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Syntax and Semantics of Prepositions

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Preface

A great deal of attention has been devoted in the past ten years in the linguistic and computational linguistics communities to the syntax and the semantics of nouns, verbs and also, but to a lesser extent, to adjectives. Related phenomena such as quantification or tense and aspect have motivated a number of in-depth studies and projects. In contrast, prepositions have received less attention. The reasons are quite clear: prepositions are highly polysemic, possibly more so than adjectives, and linguistic realizations are extremely difficult to predict, not to mention the difficulty of identifying cross-linguistic regularities. Furthermore, a number of languages do not use prepositions or postpositions (or make a limited use of them) and prefer other linguistic forms such as morphological marks, e.g. case marks.

Let us mention, however, projects devoted to prepositions expressing space, time and movement in artificial intelligence and in natural language processing, and also the development of formalisms and heuristics to handle prepositional phrase attachment ambiguities. Prepositions are also present in subcategorization frames of predicative lexical items, but often in an informal and coarse-grained way. Let us also mention the large number of studies in psycholinguistics and in ethnolinguistics around specific preposition senses. Finally, prepositions seem to reach a very deep level in the cognitive-semantic structure of the brain: cognitive grammar developers often use prepositions in their metalanguage, in order to express very primitive notions. An important and difficult question to address, is whether these notions are really primitive or can be decomposed and lexically analysed.

In argument structure, prepositions often play the crucial role of a mediator between the verb's expectations and the semantics of the nominal argument. The verb-preposition-noun semantic interactions are very subtle, but totally crucial for the development of an accurate semantics of the proposition. Languages like English have verbal compounds that integrate prepositions (compositionally or as collocations) while others, like Romance languages or Hindi either incorporate the preposition or include it in the prepositional phrase. All these configurations are semantically as well as syntactically of much interest.

Prepositions turn out to be a very useful category in language, it does not just play the role of a grammatical marker. Prepositions are essential in a number of applications such as indexing and knowledge extraction since they convey basic meanings of much interest like instruments, means, comparisons, amounts, approximations, localizations, etc. They must necessarily be taken into account—and rendered accurately—for effective machine translation and lexical choice in language generation.

Prepositions are also closely related to semantic structures such as thematic roles, semantic templates or frames, and subcategorization frames. From a linguistic perspective, several investigations have been carried out on quite diverse languages, emphasizing e.g., monolingual and cross-linguistic contrasts or the role of prepositions in syntactic alternations. These observations cover in general a small group of closely related prepositions. The semantic characterization of prepositions has also motivated the emergence of a few dedicated logical frameworks and reasoning procedures.

This book emerges from a workshop on the syntax and semantics of prepositions, organized in Toulouse in September 2003. The aim of this workshop was to bring together linguists, NLP researchers and practitioners, and AI people in order to define a common ground, to advance the state-of-the-art, to identify the primary issues and bottlenecks, and to promote future collaborations. The main topics were:

- The syntax of prepositions: formal or descriptive syntax, prepositions in alternations, principles in the syntax of PPs, syntactic and semantic restrictions. General syntactic-semantic principles. Postpositions or other equivalent markers (e.g. case).
- Descriptions: Potential WordNet / EuroWordNet descriptions of preposition uses, productive uses versus collocations, multi-lingual descriptions: mismatches, incorporation, divergences. Prepositions and thematic roles, prepositions in semantic frameworks (e.g. Framenet.).
- Cognitive or logic-based formalisms for the description of the semantics of prepositions, in isolation, and in composition / confrontation with the verb and the NP. Compositional semantics. Logical and reasoning aspects.
- Cognitive or logic-based formalisms for the description of the semantics of prepositions, in isolation, and in composition/confrontation with the verb and the NP. Compositional semantics. Logical and reasoning aspects.
- The role of prepositions in applications, in particular: in machine translation, in information extraction, and in lexicalization in language generation.

- Corpus-based studies that support or challenge any of the approaches described above.
- Lexical knowledge bases and prepositions. Prepositions in AI, KR and in reasoning procedures.

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