Logical Metonymy from Type Clash to Thematic Fit

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Logical Metonymy and Type Clash

Logical metonymy (*The author began the book*) has often been explained in terms of a type-clash between an event-subcategorizing metonymic verb (*begin*) and an entity-denoting object (*book*), triggering the recovery of a covert event (*reading*). Experiment 3 in Traxler, Pickering and McElree (2002) is often cited as a well-known correlate of this clash, as the authors find a significant interaction between type of verb (metonymic vs. non-metonymic) and type of object (entity-denoting vs. event-denoting).

Type clashes and selectional restriction violations are widely invoked in linguistic theory, but more recent work in psycholinguistics suggests that these phenomena might be better captured via graded notions such as typicality and thematic fit. For example, some of the materials of Traxler and colleagues' seem to favor event-denoting items via a better thematic fit (***The pastor*** *finished/prepared the* ***funeral****/sandwich*).

A Similarity-Based model of Type Clash

Similarity-based frameworks such as Distributional Memory and ECU described in Lenci (2011) lend themselves particularly well to modeling the graded effect of thematic fit and expectation about upcoming arguments in sentence processing. We contrast three ECU-based models: *verb-only*, *sum* and *product*. *Verb-only* exploits expectations coming from the verb to yield the thematic fit for a filler in a given object argument position (e.g. for *sandwich* and *prepare*); the other two models do the same by combining expectations from subject and verb (e.g. for *sandwich* and <*pastor*, *prepare*>) by means of two different functions (*sum* and *product*)[1]. We use the models to (1) mirror the results from Traxler and colleagues; (2) contrast expectations coming from the verb and expectations coming from the composition of subject and verb, in order to evaluate whether the type-clash effect might be due to a cueing effect of the subject; (3) suggest an alternative account of logical metonymy interpretation which re-defines the binary notion of type-clash in more graded terms, i.e. as thematic fit.

The models successfully replicated the pattern of results of the psycholinguistic experiment, yielding the lowest thematic fit for metonymic verbs combined with entity-denoting objects, and a main effect of object type (entity-denoting vs. event-denoting; ***sum*, ****product*, *****verb-only*[2]), and a significant verb-object interaction (***sum*, ***verb-only*). All models yielded a better thematic fit for event-denoting than for entity-denoting objects on the whole dataset (***sum, ****product*, *****verb-only*), for metonymic verbs (*****sum*, ***product*, *****verb-only*), but not for non-metonymic verbs. The pattern of results of the psycholinguistic experiment was replicated not only by models incorporating the subject (*sum* and *product*), but also by the *verb-only* model, thus suggesting the measured effect is not ascribable to an effect of subject only, but is indeed due to the verb-object interaction.

The models' success in replicating the results from the psycholinguistic experiments shows that similarity-based models are an adequate tool to model phenomena such as selectional preferences and logical metonymy, suggesting that they can both be accounted for in terms of thematic fit.

References

Lenci, A. (2011). Composing and Updating Verb Argument Expectations: A Distributional Semantic Model. In *Proceedings of the 2nd Workshop on Cognitive Modeling and Computational Linguistics*, Association for Computational Linguistics, Portland, Oregon, June 2011.

Traxler, M., Pickering, M. J., & McElree, B. (2002). Coercion in sentence processing: Evidence from eye-movements and self-paced reading. *Journal of Memory and Language,* 4, 530-547.

[1] It is customary in recent compositional distributional semantic work to contrast results from both functions.
[2] ***: $p<0.001$; **: $p<0.01$; *; $p<0.05$