

Formal Grammar (HPSG)

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[M]any other formal linguistic systems define themselves in relation to generative syntax.

(Bailyn, 2000, p. 2)

[W]ork that distinguishes between the adequacy of different theories will always be highly valued.

(Bailyn, 2000, p. 3, fn. 9)

1 Similarities between GB / Minimalism and HPSG

Common features of GB / Minimalism and Head-driven Phrase Structure Grammar (HPSG; Pollard and Sag 1994):

- interest in mental grammars;
- interest in linguistics as a scientific enterprise;
- often similar vocabulary (e.g., binding, extraction, structural case, etc.);
- declared use of formal methods in linguistics;
- hence, both belong to the generative paradigm.

In fact, according to Chomsky's own definitions, and to dictionary entries, HPSG seems to be a more prototypical exemplar of generative grammars than GB / Minimalism (*emphasis mine*):

If the grammar is... *perfectly explicit*... we may... call it a generative grammar.
(Chomsky, 1965, p. 4)

I have always understood a generative grammar to be nothing more than an *explicit* grammar.

(Chomsky, 1995, p. 162, fn. 1)

generative grammar n. 1. A grammar for a particular language which at least enumerates and usually also *characterizes (assigns structures to) all and only the well-formed sentences* of that language. . . Such a grammar differs from other approaches to grammatical description in that it is *fully explicit*, leaving nothing to be filled in by a human reader. The notion of a generative grammar in this sense was introduced by Chomsky (1957). . . 2. Any particular theory of grammar which has as its goal the construction of such grammars for particular languages. 3. The enterprise of constructing such theories of grammar. . .

(Trask, 1993, p. 117)

[A] **generative grammar** is a set of *formal rules* which projects a finite set of sentences upon the potentially infinite set of sentences that constitute the language as a whole, and it does this in an *explicit manner, assigning to each a set of structural descriptions*. . . In recent years, the term has come to be applied to theories of several different kinds, apart from those developed by Chomsky, such as Arc-Pair Grammar, Lexical Functional Grammar and Generalized Phrase-Structure Grammar. . .

(Crystal, 1997, pp. 166f.)

Generative grammar is the attempt to develop *precise and explicit* accounts of mental grammars and to specify what is and is not possible in such grammars.

(Borsley, 2000)

Contrast these definitions with the following extraordinary quote:

For alternatives to generative grammar, see inter alia Borsley, 1996; Pollard & Sag, 1994; Steedman, 1993; Bresnan, 1994; Hudson, 1990.

(Smith, 1999, p. 223)

2 Other Features of HPSG

These are some of the features of HPSG which I think are attractive to linguists, including Slavists:

- a **full-fledged and articulated** theory (contrast this with the programmatic character of Minimalism in which, e.g., it is not clear what the properties of the all-important interface levels LF and PF are);¹
- **constraint-based**: expressions are grammatical by virtue of simultaneously satisfying all grammatical constraints, and not by virtue of being computed or derived from other expressions (contrast with derivations and the essential procedurality of Chomskyan theories);

¹This point is made in Jackendoff (1997, p.21). See also, e.g., the following quote, from Freidin (1997, p. 580): “The overall character of the minimalist program is highly speculative, as Chomsky notes throughout MP. In a recent paper (Chomsky 1996) he is virtually categorical on this point ‘There are minimalist questions, but no specific minimalist answers’.”

- **radical nonautonomy**: no level of grammatical knowledge is privileged with respect to others, and no level is derived from any other (contrast with the autonomy of syntax in Chomskyan linguistics); thus, constraints may (and do) apply simultaneously to various levels of grammatical knowledge;²
- **psycholinguistic plausibility**:³
 - HPSG, just as other constraint-based grammars, is fully *reversible*, i.e., it is well-suited as a model of linguistic competence accessed *both* at production and comprehension (contrast this with the inherent directionality of transformational grammars);
 - HPSG is also compatible with the fact that sentences are *interpreted incrementally*; this is because, in HPSG, words have similar structure to whole sentences, i.e., they contain both phonological and semantic information, which can be immediately accessed (this should be contrasted with Minimalism, where words can apparently be interpreted only at the LF interface level, after the whole sentence has been constructed);
 - HPSG *avoids empty constituents* because there seems to be no evidence for the presence of empty constituents in syntactic structures and — in fact — there are reasons to doubt their existence (Pickering and Barry, 1991; Pickering, 1993; Fodor, 1993; Sag and Fodor, 1994);⁴
 - it has been claimed (Pullum and Scholz, 2000) that constraint-based systems, such as HPSG, but not production systems, such as Minimalism, can explicate the idea of (un)grammaticality as a matter of degree, as suggested by psycholinguistic experiments (e.g., Cowart 1997 and references therein);
 - HPSG has been shown to provide successful models of aspects of *L1 acquisition* (Wacholder, 1995; Green, 1999);
- **solid logical foundations**: a number of logics have been proposed to formalize HPSG (Carpenter, 1992; King, 1989, 1994, 1999; Pollard, 1999; Richter, 2000) (contrast this with Minimalism, where features play the primary role in derivations but there aren't (to the best of my knowledge) any formalizations of what features are, what their formal properties are, what values they may take, etc.);
- **computationally tractable**; in fact, HPSG practitioners sometimes implement their theories to check their predictions (contrast this with the computational intractability of Minimalism, discussed at length in Johnson and Lappin (1997, 1998));
- **scientifically responsible**:
 - **no excessive claims** of the kind discussed by Borsley (2000):

For example, in *The Minimalist Program*, Chomsky suggests that 'phrase structure theory can be eliminated entirely, it seems, on the

²See Janda (2000) for a similar stance within Cognitive Linguistics.

³See also Sag and Wasow (1999, §§ 9.4–9.6).

⁴See also Sekerina (2000) on inconclusiveness of various experiments trying to establish the existence of empty constituents.

basis of the most elementary assumptions' (1995:249). However, he remarks later that 'we still have no phrase structure theory for such simple matters as attributive adjectives, relative clauses, and adjuncts of different types' (1995:382, fn.22). If this is right, the idea that 'phrase structure theory can be eliminated entirely' is somewhat premature. . . . It seems to me that it is unwise for any generative linguist to talk about 'the end of syntax'. The phrase invites the response: 'So you have adequate grammars for most natural languages, do you?', to which, of course, the answer must be: 'Well, actually, no'.

(Borsley, 2000)

- **less rhetoric**, e.g., HPSG analyses are usually stated in the 'description mode', as opposed to the 'explanation mode' of Chomskyan analyses,⁵ HPSG avoids grand titles such as *Phenomenon X in Slavic*, where actually only one Slavic language is discussed and another one occasionally mentioned, hiding of 'ugly' bits of analyses in footnotes is much less frequent, etc., etc.;
- **respect for the data**: theories are derived on the basis of a comprehensive consideration of large arrays of data (contrast this with Minimalism, derived on the basis of the *a priori* criteria of *virtual conceptual necessities*, grammar as a *perfect system*, and *economy conditions*, and only subsequently being checked against the data);⁶
- **acknowledging other theories**: in HPSG, it is usual to cite and build on work done within other formalisms (contrast this with Chomskyan linguistics, where cross-theoretical citations are extremely rare).⁷

3 HPSG and Slavic Linguistics

What can HPSG offer the Slavic linguistic community?

Radical Nonautonomy From the Slavicist point of view, the **radical nonautonomy** (see §2 above) is probably the most important feature of HPSG. For example, the following grammatical levels have their own autonomous representations within HPSG:

- pragmatics, e.g.:
 - information structure (e.g., Engdahl and Vallduví (1994) and other works cited in Przepiórkowski (2000));
 - representation of mutual beliefs (Green, 1994);
 - illocutionary speech acts (Ginzburg and Sag, 1998, 1999; Green, 2000);

⁵"Many linguistics papers could be written in either description or explanation mode, with the same examples and the same hypotheses" (Pullum, 1983b, p.202), cited after Borsley (2000).

⁶See Janda (2000) on similar appreciation of data within Cognitive Linguistics.

⁷"Too many scholars are basically only bothering to acknowledge their friend and allies. If a classmate and co-thinker independently discovers your idea, you acknowledge that in a footnote. If a generative semanticist discovered it ten years ago but is now seldom heard from, you don't bother (even if you know)" (Pullum, 1983a, pp. 439–440), cited after Borsley (2000).

- phonology and morphophonology (e.g., Bird and Klein (1993), Bird (1995) and, especially, Höhle (1999), which describes a general HPSG architecture for phonology and illustrates it with an analysis of Russian obstruents, *inter alia*);
- morphology (see the works cited in Przepiórkowski (2000));
- word order (see the works cited in Przepiórkowski (2000)).

HPSG seems to be the ideal ground on which researchers working within the traditionally strong areas of Slavic linguistics, such as phonology (Bethin, 2000) or discourse analysis (Grenoble, 2000), could meet with syntacticians and develop theories encompassing both (or more) grammatical levels of representation, without any of them compromising their integrity.

Expressivity Another aspect of HPSG important in this respect is that HPSG has at its disposal a **highly expressive formal description language**, which allows to state a vast range of intuitions.⁸ This should be contrasted with Chomskyan linguistics, in which the formalism is constructed so as to have a very restricted expressive power.⁹ I think that it is this (intended!) lack of expressivity of early generative grammars, together with their orientation towards English, which made it so difficult to analyse Slavic languages and which originally turned Slavists away from generative linguistics, more than the grip of communism (cf. Bailyn (2000)).

Openness Finally, another feature of HPSG which is attractive to Slavists is its **openness to other theories and schools**. Although HPSG is as formal a theory as one can wish, there doesn't seem to be particularly strong divide between HPSG and functional approaches; for example, Rosen (2000) describes a hybrid of HPSG and the *Functional Generative Description* (i.e., the Prague-style Dependency Grammar).

HPSG can also be combined with or takes from other theories and approaches. Thus, Frank and Reyle (1995) combine HPSG with the *Underspecified Discourse Representation Theory* (Kamp and Reyle, 1993; Reyle, 1993), there is a constant dialogue with (and mutual respect for) *Lexical-Functional Grammar* and *Construction Grammar*, certain ideas have been borrowed from *Situation Semantics*, *Categorial Grammar* and *Government and Binding Theory*, etc., etc.

4 HPSG and Slavic Languages

What can Slavic languages offer HPSG?

There is a host of interesting phenomena which haven't been adequately explored in formal linguistics, but which—at the same time—have been comprehensively dealt with within traditional / functional linguistics. Formalizing and extending traditional / functional observations can be beneficial both for formal grammars (treatments of new phenomena will

⁸In fact, formalisms underlying HPSG have roughly the expressive power of (halting) Turing machines, i.e., roughly, they can express whatever may formally be expressed at all.

⁹This is because, within Chomskyan linguistics, it is the formalism that is supposed to constrain the range of possible grammars, while in HPSG, like in other exact sciences (e.g., physics), it is the axioms of the formalism that play this role. See Pollard (1996) for a lucid and very readable discussion.

lead to more comprehensive grammars) and for traditional linguistics (generalizations can be formalized and their consequences formally explored). Among these phenomena and areas are:

- ‘semi-free’ word order;
- information structure (theme–rheme, topic–comment, given–new);
- rich morphosyntax in general and case marking in particular;
- mixed categories (verbal nominals, adjectival / adverbial participles, etc.);
- rich diathesis (should it be handled in the lexicon or in the syntax proper?);
- coordination and its interaction with agreement; etc.

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