Chapter 34

HPSG and Lexical Functional Grammar

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Here is the epigram: more people have been to Berlin than I have

Here is the abstract: concrete gets you through abstract better than abstract gets you through concrete

1 Introduction

Head-Driven Phrase Structure Grammar is similar in many respects to its cousin framework, Lexical Functional Grammar or LFG (**dalrymple:2001**; Bresnan et al. 2015). Both HPSG and LFG are lexicalist frameworks in the sense that they distinguish between the morphological system which creates words, and the syntax proper which combines those fully inflected words into phrases and sentences. Both frameworks assume a lexical theory of argument structure (Müller & Wechsler 2014) in which verbs and other predicators come equipped with valence structures indicating the kinds of complements and other dependents that the word is to be combined with. Both theories treat control (equi) and raising as a lexical property of certain control or raising predicates. Both representational systems are based on unification grammar (Kay 1984), employing directed graphs that are often represented in the form of recursively embedded feature structures. Phonologically empty nodes of the constituent structure are avoided in both theories,

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with the gaps appearing in long-distance dependencies as the sole exception in some analyses, and complete elimination of empty categories even in those cases, in others.

At the same time, there are interesting differences. Each theory makes available certain representational resources that the other theory lacks. LFG has output filters in the form of *constraining equations*, HPSG does not. HPSG's feature structures are *typed*, those of LFG are not. The feature descriptions (directed graphs) are fully integrated with the phrase structure grammar in the case of HPSG, while in LFG they are intentionally separated in an autonomous level of representation in the form of a *functional structure* or f-structure. These differences lead some linguists to feel that certain types of generalization are more perspicuously stated in one framework than the other. Because LFG's functional structure is autonomous from the constituent structure whose terminal yield gives the order of words in a sentence, that functional structure can instead serve as a representation of the grammatical functions played by various components of a sentence. This makes LFG more amenable to a functionalist motivation, and also provides a standard representation language for capturing the more cross-linguistically invariant properties of syntax. Meanwhile, HPSG is more deeply rooted in phrase structure grammar, and thus provides a clearer representation of the locality conditions that are important for the proper functioning of grammars.

This chapter presents a comparison of the two theories with a focus on contrasts between the two. It is organized by grammatical topic.

2 Phrases and Endocentricity

A phrasal node shares certain grammatical features with specific daughters, such as the HEAD features that it shares with the head daughter. In HPSG this is accomplished by means of structure-sharing (reentrancies) in the immediate dominance schemata and other constraints on local sub-trees such as the Head Feature Principle. LFG employs essentially the same mechanism for feature sharing in a local sub-tree but implements it slightly differently. Each node in a phrase structure is paired with a so-called functional structure or f-structure, which is formally a set of attribute-value pairs. It is through the f-structure that the nodes of the phrase structure share features. To distinguish it from f-structure, the phrase structure is referred to as *c-structure*, for categorial or constituent structure. The grammar, in the form of a standard rewriting system, directly generates only c-structures, not f-structures. Those c-structure rules introduce equations

that form a projection function from c-structure to f-structure. For example, the phrase structure rules in

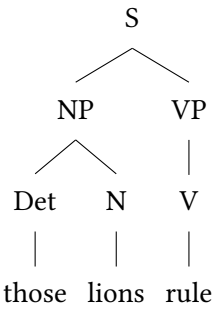
(1) a. S → NP VP
(↑ SUBJ)=↓ ↑ =↓

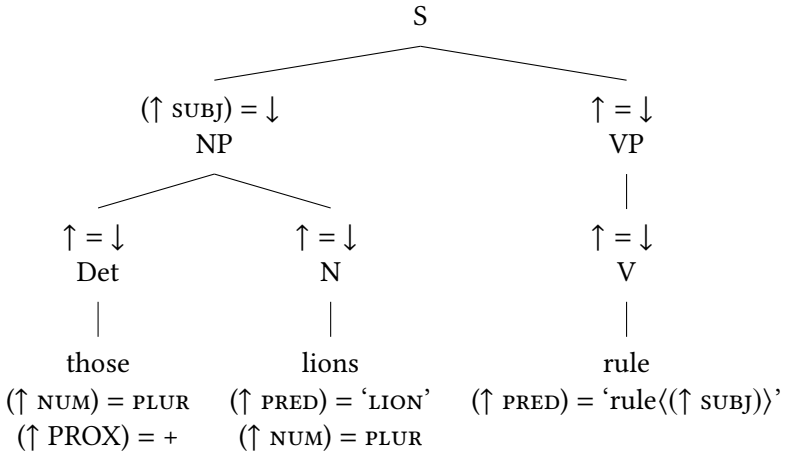
b. NP → (Det) N
(↑ =↓) ↑ =↓

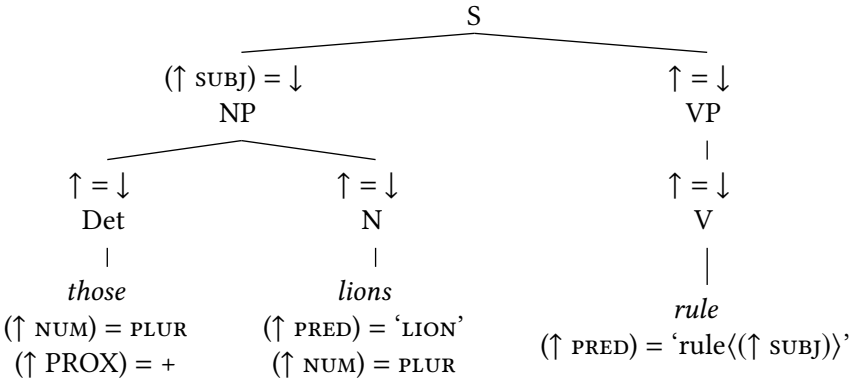
c. VP → V (PP)
↑ =↓ (↑ OBL do something in the command)=↓

d. *lion*: N (↑ PREDJ) = 'lion'
-s: *infl* (↑ NUM) = PL

e. *live*: V (↑ PREDJ) = 'live⟨. . .⟩'
-s: *infl* (↑ TENSE) = PRES
(↑ SUBJ) = ↓
(↓ PERS) = 3
(↓ NUM) = SG




S
(↑ SUBJ) = ↓
NP
↑ = ↓
VP
↑ = ↓
Det
↑ = ↓
N
↑ = ↓
V
those
(↑ NUM) = PLUR
(↑ PROX) = +
lions
(↑ PRED) = 'LION'
(↑ NUM) = PLUR
rule
(↑ PRED) = 'rule⟨(↑ SUBJ)⟩'


S
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NP
↑ = ↓
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↑ = ↓
Det
↑ = ↓
N
↑ = ↓
V
those
(↑ NUM) = PLUR
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lions
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(↑ NUM) = PLUR
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(↑ PRED) = 'rule⟨(↑ SUBJ)⟩'

References

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Müller, Stefan & Stephen Mark Wechsler. 2014. Lexical approaches to argument structure. *Theoretical Linguistics* 40(1–2). 1–76. DOI:10.1515/tl-2014-0001