Contrasting the Grammatical Complexities of Conversation and Academic Writing: Implications for EAP Writing Development and Teaching

Douglas Biber[1], Bethany Gray[2], Shelley Staples[3]

[1]Northern Arizona University, USA
[2]Iowa State University, USA
[3]Purdue University, USA

1. Introduction.

Grammatical complexity is often linked with elaboration and clausal embedding in linguistic theory. A 'simple' clause has only a subject, verb, and object or complement. A 'simple' noun phrase has a determiner and head noun. Additions to these structures represent elaboration, resulting in 'complex' grammar. In particular, there is widespread agreement that embedded clauses are an important type of grammatical complexity (often contrasted with 'simple' clauses; see e.g., Huddleston 1984: 378; Willis 2003: 192; Purpura 2004: 91; Carter & McCarthy 2006: 489).

Conversation has long been described as grammatically simple in these terms. Conversational participants share time and place, and they normally also share extensive personal background knowledge. As a result, colloquial features like pronouns and vague expressions are common. Referring expressions usually do not need to be elaborated in conversation because the addressee can readily identify the intended reference. Because of these factors, conversational grammar is often characterized as not complex, employing 'simple and short clauses, with little elaborate embedding' (Hughes 1996, pp. 33).

In contrast, academic writing is claimed to be structurally complex, as reflected by longer sentences, longer 't-units' (a main clause plus all associated dependent clauses), 'longer and more complex clauses with embedded phrases and

clauses' (Hughes 1996, pp. 34), and overall, a greater use of subordinate clauses (see, e.g., O'Donnell et al., 1967; O'Donnell, 1974; Kroll, 1977; Chafe, 1982; Brown & Yule, 1983).

These stereotypical portrayals of conversation and academic writing reflect the most salient characteristics of both. For example, some of the most noticeable characteristics of conversation are hesitations, false starts, and short non-clausal utterances, because none of these features are normally appropriate in formal writing. The following conversational excerpt illustrates these characteristics:

Text Excerpt 1: Conversation.
Non-clausal utterances are marked in bold

Barry: I went to the Institute of Terror.
Wendy: You went to where?
Barry: **The Institute of Terror.**
[…]
Wendy: **Oh.**
Barry: It's pretty cool. You want to go? I've got free tickets.
Wendy: Is it - it's a - how long is it going to be open?
Barry: **Until the thirty first.**
Wendy: **Cool.** It's, it's an, it's actually pretty scary and stuff?
Barry: I wouldn't go so far as to say it's really scary
Wendy: But it's cool. [laugh]
Barry: **Yeah.** […] I'll go with you. I wouldn't pay for you or anything
Wendy: [laugh]
Barry: But I'll go with you.
Wendy: It's expensive, isn't it? It's like five bucks.
Barry: Yeah, this one's six.
Wendy: **The one down here?** And you have free tickets?
Barry: **Well, yeah.** […]
Wendy: **Wow. Cool.**

This excerpt also illustrates the reliance on short, simple clauses in conversation, such as *where's that?, it's pretty cool, I've got free tickets, I'll go with you,* and *It's like five bucks.* If we focused only on grammatical features like these, we would be justified in concluding that conversation was generally not grammatically complex (as measured by the traditional criteria).

In contrast, one of the most noticeable characteristics of academic writing is that sentences tend to be long, with many embedded structures. Text Excerpt 2 illustrates this grammatical style of discourse:

Text Excerpt 2: Academic research article: Education textbook

A number of important themes have emerged from previous research exploring the links among gender, interaction, and collaborative learning. First, in mixed-gender interactions boys tend to dominate apparatus, teacher attention, and peer discussion within the classroom (for a review, see Howe, 1997). Second, the comparative context and, in particular, task are important in determining how children engage in collaborative interaction (Holmes-Lonergan, 2003). Third, a child's gender and that of his or her conversation partner appear to affect the dynamics of conversation but not necessarily the answer that children agree on (Leman, 2002): Specifically, boys tend to show greater resistance to girls' arguments, but ultimately all children tend to opt for the developmentally more advanced answer after interaction, regardless of whether a girl or a boy has put these arguments forward.

A further consideration for studies of gender and interaction is the influence of both speakers and partners gender on conversation. Leaper (1991) examined both these types of gender effect on communication between pairs of children in two different age groups (5 and 7 years) who were engaged in play with a puppet.

However, a careful reading of this academic excerpt shows that these long sentences are caused by the dense use of both embedded phrases as well as embedded clauses. These are the patterns of use that we discuss in the following sections.

An additional consideration, though, is the fact that it is not possible to achieve valid generalizations about a register based on analysis of a few individual text excerpts. Rather, this is the kind of research question that corpus-based research can contribute to (see, e.g., Biber, Conrad, Reppen 1998; McCenery, Tono, Xiao 2006). By basing analyses on large, representative collections of texts, it is possible to discover patterns of use that are generalizable to a register, rather than more specific patterns that characterize only particular texts. Further, corpus-based methods usually entail quantitative analysis, permitting description of the extent to which a linguistic pattern is typical of a register. Both of these analytical characteristics are important here. First, corpus research shows that the general 'complexity' characteristics of conversation and academic writing are quite different from those that are especially salient in individual texts. And second, corpus research shows that both conversation and academic writing use grammatical complexity features to some extent; the major difference between them is in the quantitative extent to which they rely on different sets of features.

Our goal in the present paper is to use large-scale corpus investigations to challenge the stereotypes about grammatical complexity noted above, summarizing

the major research findings from a series of previous studies (Biber and Gray 2010, in press; Biber, Gray, Poonpon 2011, 2013; Biber, Gray Staples 2014; Staples, et al. in press). Taken together, these studies show that both conversation and professional academic writing are grammatically complex -- but their complexities are dramatically different. Surprisingly, if we adopt the traditional view that complexity is realized through extensive clausal embedding, the evidence presented below would lead us to conclude that conversation is actually more complex than academic writing! However, this is because academic writing is complex in ways that have generally not been noticed by linguists: written academic discourse is actually much more 'compressed' than elaborated, and thus the complexities of academic writing are realized mostly as phrasal embedding rather than embedded clauses.

The following sections summarize some of the key results from large-scale corpus analyses that document these patterns of use. Section 2 introduces the corpora and linguistic features used for the analyses. Then, the corpus-based analyses comparing conversation and academic writing are discussed in Section 3. Finally, in the conclusion, we briefly discuss functional motivations for these register differences, and implications for the study of writing development and teaching EAP at the university level.

2. Corpus and grammatical features used for the analysis

We employ corpus-based analysis to describe the typical discourse styles of conversation and academic writing, investigating the extent to which both registers employ grammatical devices associated with structural elaboration. Previous corpus-based studies have documented the different complexities of spoken and written registers. For example, multi-dimensional studies of register variation (e.g., Biber, 1988, 1992, 2006) have shown repeatedly that certain dependent clause types (e.g., *because*-clauses and WH-clauses) are more strongly associated with speech than writing. The *Longman Grammar of Spoken and Written English* (Biber et al., 1999) provides more detailed descriptions of the grammatical features that are common in conversation versus those that are common in academic writing.

Building on this earlier research, we have recently undertaken a series of research studies focused specifically on grammatical complexity in spoken and written registers (Biber and Gray 2010, in press; Biber, Gray, Poonpon 2011, 2013;

Biber, Gray Staples 2014; Staples, et al. in press). The present paper summarizes some of the key research findings from those studies.

The conversation subcorpus for those studies was taken from the *Longman Spoken and Written Corpus* (see Biber et al., 1999, pp. 24-35). The subcorpus includes 723 text files and c. 4.2 million words of American English conversation. These are conversations collected by participants who agreed to carry tape recorders for a 2-week period. The corpus thus represents one of the largest collections of natural face-to-face conversations available.

We constructed a corpus of academic research articles for the analyses presented here (c. 3 million words), sampled from four general disciplines: science/medicine, education, social science (psychology), and humanities (history). We collected texts from three 20-year intervals (1965, 1985, 2005) to enable the description of short-term historical change. However, for the purposes of the present study, we consider these as a single group (429 texts, c, 2.9 million words), contrasted with conversation.

The corpora were grammatically annotated ('tagged') using software developed for the *Longman Grammar of Spoken and Written English* and earlier corpus studies of register variation (e.g., Biber, 1995). Then, more specialized computer programs were developed for detailed linguistic analyses of specific types of structural elaboration.

Table 1 lists the types of dependent clauses that we discuss below as stereotypical indicators of structural elaboration. These dependent clauses can serve three major syntactic functions: complement clauses, which usually function as the direct object of a verb; adverbial clauses, which modify the main verb; and post-nominal relative clauses, which modify a head noun. In addition, dependent clauses can be finite (with tense overtly marked) or non-finite.

Table 1: Selected types of dependent clauses associated with structural elaboration

Grammatical feature	Examples
Finite complement clauses	*I wonder how he is today.* *I thought that was just too funny.*
Non-finite complement clauses	*We'd love to come.* *They talk about building more.*
Finite adverbial clauses	*She won't narc on me, because she prides*

	herself on being a gangster.
	You can have it if you want.
Finite relative clauses	*A method that would satisfy the above conditions…*
	a repressor substance which prevents the initiation…
Non-finite relative clauses	*the assumptions given above …*
	initiatives involving local authorities …

We also considered grammatical devices that result in a 'compressed' rather than 'elaborated' discourse style, illustrated in Table 2. These are all phrases rather than dependent clauses, used to modify a head noun. Attributive adjectives and pre-modifying nouns occur before the head noun ('pre-modifiers'), while prepositional phrases occur after the head noun ('post-modifiers').

Table 2: Selected grammatical features associated with structural compression

Grammatical feature	**Examples**
Attributive adjective (adjective as noun pre-modifier)	*a large number, unusual circumstances*
Noun as noun pre-modifier	*human actions, membrane structure*
Prepositional phrase as noun post-modifier	*the scores for male and female target students in the class*
	the mechanism for penetration of protein through the ovariole wall

For our quantitative corpus-based analyses, most of these features could be identified accurately using automatic computer programs. However, prepositional phrases required hand coding to determine when the phrase was functioning as a noun modifier versus adverbial. This analysis was based on a sub-sample of tokens (every 4th occurrence) from a sub-sample of the corpus (48 conversations and 41 academic research articles). The counts for all linguistic features were converted to a 'normed' rate of occurrence (per 1,000 words) for each text (see Biber, Conrad & Reppen, 1998, pp. 263-264).

3. Structural elaboration and compression in conversation versus academic writing

As noted above, researchers have usually focused on dependent clauses (or subordinate clauses) as the primary measure of grammatical complexity or structural

elaboration.   However, corpus-bsaed research shows that there is extensive clausal embedding in conversation.   In particular, complement clauses (also called 'nominal clauses') are very common, especially *that*-clauses and *WH*-clauses.   Complement clauses normally fill a direct object slot, making it possible for a relatively short utterance to have multiple levels of embedding.   For example, the following short utterance has two embedded complement clauses:

You know [you could get [what you want]]

Unlike adverbial clauses and relative clauses, complement clauses are not optional structures; rather, they take the place of a required noun phrase.   In conversation, the complement clause usually occurs with a transitive verb (e.g., *think, know,* or *want*):   the complement clause substitutes for the noun phrase as the direct object of the verb.   As a result, these structures often contain multiple levels of structural embedding.   For example, the following relatively short sentence from conversation has four embedded complement clauses, each occurring as the object of the preceding main verb:

But I don't think [we would want [to have it [sound like [it's coming from us]]]].

Adverbial clauses are optional rather than obligatory clause elements. However, these clause types are also commonly found in conversation, as in:

She married him [because Clinton's father died before Clinton was born]
[If anybody wakes me up early] they die

Figure 1. Common finite clause types functioning as clausal constituents

Our corpus investigations show that the structures illustrated above are much more common in conversation than in academic writing. Thus, Figure 1 shows that both complement clauses and adverbial clauses are much more frequent in conversation than in academic writing. These differences are strongest for finite clauses (e.g., *that*-clauses and *WH*-clauses functioning as complement clauses; *because*-clauses and *if*-clauses functioning as adverbial clauses). However, the same general pattern holds for non-finite complement clauses (*to*-clauses and *ing*-clauses). In contrast, relative clauses are more frequent in academic writing than in conversation (especially non-finite relative clauses, such as *the concept of society proposed here*).

Text Excerpt 3 illustrates the pervasive use of embedded clauses in conversation. This conversational excerpt shows how certain kinds of dependent clauses can occur with extreme density in normal conversational interactions. For the most part, these kinds of structural elaboration do not feel complex, and they certainly do not inhibit normal communication. However, they are clearly 'complex' according to the definition of embedded clauses added on to simple clauses. Overall, Figure 1 shows that there are around twice as many dependent clauses in conversation as in academic writing. Thus, if we limited our comparison to these features, we would be forced to conclude that conversation is more complex than academic writing.

Text Excerpt 3: Conversation.
Dependent clauses bold underlined

Gayle: And Dorothy said **Bob's getting terrible with, with the smoking**. Uh, he's really getting defiant about it **because there are so many restaurants where you can't smoke** and he just gets really mad and won't go to them.
[…]
Peter: Well they, they had a party. I forget **what it was**. They had it at a friend's house. I can't remember **why it wasn't at their house** any way. And they had bought a bottle of Bailey's **because they knew** **I liked Bailey's**.
[…]
Gayle: I can't remember **who it was**. One of us kids.
[…]
Peter: Oh. I'll tell you **I think** **the biggest change in me is** **since I had my heart surgery**.
Gayle: Really? Yeah I guess my, I mean **I know** **my surgery was a good thing but**…
Peter: It makes **you think**.   You realize **it can happen to you**.

The obvious question at this point is to ask why academic research writing seems grammatically complex. That is, given that dependent clauses are generally more frequent in conversation than in writing, we need to account for the perception that academic texts are hard to process. Part of this perception is caused by difficult subject matter and complex vocabulary.   However, there are also grammatical features that make a major contribution to this complexity.   In particular, academic writing frequently employs embedded phrases (without verbs) as modifiers, often with multiple levels of embedding.   For example, consider the following sentence from a Biology research article:

The knowledge of tissue distribution of each novel molecular species is the first step toward the understanding of its possible function.

This sentence consists of only a single main clause, with the main verb *is*. There are no dependent clauses in this sentence. The sentence is relatively long because there are multiple prepositional phrases:

of tissue distribution
of each novel molecular species
toward the understanding
of its possible function

In addition, many of the noun phrases include extra nouns or adjectives as pre-modifiers before the head noun:

tissue distribution
novel molecular species
possible function

In their main clause syntax, sentences from academic writing tend to be very simple. Thus, consider the following sentence from a Psychology research article:

*This may indeed be **part** [**of** the reason [**for** the statistical link [**between** schizophrenia and membership [**in** the lower socioeconomic classes]]]].*

Similar to the example from biology above, the clausal syntactic structure of this sentence is extremely simple, with only one main verb phrase:

   X may be Y   (*This may be part…*)

Most of the elaboration here results from prepositional phrases added on to noun phrases (together with nominal premodifiers). Thus, unlike conversation, academic writing does <u>not</u> frequently employ dependent clauses for structural elaboration. Rather, we find a more 'compressed' style, employing embedded phrases rather than fuller dependent clauses.
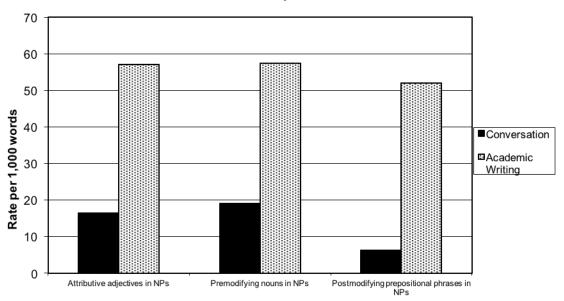
Figure 2. Common dependent phrasal types functioning as constituents in a noun phrase

As Figure 2 shows, academic writing relies heavily on non-clausal phrases instead of dependent clauses to add information.   Most of these phrases occur embedded in noun phrases. Many of these structures are adjectives modifying a head

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noun (e.g., *theoretical orientation*) or nouns pre-modifying a head noun (e.g., *system perspective*). In addition, a striking difference from conversation is for the use of prepositional phrases as noun post-modifiers. Many of these are *of*-phrases (e.g., *an interpretation <u>of the general form of mitochondria</u>*), but other prepositions are also commonly used for this function (e.g., *the complex relations between three components; <u>understanding</u> rational approach <u>to politics</u>*). Prepositional phrases used as adverbials (e.g., *<u>From the systems perspective, these stages are marked by…</u>*) are also more common in academic writing than in conversation, but the difference is much less strong.
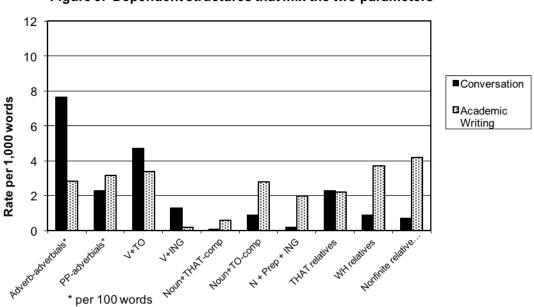

Figure 3. Dependent structures that mix the two parameters

It is not the case that there are no dependent clauses in academic writing. In fact, an equally important grammatical consideration is the syntactic role of the structure: Embedded structures that function as clause constituents are preferred in speech; Embedded structures that function as noun phrase modifiers are preferred in informational writing. Figure 3 shows these patters for several major types of grammatical structures. For example, adverbs -- a type of phrasal embedding that functions as a clause constituent (adverbial) – are much more common in conversation than academic writing. In contrast, non-finite relative clauses – a type of dependent clause that functions as a noun phrase modifier – are much more common in academic writing than in conversation. Text Excerpt 4 illustrates these patterns in academic research writing:

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Text Excerpt 4: Academic research article
Main Verbs are underlined; **main verbs in dependent clauses marked in bold**

A number of important themes <u>have emerged</u> from previous research **exploring** the links among gender, interaction, and collaborative learning. First, in mixed-gender interactions boys <u>tend</u> to **dominate** apparatus, teacher attention, and peer discussion within the classroom (for a review, <u>see</u> Howe, 1997). Second, the comparative context and, in particular, task <u>are</u> important in **determining** how children **engage** in collaborative interaction (Holmes-Lonergan, 2003). Third, a child's gender and that of his or her conversation partner <u>appear</u> to **affect** the dynamics of conversation but not necessarily the answer that children **agree** on (Leman, 2002): Specifically, boys <u>tend</u> to **show** greater resistance to girls' arguments, but ultimately all children <u>tend</u> to **opt** for the developmentally more advanced answer after interaction, regardless of whether a girl or a boy **has put** these arguments forward.

A further consideration for studies of gender and interaction <u>is</u> the influence of both speakers and partners gender on conversation. Leaper (1991) <u>examined</u> both these types of gender effect on communication between pairs of children in two different age groups (5 and 7 years) who **were engaged** in play with a puppet.

However, this same text excerpt also illustrates the more important grammatical pattern that sharply distinguishes between academic writing and conversational discourse: the heavy reliance on phrasal rather than clausal elaboration. Thus, Text Excerpt 4 is repeated as Text 5 below, highlighting the complex noun phrases with phrasal rather than clausal modifiers. A quick glance at this excerpt shows that the majority of this text is composed of phrasal rather than clausal structures.

Text Excerpt 5: Academic research article [repeated from Text 4]
Complex noun phrases with phrasal embedding are underlined

<u>A number of important themes</u> have emerged from previous research exploring <u>the links among gender, interaction, and collaborative learning</u>. First, in <u>mixed-gender interactions</u> boys tend to dominate <u>apparatus, teacher attention, and peer discussion within the classroom</u> (for a review, see Howe, 1997). Second, <u>the comparative context and, in particular, task</u> are important in determining how children engage in <u>collaborative interaction</u> (Holmes-Lonergan, 2003). Third, <u>a child's gender and that of his or her conversation partner</u> appear to affect <u>the dynamics of conversation but not necessarily the answer</u> that children agree on (Leman, 2002): Specifically, boys tend to show <u>greater resistance to girls' arguments</u>, but ultimately all children tend to opt for <u>the developmentally more advanced answer after interaction</u>, regardless of whether a girl or a boy has put these arguments forward.

<u>A further consideration for studies of gender and interaction</u> is <u>the influence of both speakers and partners gender on conversation</u>. Leaper (1991) examined <u>both these types of gender effect on communication between pairs of children in two different age groups (5 and 7 years)</u> who were engaged in <u>play with a puppet</u>.

Conclusion

In summary, the stereotype that writing is more structurally elaborated than speech is not supported by corpus evidence. In fact, using traditional measures of elaboration – considering the use of dependent clauses – we would conclude that the opposite was the case: that conversation is more complex and elaborated than academic writing. However, that conclusion would also be an over-simplification, because it does not fully capture the characteristics of either conversation or academic writing.

The elaboration of conversation is very restricted in nature. As noted above, most of the dependent clauses in conversation are integrated into the clause structure: complement clauses that normally fill an object slot controlled by a transitive verb. Adverbial clauses are optional structures, but they also function as clause elements. In contrast, relative clauses function as noun phrase modifiers.

In addition, the types of structural embedding that are common in conversation are very restricted lexically. For example, although there are over 200 different verbs that can control a *that* complement clause (e.g., *assume, ensure, feel, hear, imply, indicate, propose, realize, suggest*), only three verbs account for c. 70% of all occurrences of this clause type in conversation: *think* (35%), *say* (20%), *know* (13%) (see Biber et al., 1999, pp. 667-670). The lexical restriction is even stronger with *to* complement clauses in conversation, where c. 50% of all occurrences are controlled by the verb *want* (see Biber et al., 1999, pp. 710-714). Thus, the overall frequency of dependent clauses in conversation is largely due to a few high-frequency lexico-grammatical patterns.

On the other hand, it is certainly not accurate to interpret these findings as showing that academic writing lacks structural elaboration. Rather, we need to shift our focus: away from embedded clauses to the extremely dense use of embedded phrases – especially those functioning as noun phrase modifiers. In linguistic theory, structural elaboration has normally been analyzed by considering the extent to which dependent clauses are used in a text. By that measure, we would end up concluding that academic writing is less elaborated than conversation. However, that measure misses the most important structural characteristic of academic written discourse: the reliance on phrasal rather than clausal elaboration. Most sentences in academic prose are elaborated in the sense that they have optional phrasal modifiers, especially

nominal pre-modifiers (adjectives or nouns) and nominal postmodifiers (e.g., prepositional phrases).

These phrasal modifiers are elaborating because they are optional, providing extra information. At the same time, though, these structures are condensed or compressed: the opposite of elaborated. That is, phrasal modifiers are alternatives to fuller, elaborated expressions that use clausal modifiers.

It turns out that these phrasal modifiers continue to be acquired in adulthood, even by native speakers of English. All normal native speakers of English participate in conversational interactions and control the grammatical structures typical of conversation. In contrast, comparatively few native speakers productively control the register of academic writing. So there must be a process of writing development: academic professionals have to acquire the phrasal grammatical style of academic writing.
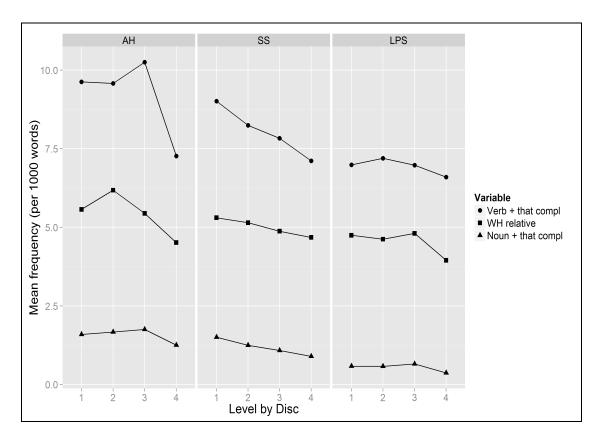

Figure 4. Major types of dependent clause across academic disciplines and years of the university. (AH = Arts and Humanities; SS = Social Science; LPS = Life and Physical Sciences)
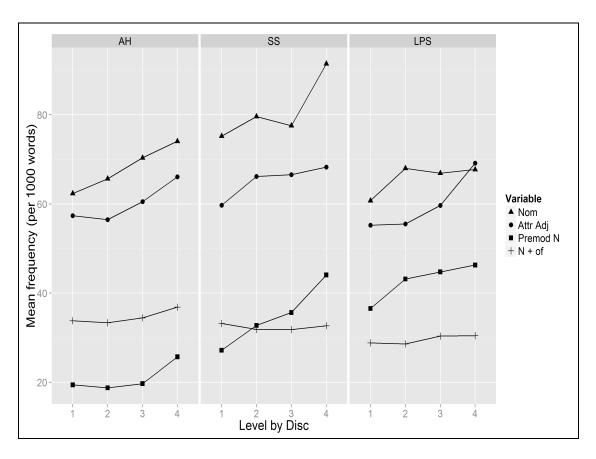
Figure 5. Major types of phrasal modifiers across academic disciplines and years of the university. (AH = Arts and Humanities; SS = Social Science; LPS = Life and Physical Sciences)

Staples et al (in press) explore these developmental trends for university students, based on analysis of the BAWE Corpus (see Nesi and Gardner 2012). For example, Figure 4 (adapted from Staples et al, in press, Figure 5) shows that dependent clauses generally decline across the years of university study. This is the case even for noun modifying clauses, like finite relative clauses and noun complement clauses. This pattern holds for students in all three major disciplines, although the overall rates of occurrence for dependent clauses are lower in the sciences than in the humanities. In contrast, Figure 5 (adapted from Staples et al, in press, Figure 4) shows that phrasal modifiers (as well as nominalizations) increase across the years of university study, again in all three disciplines.

There are good reasons why compressed, phrasal expressions are preferred over elaborated clausal expressions in academic writing: they are more economical; they allow for faster, more efficient reading; and they are equally comprehensible to the expert reader. To succeed in their academic endeavors, students (both L1-English

and L2-English) must develop control of the grammatical discourse style used in that register.   Our main claim is that writing development researchers and EAP professionals should pay attention to the distinctive grammatical features of this register -- phrasal modifiers -- and that we should figure out when and how students acquire proficiency in the use of those features.

Surprisingly, EAP writing instruction has often marginalized coverage of these complex phrasal structures. While ESL textbooks such as *Focus on Grammar 3, Grammar Sense 3,* and *Grammar Links 3* (the most advanced levels in these series) extensively cover finite dependent clausal structures (e.g., relative clauses, conditionals, and complement clauses for reporting speech), these same books have little or no coverage of prepositional phrases as noun modifiers and nouns as noun modifiers. Thus, two of the most frequently occurring complex phrasal structures in academic writing are not explicitly taught in many popular ESL textbooks.

Students need to acquire proficiency in producing (and even comprehending) discourse structured around phrasal modifiers. This is the major developmental challenge that we focused on in our previous research articles. Dependent clauses do also occur in academic writing, and non-finite dependent clauses are especially distinctive of this register. But the crucially important grammatical characteristic of advanced academic writing – which is also the characteristic that has been largely overlooked in previous studies – is the reliance on phrasal structures.

Based on the results of previous empirical corpus-based investigations, Biber et al (2011; pp. 29-31) hypothesized a sequence of developmental stages for complexity features. In brief, we predict proficiency in the use of finite dependent clauses at relatively early stages of writing development, increased proficiencies in the use of non-finite dependent clauses at later stages, and proficiency in the use of phrasal modifiers at advanced stages. Studies like Parkinson and Musgrave (2014) have tested these hypothesized stages by reference to the writing development of L2-English students (see also the survey of previous research in Staples et al. in press). Much more research remains to be done in this area. But we believe that this is an enterprise worth pursuing. It is our hope that future writing research and practice will evolve to take account of the full set of structural devices associated with grammatical complexity in academic writing.

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