Whom did you read? – On type clashes and word senses

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Word senses may change depending on sentential context and there is an ongoing debate on how the language system handles expressions like *Dickens* that may refer to the author, his work, etc. Some theories assume fully specified lexical representations, others assume underspecified lexical representations, and yet others pursue type compositional logics or apply rule-based derivations (e.g., Pustejovsky 1995; Asher 2011). Processing data point towards underspecified accounts, but they also provide discrete effects for different types of metonymy. To further understand the mixed reports in the literature, we assessed artist-for-work metonymy using time-sensitive event-related potentials (ERPs) and further sought to tease apart type conflicts from sense selection.

Previous eye tracking studies indicate no processing difference between separate senses of the artist-for-work metonymy (e.g., Frisson & Pickering 2007) – but differential eye tracking patterns for count/mass alternations (Frisson & Frazier 2005). ERP studies suggest no differences for some alternation types (e.g., content-for-container) and late positivities as a reflex of meaning shift for other types (e.g., animal-for-statue, *stone lion*) (Schumacher 2013).

To connect the eye tracking and ERP findings, we ran an ERP study on artist-for-work alternations. We constructed question-answer pairs to anticipate the meaning alternation as early as on the names in the answers (cf. Schumacher 2013 for a similar approach). The answer included the name of a familiar artist, e.g. *Brecht*, and followed three types of context-questions. These where constructed by using *whom* or *what* as question words in combination with a verb that required the artist-sense (a) or the work-sense (b). In (a) and (b), there is no type mismatch between (the animacy features of) the predicate and the *wh*-question. But when encountering *Brecht* in the answer of (b), an inanimate argument is expected. This animacy clash may evoke an N400 (cf. Weckerly & Kutas 1999) or show no consequences according to the underspecified approach/sense selection. In (c), the type conflict is already encountered on the verb of the question. Underspecification should not apply to the *wh*-word, hence the type conflict should yield an N400.

a) *Wen hat die Uroma im Urlaub **getroffen**? Sie hat **Brecht** im Urlaub getroffen.*
   'Whom has great-grandmother met on vacation? She has met Brecht on vacation.'
b) *Was hat die Oma auf der Zugfahrt **gelesen**? Sie hat **Brecht** auf der Zugfahrt gelesen.*
   'What has grandmother read during the train trip? She has read Brecht during the train trip.'
c) *Wen hat Anna auf der Zugfahrt **gelesen**? Sie hat **Brecht** auf der Zugfahrt gelesen.*
   'Whom has Anna read during the train trip? She has read Brecht during the train trip.'

In a reading ERP study, stimuli were presented segmentally and ERPs were time-locked to verb-onset in the question and to name-onset in the answer. After each trial, participants performed a word recognition task and only trials with correct responses entered the analyses. Statistical analyses at the verb revealed an N400 effect with a more pronounced deflection for (c) in contrast to (a/b). At the artist's name in the answer, no significant differences were found between the three conditions.

The data indicate that at the verb an unexpected animate argument (*whom*) is penalized, reflected in a negative deflection (cf. Weckerly & Kutas 1999 for N400 effects to unexpected argument combinations induced by animacy violations). Crucially, such a mismatch is not encountered in (b) at the name, suggesting that type restrictions of the predicate are met by the argument (*Brecht*). These data, together with earlier eye tracking results, support an underspecification approach for artist-for-work alternation. They demonstrate that the different methodologies yield compatible results after all. Diverging findings should thus be attributed to discrete underlying operations. Accordingly, the current data also add to a typology of meaning alternations distinguishing between sense selection and meaning shifts.