Universal/Existential Ambiguities in German

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1 The Data

German Perfect sentences containing durative adverbs like seit ‘since’ or bis ‘until’ are ambiguous between a universal (or ‘u’) and an existential (or ‘e’) reading.

Perfect sentences containing seit ‘since’ combined with a point of time as in (1) are u/e-ambiguous. The u-reading of (1) is: there is a time that starts in yesterday, and John was in the garden throughout that time. The e-reading of (1) is: there is a time that starts in yesterday, and John was in the garden at least once during that time.

Bis ‘until’ only combines with a point of time. (2) is ambiguous between a u- and an e-reading.

(1) John ist seit gestern im Garten gewesen
   John has since yesterday in-the garden been
   ‘John was in the garden since yesterday’

(2) John ist bis gestern im Garten gewesen
   John is until yesterday in-the garden been
   ‘John was in the garden until yesterday’

For many speakers, u-readings are easier to get than e-readings. But e-readings are salient with continuations like (3–4). With these continuations, u-readings are impossible. Thus, we have a test for e-readings.

(3) und zwar dreimal
    and actually three-times
    ‘Actually, this was three times’

(4) und zwar um eins
    and actually at one
    ‘Actually, this was at one’


2 Questions to be Addressed

Several intriguing questions come up with the data from the last section.
First, what is the meaning of the adverbs bis and seit?
Second, are the u/e-ambiguities true semantic ambiguities?
Third, have the u/e-ambiguities anything to do with the meaning of the Perfect?
But before I present my answers to these questions, I will have a look at previous analyses.

3 Previous Analyses

The only studies treating u/e-ambiguities are, to my knowledge, Anagnostopoulos et al. (1999) and Fabricius-Hansen (1986). Let us look at Anagnostopoulos et al. (1999) first.

3.1 Anagnostopoulos et al. (1999)

In the analysis of Anagnostopoulos et al. (1999), the u/e-ambiguity of (5) is due to a lexical ambiguity of since.

(5) Since 1990 I have been sick

Durational since yields the u-, and inclusive since yields the e-reading. This is illustrated by the following LFs:

(6) u-reading: \( \exists i \ [\text{begin}(i)=1990 \& \text{end}(i)=\text{Now} \& \forall t \in i \ (\text{VP}(t))] \)

(7) e-reading: \( \exists i \ [\text{begin}(i)=1990 \& \text{end}(i)=\text{Now} \& \exists t \in i \ (\text{VP}(t))] \)

My objection against Anagnostopoulos et al. (1999) is the following. In German, all so-called Grenzadverbien ‘border-adverbs’ display the u/e-ambiguity: bis ‘until’, seit ‘since’, von...bis ‘from...until’, von...an ‘from...on’, and ab ‘as from’. It is not desirable to make a whole class of adverbs simply lexically ambiguous. Moreover, if the adverbs mentioned were lexically ambiguous as Anagnostopoulos et al. claim, one would expect to find the u/e-ambiguity with all tenses. But compare:

(8) Preterite: Er rannte seit gestern
he ran since yesterday
‘He ran since yesterday’
(9) Future: Dann wird er seit 1980 hier arbeiten
then will he since 1980 here work
‘At that time, he will have worked here since 1980’

(10) Present: Er rennt seit gestern
he runs since yesterday
‘He runs since yesterday’

The data in (8–10) do not display the u/e-ambiguity. There is always only the u-reading. Thus, the adverbs cannot be lexically ambiguous.

3.2 Fabricius-Hansen (1986)

Fabricius-Hansen (1986) offers a scope solution for the following u/e-ambiguous sentence.

(11) Es hat seit gestern geregnet
it has since yesterday rained
‘It has rained since yesterday’.

In the case of the e-reading of (11), seit gestern ‘since yesterday’ has wide scope, cf. the LF in (12).

(12) seit gestern (PRES (PERF (es regnen)))
since yesterday (PRES (PERF (it rain)))

But in the case of the u-reading of (11), seit gestern ‘since yesterday’ has narrow scope, cf.:

(13) PRES (PERF (seit gestern (es regnen)))
PRES (PERF (since yesterday (it rain)))

Obviously, there is also a third possibility. Seit gestern ‘since yesterday’ could be inserted between PRES and PERF. In Fabricius-Hansen’s system, however, this does not result in a third reading, but in the e-reading again.

To interpret the formulas above, we need Fabricius-Hansen’s rules for PRES, PERF and seit ‘since’. Cf.:

(14) PRES:
(a) PRES $\phi$ is true at $(t_0, T_0, T_K)$
    iff $\phi$ is true at $(t_0, T_{G0}, T_K)$. $T_{G0}$ is a superinterval of $t_0$. 

(b) PRES $\phi$ is true at $(t_0, T_j, T_K)$
   iff (i) or (ii) is true:
   (i) $t_j$ is a co-time $t_k$, which is an event-time of a proposition,
       and $\phi$ is true at $(t_k, T_k, T_K)$
   (ii) $t_j$ is no co-time, and $\phi$ is true at $(t_0, T_j, T_K)$

(15) PERF:
   (a) PERF $\phi$ is true at $(t_j, T_j, T_K)$, $j \neq 0$,
       iff $\phi$ is true at $(t_j, T_+, T_K)$. $T_+$ stretches backward from $t_j$
       and includes $t_j$.
       ($T_+$ is called unechter Vergangenheitsbereich ‘unreal past’ of $t_j$)
   (b) PERF $\phi$ is true at $(t_i, T_j, T_K)$
       iff (i) or (ii) is true:
       (i) $\phi$ is true at $(t_i, T_+, T_K)$.
           $T_+$ is that part of unechter Vergangenheitsbereich ‘unreal past’ of $t_i$
           which elements are subintervals of $t_j$.
       (ii) $\phi$ is true at $(t_j, T_+, T_K)$.
           $T_+$ is that part of unechter Vergangenheitsbereich ‘unreal past’ of $t_j$
           which elements are subintervals of $T_k$.
           $T_k$ is an interval provided by the context.
           $T_k$ reaches over the left boundary of $t_j$.

(16) seit ‘since’:
   (a) ‘seit 1972 $\phi$’ is true at $(t_i, T_i, T_K)$ iff 1972 is before $t_i$
       and $\phi$ is true at $(t_i, T_b, T_K)$.
       $T_b$ is the set of all superintervals of $t_i$ that follow 1972
   (b) ‘seit 1972 $\phi$’ is true at $(t_i, T_j, T_K)$ iff 1972 is before $t_i$
       and $\phi$ is true at $(t_i, T_b, T_K)$.
       $T_b$ is the set of intervals following 1972
       and standing in the very same relationship to $t_i$ as $t_j$ does.

Within this system, propositions are to be evaluated at the triple
$(t, T_B, T_K)$. That is to say, there are three indices; we are dealing with a complex intension.

The first index $t$ is the reference time. At the beginning of recursion, $t$ is identical with speech time $t_0$. But in the course of evaluation, $t$ may denote other times (e.g. it may denote a contextually given time of another event or it may denote the time of a sentence-internal temporal adverb).

$T_B$ is the set of times to be considered (or, in Fabricius-Hansen’s terms, Betrachtzeitmenge). Often, $T_B$ is the temporal adverb of the proposition. But in other cases, $T_B$ is an event time or a time delivered by the evaluation process. In rule (a) for PRES, $T_{G0}$ is a time delivered by the evaluation process.
The time $T_0$ in the triple $(t_0, T_0, T_K)$ of rule (a) for the Present is (just as $t_0$ for the first index $t$) the default. At the beginning of recursion, $T_B$ gets the value $T_0$ (but only if the sentence contains no temporal adverb and there is no context).

$T_K$ is a store for times which have already (i.e. up to the time of evaluation) occurred in discourse. Times of temporal adverbs and times of events are stored, but times delivered by the evaluation process are stored as well.

The interpretation of (12), i.e. the e-reading, goes as follows. Seit gestern 'since yesterday' is the set of intervals starting in yesterday and overlapping $S$ at the same time. PRES is redundant here. PERF establishes a set of intervals that are in the Extended Now (defined as in McCoad 1978) and that are part of a since-yesterday-interval. One of these is a raining-interval.

The calculation of the u-reading in (13) goes as follows. PRES establishes an interval including $S$. PERF establishes a set of intervals that are in the Extended Now and that are part of a PRES-interval. Seit gestern 'since yesterday' selects intervals starting in yesterday and continuing up to $S$. One of these is a raining-interval.

My objection against Fabricius-Hansen (1986) is that she makes use of too many semantic distinctions. There are three different rules for PERF in Fabricius-Hansen (1986), cf. (15). Three distinct rules for PRES are used, cf. (14). Even seit 'since' is ambiguous in meaning, cf. (16).

4 My Proposal

To account for the u/e-ambiguity occurring with seit 'since' and bis 'until', I make the following assumption. Every sentence has exactly one adverb of quantification (Qadv), the default being $\exists_\omega$ (einmal 'once') (Bäuerle 1979, Stechow 1991).

It is my thesis that durative adverbs like seit 'since' and bis 'until' have scope with respect to Qadv. The u/e-ambiguity thus receives a scope solution:

\[(17)\] e-reading:  
\[
\begin{array}{c}
\text{TP} \\
\text{PerfP} \\
\text{Pres} \\
\text{Adverb-PP} \\
\text{Qadv VP}
\end{array}
\]

\[
\begin{array}{c}
\text{TP} \\
\text{PerfP} \\
\text{Qadv} \\
\text{Adverb-PPVP}
\end{array}
\]
4.1 seit ‘since’

To tackle the u/e-ambiguity of (1) (repeated here as (18)), we need the rules in (19). Pres denotes S’ which is a superinterval of S.

(18) John ist seit gestern im Garten gewesen
   ‘John has been in the garden since yesterday’

(19) a. $\ll_\circ (p)(t)=1$ iff $\exists t'[t' \subseteq t$ & $p(t')=1]$

b. $\text{Perf}:= \lambda P \lambda t \exists u [u \supseteq t$ & $P(u)=1]$

c. $\ll_{\text{seit plus point-of-time}}(z)(p)(t)=1$ iff
   $\exists t'[\text{begin}(t') \subseteq S$ & $\text{end}(t') \leq S$ & $S \subseteq t$ & $p(t')=1]$

The Perfect denotes the Extended Now, but the reference point is excluded. See Rathert (2000) for an argument for this meaning of the Perfect.

One may wonder about the condition ‘$\text{end}(t') \leq S$’ in the meaning rule for seit ‘since’. Usually, the interval established by seit ‘since’ reaches up to S. But this need not always be the case, as Latzel (1977:159f.) and Fabricius-Hansen (1986:212f.) have shown. The seit-interval may stop before S. Compare:

(20) a. Schopenhauer hat seit 1831 in Frankfurt gewohnt
   ‘Since 1831, Schopenhauer lived in Frankfurt’

b. Seit 1935 wurde Hitlers Phantasie von einem Magenleiden beherrscht
   ‘Since 1935, Hitler’s phantasy was occupied by a stomach complaint’

Now we can calculate the meanings of (18):

(21) e-reading of (18): $\text{Pres(Perf(seit gestern(3 o (VP))))} =$
   $\exists u [u \supseteq S'$ & $\exists t'[t' \subseteq t$ & $VP(t')=1]]$

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1 This example is taken from Latzel (1977:159), the following is from Fabricius-Hansen (1986:212).
(22) u-reading of (18):
\[
\text{Pres(Perf}(\exists_\geq (\text{seit gestern}(\text{VP})))) = \exists u [(u \supset S') \& \exists t [t \subseteq u \& \exists t' [(\text{begin}(t') \subseteq \text{yesterday} \& \text{end}(t') \leq S \& S \subseteq t \& \text{VP}(t') = 1)]]]
\]

Arnim von Stechow suggested that the Qadv $\exists_\geq$ may be omitted in the case of the u-reading (cf. also Paslawska & Stechow 1999). He argued that we get a true u-reading also without $\exists_\geq$. Furthermore, he argued that using $\exists_\geq$ only for the e-reading correctly models our intuition that the e-reading is hard to get. It is hard to get because we need something complicated, something which we do not need elsewhere, namely $\exists_\geq$. I do not agree that $\exists_\geq$ may be omitted in case of the u-reading, because you can say something like (23).

(23) Charly ist dreimal seit drei gerannt
   Charly is three-times since three run
   ‘Charly has run three times since three’

$\exists_\geq$ means ‘once’, but its place in the tree is the general slot for quantificational adverbs. (23) means that there are three different times ‘three’ from each of which Charly starts to run. That is to say: you can count u-readings. It is obvious that the place of $\exists_\geq$ in the tree is the general slot for quantificational adverbs also in case of e-readings, as you can say something like (24).

(24) Charly ist seit drei dreimal gerannt
   Charly is since three three-times run
   ‘Charly has run three times until three’

Thus, overt quantificational adverbs provide additional support for my analysis.

4.2 bis ‘until’

To tackle the ambiguous sentence in (2) (repeated here as (25)), we need the rule in (26). The calculations are in (27–28).

(25) John ist bis gestern im Garten gewesen
   John is until yesterday in-the garden been
   ‘John was in the garden until yesterday’

(26) \(\text{bis}(z)(p)(t) = 1 \iff \exists t' [\text{end}(t') \subseteq z \& z \subseteq t \& p(t') = 1]\)
(27) e-reading of (25): Pres(Perf(bis gestern(∃c(VP)))) =
\exists u [u \supset S' & 
\exists t [\text{end}(t) \subseteq \text{yesterday} & \text{yesterday} \subseteq u & \exists t' [t' \subseteq t & VP(t')=1]]]

(28) u-reading of (25): Pres(Perf(∃c(bis gestern(VP)))) =
\exists u [u \supset S' & 
\exists t [t \subseteq u & \exists t' [\text{end}(t') \subseteq \text{yesterday} & \text{yesterday} \subseteq t & VP(t')=1]]]

Back to the trees in (17). Qadv and Adverb-PP interact, but there is no scope interaction with Perf. The u/e-ambiguity thus has nothing to do with the meaning of the Perfect. This is contrary to what is said in the literature on the topic. But if this is true, the u/e-ambiguity should also be found with other tenses. This is indeed the case (to my knowledge, this has not been noticed before):

(29) Future: Charly wird bis morgen rennen
Charly will until tomorrow run
‘Charly will run until tomorrow’

(30) Present: Charly rennt bis morgen
Charly runs until tomorrow
‘Charly runs until tomorrow’

The trees for (29) would look exactly like the trees in (17), the only difference being that there is no Perf and no PerfP for (29) but a Fut and a FutP instead. This in turn would mean that the Perfect and the Future are analyzed on a par, which is in accordance with Stechow (1999). We need a Pres above Perf and above Fut for the embedded cases. In the embedded cases, Perf and Fut are deleted and Pres remains.

The only tense with which the complex u/e-ambiguity does not occur is the Preterite. Something like

(31) Charly rannte bis drei
Charly ran until three
‘Charly ran until three’

never has an e-reading. (31) always means that there is a time that ended at three, and Charly ran throughout that time. That is to say, you only get the u-reading. I suggest the following analysis.
First, quantifying adverbs are incompatible with the Preterite. This has been shown by Latzel (1977) and Schipporeit (1971). Thus I suppose that \( \exists_2 \) is not present in Preterite sentences either.

Second, the Preterite is an anaphorical tense, i.e., it either demands a sentence-internal adverb or a context that makes the time of the event clear. In (31), there is a sentence-internal adverb, the LF could therefore be like (32), with the adverb being lambdad-in as an argument of the Preterite:

\[
\begin{array}{c}
\text{TP} \\
\text{PerfP} \\
\text{Pres} \\
\text{forPP} \\
\exists_2 \text{VP}
\end{array}
\]

References

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