Douglas Biber and **Bethany Gray**. *Grammatical complexity in academic English. Linguistic change in writing*. Cambridge: Cambridge University Press. 2016. 277 pp. ISBN 978-1-107-00926-4. Reviewed by **Magnus Levin**, Linnaeus University.

In recent years, academic writing has received increasing attention from both applied linguists and corpus linguists. This research has mostly concerned the teaching of academic writing and the analysis of specific linguistic features from a synchronic perspective. Thus, the present volume fills a gap in that it to a great extent assumes a diachronic perspective on academic writing in English, and that it highlights the differences between humanities writing and science writing.

Chapter 1, "Academic writing: Challenging the stereotypes", discusses some stereotypical views about academic writing, and some shortcomings of earlier accounts. Chapter 2 presents the corpus material used, and in Chapter 3, the phrasal (nominal) and clausal discourse styles in different genres are compared from a synchronic perspective. Chapter 4 shows how the stylistic preferences regarding more phrasal or more clausal discourse style in academic writing have evolved across the centuries. Chapter 5 discusses the functional extension of phrasal features in academic writing, while Chapter 6 exemplifies the loss of explicitness following from the increased use of a phrasal style. Finally, Chapter 7 concludes the volume, suggesting some implications for applied linguistics.

The first chapter challenges a number of stereotypes of academic writing, including that all academic prose is "essentially the same", uses "complex and elaborated grammar", is "maximally explicit in meaning" and is "resistant to linguistic change" (p. 7). However, the support that is presented for present-day linguists subscribing to these views is fairly tenuous. The evidence includes two quotes from early 20th-century linguists, an introductory textbook from the 1960s and a popular text about language use from the 2000s (p. 33). The findings of the volume would not have lost their relevance if the discussions of stereotypes had been toned down.

A strength of this chapter is the discussion of different measures of grammatical complexity, covering both subordinate clauses and noun phrase complexity. The authors show that embedded dependent clauses, e.g., *Jill* mentioned *twice today that I* need *to* find *something to* put *my trophy on*, (p. 16) are quite frequent in speech, which would lead to the unexpected conclusion that conversational speech is quite complex. In the following chapters, the authors show that even within the macro-genre of academic English there are considerable differences with humanities academic prose preferring clausal modification (relative clauses) and specialist science writing increasingly preferring phrasal modification such as pre-modifying nouns.

Chapter 2 presents the corpora and the methods used. The material covers a wide range of data, including both more well-known corpora such as the academic sub-part of ARCHER, the Longman Corpus of Spoken and Written English and also specialized corpora such as a 3.6-million-word corpus of 20th-century research articles. Most of the features investigated were retrieved using automatic tagging and counting. This approach undeniably enables fast processing of vast amounts of data, but the levels of precision and recall usually remain unclear. This issue is only commented on briefly (pp. 65–66). "Many features" (p. 65) were automatically identified, but some, such as post-modifying prepositional phrases, were checked using human coding for samples of instances.

Chapter 3, on the one hand, compares academic writing to newspapers and fiction, and on the other explores differences within academic English. The results show, expectedly, that academic writing differs from the other genres in its stronger preference for nominal style. Nouns (and nominalizations) are more frequent, and in particular certain types of noun phrase modifiers such as pre-modifying nouns, attributive adjectives and prepositional phrases. For some features, a number of differences between academic sub-genres are apparent. The most evident differences are found between humanities and science texts. Common nouns occur most frequently in specialist science writing while they are rarest in humanities texts.

Chapter 4 focuses on changing style in academic writing in comparison with other genres. As found by numerous previous studies, colloquial features such as semi-modals and progressives have increased in fiction but not in science writing (p. 137). For science, the most notable change is that the frequency of nouns has increased, while lexical verbs and adverbs have decreased considerably in the last 250 years. There has been a very steep increase in the use of pre-modifying nouns during the 20th century (p. 148). Post-modifying prepositional phrases with *in*, *for*, *on* and *with* (p. 152) have also become more common. Nominalizations such as *discovery*, *observation* and *attention*, which have

often been seen as typical of academic writing, have nevertheless increased relatively little over 250 years (p. 147).

Pre-modifying N-X*ed* and N-X*ing* structures such as *accountability-based reform efforts* and *decision-making practices* have increased sharply (albeit from low levels), N-X*ing* having doubled and N-X*ed* structures having quadrupled since the mid-twentieth century (p. 149). In this context it would have been interesting to see to what extent this also holds true for other complex pre-modifying structures such as numeral-N (e.g., *one-inch diameter*), numeral-X*ed* (*three-tiered model*), ADJ-X*ing* (*high-functioning autism*) and longer types (*before-and-after tests*; *person-to-person transmission*). Interestingly, it is noted later (pp. 230–231) that there is a recent tendency in science writing for even less explicit structures where the hyphen is omitted in noun-participle modifiers (*colony forming units*). This is an unexpected finding which could have been developed further.

Chapter 5 discusses functional extension of the different grammatical features. Pre-modifying nouns (*the Communist Party chief*) are found to be encroaching on the territory of *'s*-genitives (*the Communist Party's chief*) and *of*-genitives (*the chief of the Communist Party*). Since the 16th century, the types and tokens of pre-modifying nouns as well as the range of meaning relationships between the modifying noun and its head have increased exponentially, and now noun sequences consisting of three or even four nouns are not unusual in academic writing (e.g., *air flow limitations*; *life table survival curves*). Noun-participle pre-modifiers have extended their functionality in academic writing mainly through their increase in types, the most frequent being -*based* and -*related*. The increase in frequency in post-modifying prepositional phrases is to a great extent an effect of abstract meanings more often being expressed with these prepositions. For instance, now more abstract uses of *on* as in *a significant impact on sea-bird numbers* frequently occur alongside concrete prepositional meanings such as *two on each side*.

Chapter 5 ends with a look at the systemic 'drift' towards compression driven by economy of expression. Here it is argued that "the 'information explosion' and the need to present more information in an efficient and concise way" (p. 207) is a major driving force behind structural compression. Finite relative clauses are the least compressed noun-phrase modifiers, followed by non-finite relative clauses and post-modifying prepositional or appositional phrases. The most compressed ones are pre-modifying adjectives and nouns. Evidence from the COCA and COHA corpora (pp. 213–216) suggests that pre-modifying nouns (*temperature variation*) are slowly replacing noun + preposition sequences (*variation in temperature*). However, these findings are based on the

whole corpora, and not restricted to the academic sub-corpora, which does not strengthen the idea that academic writing is changing in ways which are distinctly different from other genres.

In Chapter 6 it is shown that the condensed style typical of present-day science writing often leads to loss of explicitness. Compressed structures may be efficient for experts, but they are often difficult to understand for non-expert readers. For example, one and the same noun used as a pre-modifier can produce entirely different meanings depending on the noun it modifies: a *pressure hose* is a hose that is able to withstand pressure, while a *pressure ratio* is a ratio that measures pressure.

Among the less explicit, compressed structures are also noun-participle pre-modifiers and appositives. For example, *plastic-embedded tissue* may (to non-experts) refer to either tissue that is imbedded in plastic or to plastic that is embedded in the tissue. Appositives are noun phrases modifying the preceding head noun without an overt grammatical connector. Some of these are straightforward, such as a term or an acronym being given or explained (e.g., *judicium (good sense and good taste)*; *intensive care unit (ICU)*). Sometimes, however, research findings are presented in appositives, and sometimes this occurs in embedded structures in which each appositive stands in a specific meaning relationship to the head noun (e.g., *diffuse cutaneous involvement at enrollment (8% [Mayo] to 51% [Pittsburgh])* (p. 237)).

Chapter 7 concludes the volume by summarizing the main findings in relation to the stereotypes cited in Chapter 1: (i) academic writing is complex, and this complexity is often due to structural compression rather than elaboration; (ii) humanities research writing is more conservative and relies more on clausal modification than science writing, which instead prefers phrasal modification; (iii) compressed phrasal structures are *in*explicit in meaning, but are an efficient way for experts to give and obtain information; and (iv) academic writing is not necessarily resistant to language change, and major linguistic innovations can occur in writing.

Biber and Gray's volume is a valuable contribution to the study of written academic English. The diachronic perspective creates new insights into the synchronic processes and patterns of variation in present-day academic writing. The findings are original, well-supported and cover a wide range of areas. And therefore the findings are justified in their own right without arguing against less well-founded claims regarding stereotypes about academic writing. The largely automatic approach to data gathering should be used with some caution. Even if advanced statistical methods are used, the data on which these calculations are based appear only rarely to have been carefully checked. Thus one might won-

der to what extent, for instance, two nouns occurring next to each other in sequences such as *the way people work* have been included in the statistics for pre-modifying nouns.

The strengths of the study are the variety of corpora used, the large number of linguistic features investigated, some of which have received scant attention in previous studies, the interrelatedness of the features discussed and the combination of extensive quantitative and qualitative analyses. The conclusions are reiterated throughout, which makes it easy to follow the line of reasoning in spite of the complexity of the evidence. This volume will inspire further diachronic and synchronic studies of academic English.