Grammatical theory: From transformational grammar to constraint-based approaches.

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In Grammatical theory (henceforth GT), Stefan Müller (henceforth M) provides a rich critical overview of the current state of research in syntactic theory. The book presents an authoritative discussion of the major theoretical frameworks in contemporary linguistics in a way that manages to be at once comprehensive, detailed, and critical. Furthermore, it strives to do so in a format that works both as an introductory textbook and as an advanced monograph on an impressive range of topics that are at the forefront of contemporary research. All of these features make GT a formidable achievement on many fronts. In some respects, though, the book’s ambitious goals compromise its general structure and organization as a cohesive text. Some concrete examples are given below.

1. Structure. GT is organized into two parts. Part I introduces the general background for discussion (Chs. 1 and 6) and reviews a range of theories that have played an important role in linguistic theorizing over the past century: phrase structure grammar (Ch. 2), government and binding (GB; Ch. 3), minimalism (Ch. 4), generalized phrase structure grammar (GPSG; Ch. 5), lexical-functional grammar (LFG; Ch. 7), categorial grammar (Ch. 8), head-driven phrase structure grammar (HPSG; Ch. 9), construction grammar (CxG; Ch. 10), dependency grammar (Ch. 11), and tree-adjoining grammar (TAG; Ch. 12). The discussion in these chapters is mostly aimed at readers without prior knowledge of grammatical theory.

Part II presents a more personal view on topics that cut across theories and pertain to some of the most lively issues in linguistics today: the innateness of linguistic knowledge (Ch. 13), the opposition between generative-enumerative and model-theoretic formalisms (Ch. 14), the competence/performance distinction (Ch. 15), language acquisition (Ch. 16), generative capacity (Ch. 17), general topics concerning the abstract properties of syntactic structures (Ch. 18), empty elements (Ch. 19), the diversity of displacement phenomena (Ch. 20), lexicalism (Ch. 21), analyses of complex predicates (Ch. 22), and the tools for capturing crosstheoretical generalizations (Ch. 23). This part of the book is aimed at more advanced readers and presupposes most of the material presented in Part I.

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2. Evaluation.

2.1. As textbook. *GT* begins with a survey of virtually all of the phenomena typically covered in a standard undergraduate introduction on syntactic theory: constituency tests, categories, arguments and adjuncts, grammatical functions, phrase structure, passive, wh-questions, and relative clauses. Building on this empirical foundation, the text then proceeds to elaborate most of the main formal approaches to syntactic description, as laid out in the list of chapters given above.

Notably, *GT* uses German and not the usual English as the main object language (though many examples from English and other languages are provided when relevant). For the reader who knows German and is somewhat familiar with the standard analyses, the presentation is extremely lucid and informative. But for newcomers to syntactic theory who do not know German and are not adept at reading glosses, this material might prove to be quite challenging. Fine points of German grammar that are obvious to someone who knows the language are likely to either escape or confuse someone who does not, especially the beginning student: for example, the fact that case is usually marked only on the determiner in German, but sometimes on the head noun as well, or syncretism in the definite determiners.

This said, the extensive use of German provides a useful perspective on issues that are addressed in a somewhat pedestrian fashion in textbooks centered around English. Particularly good examples of this are *GT*’s discussion of constituency and verb position, given the flexibility of German topicalization vis-à-vis English topicalization, and the dramatic word-order differences between main and subordinate clauses in German, but not English.

In addition, topics such as scrambling/local reordering and the traditional organization of the German clause into fields—which are particularly relevant to the description of German but not English, and thus are typically not addressed in detail in introductory syntax texts, if at all—receive a thorough treatment in *GT*. This is one of *GT*’s most important pedagogic contributions, because facts about the grammar of English have been the main driving force behind the development of most syntactic theories. By showing that a particular framework handles phenomena that do not exist in English more naturally than others do, *GT* grants more empirical content to cross-theoretical disputes that have often been conducted in quite abstract terms. Regarding scrambling, for example, the treatments offered within frameworks that are able to sustain a dissociation between syntactic structure and linear order or represent more flexible combinations between verbs and their arguments are arguably preferable on the grounds of simplicity and elegance. This covers a wide array of theories, from GPSG/HPSG (Gazdar et al. 1985, Reape 1993, Pollard & Sag 1994) to order-free variants of minimalism (Chomsky 2013, Chomsky et al. 2019). *GT* does a good job of expressing the commonalities between such diverse frameworks.

However, some topics that are often discussed at length in English-based textbooks, such as anaphora, scope and binding phenomena in general, and islands and the central role of c-command, are left out of the introductory picture and addressed only briefly in Part II. It would have been interesting to see if *GT*’s emphasis on German could have provided novel insights on these as well. For instance, it has often been remarked that the German anaphor *sich* does not behave in accordance with received notions about binding condition A, developed on the basis of the distribution of English reflexives (Riezler 1995, Kiss 2012, Hendriks et al. 2014).

2.2. As survey of theories. *GT* makes a serious attempt to bridge the gap between research communities that are often isolated from each other. One way that *GT* manages to do this is by framing the discussion of different frameworks in terms of their analyses of the same set of phenomena (e.g. passive, verb position, local reordering, local dominance). Even the discussion of abstract design features of the approaches is couched in eminently empirical terms. (Since *GT* discusses so many theories, including theories that seem to be falling out of fashion within theoretical linguistics, it is worth noting that optimality theory was left out.)

Some of the claims made about minimalism seem a bit outdated. This might stem from the fact that *GT* uses as its main source Adger 2003, a twenty-year-old textbook. Not all minimalists view movement as a last resort to check uninterpretable features (Chomsky et al. 2019) (contra *GT*, p. 144); the DP hypothesis is no longer universally accepted (Chomsky 2007, 2013) (contra *GT*, p. 128); and internal Merge and external Merge are two instances of the same operation, rather
than two distinct rules (Collins & Stabler 2016) (contra GT, p. 144). This said, there is clearly value in introducing students to an earlier incarnation of an influential theoretical perspective whose assumptions and terminology are reflected in much of the mainstream literature of the past thirty years or so.

2.3. AS THEORY. One of the virtues of GT is that the same syntactic phenomena are analyzed rigorously across different frameworks. This ensures a kind of commensurability that is often lacking from most cross-theoretical comparisons. However, it also raises a question about the state of the field: what do we do with the fact that we have (at least) nine different grammatical frameworks that are for the most part notational variants?!

One can argue for and against particular analyses within each framework, but it is quite hard, if not impossible, to satisfactorily settle disputes among frameworks on purely empirical grounds. Though certain analyses may look contrived or ad hoc, a theorist can always justify their choice in terms of some external motivation. Usually, this takes one of two forms:

(i) some general narrative that linguists are attracted to or feel linguistic theory should provide answers to (e.g. Plato’s problem, the evolution of language, concerns with generative capacity);

(ii) the desire to achieve some specific technological goal (e.g. computational implementation).

An example of this trend is GT’s discussion of the transformational analysis of local reordering/scrambling in German (pp. 114–16 and 142–43). The phenomena are illustrated in 1.

(1) German (adapted from GT, p. 114)
   a. … weil der Mann dem Kind das Buch gibt
      because the.NOM man the.DAT child the.ACC book gives
      ‘… because the man gives the child the book’
   b. … weil der Mann das Buch dem Kind gibt
   c. … weil das Buch der Mann dem Kind gibt
   d. … weil das Buch dem Kind der Mann gibt
   e. … weil dem Kind der Mann das Buch gibt
   f. … weil dem Kind das Buch der Mann gibt

Though specific assumptions about the repertoire of invisible functional heads and the nature of the movement operation may vary, most proponents of GB/PRINCIPLES AND PARAMETERS (P&P) and minimalism assume that one of the sentences in 1 reflects the canonical order of arguments more directly than the others and that the orders found in the latter result from movement of constituents to various noncanonical positions. It is widely held that the movement of phrases to noncanonical positions is driven by the need to check certain uninterpretable features in a local Spec-Head configuration.

Assuming that 1a reflects the basic order, the derivation of 1d would have to be something along the lines of the roll-up derivation in 2.

(2) [weil [der Mann [dem Kind [das Buch gibt]]]]
    ⇒ [weil [das Buch gibt], [der Mann [dem Kind t1]]]
    ⇒ [weil [der Mann [dem Kind t1]], [das Buch gibt]1 t2]
    ⇒ [weil [dem Kind t1], [der Mann t3]2 [das Buch gibt]1 t2]
    ⇒ [weil [das Buch]4, [dem Kind t1]3 [der Mann t3]2 [t4 gibt]1 t2]

Such a proposal (which is similar to many proposals actually found in the literature) is not directly motivated by the data in 1, but follows from general assumptions about language that are taken as given by most proponents of transformational grammar: for example, the widely held view that arguments are first-merged to the verb in accordance with a crosslinguistically fixed
order that reflects the thematic hierarchy (Larson 1988, Hale & Keyser 1993, 2002, Baker 1997) and the assumption that movement is feature-driven.

Though empirical evidence is often cited as confirming these assumptions, the reason most proponents of derivational approaches make them has to do with a certain picture of what language is. The idea that movement is a last-resort operation, driven by the need to eliminate uninterpretable features, is inspired by the general tenet that language is a perfect solution to the problem of linking sound and meaning, thereby meeting the principle of full interpretation (Chomsky 1995b).

For other theories (e.g. LFG, HPSG, and TAG), concerns about how perfect language might be simply play no role in motivating hypotheses about linguistic phenomena. These theories are more concerned with directly capturing patterns in the data and stating them in a rigorous way. But these theories also have very little to say about language as a cognitive capacity and how it emerged in the human species. These different concerns and narratives about language are clearly part of what insulates different frameworks from each other.

All in all, paradigm shifts within contemporary syntactic theory do not seem to follow the standard Kuhnian trajectory, which takes place over generations and is generally driven by the recognition of multiple anomalies that cannot be explained within the context of a received framework (Lappin et al. 2000); rather, what often happens is that a new perspective on well-researched syntactic phenomena is offered by a new approach that emerges either in some other corner of linguistics, or from some neighboring field. Epistemological concerns with perfection and simplicity, for instance, emerged only in the mid-1990s, after various developments of the P&P approach led to what appeared to be an excessively baroque picture of universal grammar (Chomsky 1995a, 2007, 2021, Freidin & Vergnaud 2001).

A few years later, this drive for simplicity was reinterpreted as being motivated on evolutionary grounds (Chomsky 2005, Berwick & Chomsky 2015, Hornstein 2018). The goal of broader integration of linguistics with biology has spawned a growing interest in a biolinguistic perspective, which is not explicitly shared by theories that focus on developing rigorous, computationally implementable formalisms.

The foregoing observations suggest that there may be a practical conflict between the general goal of offering a linguistic theory that is psychologically and biologically plausible, given what we know about how human cognition works, and that of developing a formalism that is formally rigorous and comprehensive in its descriptive coverage. A lesson that GT makes clear, in virtue of its breadth and attention to detail, is that we have yet to see a theory that seriously attempts to reconcile these two goals, which Chomsky (1965) convincingly articulated in the 1960s.

2.4. QUALITY AND QUALITY CONTROL. In Part I of GT, introductory expositions aimed at making core concepts accessible to newcomers are sometimes intertwined with esoteric critical comments fully comprehensible only to connoisseurs of particular debates within linguistics.

A striking example of this is the discussion on formalization and computational implementations in Section 3.6.2. Up to that point, readers have only been presented with simple phrase structure grammars and the theory of GB (Chomsky 1981). GT criticizes the latter for not being thoroughly formalized in a way that lends itself to the statement of computationally implementable grammar fragments incorporating proposals in the theoretical literature. Computationally implemented fragments allow linguists to check hypothesized constraints for consistency as well as to see whether they yield unforeseen predictions, given the way they interact with other constraints proposed as explanations of other phenomena. Granted, this exercise is very helpful, insofar as it liberates researchers from relying exclusively on their intuitions, allowing for automatic testing of predictions (see also Abney 1996, Müller 2015).

However, the problem with this whole discussion is that the concern with lack of proper formalization of mainstream generative grammar (MGG) post-1980 is hardly comprehensible for students who are not previously familiarized with more formally robust and computationally tractable grammatical theories such as GPSG, LFG, and HPSG. In fact, the criticisms against MGG’s lack of formalization were primarily voiced by proponents of these theories (Gazdar 1979, Gazdar et al. 1985, Pullum 1989, Kornai & Pullum 1990).
GT then goes on to discuss technical computational implementations that build on insights from GB but downplay the role of transformations in favor of constraint-based devices (e.g. base-generation of traces, feature inheritance). It is not clear why these proposals are discussed in such detail, given that they have had a very limited influence on the actual research carried out by proponents of MGG. There may, in fact, be a good reason for this: it is questionable whether the particular formal implementations mentioned in GT actually address the foundational concerns that motivated the creation of the GB paradigm—basically, Plato’s problem.2

There are also some problems with the organization of the book; for example, several portions of Section 4.6 of the minimalism chapter presuppose familiarity with HPSG and categorial grammar, yet to be discussed. It is good that M does not refrain from delving into critical discussions of the frameworks that he is discussing. Nor are there problems with the specific content of these more advanced sections (in fact, most of M’s critical assessments appear to be on the mark). The problem is that doing this so early in a book that is intended for beginners is in conflict with the introductory purpose of the enterprise.

Part II presents a competent discussion of various topics, but its general narrative seems somewhat unstructured. There are very long and detailed chapters—such as ‘Phrasal vs. lexical analyses’—and short chapters that are somewhat perfunctory—such as ‘Generative capacity and grammar formalisms’ and ‘Structure, potential structure and underspecification’. Many of the chapters deal with particular technical issues, and do not adhere to an overarching theme. That M uses these chapters to offer judgments about disparate topics that are not directly relevant to what is being discussed makes the general narrative of the book lose focus.

It is not entirely clear what role most of Part II would play in a textbook, even one that is used in a more advanced course. It might make more sense if much of Part II was published as a separate book, perhaps as a collection of articles, or was in some way strung together by a few clear themes. The fact that Part II is joined with Part I (which does have a clear structure, pace minor quirks) masks the fact that Part II is largely a collection of highly personal, albeit interesting, essays on disparate topics.

A constant theme that appears in several places in Part I and also makes for one of the best chapters in Part II is the issue of lexicalism; another one is computational implementation and the role of formalization. These two topics arguably reflect M’s own interests and predilection toward one of the theories discussed in Part I, namely HPSG. Perhaps Part II could be restructured (and better integrated with Part I) as an explicit defense of the HPSG views on these and other metatheoretical matters. Ch. 21 presents convincing evidence which suggests that HPSG fares better than competing theories (e.g. CxG, exoskeletal approaches in minimalism, and constructional variants of LFG) in its account of argument structure alternations, such as passive and active. In fact, the HPSG position seems to be vindicated in most of the chapters that make up Part II. Making explicit how the conclusions of each chapter in Part II relate to the author’s own favored framework would give GT a more cohesive narrative.3

Finally, there is one notable aspect of GT that sets it apart from the usual run of textbooks: it is published by Language Science Press, an effort by members of the linguistics community to offer high-quality, peer-reviewed academic publications in the field at no cost to readers and authors.

2 It is understandable, however, why GT diverts the discussion of GB toward implementational concerns. By doing so, M is, in fact, seeing how GB fares with respect to goals that the theory did not set itself out to address, at least initially. This is an important step in starting a dialogue with other frameworks that are more concerned with building large-scale, computationally implementable grammar fragments. Whether it is best situated in the introduction part of the text is debatable. A better solution, perhaps, might be to devote an entire chapter in Part II to discussing how the different approaches fare with respect to computational tractability.

3 It might even make Part II more concise and focused. For instance, if the point of Part II is to offer a general metatheoretical defense of HPSG, footnotes, paragraphs, and even some (short) chapters that are devoted to highly technical issues of limited interest to readers who are mainly seeking a critical overview of linguistic theory may profitably be eliminated. Similarly, one could plausibly merge the chapters on acquisition and innateness into a single chapter.
This is an extraordinary contribution to the field and should be applauded as such. At the same time, proofreading is carried out by volunteers, and at least in the case of GT, the result has been that there are more typos than one would like to see, as well as a lack of cohesion and organization at times that makes GT less useful than it could have been. The end result achieved by GT makes it clear that, while this approach to publishing has undeniable virtues, challenges remain.

3. Conclusion. GT’s goal is very ambitious, and it meets it to varying degrees of success. Though the actual content of the volume is unobjectionable, its sheer scale and diversity present the reader with significant obstacles. Advanced readers will find sections too introductory for their taste; beginners will find many topics beyond them, both conceptually and technically; readers not familiar with German may find many examples confusing, or opaque, or fail to appreciate their full significance; instructors may find the question of how best to use the book challenging.

In the end, though, in spite of its textual and editorial problems, this book is an essential contribution to syntactic theory. The field will profit from reflecting on GT’s essential critical insights and its broad and open-minded perspective on linguistic theory.

REFERENCES


Hendriks, Petra; John C. J. Hoeks; and Jennifer Spenader. 2014. Reflexive choice in Dutch and German. The Journal of Comparative Germanic Linguistics 17(3).229–52. DOI: 10.1007/s10828-014-9070-x.

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The focus of Bilingualism, executive function, and beyond is the hypothesis that managing two languages requires domain-general executive functioning (EF) and that this ubiquitous practice leads to an enhancement of cognitive control. This hypothesis was first challenged in the context of a failed replication by Morton and Harper in 2007, and the ensuing debate continued to pick up steam for fifteen years and counting. The dominant view expressed throughout the book is that bilinguals do adapt to the demands of managing multiple languages and that these adaptations affect and enhance general control mechanisms. However, each bilingual’s experience is distinctive, as determined by the specific languages acquired, the age of acquisition, the proficiency attained, the amount of use, and the pattern of use. The latter emphasizes a distinction between single-language contexts, where a single language dominates in each context (e.g. English at school, Spanish at home), and dual-language contexts, where there is frequent language switching depending upon changes in conversational partners or topics. With the further refinement and adoption of the theoretical framework that general cognitive control is best viewed as a set of interrelated component processes, one comes to appreciate that different types of bilinguals will recruit and strengthen different component processes of EF. Thus, another major theme of the book is that the hypothesis of a bilingual advantage in EF (the BILINGUAL ADVANTAGE HYPOTHESIS) cannot be tested with a simple comparison between bilinguals and monolinguals but must take the type of bilingual into account; this requires advances in the methods used to measure different facets of bilingualism and in the tasks used to measure different components of EF. The book does a good job of laying out this agenda, although there is no attempt to integrate the separate