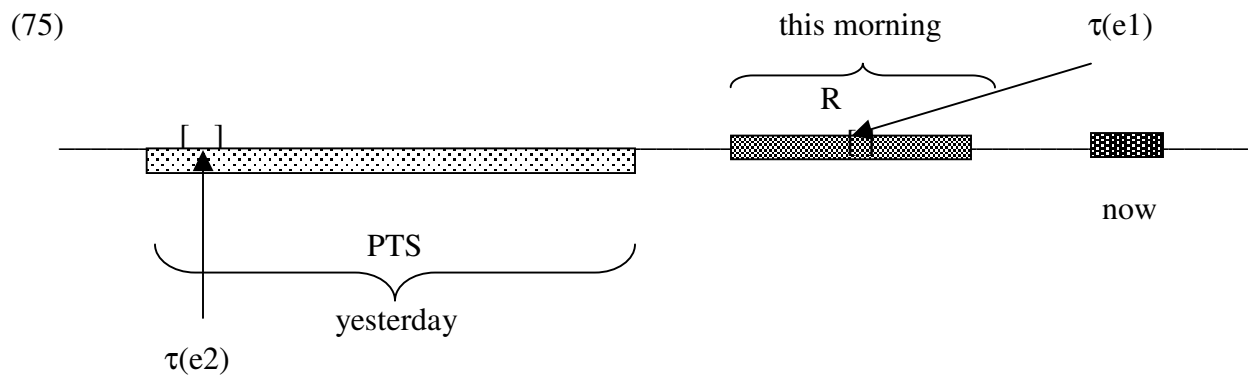
(73)   [[PERFECT]] $= \lambda p_{<i,t>}.\ \lambda t_i.\ \exists t'_i\ [t' \leq t\ \&\ p(t')]$
          where $t' \leq t$ iff there is no $t'' \subset t'$ such that $t'' > t$

(74)   a.   R   b.   R   c.   R

             PTS   PTS   PTS

- The proposal is in the spirit of the XN theory. But whereas the XN has to include the reference time as its final subinterval, the PTS has weaker restrictions: it may also precede and partially overlap with the reference time, or it may entirely precede it.

4.1   THE OTHER PERFECT PUZZLE

- The new meaning is compatible with the facts of the new generalization.

(75)

- The past perfect puzzle follows from a more general constraint on adverbial modification of intervals – a locality condition of sorts.

(76)   a. ?? Mary left *last night*. I spoke to her *yesterday*…
          b.   Mary left *this morning*. I spoke to her *yesterday*…
          c.   Mary left *last night*. I spoke to her earlier *that day*…

          d.   ?? Mary moved to LA *exactly a year ago*. I met her *in 2003*…
          e.   Mary moved to LA *exactly three years ago*. I met her *in 2003*…
          f.   Mary moved to LA *exactly a year ago*. I met her *that April/ that spring*… (said in April)

- Constraints analogous to those of Binding Theory are operative in determining the distribution of temporal adverbials

(77) a. (Non-t_c) anaphoric adverbials are "bound" by the local evaluation interval.

 b. Indexical (t_c-anaphoric) adverbials may not be "bound" by a local evaluation interval, unless that interval is the speech time.

 c. Referential adverbials may not be "bound" (by the local evaluation interval).

(78) An evaluation interval even partially included in another interval "binds" that interval.

(79) ?? Hillary thinks that the Clintons will win.

4.2 THE PRESENT PERFECT PUZZLE

4.2.1 AN OUTLINE OF THE SOLUTION

- A three-component solution (Pancheva and von Stechow 2004)

(80) a. PERFECT has a weak semantics, as in (73).
 b. a cross-linguistic variation in the semantics of PRESENT
 c. a mechanism of grammatical competition and strengthening of meaning

- In English, PRESENT introduces an interval coextensive with the speech time, whereas in German, it introduces an interval no part of which may precede the speech time. (cf. similar proposals in Klein 1992, Giorgi and Pianesi 1998, a.o.)

(81) a. $[\![\text{PRESENT}]\!] = \lambda p_{<it>}. \exists t_i [t = t_c \ \& \ p(t)]$ English
 b. $[\![\text{PRESENT}]\!] = \lambda p_{<it>}. \exists t_i [t \geq t_c \ \& \ p(t)]$ German
   where $t' \geq t$ iff there is no $t'' \subset t'$, such that $t'' < t$

(82) a. # Fred is sick in 10 days.
 b. # It {rains/is raining} next week.

(83) a. Fritz ist in 10 Tagen   krank.   (German)
   Fritz is in 10 days   sick
   'Fritz will be sick in 10 days.'

 b. Nächste Woche ist das Wetter   schlecht.
   next   week   is the   weather   bad
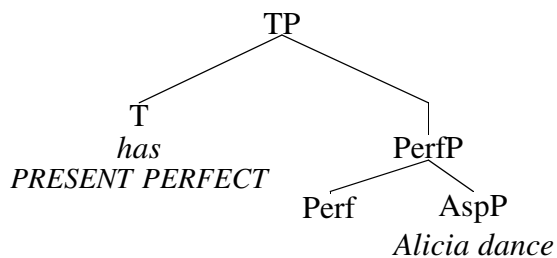   'Next week the weather will be bad.'

- In the English present perfect, the PTS necessarily includes the speech time. This is because the strictly compositional meaning of PRESENT PERFECT is restricted under competition with a semantic formative with a more specified meaning, namely PAST. The particular semantics of PRESENT is the reason PAST is a stronger scalar alternative to PRESENT PERFECT in English.

- Under competition with PAST, PRESENT PERFECT is strengthened to non-PAST, requiring inclusion of the speech time. Failure of modification by past positional adverbials then follows, as intervals including the speech time may not be modified by e.g. *yesterday*.

- Strengthening does not happen in German because of the different meaning of PRESENT in this language. Since inclusion of the speech time is not required, positional adverbials are predictably acceptable.

4.2.2 THE GRAMMATICAL COMPETITION IN MORE DETAIL

- In the unmarked case, the feature PERFECT moves to Aux *have/be*. Feature-movement leaves no trace/copy behind.

- When the auxiliary is finite, it, together with the feature PERFECT, moves to T. PRESENT and PERFECT thus meet at finite T (see (84)), and form the complex operator PRESENT ° PERFECT, as in (85).

- If the auxiliary is non-finite, PRESENT and PERFECT do not meet, as in (86).

(84)

```
              TP
             /  \
          T       PerfP
         has      /   \
  PRESENT PERFECT Perf  AspP
                    Alicia dance
```

(85)   [[PRESENT ° PERFECT]] $= \lambda p_{<it>}.$ PRESENT (PERFECT (p)) =
                    $= \lambda p \; \exists t_1 \exists t_2 \; [t_2 \leq t_1 \; \& \; p(t_2)]$

(86)

```
                  TP
                 /  \
              T      AuxP
            must     /   \
          PRESENT Aux    PerfP
                  have   /   \
                PERFECT Perf  AspP
                          Alicia dance
```

- A general principle dictates that meanings be expressed by the most specified form available. A familiar application of this principle is the realization of syntactic features by morphological forms.

- Semantic features realized at the same syntactic node compete with each other. The competition applies in the construction of an LF, both on the basis of an intended meaning (by a speaker), and on the basis of an utterance (by a hearer).

- PAST, for instance, competes with PRESENT as only one of them can occupy finite T. Since the two do not share aspects of their meaning, i.e., no interval can be described by both PAST and PRESENT, the outcome of the competition is trivial.

4.2.3 THE PRESENT PERFECT IN ENGLISH AND GERMAN

- We get essentially an XN meaning for the English present perfect, without positing in the lexical semantics of PERFECT that the PTS has to overlap with the reference time.

(87) $[[\text{PAST}]] = \lambda p \; \exists t_1 \; [t_1 < t_c \; \& \; p(t_1)]$

(88) $[[\text{PRESENT} \degree \text{PERFECT}]] = \lambda p \; \exists t_1 \exists t_2 \; [t_2 \leq t_1 \; \& \; p(t_2)] =$
      a. $= \lambda p \; \exists t_1 \; [t_1 = t_c \; \& \; \exists t_2 \; [t_2 \leq t_1 \; \& \; p(t_2)]] = \lambda p \; \exists t_2 \; [t_2 \leq t_c \; \& \; p(t_2)]]$ English
      b. $= \lambda p \; \exists t_1 \; [t_1 \geq t_c \; \& \; \exists t_2 \; [t_2 \leq t_1 \; \& \; p(t_2)]]$ German

- Strengthening of meaning in English

(89) $[[\text{PRESENT} \degree \text{PERFECT}]] = \lambda p \; \exists t_1 \; [t_1 = t_c \; \& \; \exists t_2 \; [t_2 \cap t_1 \; \& \; p(t_2)]]$ (strengthened)
           where $t \cap t'$ iff $t \cap t' \neq \varnothing$ and there is no $t'' \subset t$, such that $t'' > t'$

- In English, PRESENT ° PERFECT competes not only with PAST but also with PRESENT. Note that the meaning of PRESENT in English is a special case of the meaning of PRESENT ° PERFECT (compare (81a) and (88a)). As a result of this competition, the meaning of PRESENT ° PERFECT is strengthened such that the PTS may not coincide with the speech time. Rather some part of the PTS must precede the speech time.

- No strengthening in German

(90) $[_{TP} [\text{PRESENT} \degree \text{PERFECT}] [_{PerfP} \textit{yesterday} [_{AspP} \text{PERFECTIVE} [_{vP} \text{Alicia dance}]]]]$ (German)
         $= \exists t_1 \; [t_1 \geq t_c \; \& \; \exists t_2 \; [t_2 \leq t_1 \; \& \; t_2 \subseteq \text{yesterday}_c \; \& \; \exists e \; [\tau(e) \subset t_2 \; \& \; \text{dance (Alicia, e)}]]]$

(91)   I have always lived here (*… until recently).

(92) Ich   habe hier   immer   gewohnt … bis   vor   kurzem   (German)
     I   have here   always   lived   until recently
     'I have always lived here … until recently.'

- It is important to emphasize that the competition responsible for the strengthening of the meaning of a present perfect in English is strictly local, operating between two features that can potentially be realized at a single syntactic node. There is no global competition between proposition-expressing LFs. If there were such a global competition, the German present perfect too would have its meaning strengthened because of the existence of the past as a competitor.

4.2.4 PAST PERFECTS

- When the PTS is modified by a positional adverbial, the reference time need not be included in the denotation of the adverbial (see (93) where clearly *last night*$_c$, which serves as the reference time for the subsequent past perfect, is not included in *Monday*$_c$). Here the proposal differs from the predictions of the XN account, which requires such inclusion, because of the lexical meaning of PERFECT.

(93) a. I saw Alicia last night. She had danced on Monday.
      b. $\exists t_1 [t_1 < t_c \& t_1 \subseteq last\ night_c \& \exists t_2 [t_2 \leq t_1 \& t_2 \subseteq Monday_c \& \exists e [\tau(e) \subset t_2 \& dance\ (Alicia,\ e)]]]$

- Importantly, the PTS is not required to overlap with the reference time through strengthening either. This is so, because there is no semantic tense with a more specified meaning of a PAST-under-PAST, i.e., a tense feature denoting an interval that precedes a past interval.

4.2.5 NON-FINITE PERFECTS

- The auxiliary is non-finite, so it doesn't move to T, therefore PRESENT and PERFECT do not meet at the same node.

(94) [TP [PRESENT must$_H$] [PerfP PERFECT *yesterday* [AspP PERFECTIVE [vP Alicia dance]]]]
      $= \exists t_1 \lambda w[t_1 = t_c \& H(t_1)(w) \subseteq \lambda w'\exists t_2[t_2 \leq t_1 \& t_2 \subseteq yesterday_c \& \exists e [\tau(e) \subset t_2 \& A\text{-}dance(w',e)]]]$

- Because PRESENT and PERFECT are not together at the same node, competition with PAST does not arise, and the meaning of the modal present perfect is not strengthened. Furthermore, competition may not arise between PAST and PERFECT at the non-finite Aux node, as PAST is a finite tense feature and needs to be expressed at T.

4.2.6 COORDINATED PERFECTS

- McCoard (1978) (attributed to Diver 1963):

(95) How has he been occupying himself this week?
      Well, he's played golf on Tuesday, ridden horseback on Wednesday, and rested on Thursday.

- When Tense is repeated in each conjunct, the prohibition against positional adverbials resurfaces, as (96) (from Schein 2003) shows.
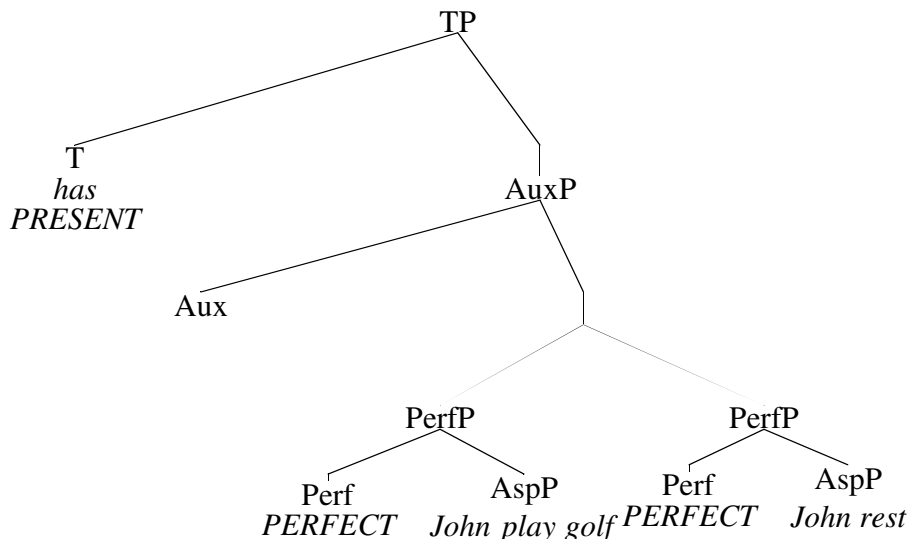
(96)   How has he been occupying himself this week?
        *He has played golf on Tuesday, has ridden horseback on Wednesday, and has rested on Thursday.

- Sharing the subject but not the Tense is not what is causing the unacceptability of (96), nor is the initial question necessary for the contrast between (95) and (96) to obtain.

(97)   a. John has played golf on Tuesday and ridden horseback on Wednesday.
        b. *John has played golf on Tuesday and has ridden horseback on Wednesday.
        c. John has played golf and has ridden horseback.

- There are two semantic features PERFECT, one in each conjunct. Since the auxiliary is shared, there is no feature movement of PERFECT to Aux. Across-the-board-style feature movement of PERFECT is syntactically possible, but would yield a single shared PERFECT, whose PTS will have to be simultaneously included in *Tuesday$_c$* and *Wednesday$_c$*.

(98)

(99)   [$_{TP}$ PRESENT   [$_{PerfP1}$ PERFECT *on Tue.* [$_{AspP}$ PERFECTIVE [$_{vP}$ he play golf]]] &
                           [$_{PerfP2}$ PERFECT *on Wed.* [$_{AspP}$ PERFECTIVE [$_{vP}$ he ride horseback]]]
        = $\exists t$ [t = t$_c$ & $\exists t_1$ [t$_1$ ≤ t & t$_1$ ⊆ *Tuesday$_c$* & $\exists e[\tau(e) \subset t_1$ & play-golf (he, e)]] &
                    $\exists t_2$ [t$_2$ ≤ t & t$_2$ ⊆ *Wed.$_c$* & $\exists e[\tau(e) \subset t_2$ & ride-horseback (he, e)]]]

- PRESENT and PERFECT are not at the same node, so no competition with PAST arises. No competition arises at the Perf node either, as there is no non-finite PAST in English. Because no competition with PAST arises, the PTSs do not have to be interpreted as intersecting with the speech time, hence the acceptability of positional adverbials.

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