

Optimal Interpretations and Harmonic Alignment: Towards the Constrained Lexicon

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This paper will deal with mechanisms determining the interpretation of ambiguous adverbials such as prepositional phrases headed by the German preposition *durch* (Eng. *through*), which may be ambiguous between a spatial and a causal interpretation, as exemplified in (1):

- (1) Manchmal kann man die Sonne durch den Rauch nicht sehen.
Sometimes can one the sun due to/through_{SPATIAL} the smoke not see
Sometimes one cannot see the sun due to/through_{SPATIAL} the smoke.

The causal interpretation can be paraphrased as "one cannot see the sun, because the smoke is everywhere", and the spatial one as "one can see the sun, but not through the area where the smoke is".

References on both the relationship between expressions of space and causality (Lakoff 1987, Langacker 1987 and others) and the semantics of prepositions in general and *durch* in particular (Lakoff 1987, Kaufmann 1993, Egg 1995, Wunderlich 1991, Wunderlich/Herweg 1991) will be reviewed. It is argued from a lexical-pragmatic point of view that the (explicit or implicit) view in earlier work on such adverbials is wrong in assuming an overall homonymy between the variants, and that the relation between them can be described adequately within Optimality Theory (OT).

The interpretation of the *durch* adverbial is determined by several factors, one of the most prominent being adjunction sites, as shown in (2a-b), assuming neutral intonation:

- (2a) Manchmal kann man die Sonne nicht durch den Rauch sehen.
(only spatial interpretation)
(2b) Man kann durch den Rauch manchmal die Sonne nicht sehen.
(only causal interpretation)

In (2a-b) one only gets a spatial or causal interpretation respectively, depending on the adjunction site of the adverb being at Vⁿ- or IP-level.

This can be implemented in OT by means of *harmonic alignment*, a mechanism which is used to interrelate prominence scales, one of which has to be binary. In the above examples, one would proceed as follows: First, a scale relating the preferred interpretations for phrases being ambiguous between a causal and spatial interpretation like *durch* adverbials is postulated: **spatial** > **causal** (> = "is more prominent than"). This has its motivation in research on the relation between spatial and causal cognitive domains (Langacker 1987, Lakoff 1987, Miller/Johnson-Laird 1976). Second, the adjunction site influence is represented in the scale **Vⁿ-adjunct** > **VP-adjunct** > **IP-adjunct**, expressing that adjunction should take place as low as possible in syntactic structure. This ranking is based on standard assumptions about

adjunction sites for different classes of adverbs. Now, harmonic alignment provides the following markedness hierarchies based on a combination of the two scales, see Prince/Smolensky (1993), Aissen (to appear) (\supset = "is more harmonic/less marked than"):

(3a) spatial/Vⁿ-adjunct \supset spatial/VP-adjunct \supset spatial/IP-adjunct

(3b) causal/IP-adjunct \supset causal/VP-adjunct \supset causal/Vⁿ-adjunct

This expresses that a spatial Vⁿ-adjunct is less marked than a spatial VP-adjunct and that a causal Vⁿ-adjunct is more marked than a causal VP-adjunct, and so forth. The two readings are predicted to be simultaneously available exactly in the middle position(s) of the hierarchies, as is the case in example (1). Further, (3a-b) can be interpreted as constraint hierarchies, and thereby constitute parts of an OT grammar.

Other factors involved in giving a precise analysis of *durch* can also be implemented this way. These include e.g. the matrix verb and its arguments, aktionsart, voice, the semantics of the complement of the preposition, presence/absence of focal intonation of the *durch*-phrase and expressions of modality, i.e. they are of a semantic, pragmatic and, as in the case of adjunction, syntactic nature.

This analysis enables an adequate modelling of the fact that getting to the interpretation of ambiguous expressions is often not a clear-cut matter, but rather a complicated interplay between a range of contextual factors. It is also relevant for lexicon theories, such as Pustejovsky (1995).

References

- Aissen, J. (to appear) Differential Object Marking: Iconicity and Economy. Ms.
- Egg, M. (1995) The intergressive as a new category of verbal aktionsart. *Journal of Semantics* 12, 311-356.
- Kaufmann, I. (1993) Semantic and conceptual aspects of the preposition *durch*. In: C. Zelinsky-Wibbelt (ed.): *The Semantics of Prepositions – From Mental Processing to Natural Language Processing*, Berlin: Mouton de Gruyter.
- Lakoff, G. (1987) *Women, Fire and Dangerous Things*, Chicago: The University of Chicago Press.
- Langacker, R. W. (1987) *Foundations of Cognitive Grammar, Vol. 1: Theoretical Prerequisites*, Stanford: Stanford University Press
- Miller, G. A. & P. N. Johnson-Laird (1976) *Language and Perception*, Cambridge: Harvard University Press.
- Prince, A. & P. Smolensky (1993) *Optimality theory*, Ms., Rutgers University, USA.
- Pustejovsky, J. (1995) *The Generative Lexicon*, Cambridge: MIT Press.
- Wunderlich, D. (1991) How do prepositional phrases fit into compositional syntax and semantics? *Linguistics* 29, 591-621.
- Wunderlich, D. & M. Herweg (1991) Lokale und Direktionale. In: A. von Stechow & D. Wunderlich (eds.): *Semantics – an international handbook of contemporary research*. Berlin: Mouton de Gruyter.