

On one alleged subtype of strict NPIs

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FDSL 2016, 7. 12. 2016

Intro: types of NPIs

- ▶ weak NPIs (require DE environment in at-issue meaning; licensed by neg + NR predicates *and* other, non-NR, predicates, Gajewski, 2007): *sebemenší tušení* 'slightest suspicion':

- (1) Nikdo/málo lidí/*někdo o tom
nobody/few people/*somebody about that
(ne)-měl-o/-o sebemenší tušení.
had slightest suspicion
'Nobody/few people/*somebody had slightest suspicion
about that.'

- ▶ strict NPIs (require DE in at-issue and implicated/presupposed meaning, cf. Gajewski, 2013; licensed by neg + NR predicates): *ani jeden* 'even one':

(2) Nikdo/*málo lidí/*někdo (ne)-přečetl ani jeden
nobody/*few people/*somebody read even one
článek.
article
'Nobody/*few people/*somebody read even one article.'

Note: *until* + time expr is usually taken to be a strict NPI (Gajewski 2005, Romoli 2013 a.o.). In Czech, we will classify it as a separate type.

- ▶ Gajewski's examples (similarly: Hoeksema 2006, Rullmann 2003, deSwart 1996 and Giannakidou 2002):

- (3)
- Bill didn't leave until his birthday.
 - No student left until his birthday.
 - ??Few students left until their birthdays.
 - *At most 5 students left until their birthdays.
 - *Between 5 and 10 students left until their birthdays.
 - *Some/*most/*all students left until their birthdays.

- ▶ another approach: *until* is semantically ambiguous (Karttunen 1974, Giannakidou 2002 a.o.):
 - ▶ durative *until* – (4)– Homogeneity Sensitive Expression (HSE)
 - ▶ punctual *until* – (5)– NPI

(4) John didn't sleep until midnight.

- a. until midnight > \neg sleep(John)
- b. \neg > until midnight > sleep (John)
- a. John slept until midnight.

(5) John didn't arrive until midnight.

- a. until midnight > \neg arrive(John)
- b. $*\neg$ > until midnight > arrive(John)

- ▶ 'even one' is not a n-word ↔ locality:

- (6) a. ?Petr nechce, aby přišel ani jeden
Petr NEG-wants that.SUBJ came even one
archeolog.
archaeologist
'Petr doesn't want even one archaeologist to come.'
- b. *Petr nechce, aby přišel žádný
Petr NEG-wants that.SUBJ came no
archeolog.
archaeologist
'Petr doesn't want any archaeologist to come.'

Side note

- ▶ Prediction: distinction between Czech Constituent Negation (CN) and verbal negation
- ▶ CN licenses weak NPIs but not strict NPIs \leftrightarrow it is presuppositional
- ▶ verbal negation licenses both (it is not focus operator – Rooth 1998)

- (7) a. Netvrdím, [že by ho [*weakNPI* **až do pondělí**] někdo spatřil].
not-claim.1sg C SUBJ him until monday someone saw
- b. Nechci, [aby ho spatřil [*strictNPI* **ani jeden student**]].
not-want.1sg C-SUBJ him saw even one student
- (8) a. *Ne [že by ho spatřil [*strictNPI* **ani jeden student**]].
not that SUBJ him saw even one student
- b. Ne [že by ho někdo [*???StrictNPI* **až do pondělí**] spatřil].
not C SUBJ him someone until Monday saw

Outline

1. Experiment: Czech *until* (*až do*) and *ani jeden* 'not even one'
2. Differential acceptability in:
 - 2.1 simple negative clauses
 - 2.2 Neg-raising predicates
 - 2.3 No neg-raising predicates
3. Czech *until* (*až do*) just durative

Classes of NPIs in Czech: data from 2 NR experiments

- ▶ data from 2 experimental studies originally focusing on Neg-Raising (NR) in SL

(9) a. John doesn't want Mary to leave. (NR)
b. \rightsquigarrow John wants Mary not to leave.

(10) a. John doesn't say that Mary left. (not NR)
b. $\not\rightsquigarrow$ John said that Mary didn't leave.

- ▶ comparison of recent NR theories: Gajewski 2007, Romoli 2013, Collins & Postal 2014
- ▶ interaction between NR and subjunctive/indicative mood

Experiment 1

- ▶ 60 Czech native speakers (3 participants excluded for mistakes in fillers), run online on IBEX, acceptability judgments on 5-point Likert scale, 40 items in 5 conditions, 30 fillers; results of the study are reported in Dočekal & Dotlačil (2016)
- ▶ statistics: R, mixed model linear regression
- ▶ post-hoc analysis: two (alleged) types of strict NPIs differ in their acceptability in different environments

Experiment 2

- ▶ acceptability of sentences with strict NPIs, *ani jeden* 'even one' and HSE *až do* 'until' + time expression
- ▶ three predicate types: (11) opinion class of NRs, (12) probability class of NRs, (13) non-NR communication predicates
- ▶ each environment was varied for the mood of the predicate in the embedded clause (indicative mood vs. subjunctive mood)
- ▶ 36 exp. items in 2x3 (=6) conditions + 36 fillers

- (11) Nemyslím, že 0/by ani jeden z běžců
do-not-think-I that IND/SUBJ even one of runners
může/mohl ten závod vyhrát.
can/could the race win
'I don't think that even one of the runners can/could win
the race.'
- (12) Není možné, že 0/by ani jeden z běžců
it's-not possible that IND/SUBJ even one of runners
může/mohl ten závod vyhrát.
can/could the race win
'It's not possible that even one of the runners can/could
win the race.'
- (13) Netvrdím, že 0/by ani jeden z běžců
do-not-say-I that IND/SUBJ even one of runners
může/mohl ten závod vyhrát.
can/could the race win
'I don't say that even one of the runners can/could win the
race.'

Mixed-effects probit models to analyze the data with mood (subjunctive vs. indicative), predicate type (opinion, probability, communication) and their interaction as fixed effects

- ▶ NR predicates ((11) and (12)) judged as significantly better than non-NR communication predicates (13) – $z = -2.51$, $p = 0.012$
- ▶ no difference between opinion and probability NR predicates
- ▶ subjunctive mood better than indicative mood ($z = 2.39$, $p = 0.017$)
- ▶ strict NPIs (*ani jeden* ‘not even one’) judged as worse than HSEs (*až do* ‘until’) with NR predicates ($z = 2.65$, $p = 0.008$)

Post-hoc analysis of two types of strict NPIs

- ▶ ‘even one’ was fully acceptable in sentences with clause-mate negation but degraded with negated NR predicates ($\beta = -4.7, z = 10.4, p < .001$) – (14-a) (one of the items in two conditions)
- ▶ with non-NR predicates ((14-b)) ‘even one’ was judged as worse than with NR predicates ($\beta = -1.1, z = 5.7, p < .001$).

- (14) a. Náš nový knihovník si nepřeje, aby zmizela
our new librarian SE neg-wishes C lost
ani jedna kniha.
even one book
‘Our new librarian doesn’t wish even one book to be missing.’
- b. Náš nový knihovník neslyšel, že zmizela ani jedna kniha.
‘Our new librarian didn’t hear that even one book was lost.’

- ▶ 'even one' behaved like a strict NPI: fully licensed by the clause-mate negation
- ▶ licensed by a non-local NR negation but hardly acceptable with a non-local non-NR negation (presupposition, implicatures destroying the DE)

- ▶ 'until' behaved strangely differently: significantly less acceptable in sentences with clause-mate negation compared to 'even one' ($\beta = -3.2, z = -6.4, p < .001$)
- ▶ even more surprisingly 'until' was more acceptable than 'even one' with NR predicates ($\beta = 0.6, z = 2.6, p < .01$) – (15-a)

(15) a. Velitel stráže nechce, aby se vojáci
 chief guards.GEN neg-wants C SE soldiers
 vystřídali až do půlnoci.
 change till to midnight
 'Chief of guards doesn't want the soldiers to change
 until midnight.'

- ▶ the best environment for 'until' is clause-mate negation but compared to 'even one', 'until' is significantly less acceptable there (Figure 1 and Figure 2)

- ▶ 'until' is more acceptable with negated NR predicates than 'even one' is
- ▶ but again significantly worse with non-NR predicates like in (16)

(16) Velitel stráže neříkal, že se vojáci vystřídají až do půlnoci.
'Chief of guards didn't say that soldiers will be changed until midnight.'

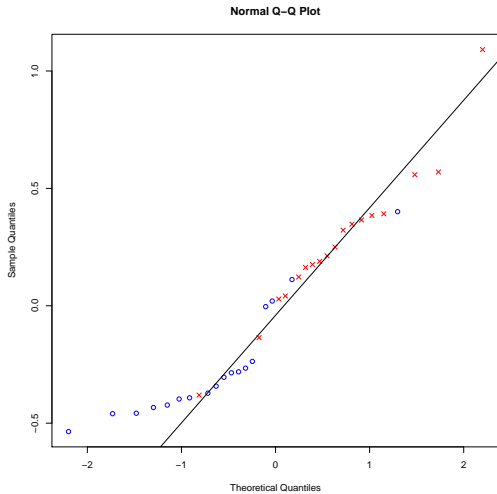


Figure 1: Quantiles for two NPIs

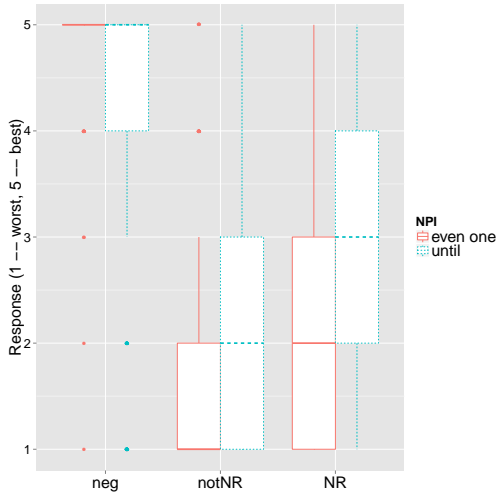


Figure 2: Acceptability judgements

Two classes of NPIs – theory

1. 'even one' is a real strict NPI;
2. 'until' is an aspectually sensitive expression which requires its local predicate to be homogeneous (most frequent occurrences of Czech 'until' in the SYN2010 corpus: upward entailing with imperfective verbs):
 - ▶ 'until' was judged as worse than 'even one' when following negated telic predicates ↔ due to linearization 'until' is parsed as a modifier of telic events and this is ungrammatical

- ▶ 'until' is better when preceding negated telic predicates – but NPIs normally cannot c-command their licensors (de Swart, 1998):

(17)??It is any student that no professor like.

- (18) a. ??Petr nespal [až do půlnoci].
Petr neg-slept until midnight
- b. [Až do půlnoci]₁ Petr nespal t₁.
until midnight Petr neg-slept

Note: Czech NPIs (strict or not) are able to reconstruct but still c-commanding their licenser is dis-preferred

- ▶ the reconstruction can be forced by binding though
- ▶ exactly the opposite behaviour to Czech 'until'

(19) a. Málo studentů lingvistiky má sebemenší tušení o NPI.
few students of linguistics has slightest knowledge of NPIs

b.???[Sebemenší tušení o NPI]₁ má₂ málo studentů lingvistiky t₂ t₁.

c. [Sebemenší tušení o svých povinnostech]₁ má₂ málo studentů lingvistiky t₂ t₁.
[slightest knowledg of her duties] ...

(20) a. Petr neviděl ani jednoho studenta.
Petr didn't-see even one student.

b.???[Ani jednoho studenta]₁ Petr neviděl t₁.

c. [Ani jednoho svého studenta]₁ Petr neviděl t₁.

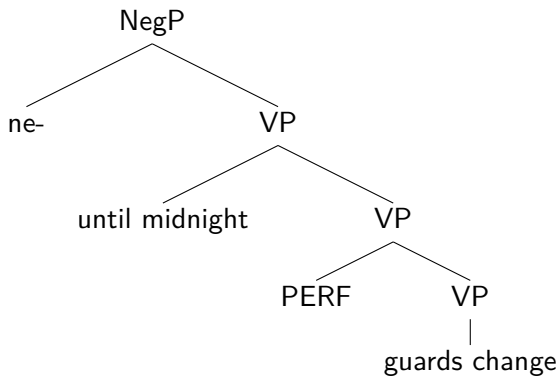
Theoretical explanation

'Until' in negated sentences

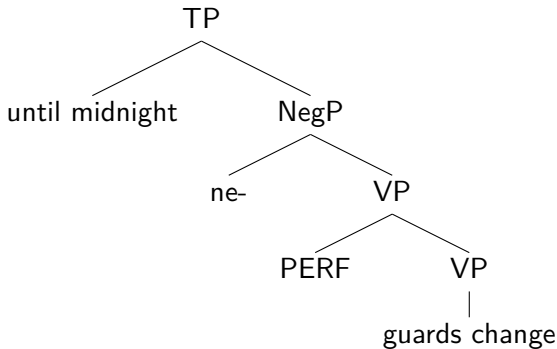
(21) Soldiers will be not changed until midnight.

- ▶ In Slavic languages perfective aspectual marker (corresponding in majority of cases to verbal prefix) operates at VP level (Filip and Rothstein (2006)), negation is located between TP and VP and event time is anchored to VP

- ▶ consequently (21) has a syntactic structure like:



- ▶ there is a semantically correct parsing for (21):



- ▶ where negation (due to its entailment reversal logical property) turns the former achievement into homogeneous eventuality and 'until' modifies (at TP level) the reference time of the sentence; nevertheless such parsing is not easy to get with the linearization (21)

Analysis and discussion: NR and strict NPIs (Experiment II)

- ▶ Villalta (2008): subjunctive mood in embedded clauses allows the transfer of alternatives from the embedded sentence to its embedding predicate (unlike indicative mood)
- ▶ fits well the scalar approach to NR (Romoli 2013): NR predicates (beside the assertion) contribute the excluded middle alternative (EM): (22-a), assertion + exh – (22-b) \models (22-c)

- (22) a. $Alt(NR) = \{\lambda p \lambda x. \Box_x[p], \lambda p \lambda x. [\Box_x[p] \vee \Box_x[\neg p]]\}$
b. the exhaustification of the EM alternative:
 $\neg \Box_x p \wedge \neg \neg [\Box_x p \vee \Box_x \neg p]$
c. $\Box_x \neg p$ (the DE environment both in the at-issue and implicated meaning)

- ▶ \rightarrow strict NPIs licensed

- ▶ only if NR predicates can evaluate the alternatives of the embedded sentence (in languages with the grammaticalized indicative/subjunctive distinction) – contribution of Experiment II
- ▶ Slavic languages reveal the dependence of NR interpretation on the availability of alternatives: supports for the scalar approach to NR
- ▶ the difference between two types of NPIs suggests that, contrary to standard claims, strict NPIs do not form one coherent class

- ▶ in case of NR predicates embedding a subjunctive clause, the embedded propositions are negated and in sentences like (22) we don't observe any effects of 'until' adjunction unlike in simple negated sentences
- ▶ negation isn't in NegP
- ▶ in telic sentences embedded under negated non-NR predicates like in (23) (which were judged as worse than (22) conditions) the embedded predicate isn't homogenized by the negation as there is no NR at all, consequently 'until' clashes with the telic eventuality of its local predicate.

(23) Chief of guards didn't say that soldiers will be changed until midnight.

Note: both types of NR (opinion and probability) qualify as NR not as modal PPIs in the sense of Iatridou & Zeijlstra:

- ▶ unlike regular modal PPI *měl by* 'should' the wide scope of negation can be suspended (similar for probability):

(24) Nemyslím si, že Terst je ve Slovinsku.
I don't think Trieste is in Slovenia.

- NR: $\Box_I \neg p$
- non-NR: $?? \neg \Box_I p$

(25) Mojmírek se ještě neučil zeměpis a nemyslí si, že Terst je ve Slovinsku.

Mojmírek doesn't have a clue about European geography and he doesn't think Trieste is in Slovenia.

- non-NR: $\neg \Box_{MP}$

- ▶ for modals the presupposition is (Yanovich 2013, Homer 2015, ...):

(26) Presupposition enabling Neg-raising for modals: Either it is necessary that p , or it is necessary that $\neg p$.

(27) Podle pravidel tohoto předmětu musí studenti zakončit semestr buď písemkou nebo mohou napsat referát.
According to the rules for this class, the students have to finish either by test or they can write a qualifying paper.

a. A pokud jde o Petra, studenta tohoto předmětu, tak by neměl psát písemku.
And w.r.t. Petr, student in this class, he shouldn't write test.

- ▶ genuine wide scope, not NR
- ▶ next experiment: NR and PPI modals, relative scope, NPIs, ...

Summary

- ▶ Czech 'until' is not weak neither strict NPI
- ▶ it is homogeneity sensitive frame adverbial
- ▶ can be a supportive argument for two *until* approaches
- ▶ tentative formalization

(28) $\llbracket \text{až do} \rrbracket(t) = \lambda P \lambda t'. P(t') \wedge \text{RightBoundary}(t', t)$, P is homogeneous

- ▶ classification of Czech NPIs:
 1. strict NPI: *ani jeden* 'not even one'
 2. weak NPIs: *sebemenší tušení* 'slightest suspicion'
 3. homogeneity sensitive expressions (sortally at predicate):
frame adverbials *až do* 'until' + time expression

Thanks!

Selected references

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