How to interpret "expletive" negation under *bevor* in German

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The puzzle

- *Der Aphorimus hat vor jeder anderen Literaturgattung den Vorteil,
  dass man ihn nicht weglegt, bevor man ihn nicht zu Ende gelesen hat.*
  (aphorism by Gabriel Laub)
  'The advantage of the aphorism over other kinds of literature is
  that people don't put it aside before they finish reading it.'

  'The advantage of the aphorism over other kinds of literature is
  that people don't put it aside before they DON'T finish reading it.'

- *Der Aphorimus hat vor jeder anderen Literaturgattung den Vorteil,
  dass man ihn nicht weglegt, bevor man ihn ▮▮▮▮ zu Ende gelesen hat.*

Questions:
  -- What licenses the "superfluous" or "expletive" negation in German?
  -- Is this due to negative concord or something?
  -- Why does it not appear in English, Scandinavian lg., Dutch(?) ?

Similar examples – *bevor, ehe, bis* (from DWDS Corpus)

- *Aber ich wollte meiner zärtlichen Rechnung nicht trauen, bevor **nicht** eine verläßliche Probe gemacht war.* [Ge 1911]
  'But I did not want to trust my tender computation before NEG a more reliable test was done.'

- *Bevor die DDR **nicht** alle volkswirtschaftlichen Daten offengelegt habe, könne darüber nicht gesprochen werden.* (Ze 1990)
  'Before East Germany NEG has made accessible all economic data one cannot talk about that.'

- *Von unsern Leuten darf niemand an Land, ehe **nicht** morgen die Behörde die Pera freigibt.* [Ge 1929]
  'Noone of our people should disembark before NEG the officials allow the use of the Pera.'

- *Er hat erklärt, er wolle nicht eher ruhen, als bis **nicht** der letzte Nationalliberale aus Hannover verschwunden sei.* [Ze 1910]
  'He explained he would not rest before than NEG the last member of the national liberal party was gone from Hanover.

Some statistics (DWDS corpus)

Instances of *bevor*: 7507   Instances of *bevor* followed by *nicht*: 63
                                         (*bevor ** nicht*)

Instances of *ehe*:   6169   Instances of *ehe* followed by *nicht*: 67
    (literary texts, reduced frequency over 20th century)

Instances of *bis*:   19389   Instances of *bis* followed by *nicht*: 19

- *Aber ich wollte meiner zärtlichen Rechnung **nicht** trauen, bevor **nicht** eine verläßliche Probe gemacht war.* [Ge 1911]
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- *Von unsern Leuten darf **niemand** an Land, ehe **nicht** morgen die Behörde die Pera freigibt.* [Ge 1929]
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Negation in main clause appears to be required:

- *#Der Aphorimus hat vor jeder anderen Literaturgattung den Vorteil, dass man ihn ▮▮ weglegt, bevor man ihn **nicht** zu Ende gelesen hat.*

- *Der Aphorismus hat vor jeder anderen Literaturgattung den Vorteil, dass man ihn ▮▮ weglegt, bevor man ihn ▮▮ zu Ende gelesen hat.*

The type of negation in the main clause can vary:

- ***Niemand** legt seine Serviette vom Schoß auf den Tisch zurück, bevor das nicht die Hausfrau getan hat.*

- *und **nur wenige** können das, bevor sie nicht selbst Vergebung erfahren haben**.***

- *Der Geschäftsausschuss **warnt**, sich auf Verträge einzulassen, bevor nicht die Mitgliedervesammlung ihr Votum abgegeben hat.*

- *Janek **weigerte sich**, aufzuhören, bevor er nicht von der Gefangenendelegation dazu aufgefordert wurde.*

Negation in Main Clause

Negation in main clause cannot be denial:

- *Man legt den Aphorismus nicht weg, bevor man ihn nicht zu Ende gelesen hat.*
- *#Man legt den Aphorismus **keineswegs** weg, bevor man ihn nicht zu Ende gelesen hat.*
- *#Es is **nicht** der Fall, dass man den Aphorismus weglegt, bevor man ihn nicht zu Ende gelesen hat.*

And in rare cases, there is no negation in the main clause!

- *So lange ein Kind das Köpfchen nicht selbst zu heben vermag und bevor es **nicht** allein sitzen kann, **fühlt es sich im Liegen am wohlsten**.*
  'As long as a child cannot lift his little head and before he NEG can sit up on his own, he feels most comfortable in a reclining position.'

Negation in Dependent Clause

Negation in embedded clause must be *nicht* or *kein*.

- *Wir gehen nicht, bevor wir (nicht einen Artisten /? keinen Artisten *wenige Artisten / *weniger als drei Artisten) gesehen haben.*

Negation under *bevor* tends to be syntacally high
-- "light negation", Schwarz & Bhatt (2006).

- *weil **Peter nich**t gekommen ist*
  'because Peter didn't come'
- *weil **nicht Peter** gekommen ist (sondern Paul)* – contrastive only
  'because it wasn't Peter who came (but Paul)'
- *wir gehen nicht, bevor **nicht Peter** gekommen ist*
  *wir gehen nicht, bevor **Peter nich**t gekommen ist*
  'we do not go before Peter NEG came'

Negation under *bevor* as negative concord?

Negation under 'before' as negative concord: Catalan (Espinal 2000).

albans 'before' is a negation; it triggers n-words and optional negation in its scope non-factual reading:

- ***Albans*** *que et vegi   **ningú**, vés-te'n.*
  before   than you see.SUBJ.3SG anybody go.IMP-2SG
  'Before anybody sees you, you should go.'

- ***Albans*** *que (**no**) et vegin,   vés-te'n.*
  before than not you see.SUBJ.3PL go.IMP-2SG
  'Before anybody sees you [they see you], you should go'

But German is different: We need a negation in the main clause.

Negation under *bevor* as negation under comparative?

Del Prete (2008), *prima* 'before' in Italian as comparative:

- *Gianni arrivó **prima** que arivasse Lea.*
  'Gianni arrived before Lea arrived.SUBJ'
  ∃d[¬[Lea arrived d-early] ∧ Gianni arrived d-early]

Negation in logical form "absorbs" negation in *prima*-clause,
  just as in other cases of comparatives:

- *Le fermerai **prima** que **non** faccia qualche sciochezza.*
  'You will stop him before he NEG does.SUBJ anything silly.'

- *Sparerà **più** in alto que **non** pensi.*
  'He will shoot higher than you NEG think.'

Problem with transfer of this account to German:
  -- *bevor* is not a comparive: **bevor als du gekommen bist*
  -- No "expletive" negation in German comparatives
  -- German requires expletive negation in main clause.

Negation under *bevor* as exception clause?

- *Wir reisen nicht ab bevor <u>nicht</u> Peter gekommen ist.*
  ⇔ *Wir reisen nicht ab, <u>nicht</u> bevor Peter gekommen ist.*
  'We do not leave, not before Peter arrives.'

Could explain the "high" position of negation, but:

    -- How come that the negation is lowered from c-commanding *bevor*
      into the scope of *bevor*?
    -- Negative exception clause is offset by "comma" intonation,
      this is lacking with negation under *bevor*.

Bevor + negation as temporal conditional marker?

Weisgerber (1960):

- *Bevor nicht Peter gekommen ist, reisen wir nicht ab.*
  Wenn Peter noch nicht angekommen ist, reisen wir nicht ab.
  'For every time t, if Peter has not arrived at t yet, we do not leave at t'

Problems:

    -- How does *bevor nicht* acquire this temporal conditional meaning?
    -- Why do we need a negation in the main clause?

Towards an explanation: The meaning of *bevor*

Core meaning, following Ascombe (1964) for English *before*:

- $[\![bevor\ B]\!]^n = \lambda t\ \neg \exists t'[t' \leq t \land [\![B]\!]^n(t')]$
  a temporalized negation of B

- $[\![[A\ [bevor\ B]]]\!]^n = \lambda t[[\![A]\!]^n(t) \land [\![bevor\ B]\!]^n(t)]$
  $= \lambda t[[\![A]\!]^n(t) \land \neg \exists t'[t' \leq t \land [\![B]\!]^n(t')]]$

- $[\![ASSERT[A\ bevor\ B]]\!]$
  $= \exists t[[\![A]\!]^n(t) \land \neg \exists t'[t' \leq t \land [\![B]\!]^n(t')]]$

Examples with statives and episodics:

- *Die Göttinger Universität gab es bevor es die Berliner Universität gab.*
  'The University of Göttingen was there before the University of Berlin was there.'

- *Die Universität Göttingen wurde gegründet, bevor die Universität Berlin gegründet wurde.*
  'The University of Göttingen was founded before the University of Berlin was founded.'

Nonfactual use of *bevor* (cf. Heinämäki 1972, Ogihara 1995)

- *Mozart starb bevor er sein Requiem vollendete.*
  'Mozart died before he finished his requiem.'

- $[\![Mozart\ starb]\!]^n$
  $= [\![PAST]\!]^n([\![Mozart\ sterb\text{-}]\!]^n)$
  $= \lambda t[t < n \land M\ dies\ at\ t]$

- $[\![er\ sein\ Requiem\ vollendete]\!]^n$
  $= [\![PAST]\!]^n([\![Mozart\ sein\ Requiem\ vollend\text{-}]\!]^n)$
  $= \lambda t[t < n \land M\ finishes\ requiem\ at\ t]$

- $[\![bevor\ er\ sein\ Requiem\ vollendete]\!]^n$
  $= \lambda t\ \neg \exists t'[t' < t \land [t' < n \land M\ finishes\ requiem\ at\ t']]$

- $[\![Mozart\ starb\ [bevor\ [er\ sein\ Requiem\ vollendete]]]\!]^n$
  $= \lambda t[t<n \land M\ dies\ at\ t \land \neg \exists t'[t'<t \land [t'<n \land M\ finishes\ requiem\ at\ t']]]$

- Assertional closure applies only at this stage:
  $[\![ASSERT]\!]^n([\![Mozart\ starb\ [bevor\ [er\ sein\ Requiem\ vollendete]]]\!]^n)$
  $= \exists t[t < n \land M\ dies\ at\ t \land \neg \exists t'[t' < t \land M\ finishes\ requiem\ at\ t']]$

Implicature of likelihood

- *#Mozart starb bevor er ein Oktett für Streicher und Helikopter komponierte.*
  *'*Mozart died before he composed an octet for strings and helicopters'

- *Mozart starb bevor er ein Requiem komponierte*.
  'Mozart died before he composed a requiem.'
  o.k. because it seemed likely that Mozart would have composed a requiem before he died.

Heinämäki (1972), Ogihara (1995), Beaver & Condoravdi (2004):
  modal core meaning of *before* expressing likelihood of *before*-clause.

Here: Likelihood by implicature of relevance:

- If the *a-priori* likelihood of $\exists t[B(t)]$ is close to 0,
  then the *a priori* likeli-hood of [A *before* B] is close to 1,
  and asserting it would violate the maxim of relevance.

- Consequently, when uttering a sentence [A *before* B],
  the speaker implicates
  that the *a priori* probability that $\exists t[B(t)]$ is substantially greater than 0.

Factual interpretation of *bevor*

- *Herr Maier lernte Frau Schmidt kennen, bevor er Herrn Schmidt kennenlernte.*
  'Mr. Maier met Mrs. Schmidt before he met Mr. Schmidt.'

By default, we assume that Mr. Maier met Mr. Schmidt as well.
  For example, possible follow-up question:
  Wann hat Herr Maier Herrn Schmidt kennengelernt?
  'When did Mr. Maier meet Mr. Schmidt?'

This is an implicature, as it can be cancelled:
  Tatsächlich hat er Herrn Schmidt nie kennengelernt,
  denn die Schmidts haben sich kurz darauf getrennt.
  'As a matter of fact, he never met Mr. Schmidt
  because the Schmidts separated soon after.'

Factual interpretation of *bevor*

Derivation by scalar implicature:

- temporal negation [A *bevor* B]
  competes with the stronger general negation *nicht* B.
- when [A *bevor* B] is uttered,
  Hearer can infer that the stronger statement *nicht* B does not obey maxim of quality (it is either known to be false, or evidence for it is lacking).
- Hearer concludes: ¬ *nicht* B, equivalent to B.

With the core meaning of [A *bevor* B]:

- asserted: $\exists t[[\![A]\!]^n(t) \wedge \neg \exists t'[t' \leq t \wedge [\![B]\!]^n(t')]]$,
  implicated: $\underline{\exists t[[\![B]\!]^n(t)]}$
- implicature together with assertion:
  $\exists t[[\![A]\!]^n(t) \wedge \underline{\exists t'[t < t' \wedge [\![B]\!]^n(t')]}]$

Our example:

     -- Asserted: Mr. Maier met Mrs. Schmidt when he did not know Mr. Schmidt.
     -- Implicated: Mr. Maier met Mr. Schmidt **after** he met Mrs. Schmidt.

Reified implicatures

Assume: Implicatures, though cancellable, are introduced with meanings
     (cf. Levinson 2000) – "reified implicatures";
     Format: Parallel construction ⟨core meaning, <u>implicature</u>⟩

Example:

- $[\![or]\!] = \langle \lambda p \lambda p' \lambda t[p(t) \vee p'(t)], \lambda p \lambda p' \lambda t \neg[p(t) \wedge p'(t)] \rangle$
- $[\![raining\ or\ snowing]\!] = \langle \lambda t[r(t) \vee s(x)], \lambda t \neg[r(t) \wedge s(t)] \rangle$
- $[\![ASSERT]\!]([\![raining\ or\ snowing]\!])$
  $= \lambda \langle p, p' \rangle[asserted: \exists t$

Reified implicature of *bevor*

Assume: Implicatures, though cancellable, are introduced with meanings
(cf. Levinson 2000) – "reified impicatures";
Format: Parallel construction $\langle$core meaning, <u>implicature</u>$\rangle$

Application to *bevor*:

- $[\![bevor\ B]\!]^n$
$= \langle \lambda t \neg \exists t'[t' \le t \land [\![B]\!]^n(t')], \underline{\lambda t \exists t'[t < t' \land [\![B]\!]^n(t')]}\rangle$

- $[\![A\ [bevor\ B]]\!]^n$
$= \langle \lambda t[[\![A]\!]^n(t) \land \neg \exists t'[t' \le t\ [\![B]\!]^n(t')]], \underline{\lambda t[[\![A]\!]^n(t) \land \exists t'[t < t' \land [\![B]\!]^n(t')]]}\rangle$

- $[\![ASSERT]\!]^n = \lambda\langle p,p'\rangle[\text{asserted}: \exists t[p(t)], \text{implicated}: \underline{\exists t[p'(t)]}]$

- $[\![ASSERT]\!]^n([\![A\ [bevor\ B]]\!]^n)$
$= [\text{asserted}: \exists t[[\![A]\!]^n(t) \land \neg \exists t'[t' \le t\ [\![B]\!]^n(t')]],$
  $\text{implicated}: \underline{\exists t[[\![A]\!]^n(t) \land \exists t'[t < t' \land [\![B]\!]^n(t')]]}$

- If implicature does not contradict asserted meaning:
$\exists t[[\![A]\!]^n(t) \land \neg \exists t'[t' \le t\ [\![B]\!]^n(t')]] \land \underline{\exists t[[\![A]\!]^n(t) \land \exists t'[t < t' \land [\![B]\!]^n(t')]]}$

Meaning of *bevor nicht* clause

- *Maria schlief nicht ein bevor nicht Hans zuhause war*.
'Maria didn't fall asleep before NEG Hans was home.'

Assume: Negation under *bevor* negates a proposition.

- $[\![nicht_p\ A]\!]^n = \lambda t \neg[[\![A]\!]^n(t)]$

- $[\![nicht_p\ [Hans\ zuhause\ war]]\!]^n = \lambda t \neg[t < n \land \text{Hans is home at } t]$

- $[\![bevor]\!]^n = \lambda p \langle \lambda t \neg \exists t'[t' \le t \land p(t')], \underline{\lambda t \exists t'[t < t' \land p(t')]}\rangle$

- $[\![bevor\ [nicht_p\ [Hans\ zuhause\ war]]]\!]^n$
$\langle \lambda t \neg \exists t'[t' \le t \land \neg[t' < n \land \text{Hans is home at } t']],$
 $\underline{\lambda t \exists t'[t < t' \land \neg[t' < n \land \text{Hans is home at } t']]}\rangle$

- Core meaning can be rendered more perspicuously as:
$\lambda t \forall t'[t' \le t \rightarrow [t' < n \land \text{Hans is home at } t']]$
Entails that Hans is home at the beginning of time!

- We assume that this is false at all plausible models.
$\langle \lambda t\ [\bot], \underline{\lambda t \exists t'[t < t' \land \neg[t' < n \land \text{Hans is home at } t']]}\rangle$
The core meaning does not apply to any time!

Meaning of *bevor nicht* construction:

Negation of main clause is assertional:

- $[\![nicht_a]\!]^n = \lambda p \, \neg \exists t[p(t)]$
- $[\![nicht_a]\!]^n([\![Maria\ einschlief]\!]^n) = \neg \exists t[t<n \land Maria\ falls\ asleep\ at\ t]$

Assertive negation scopes over *bevor* clause:

- $[_{CP}$ *Maria*$_2$ $[_{C0}$ *schlief*$_1$ $[_{IP}$ **nicht$_a$**
  $[[_{IP} t_2 [_{VP} t_2 [_{V0} t_0]] [_{I0}$ *ein* $t_1]_0]][_{IP}$ *bevor nicht Hans zuhause war*$]]]]]$

As *bevor*-clause contains a reified implicature, assertional negation is:

- $[\![nicht_a]\!]^n = \lambda\langle p, p'\rangle[\text{asserted: } \neg \exists t[p(t)], \text{implicated: } \neg \exists t[p'(t)]]$
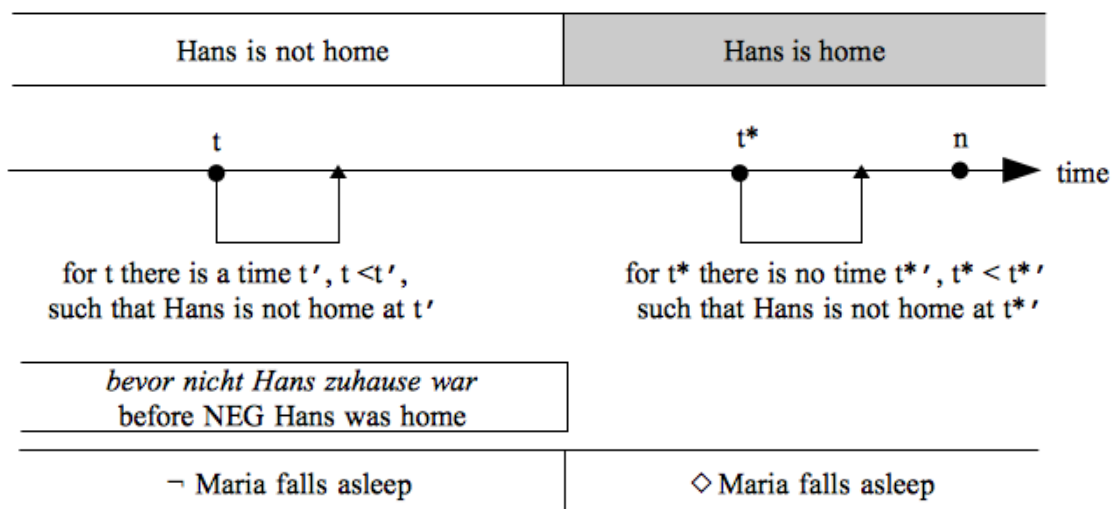
Applied to case at hand:

- $[\![nicht_a]\!]^n([\![Maria\ schlief\ ein\ [bevor\ nicht\ Hans\ zuhause\ war]]\!]^n)$
- asserted: $\neg \exists t[t < n \land Maria\ falls\ asleep\ at\ t \land \bot]$, $= \top$
  implicated: $\neg \exists t[t < n \land Maria\ falls\ asleep\ at\ t$
  $\qquad\qquad \land \exists t'[t < t' \land \neg[t' < n \land Hans\ is\ home\ at\ t']]]$
- Core meaning is a tautology; information is only carried by implicature.

Diagram for *bevor nicht* construction

- *Maria schlief nicht ein bevor nicht Hans zuhause war*

Hans is not home	Hans is home

for t there is a time t′, t <t′,
such that Hans is not home at t′

for t* there is no time t*′, t* < t*′
such that Hans is not home at t*′

bevor nicht Hans zuhause war
before NEG Hans was home

¬ Maria falls asleep   ◇ Maria falls asleep

- *Maria schlief ein bevor nicht Hans zuhause war.*
  asserted: $\exists t$[Maria falls asleep at t $\land$ $\bot$], = $\bot$
  implicated: $\exists t$[Maria falls asleep at t $\land$ $\exists t'$[t < t' $\land$ ¬[Hans is home at t']]
  asserted meaning is a contradiction!

- *Bevor das Kind nicht sitzen kann, fühlt es sich im Liegen am wohlsten.*
  'Before the child NEG can sit up, he feels most comfortable lying down.'

- $\forall t$[⟦*bevor das Kind nicht sitzen kann*⟧^{n}(t)
  $\rightarrow$ ⟦*es fühlt sich im Liegen am wohlsten*⟧^{n}(t)]

- ⟦*bevor das Kind nicht sitzen kann*⟧^{n}
  = ⟨λt ¬$\exists t'$[t' ≤ t $\land$ ¬[the child can sit up at t'],
  λt $\exists t'$[t < t' $\land$ ¬[the child can sit up at t']]⟩
  = ⟨λt[$\bot$], λt $\exists t'$[t < t' $\land$ ¬[the child can sit up at t']]⟩

- Core meaning of antecendent is falsity, hence it leads to a tautology:
  $\forall t$[$\bot$ $\rightarrow$ [the child feels most comfortable lying down at t]] (= $\top$)

- Implicature meaning of antecendent leads to correct result:
  $\forall t$[$\exists t'$[t < t' $\land$ ¬[the child can sit up at t']]
  $\rightarrow$ [the child feels most comfortable lying down at t]]⟩

- Total meaning is conjunction of core meaning and implicature meaning.

Propositional vs. assertional negation

Propositional negation ("light negation"):

- Syntax: Tendency for high realization, no combination with indefinites
  bevor nicht Hans gekommen ist > bevor Hans nicht gekommen ist
  bevor nicht jemand gekommen ist > bevor niemand gekommen ist

- Semantics: Complement formation on times.
  $[\![nicht_p A]\!]^n = \lambda t \neg [[\![A]\!]^n(t)]$

Assertional negation:

- Syntax: Tendency for low realization, combination with indefinites
  weil Hans nicht gekommen ist >> weil nicht Hans gekommen ist
  weil niemand gekommen ist >> weil nicht jemand gekommen ist

- Semantics: existential binding of argument variable.
  $[\![nicht_a]\!]^n = \lambda \langle p, p' \rangle [\text{asserted}: \neg \exists t[p(t)], \text{implicated}: \neg \exists t[p'(t)]]$

- Syntactic position appears unintutive:
  Assertional negation should be higher than propositional negation!

Assertional negation

Negation words indicating operator agreement:
Penka & von Stechow 2001, Zeijlstra 2004, Penka 2007

- *niemand* 'nobody' means the same as *jemand* 'somebody',
  but must occur in the scope of an assertional negation operator
  covert in Standard German (overt in Bavarian, Middle High German)
  weil **NEG** [*gestern* **niemand** *gekommen ist*]

- *nicht* 'not' is a particle with no truth-functional interpretation,
  but it must occur in the scope of the covert assertional negation operator
  weil **NEG** [*Hans gestern* **nicht** *gekommen ist*]

- Position of negative indefinites *niemand*, particle *nicht* is known to
  interact with information structure: Positioning before focused elements.

Under this assumption, we can explain:

- Assertional negation is syntactically high (the covert NEG operator),
  but it is realized syntactically low (negative indefinites, *nicht*).

English vs. German

Modern English does not allow negation under before:

- *Mary didn't sleep before John (# didn't) come home.*

Possible explanation:

- English lacks propositional negation;
  notice that negation is realized as a syntactic head (*didn't*),
  not as a modifier.

 A point in favour:

- Expletive negation under *before* disappears in the 15th century,
  cf. van der Wurff (1999), at a time when *do*-support for negation arises.

What about Dutch, Scandinavian languages?