Effects of lexical aspect on the mental representation of situations: An Eye-Tracking study of the non-aspect language German

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Temporal information about the duration of events, as encoded in aspectual markers, is important in the construction of the mental representation of events. Verb aspect is thought to act as a processing cue since it has been shown that the construal of events when reading or listening to event descriptions is influenced by the inflectional morphology of verbs. In English, the imperfective aspect (*She was writing*) can emphasize the dynamic, ongoing nature of events and can encourage an internal perspective. Perhaps as a result, imperfective (vs. perfective) facilitates the processing of the location where the action takes place (seen as event background information, cf., Ferretti et al., 2007). In contrast, the perfective aspect (*She wrote*) could focus the conceptualiser’s attention on the static, completed end state of situations and encourage a goal-driven, external perspective. Therefore perfective (vs. imperfective) has been suggested to facilitate the processing of action-related instruments (cf., Ferretti et al., 2001).

Aspect in English is thus conveyed per the verb phrase. Verbs assign thematic roles which can give immediate access to situation knowledge. The grammatical form of a verb influences access to this knowledge. In addition, temporal properties of events are rapidly computed and influence linguistic processing online. Compared with English, however, aspect in German is not realized grammatically but expressed lexically per temporal adverbs among others. Would lexical elements such as adverbs in German – much like verb morphosyntax does in English – rapidly shift comprehenders’ attention to location (background) compared with instrument (goal-driven) event information?

A visual-world eye-tracking study investigates whether lexical aspect in a non-aspect language rapidly facilitates processing of event-related location and instrument information and to what extend these effects resemble grammatical aspect effects in English. In our study, German adults (*N*=64, 18-31 years) heard sentences (*N*=32) with imperfective¹ or perfective² (see eg., a)) aspect and a location or instrument prepositional phrase (PP) while inspecting four images (see Fig. 1): a verb-related instrument & location and two distracters. We recorded reaction times and accuracy in a post-trial task (click on the picture which matches the sentence).

Fig. 1: Example of a trial scene showing the target instrument (pen) and location (school) and the distractor instrument (ball) and location (pool).

\begin{verbatim}
a) Das Mädchen schrieb ¹gerade_Adv/²kürzlich_Adv in der Schule_LOC_PP/mit dem Füller_INST_PP

Lit. trans.: ‘The girl wrote ¹currently_Adv/²recently_Adv at the school_INST_PP/ with the fountain pen_INST_PP.’
\end{verbatim}
**Results:** Sign. main effects of PP type (p < 0.1) and of aspect (p < 0.5) emerged in the PP region: Participants fixated the instrument (vs. location) picture more when hearing the instrument (vs. location) PP and vice versa. Moreover, they fixated the location (vs. instrument) picture more when hearing an imperfective (vs. perfective) and the instrument (vs. location) picture more when hearing a perfective (vs. imperfective) aspect marker (Fig. 1). The accuracy data revealed a main effect of PP type (p < 0.1): participants were sign. more accurate after having heard an instrument PP (vs. location PP, Fig. 2). No other effects reached significance. The reaction time data did not reveal any significant differences between conditions.

**Discussion:** Results replicate and extend previous word – word priming and EEG studies (cf. Ferretti et al., 2007, 2011). German lexical aspect markers seem to enrich location/instrument representations while processing lexical referential information. Interestingly, the accuracy data (and to some extend the gaze date, Fig. 1) suggests that German participants’ representations might overall be stronger for instruments (vs. locations). This would be in line with previous studies suggesting that languages featuring only lexical aspect (e.g., Swedish) focus more on end-states and goal-driven events compared with the ongoing nature of a situation and background information (e.g., Bylund et al., 2013).

References


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**Figure 2:** Mean log ratio of looks to instrument (neg. values) and location picture (pos. values) by aspect during the PP region. Error bars = 95% confidence intervals.

**Figure 3:** Accuracy in percent for the PP type effect. Error bars = 95% confidence intervals.