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Ph.D. Studies

Dependency Phonology

By

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Dependency structures in syntax, morphology and phonology Dependency representations have been devised in an attempt to formalize the notion of head and subordinate - a subordinate being either an argument or a modifier. These notions are familiar from traditional and recent grammar where, for instance, a verb is said to 'govern' the noun phrases in its frame (in the sense that it imposes restrictions on their nature) so that in many linguists go to Essex we would take go as the pivot element of the sentence relating many linguists and to Essex. In turn, prepositions can be argued to govern noun phrases and, at least at surface level, determiners can be taken as dependants of their governing nouns. Apart from the labelling, [1] encodes two types of relation: 'government' and 'precedence'. Go governs directly linguists and to, and, in turn, linguists governs many and to governs Essex.

Government is expressed by placing the node (vertex) corresponding. them by an arc. A category will be said to be governed by, or be the dependant of, another category if and only if one arc connects them (eg many and linguists). On the other hand, a category related to a head by a continuing descending sequence of arcs will be said to be a subordinate (eg many as well as linguists are subordinates of go). As for the relation of precedence - ie the fact that many immediately precedes linguists which immediately precedes go, and so on - it is expressed by simple left-to-right ordering on the page. One major difference between a classical dependency representation such as [1] and a constituency representation (whether or not of the X-bar type) is that in [1] each syntactic category is immediately associated with a terminal. An NP is an N with its dependants, but there is no category NP superordinate to D and N. While the nodes in [1] are labelled and connected by association with words instantiating the various syntactic categories, an equally adequate representation, favoured from now on, can be devised where the syntactic structure is a projection from the category labels and the words associated with them as in The same type of representation can be adopted in phonology. The syllable also has a head - a vowel in many languages - without which it does not exist as a constituent. That head is flanked by margins and the segments are normally ranked in accordance with the sonority hierarchy (ie with an ascending slope from the initiation to the syllabic and then with a descending slope). This is precisely what is expressed by the representation for the syllable flint [3], where fl{ and /n/ respectively govern the less sonorous and /f/ and /t/. Note that there is no need for quasi-categorial labels like strong-weak, as used in metrical phonology (cf 6.2.1.2), since the incorporation of strength relations falls out from our choice of graph representation.

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Representations such as [3], used in early .work on DP, encounter a problem in that they do not incorporate divisions such as onset vs. rhyme, and nucleus vs. coda, which have been argued to be well motivated in Chapter 6. (That is, there is no vertex in [3] of which one could say, 'this vertex with its dependants comprises the rhyme', the rhyme being the sequence /int/.) The difficulty lies with the assumption made in classical dependency systems that a head is the governor of one and only one construction. But this assumption seems far too strong. Thus, a stressed syllabic within a foot (say /re/ in catty) is successively the head of the syllable that contains it and the head of the foot. And, if that foot is the strong element of a tone group (eg Don't be catty), the syllabic will be projected as the head of the whole construction. By the same token, in VP languages, a verb is successively head of the VP and head of the whole sentence (leaving aside the possibility of further protections as defended in X-bar syntax). If we do want to represent the possibility of this type of layering, while retaining the perspicuity of the dependency notation in expressing the notion of head, some assumption(s) of classical dependency systems, as summarized in [4], must be changed. [4] Standard dependency graphs [4a] There is a unique vertex or root. [4b] All other vertices are subordinate to the root. [4c] All other vertices

terminate only one arc. [4d] Every vertex is immediately associated with a terminal category. [4e] No crossing of arcs or association lines is allowed. Assumption [4d] only allows nodes to be adjoined to their heads. If we drop this condition, and also allow nodes to be subjoined, we will license representations such as [5], where go is successively the head of the VP go to Essex and of the whole sentence. This relaxation of [4d] is independently motivated since, if we turn to morphological structure, we clearly need to elaborate more on it.

Dependency and Structural Analogy Dependency Phonology adopts the basic premise of Dependency Grammar, which is that linguistic units enter into constructions that are characterized by a relation of dependency between heads and dependents. The relation of dependency is applied in both the plane that combines meaningful (conceptually-based) basic units into larger constructs (i.e. syntax; the content plane) and in the phonological plane (whose constructs involve meaningless, perceptually-based basic units: the expression plane).3 Fundamental to Anderson's work is the Structural Analogy Assumption (see also Anderson (1971); Anderson (1987), Anderson (2004); Anderson (2011a); (2011b; 2011c), Bauer (1994) and Staun (1996a) for discussion), which holds that structural relations and principles are the same in both planes of grammar. The planes therefore primarily differ in terms of the sets of their basic units, i.e. their alphabets, which are determined by the interface with phonetic substance (for the expression plane) and conceptual meaning (for the content plane).4 The assumption of structural analogy has roots in Louis Hjelmslev's theory of glossematics (e.g. Hjelmslev (1953)). It might seem that this assumption runs counter to the modularity assumption that is prevalent in Generative Grammar (and Cognitive Science in general), but this is only true if we assume that recognizing different modules (of grammar or of the mind) somehow entails that these modules must have radically

different organizations. Anderson, as do we, adopts the more plausible assumption that different modules follow the same principles of organization to the extent that this is possible. Indeed, there is no reason to believe that the notion of dependency, or any of the other basic principles that we will discuss, are limited to grammatical modules.5 By taking analogies between the two planes as non-accidental and in fact reflecting the relevance of general principles in both domains, Anderson's Dependency Grammar takes a stance that has obvious implications for the debate about an alleged Universal Grammar that merely comprises a syntactic system, relegating phonology to a separate 'expression system' (e.g. Hauser et al. (2002)). We will follow Anderson in claiming that the existence of profound analogies between the expression plane and the content plane strongly argues against separating the cognitive systems that permit humans to construct a mental grammar for their language(s) in this radical fashion. At the same time, we agree with Anderson that there is little reason to believe that these analogies reflect principles that are confined to an alleged innate Universal Grammar, however construed. Dependency structures form an alternative to constituency-based approaches: there is a principled distinction between the two. In a dependency approach, all nodes are associated to units from the alphabet. This means that there are no phrasal nodes that dominate non-terminal nodes. This fundamental difference may be obscured by several factors, however. Firstly, constituent structure in Generative Grammar has been augmented with the notion of headedness ever since Chomsky (1980). Constituents are said to be headed, with the head being a basic, i.e. lexical, unit that determines the characteristic properties of the phrase it heads. The resulting hybrid approach (constituency-cum-headedness) has also found its way into Generative Phonology (specifically in theories of suprasegmental structure). Secondly, depending on how dependency graphs are conceived, it is often very easy to map a dependency graph onto a more familiar-looking constituent structure, especially

when the relationship of subjunction is used (see section 4). While such a mapping may be deemed to serve no purpose, it is nonetheless the case that the resemblance may obscure the principled difference. Despite these factors that might blur the distinction to the casual observer, the rejection of constituent structure is fundamental to Dependency Grammar.