



Scope of Temporal Modifiers: Or how I learned to stop worrying and love the MRS scoping machinery

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Delph-in 2018

Problem

- It didn't rain for an hour

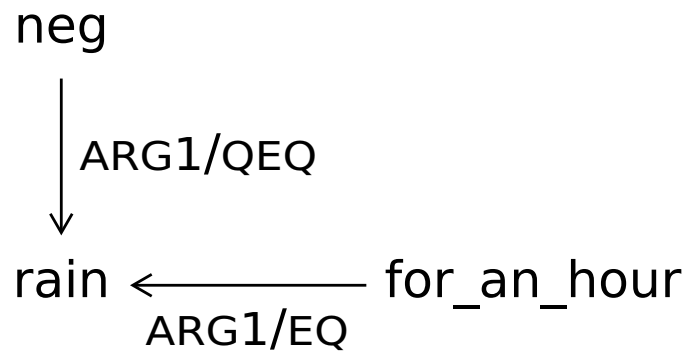
A motivating example. Previous discussion on the developers list: <http://lists.delph-in.net/archives/developers/2017/002512.html>

Problem

- It didn't rain for an hour
 - It was dry for an hour
 - It rained for less than an hour

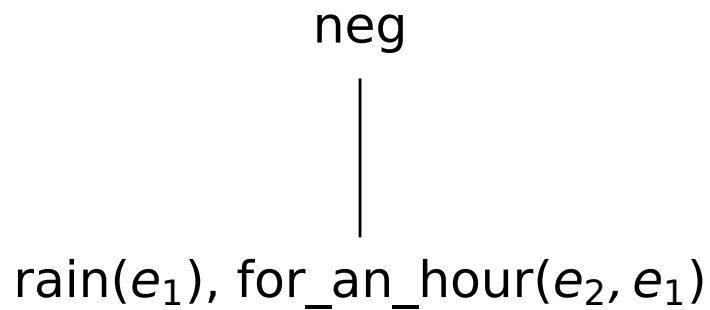
There are two readings.

Problem



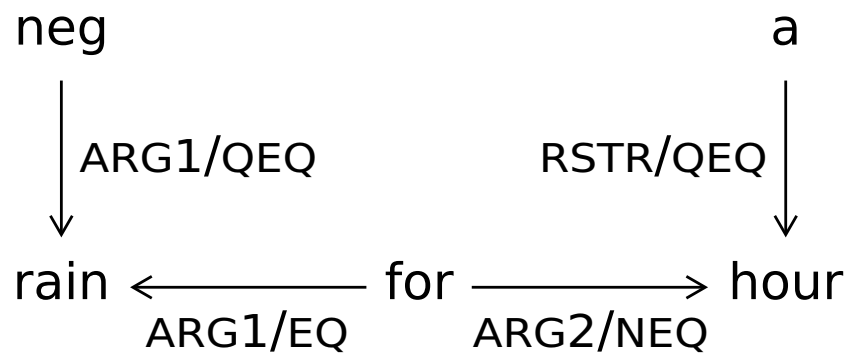
Simplifying the adverbial to a single predicate, we get this DMRS.

Problem



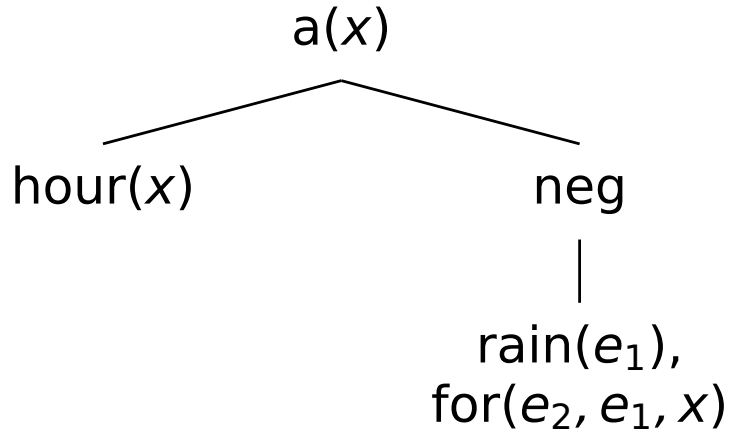
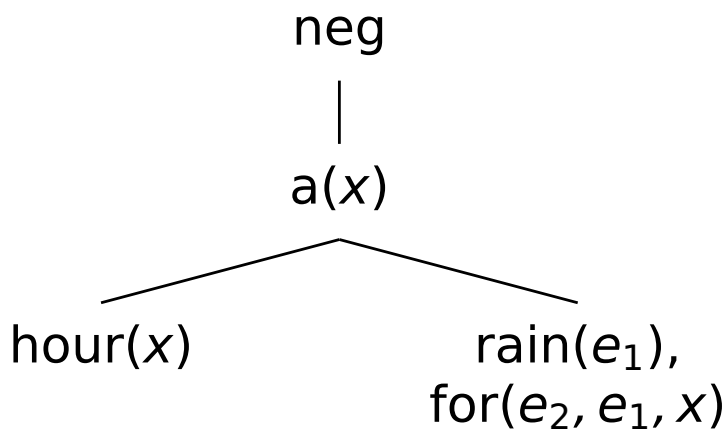
However, this only gives one possible scope tree!
The time adverbial must scope below negation.
Moving the adverbial up, to modify the negation,
would require postulating negation events.

Quantifying lengths of time



But the previous analysis simplified the adverbial.
The ERG actually gives us this.

Quantifying lengths of time



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Because there is a quantifier and a scopal adverb, we get two scope readings! The short answer is: the ERG is fine as it is.

for events

- It rained for an hour

But have we just shifted the problem elsewhere?
Does it make sense to have a *for* event?

for events

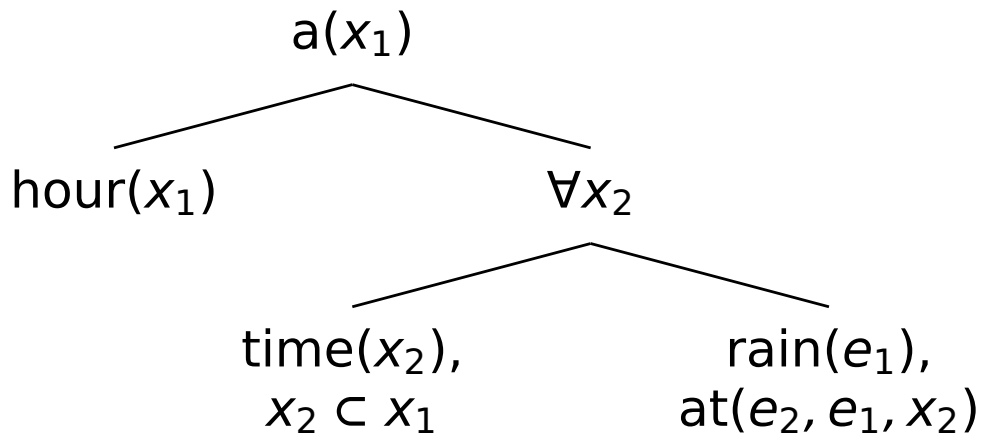
- It rained for an hour
 - At every time in that hour, it rained (Dowty, 1979)

Dowty (1979, section 7.3) gave a decomposed analysis of *for* adverbials and other temporal adverbials.

Reference:

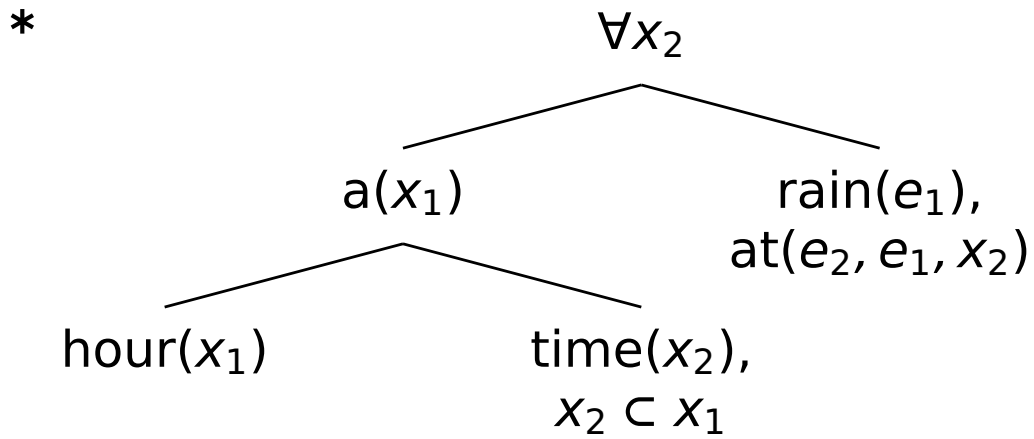
David Dowty (1979). *Word Meaning and Montague Grammar: The Semantics of Verbs and Times in Generative Semantics and in Montague's PTQ*. D. Reidel Publishing Company.

for events



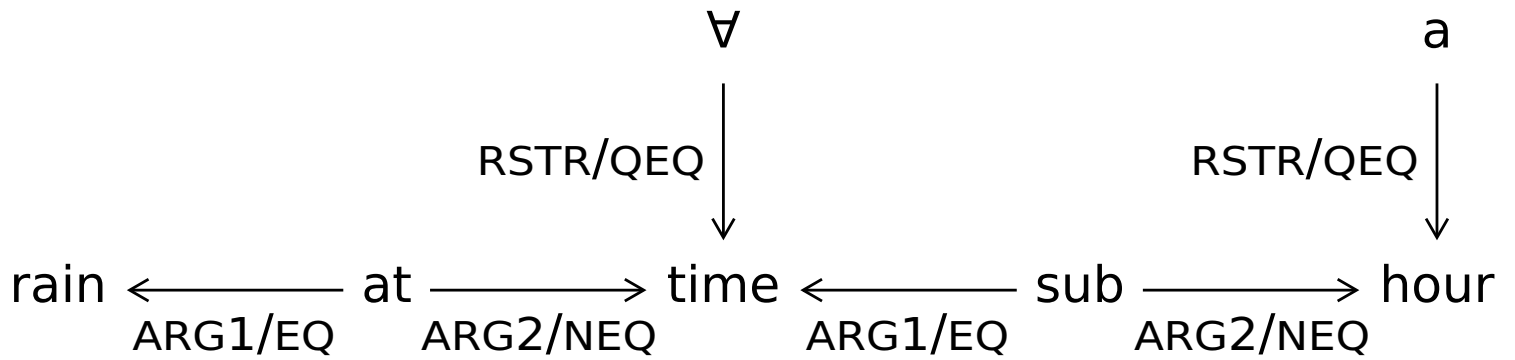
Dowty's analysis as a scope tree.

for events



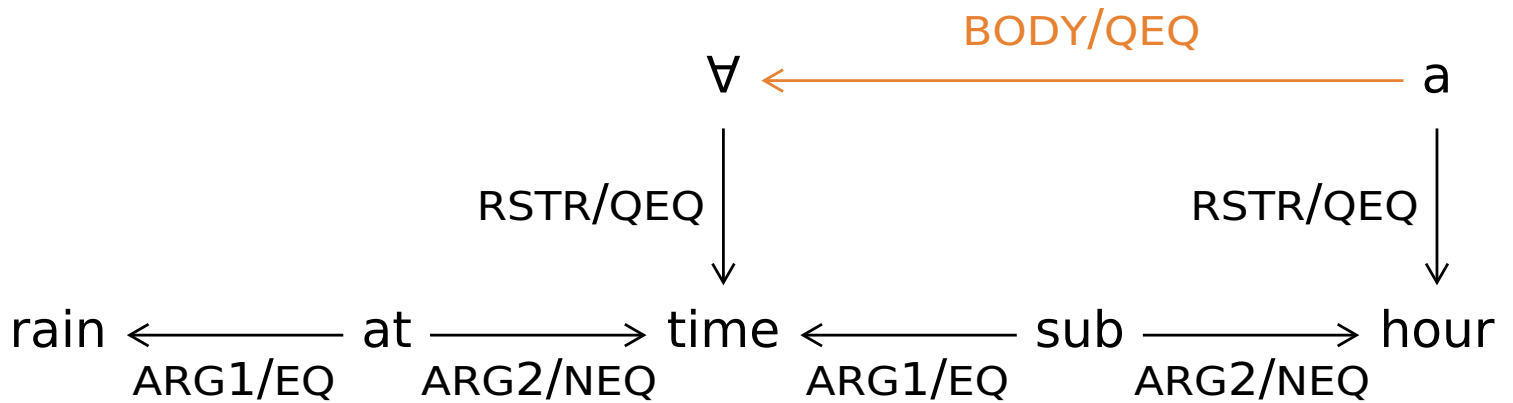
The inverse scope is impossible. This would mean that it always rains (more specifically, at every time that exists in some hour).

for events



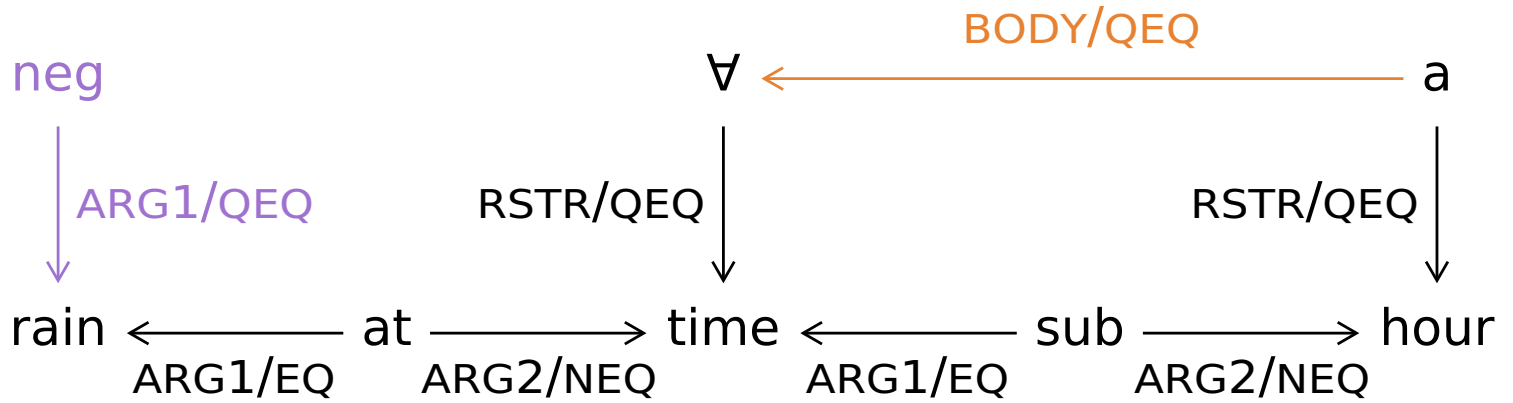
This DMRS would allow both scopes.

for events



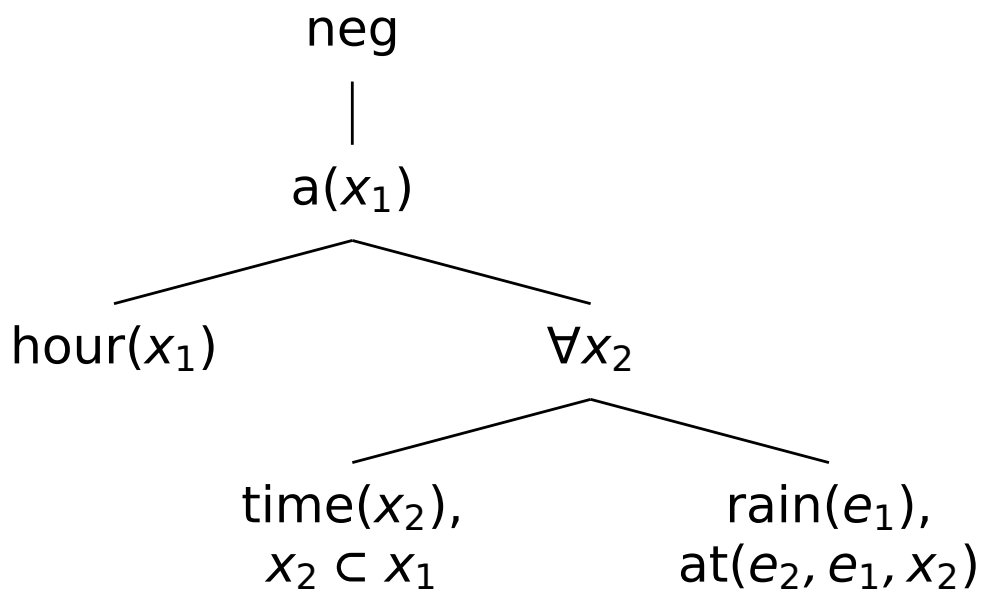
To rule out the impossible scope, we can add a BODY/QEQ link. This is possible to construct compositionally, but would require extending the algebra.

Negating *for* events



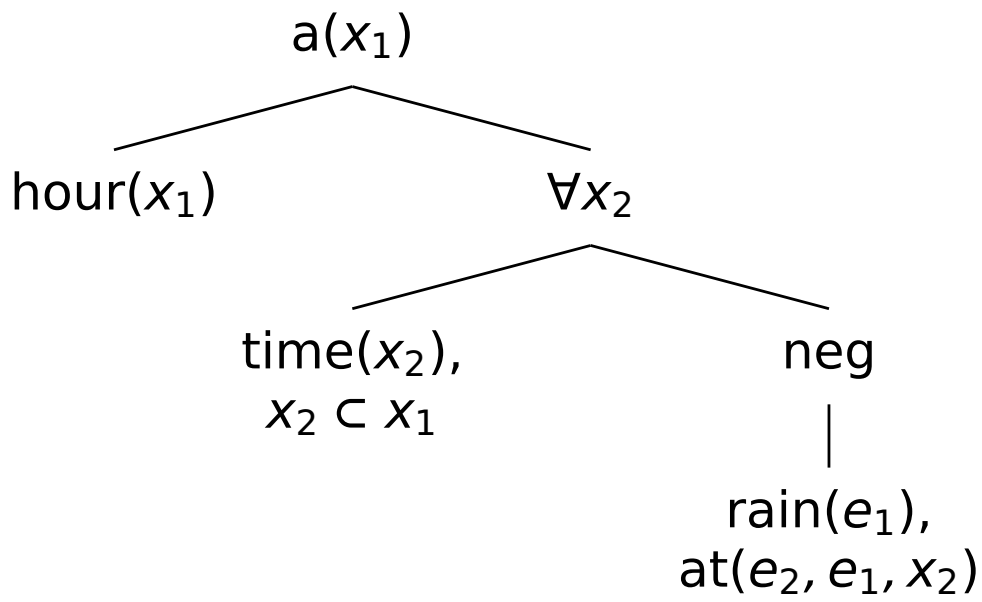
What if we add negation back in again?

Negating *for* events



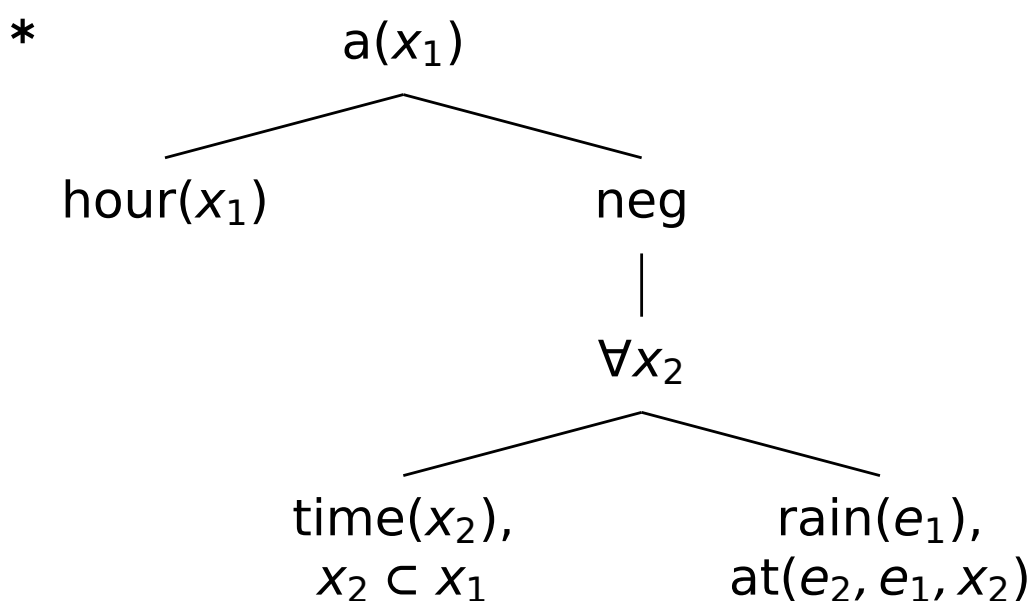
It rained for less than an hour.

Negating *for* events



It was dry for an hour.

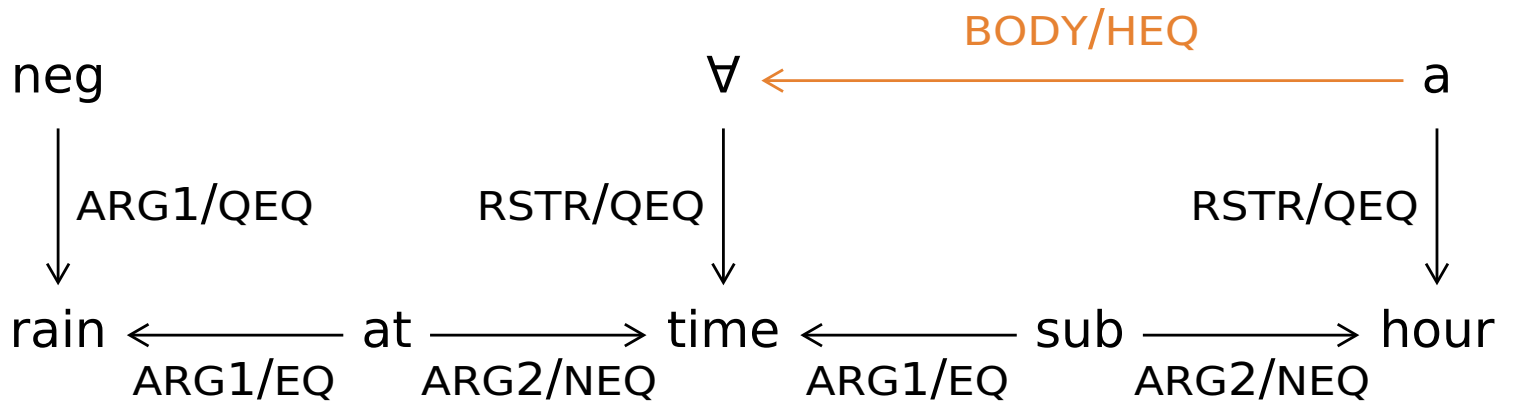
Negating *for* events



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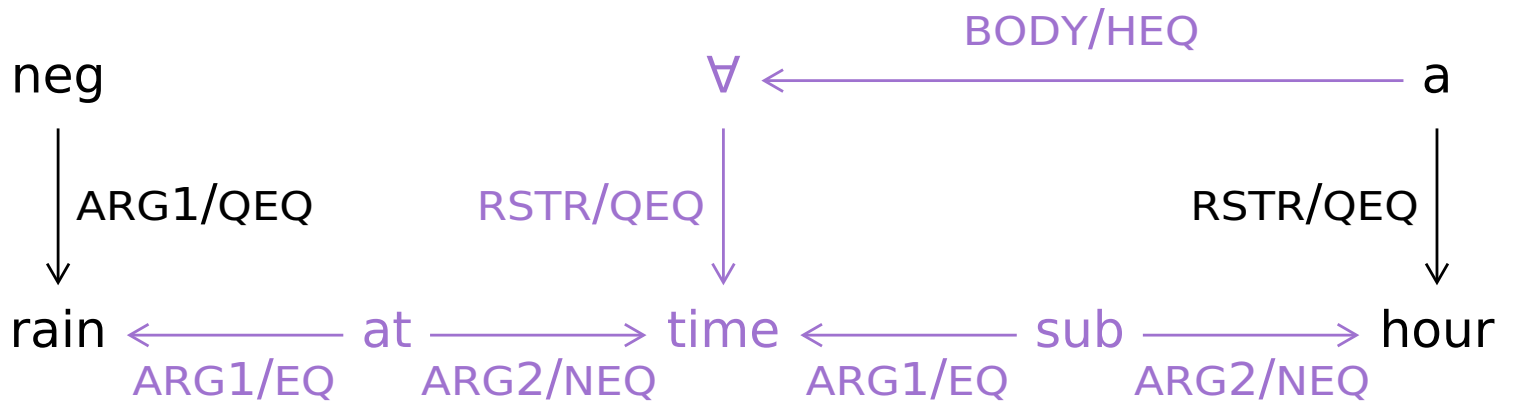
The additional quantifier admits an additional scope reading. However, this scope is impossible. It would mean that there is some hour in which there is some time when it didn't rain. For example, suppose it rained solidly all of yesterday, except for one minute. This scope tree would be true of this situation, since this minute without rain exists in an hour. However, it would be false to say, "Yesterday it didn't rain for an hour".

Negating *for* events



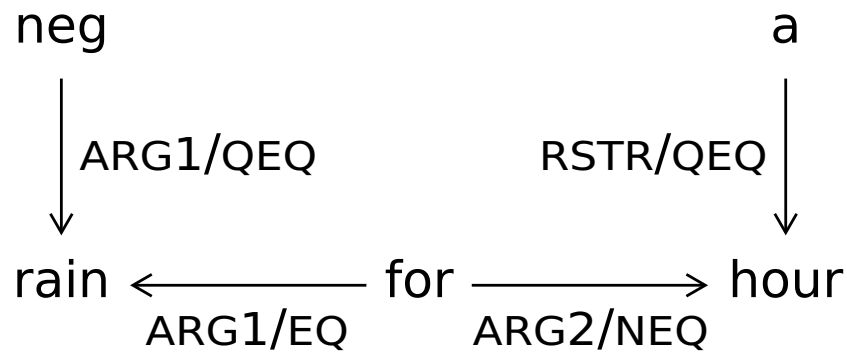
To rule out the extra reading, we can make the extra link an HEQ link.

Negating *for* events



This subgraph is the meaning of *for* under this analysis.

Negating *for* events



The decomposed analysis can be deterministically produced from the original simpler analysis. The extra quantifier in the decomposed analysis doesn't seem to give us anything, since we had to remove the additional scope readings, anyway. Using the simpler analysis means we don't need to modify the algebra.

Conclusion

- Temporal modifiers can outscope scopal modifiers (via quantifiers)
- No change necessary to the ERG
- No need to invoke negation events

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- Temporal modifiers can outscope scopal modifiers (via quantifiers)
- No change necessary to the ERG
- No need to invoke negation events
- Decompose semantics of adverbs like *never*, *always*, *frequently*?

Inverse scope of temporal modifiers

- “So ive been [on] a treadmill everyday for nearly 3 weeks for 20 minutes burning 200 calories at a time”
- “I have started walking for the last six days for nearly 45 minutes a day”

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Backup slide!

Under this analysis, we would expect to see temporal modifiers appearing in the “wrong order”, as shown above.

Sources:

<https://www.thestudentroom.co.uk/showthread.php?t=1342122>

<http://www.wisegeek.org/how-many-miles-should-i-walk-to-lose-weight.htm#comments>