

Dependency grammar and Hebrew

Dependency Grammar is a type of linguistic theory that builds syntactic structure on the dependency relation between two words. Although the approach can be traced back to linguists of antiquity, the original formulation of the formal theory is that of Tesnière (1959). Lucien Tesnière was a French linguist, and a member of the so-called Prague School of Linguistics. The dependency relation is an asymmetrical relation between two words, one of which (the Head) exhibits a host of local control phenomena towards another word (the Dependent). Heads determine the syntactic and semantic features of the head-dependent combination, so that in most cases the combination inherits the features of the head-word. For example, a modified noun such as ‘big chair’ is a nominal just like ‘chair’ as far as its semantics and its syntactic combinatory behaviour are concerned. Second, heads control the characteristics and placement of their dependents: for example, the transitive verb ‘saw’ in the English clause ‘Mary saw Richard’ requires a pre-verbal subject nominal complement (‘Mary’) and a post-verbal direct object (‘Richard’). According to theory, the syntactic structure of a sentence is built up from such pairwise dependency relations between individual pairs of words, applied recursively.

By contrast to Phrase- or Constituency-Structure theories of linguistic structure, Dependency Grammars do not employ units larger than words in characterizing sentence structure. The binary Dependency relation between pairs of words is the atomic building block of syntax, and larger units built up from it do not require explicit acknowledgement.

The grammars belonging to this family include Tesnière’s (1959) original formulation of Dependency Theory; Melčuk’s Meaning-Text Theory (1979; 1988); Hudson’s Word Grammar (1984; 1990); Sgall’s Functional Generative Description (Sgall et al. 1986) and Starosta’s Lexicase (1988). Lately, Chomskian grammar has joined the class of Dependency Grammars. In the Minimalist Program, Chomsky (1995) defines as the major building block of syntactic structure the asymmetrical opera-

tion Merge that creates a new syntactic unit from the unification of two old ones; this operation is identical to the Dependency relation. The convergence between Chomskian linguistics and Dependency Grammars has been pointed out by linguists of the two schools of thought (e.g., Epstein 1999; Epstein et al. 1998; Hudson 1995).

Grammatical relations such as Subject-Verb and Verb-Direct Object are subtypes of the general Head-Dependent relation, each representing a concrete and embodied expression of the abstract Dependency relation. Thus, grammars that allocate a formal role to grammatical relations belong, at least implicitly, to the family of Dependency Grammars. This includes the pre-theoretical so-called ‘traditional grammar’.

Dependency-type analyses are the dominant mode of grammatical analysis adopted in descriptions of Hebrew grammar. First, the great majority of Semitic linguists studying the structure of Hebrew (e.g., Perez 1951; Blau 1966; Yoeli 1970; Ben-Asher 1972; Rosen 1977; Ornan 1979; Goldenberg 1985) explicitly acknowledge binary grammatical relations between a Head element such as the verb and a dependent element such as its subject or direct object. Notions such as ‘obligation’ of the dependent vis-à-vis the Head form part of the descriptive apparatus of syntactic structure in the traditional literature. The same approach informs textbooks on modern Hebrew grammar (e.g., Glinert 1989) and it is the mode of analysis employed even in elementary textbooks on Hebrew syntax. For instance, Avikazar (1982:64–69) defines the relation of complementation by which such elements as subject and direct object obligatorily or optionally complement their ‘nucleus’ (namely, Head). In his textbook, high-school pupils are instructed to mark the relevant relations between pairs of words of a sentence by arrows, in a typical Dependency notation.

In the field of developmental psycholinguistics, most researchers working on the development of Hebrew in children use grammatical relations as formal units of analysis, thus at least implicitly embracing a Dependency-type

grammar without identifying their work as belonging to the Dependency tradition (e.g., Berman 1980). An explicit call to adopt Dependency Grammar as the theoretical framework for studying language acquisition, and in particular in Hebrew, was made by Ninio (1996). In subsequent studies, Ninio (1998; 2006) explored the syntactic development of Hebrew-speaking children from a Dependency Grammar perspective and performed Dependency analysis on several maternal and longitudinal child corpora.

Dependency Grammar proper is slowly gaining a foothold in linguistic analyses of Hebrew. Some recent theses employed this framework as their methodology, such as Malessa's (2006) Ph.D. thesis on biblical Hebrew, carried out in the Netherlands.

Another recent development is the use of dependency analysis for the construction of natural language processing (NLP) applications such as the building of automatic parsers. Projects such as these relating to Hebrew are in their initial phases, some published results representing a trial run on a small corpus (Goldberg and Elhadad 2009; 2010), other publications are announcements of future plans to develop such parsers (Nir et al. 2010). When these projects are completed, the availability of easy methods of parsing is likely to increase the number of corpus-based linguistic studies of Hebrew.

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