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## The persistence of space: formalizing the polysemy of spatial relations in functional elements

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## Summary and implications

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The preceding five chapters have described various ways in which abstract relations are expressed in spatial terms.

Chapter 1 introduced a new way to formalize polysemy in prepositions with both a spatial and a causal meaning. In particular, this approach can be used to derive the meaning of *by*-phrases in passives. It was shown that current analyses of such phrases are not suitable for languages with multiple Agent prepositions, such as French. The model introduced in chapter 1 correctly derives the difference in meaning between French *de* ‘from’ and *par* ‘through’, in spatial contexts, causal adjuncts, and passives. Unlike other accounts of *by*-phrases, this approach does not take the Agent preposition as accidentally homonymous with its spatial counterpart, but rather derives its meaning in passives as an interpretation of the same abstract meaning in a different semantic-syntactic context.

Chapter 2 applied the same model to causal adjuncts in Biblical Hebrew. Like French, Biblical Hebrew has (at least) two prepositions which have, among others, a spatial and a causal meaning: *מִן* *min* ‘from (Source), out of (Reason, Cause)’ and *בְּ* *bə* ‘in (Locative), for (Reason), with (Instrument)’. It was shown that taking the spatial origin of these prepositions into account leads to a more precise description of the contrast between the two in causal environments where both are, in principle, felicitous.

Interestingly, while the spatial meanings of French *de* and Biblical Hebrew *min* are very similar, their causal meanings are not. In French, the greater distance expressed by *de* compared to *par* is interpreted as a decreased ability to affect the Patient. By contrast, in Biblical Hebrew, the fact that *min* points to the Origin is relevant as well: a causer at the origin of a causal model can affect the Patient to a greater extent. We thus see that the mapping of the causal domain onto the spatial domain can exploit different features: the mapping in Biblical Hebrew is primarily based on Origin

(though distance is to some extent involved as well); the mapping in French is only based on distance. This difference is not problematic. One may compare this with the two conceptualizations of time (Lakoff & Johnson 1980): one in which we are stationary and time moves (*there's a deadline coming up*), and one in which we move through time (*the weeks that are behind us*). These two conceptualizations can coexist even within the same language, so there is no reason why perspectives on the causal chain could not be realized differently between languages.

The main contribution of part I consists in providing a way to describe spatial-causal polysemy in a compositional formal semantic analysis. Under this view, prepositions have an abstract meaning, expressing an *abstract spatial* relation between a Figure and a Ground. Whether a particular prepositional construction is felicitous depends on the availability of an interpretation for the abstract meaning of the preposition given the specific semantic type of the Figure and the Ground in context. Unlike traditional grammaticalization studies in which the physical meaning of a preposition is taken as primary, in this model I propose to derive the *physical* spatial meaning from an *abstract* spatial meaning. Therefore, on this view, the physical spatial meaning of a preposition has the same status as its causal (temporal, ...) meaning, because both are directly derived from the same abstract spatial meaning.

Crucially, the data surveyed in part I show that the abstract meaning of a preposition has a spatial component. Both the physical and the causal domain are cognitively represented with some kind of spatial structure. More work is needed to determine what kind of spatial structure is involved, exactly. It seems intuitive to think that physical space is cognitively represented using a three-dimensional axis system, but this does not need to be the same in other domains. In particular, causal dependencies were described in chapters 1 and 2 using causal models, which can be seen as directed graphs. In this representation there is no notion of x, y, and z coordinates, though the notion of distance can be defined and receives a causal interpretation. This allows us to draw a sharp line between spatial notions that *are* exploited in the causal domain, such as distance, and spatial notions that are *not* exploited in the causal domain (for example, angles can be computed in the physical but not the causal domain). In this way, more precise descriptions of polysemy involving spatial representations enable us to determine which spatial notions are more primitive than others.

In part II the focus was on the interpretation of abstract spatial notions in the left periphery, in which attitudes of Speaker and Addressee towards information content are marked. Chapter 3 mostly focused on the English demonstrative and complementizer *that*, with an excursus into Romance complementizers derived from Latin *quod*. It was argued that the complementizer *that* is not entirely bleached, but still preserves some semantic content. In particular, it still holds a [+distal] feature. While this [+distal] feature is typically interpreted as describing a property of physical space in the nominal domain, in the left periphery, it can be said to involve the Addressee, who is seen as “far” from the Speaker. A typical example of an effect of [+distal] marking in the left periphery is that information content marked as [+distal] is seen as a presupposition, that is, a proposition that the Speaker takes for granted to be shared with the Addressee. At the same time, a non-physical interpretation of [+distal] can also be used to explain the interpretation of non-exophoric demonstrative *that*. Chapter 3 presented a model in which the exact interpretation of [+distal] is derived from the syntactic position (in the CP or DP layer) and the type of referent (concrete, physical or abstract, conceptual). In doing so it provided a unified analysis of demonstrative and complementizer *that*.

The same model was then applied to the Biblical Hebrew clausal connective כִּי *kī* in chapter 4. This clausal connective can express a vast variety of functions, which scholarship has so far only been able to describe using a large number of historically related but synchronically unrelated lexical entries. Chapter 4 showed that a more economical account is possible using the notion of Addressee involvement — in particular, *kī* is marked for reference to Common Ground. This account only requires separate lexical entries for two lexicalized meanings, and can derive all other functions from context. In addition, this description is better able to explain contrasts between *kī* and related particles with a partial functional overlap.

Finally, part III considered the use of spatial terms to describe relations between people, with the example of Biblical Hebrew לִפְנֵי *līpnē* ‘to the face of’. Like the constructions described in the first two parts, this case study shows very clearly that spatial terms can be used to describe relations in abstract domains. In this case, the noun *pānim* ‘face’ comes to describe an area in front of the face of the prepositional object. Although this area does not have clear boundaries, it is possible to express that something is ‘to’ or ‘from’

someone's face. The face is an area in an abstract space, representing someone's authority and dignity, which can be challenged by placing something in that area.

Let me finish by pointing out three implications of these results. First of all, it is sometimes assumed in grammaticalization studies, implicitly or explicitly, that grammaticalized forms have lost all connection to earlier stages. The literature reviews in the chapters throughout this dissertation provide examples of this view: the Agent preposition *by* often receives a denotation entirely different from spatial *by* (section 1.4.2); the complementizer *that* is seen as semantically vacuous, apart from carrying a feature indicating that it introduces a tensed clause (section 3.1); and several authors explicitly state that the synchronic meaning of Biblical Hebrew *kī* cannot be related to the deictic function of the particle it derives from (section 4.1.2). By contrast, the analyses in the preceding chapters have shown that it is often more economical to assume that not all meaning bleached away, but that some meaning — specifically, *spatial* meaning — remains. This is in fact an expected feature of grammaticalization processes, but it is not always given enough thought. The formal models in chapters 1 and 3, together with their application in chapters 2 and 4, show that taking persistent spatial meaning into account actually leads to simpler and yet more precise synchronic descriptions.

Second, it is important to note that not all of the types of polysemy considered in this dissertation can accurately be described as metaphors. In the cognitive linguistic tradition, as well as in some studies on grammaticalization, syncretisms involving the spatial domain are sometimes described using Lakoffian metaphors like TIME IS SPACE. However, it is important to note that Lakoffian metaphors also cover things like AN ARGUMENT IS WAR, which are mostly reflected in lexical items (e.g., *your claims are indefensible*; Lakoff & Johnson 1980). The polysemy studied in part III could perhaps be described this way. However, the prepositional polysemy discussed in part I and the spatial features persisting in complementizers discussed in part II show that spatial terms are well-suited to be used in functional items as well. This type of non-spatial extension is crucially different. A metaphor of the type AN ARGUMENT IS WAR is defeasible, and there is a point where the metaphor fails. It is a 'way of thinking about something', and in principle there are multiple, mutually compatible ways to think about the same do-

main, which may be selected by speakers depending on their culture and/or the specific context. By contrast, it appears that the grammaticalized spatial features in prepositions and complementizers are the only natural way to express causation and refer to information content without periphrasis. These non-spatial extensions appear to be more firmly anchored in our cognitive conceptualization. Though the exact distinction from metaphors remains a topic for further study, it is clear that such a distinction is needed.

The final point concerns the *kind of spatial notions* that are exploited to describe relations in non-spatial domains. Previous scholarship on prepositional polysemy has focused on the *relative location* between Figure and Ground (for example, the fact that Source prepositions often mark Causes: chapters 1 and 2). The studies in this dissertation show that the notion of *distance* is worth exploring in greater depth as well. This notion was relevant for non-spatial domains in all three parts. Causal distance is used to express properties of causal models used to describe causal relations (part I). In part II we saw that distance can also make a distinction between the Speaker (“near”) and the Addressee (“far”). Finally, in part III, a small distance to a valuable entity (the face) received an emotive, threatening interpretation. The fact that distance appears in three entirely different domains is strong evidence for it being a primitive, but highly versatile cognitive concept that easily extends to other domains. More studies of this type are needed to obtain a complete overview of the spatial notions most frequently extended to other domains.