Doing it again and again may be difficult – but it depends on what you are doing…

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Psycholinguistic experimentation has recently started to investigate processing difficulty in aspectual coercion. A number of studies focus on the computation of iterative readings in sentences like *John coughed all night*. The findings are rather mixed. While some studies report difficulty (Piñango et al., 1999, Todorova et al. 2000, Husband et al., 2006, Piñango et al., 2006, Brennan & Pylkkänen, submitted) others don't find any effect (Pickering et al., 2006). Brennan & Pylkkänen (submitted) argue that this may be due to disregarding aspectual properties of the materials. They carefully selected clear instances of point-action verbs (points) and for these they obtained enhanced processing load in reading times and MEG data. The present study scrutinizes the processing of iterative readings contingent on aspectual class. We are especially interested in iterated accomplishments where we expect initial construction of an implausible model and subsequent recomputation of a more plausible situation. We describe two reading time experiments in German which compared the processing of aspectual coercion.

Experiment 1 tested two different kinds of coercion. The short *for*-adverbial in (1a) is an instance of *subtractive coercion* - the accomplishment is coerced into an activity[1] by "subtracting" the culmination from the eventuality. The long *for*-adverbial in (1c) coerces the accomplishment into an *iterative* or *habitual* reading because a loading activity cannot last for such a long time. The long *in*-adverbial in (1d) is a pragmatic mismatch that cannot be resolved. Short *in*-adverbials in (1b) are used as control. Experiment 2 investigated points in single event (2a) vs. iterative readings (2b) in constructions similar to the one used in Brennan & Pylkkänen (submitted).

To make sure that the materials of Experiment 1 and 2 in fact exhibit the intended readings, we pretested conditions (1a-c) and (2) in a questionnaire study (40 acc. and 20 points). 24 subjects judged whether the sentence expresses that the (with acc.: culminating) event happened and if so, whether it happened only once or repeatedly. Short *in*-adverbials (71%) and long *for*-adverbials (86%) over-whelmingly received "yes" responses compared to 15% for short *for*-adverbials. Thus, short *for* triggered subtractive coercion. All of the "yes" answers in the short *in* condition were "only once" while in the long *for* condition 97% were "repeatedly". Thus, long *for* coerced accomplishments into an iterative reading. The points received 100% "yes" in both conditions. Single events had "only once" judgments in 94%, whereas iterated events were 94% judged "repeatedly" indicating the computation of coerced readings.

In Experiment 1 participants read the sentences phrase-by-phrase and judged if they made sense. All conditions except mismatch (23%) were overwhelmingly judged sensible: subtractive coercion (87%), iteration (70%) and control (84%). Shifting an accomplishment into an iterative reading slowed down reading times of the long *for*-adverbial compared to those of short *in*. The former were numerically roughly equal to mismatch. Interestingly, subtractive coercion (short *for*) didn't differ significantly from control (short *in*). The reading times of Experiment 1 are depicted in Figure 1.

Experiment 2 revealed no difference in reading time between single event and iterated event sentences (see Figure 2). The latter were numerically even faster than the former. Taken together, the results show that computing an iterated reading doesn't introduce difficulty per se but rather, difficulty depends on aspectual class.

The findings can be explained using the Event Calculus (EC) by Hamm & van Lambalgen (2005), an algorithmic semantic framework that constructs situation models in a computationally tractable way. EC allows us to model difficulty in iterative accomplishments due to reanalysis of the initial, implausible model. Both subtractive coercion and the iterative coercion of a point involve completely different computations and are predicted to be less demanding. We argue that it is this computational difference that corresponds to the differential effect in processing.

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[1] This is shown by the different entailments: *The worker loaded the cart* entails *the cart was completely loaded* but when modified by *for twenty minutes* the entailment doesn't hold anymore.

Sample materials (vertical bars indicate segmentation):

(1) a: short-*for*) Der Arbeiter| belud| die Karre| <u>zwanzig Minuten lang,</u>| dann| ging| er|in die Pause.
　　　　　　　　　The worker   loaded   the cart   twenty minutes long,   then   went he in the break.
　　　　　　　　　For twenty minutes, the worker loaded the cart then he went into the break.
　　 b: short-*in*) Der Arbeiter| belud| die Karre|<u>in zwanzig Minuten,</u>| dann| ging| er|in die Pause.
　　　　　　　　　　　　　　　　　　　　　　　　in twenty minutes
　　 c: long-*for*) Der Arbeiter|belud|die Karre| <u>fünfzehn Jahre lang,</u>| dann| ging| er|in Rente.
　　　　　　　　　　　　　　　　　　　　　fifteen years long,   then   went he into retirement
　　　　　　　　　　　　　　　　　　　　　for fifteen years
　　 d: long-*in*) Der Arbeiter|belud|die Karre|<u>in fünfzehn Jahren,</u>|dann|ging|er|in Rente.
　　　　　　　　　　　　　　　　　　　　　in fifteen years
(2) a: single) Vor fünf Minuten|<u>nieste| der Junge</u>| ziemlich laut,| dann| verließ|er| das Klassenzimmer.
　　　　　　　　Ago five minutes   sneezed the boy   rather loudly, then   left   he the classroom
　　　　　　　　Five minutes ago, the boy sneezed rather loudly, then he left the classroom.
　　 b: iterative) Fünf Minuten lang|<u>nieste| der Junge</u>| überaus laut,|dann| verließ|er| das Klassenzimmer.
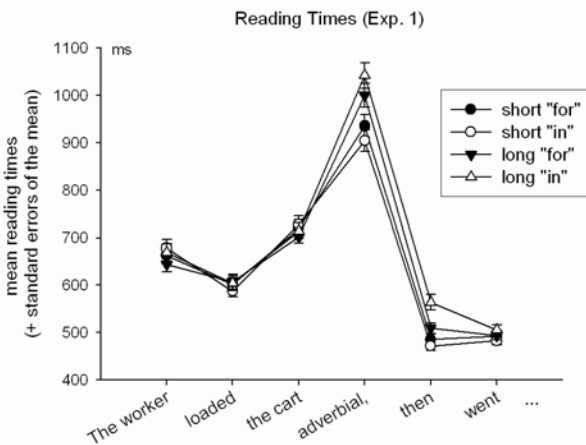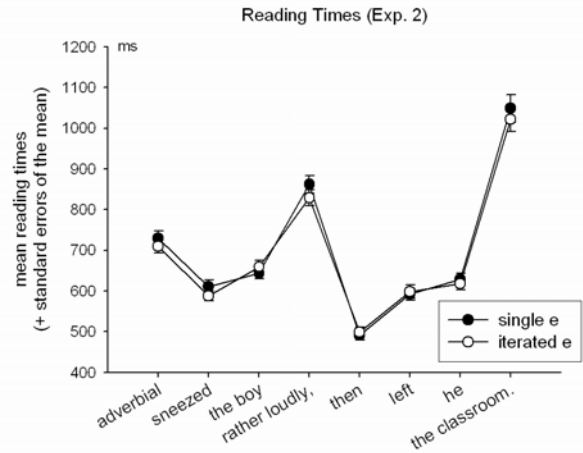　　　　　　　　For five minutes

Figure 1 (N=40):

Figure 2 (N=40):

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