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Understanding Vocabulary Learning and Teaching: Implications for Language Program Development

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Chapter 8

Setting the Lexical EAP Bar for ESL Students: Lexical Complexity of L2 Academic Presentations

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Introduction

This chapter concerns the lexical complexity of academic presentations of college students (undergraduate and newly admitted graduate students) who are advanced English-as-a-second- or subsequent-language (ESL) users. Of all proficiency levels in the context of English for academic purposes (EAP), the advanced ESL lexicon has received the least attention in the research literature and instructional materials, a situation that is likely based on the assumption that at that level of language proficiency, learners' lexicons are developed well enough to be functional and do not need special attention. Such an assumption, however, is somewhat misleading because it underestimates the lexical problems that higher proficiency second language (L2) learners often have when they must transition rapidly from university-based ESL programs to degree-granting programs. Unfortunately, language instructors and material designers do not seem to approach lexical complexity as a multidimensional phenomenon and neither teaching materials nor instructional practices focus on the multiple aspects of lexical complexity of language learners' production in order to improve it and raise learners' awareness of the importance of lexical complexity in academic contexts.

The discussion of lexical complexity in this chapter will be based on the English language and will offer specific parameters as guidelines that both ESL instructors and students should consider in oral communication courses that include a focus on academic presentations. However, the framework of lexical complexity that will be introduced here is not language specific and can thus be adopted conceptually by other higher education language programs (LPs), insofar as the framework in question offers an opportunity to establish lexical complexity baselines for various proficiency levels in measurable terms. In addition, although most research on lexical complexity (the notion is discussed in greater detail in the following section) is based on comparisons between texts produced by language learners and texts produced by professional writers or speakers (e.g., articles,

textbooks, lectures, and conference presentations), this study is based on data from successful student academic presentations (delivered by both English native speaking and ESL presenters), which is a more realistic way of establishing base-lines for various linguistic features. Thus, LP directors and other faculty members engaged in curriculum design and program evaluation may find the methodology of this study useful, especially if their programs offer higher division language courses or prepare language majors for graduate-level coursework. At that level of instruction, university-based ESL programs and foreign LPs seem to share a lot of similarities in their student needs and curricular goals.

What places the student presentation among the important academic genres students need to master is primarily its great potential for disciplinary learning and its special place in the network of genres that college students have to participate in during their studies (Zareva, 2009a). From a learning point of view, preparing an academic presentation is a process that requires the mastery of many academic skills that are shared between different academic genres both in speech and in writing, which is probably one of the reasons why the presentation is frequently used as a graded assignment in academic courses. Thus, knowing more about the various aspects of student presentations (lexical, grammatical, rhetorical, compositional, etc.) will give us valuable insights into how these aspects interact with each other and will allow us to more clearly articulate the learning targets needed for advanced proficiency and skill with this genre.

What makes lexical complexity of academic presentations an interesting aspect of investigation is its contribution to the informational packaging of the presentation content, its discipline-specific appropriateness, and its suitability for the mode of delivery. In other words, given that the academic presentation is largely a monologic speech act that is dense in informational content primarily derived from written academic sources, we should expect that, lexically, it will share features that are typical of both written and oral academic discourse. Surprisingly, however, we still know little about the extent to which these two competing driving forces (i.e., informational packaging and oral mode of delivery) impact the lexical complexity of academic presentations. Such knowledge will give us better insights into the lexical choices student presenters make to display their depth of topic-related knowledge in relation to their sense of mode-of-delivery appropriateness and give us evidence-based feedback, recommendations, and advice for improvement when necessary.

In the rest of the chapter, I will first elaborate on the notion of lexical complexity adopted in the study in order to highlight its multifaceted nature from theoretical, observational, and operational points of view. The review of the current literature will focus on what lexical complexity entails, how the notion is similar to and different from the notion of lexical richness, how lexical complexity is manifested in naturally occurring academic oral and written discourse, and what measures can capture its various dimensions most reliably. Next, I will present

the comparative results from a study of a number of lexical complexity features in two corpora of presentations from high-quality native speakers of English (first language or L1) and ESL speakers. The discussion will highlight what is lexically “typical” of successful student presentations; the implications for teaching, material, and course design; and how instructors and students can monitor these features in academic communication courses. Knowing what lexical complexity entails and exploring how its dimensions are realized in successful presentations give us a better sense of “where the lexical bar should be set” in order to make better decisions about how to get language learners to that level.

Lexical Complexity: Operationalization and Measurement

Discussions about lexical richness commonly highlight the value of knowing more about how L2 learners use vocabulary beyond the 2,000 (2K) most frequent words in the English language (Laufer & Nation, 1995; Lu, 2012; Morris & Cobb, 2004; Nation, 2001; Read, 2000; Zareva, 2012). Likewise, L2 instructors and researchers unanimously recognize lexical richness as an important construct that is directly linked to students’ ability to function effectively in both speech and writing. Sophisticated lexical usage becomes particularly important in academic contexts where demands for precision and disciplinary relevance are greater and more heightened than in general language usage. Undoubtedly, the 2K most frequent English words provide the greatest coverage of vocabulary used in academic and nonacademic speech and writing (e.g., Laufer & Nation, 1995; Morris & Cobb, 2004; Nation, 2001; Zareva, 2012). However, it is the lexical layers beyond the 2K words (e.g., lower frequency, academic, specialized, and technical vocabulary) that allow proficient L2 users to put their academic and disciplinary knowledge on display in a relevant way (Nation, 2001). This is perhaps one of the main reasons why the lexical richness of students’ productively used vocabulary has become an area of considerable research interest in recent years yet not without some terminological and conceptual ambiguities.

To avoid the terminological and conceptual ambiguity associated with the term “lexical richness,” the notion of lexical complexity as operationalized by Bulté and Housen (2012) will be used in this study, which bears a great deal of similarity to Read’s (2000) understanding of lexical richness. Bulté and Housen (2012) viewed lexical complexity on a broader scale within a larger descriptive and analytic framework of language complexity. The authors strongly emphasized that any analysis of L2 complexity should specify how we can distinguish between simple and complex language features, what is meant by the “complexity” of a linguistic feature, and how “complexity” can be reliably operationalized, measured, and evaluated. At the heart of the notion is the idea that there is a wide range of basic and sophisticated words available to L2 learners that contribute differently to the lexical complexity of their performance. In this sense, it is important to

know what the contribution of these words is and how we can measure and evaluate it in order to practically determine, at various proficiency levels, the aspects of learners' lexical knowledge that deserve more instruction and other aspects of that knowledge that are already stable and functional relative to students' academic goals and needs.

Bulté and Housen's (2012) framework includes three of the subcomponents of Read's (2000) model: *lexical density*, *lexical sophistication*, and *lexical diversity*. The fourth subcomponent they proposed is *compositionality of words* (morpheme and syllable structure), which will likely be useful for evaluating texts produced by young L2 learners or lower proficiency learners but not so much for evaluating the performance of higher proficiency learners. Based on a review of the literature, the authors proposed various measures that can reliably capture each of the aforementioned subcomponents of lexical complexity, some of which are more stable for different text samples than others. In the following paragraphs, I will briefly discuss each of the subcomponents in the lexical complexity framework.

In both Bulté and Housen's (2012) and Read's (2000) models, *lexical density* refers to the ratio of content words or lexical words (e.g., nouns, verbs, adjectives, and adverbs) to the total number of words in a text—a notion that was first introduced by Ure (1971). Thus, lexical density is linked to the idea that a message containing more complex information requires the use of more content vocabulary as compared to grammatical or function words (e.g., articles, prepositions, particles, auxiliary verbs, modal verbs, coordinators, subordinators, and pronouns). In general, spoken texts within the conversational register have a lower lexical density (between 24% and 35% of content words) than written texts (36% to 57%) (Ure, 1971). This is perhaps because spontaneous speech can be influenced by factors such as time pressure, online production, planning, and interactivity. The lexical density of written academic texts (both student- and expert-written) has received a great deal of attention in the research literature; however, the lexical density of oral academic texts has been less well examined.

Lexical sophistication (also called *lexical rarity*) refers to the proportion of lower frequency vocabulary to the total number of words. Thus, it would include technical vocabulary, jargon, subject-specific vocabulary, and other uncommon lower frequency words that may be related to a specific genre, discipline, or topic. Typically, the 2K most frequent words in English are considered to be "basic" vocabulary (e.g., Laufer & Nation, 1995; Lu, 2012; Nation, 2001); however, it should be noted here that these words provide the greatest coverage in both spoken and written texts. For instance, Nation (2001) estimated that the 2K words account for about 90% of the vocabulary in conversation, 87% in fiction, 80% in newspapers, and 78% in written academic texts, which shows their fundamental importance across the registers. Nonetheless, research to date has consistently

confirmed that the increased use of academic vocabulary and specialized or technical vocabulary is what sets apart the academic register from the less formal ones.

An important layer of L2 students' lexical sophistication in academic contexts is their knowledge of academic vocabulary. To guide L2 instructors and learners in their selection of academic words for academic writing purposes, Coxhead (2000) compiled the Academic Word List (AWL), which consists of 570 academic word families widely used across different disciplines. In other words, the AWL does not include vocabulary that is technical or field specific. Rather, these are words beyond the 2K vocabulary that comprise approximately 10% of any academic text (written by experts), although they occur less frequently in newspaper articles (about 4.5%) and fiction texts (approximately 1.4%) (Coxhead, 2011). In this regard, Coxhead (2011) has rightly pointed out that the AWL should require special instruction because the reading and analysis of fiction, for example, will not provide sufficient access to this vocabulary for students who need to become effective academic writers.

Although the study of students' use of academic vocabulary in writing has received a good amount of attention in the research literature, the study of students' use of these words in the oral academic genres, including student presentations, is seriously lagging behind. The few of such studies that exist suggest that L2 learners employ much less academic vocabulary in their presentations (2.53% in tokens—i.e., the percentage includes repetitively used vocabulary) compared to L2 expert conference presenters (between 7.25% and 7.87%) (Kao & Wang, 2014) or L1 and L2 advanced degree students' research presentations (approximately 5.7%) (Zareva, 2012). The lack of such research in general, and especially the lack of such research across the various proficiency levels, prevents us from establishing and setting reasonable academic vocabulary use baselines in a way that would serve to align the goals of language teaching with students' needs and outcomes.

Lexical diversity (also called *lexical variation*) is another subcomponent of lexical complexity that is associated with the use of different words in a text versus a limited number of words used repetitively. In other words, it refers to the range and variability of expression as displayed in language performance and, in that sense, lexical diversity reflects the variety of active vocabulary that speakers or writers choose to use as opposed to the vocabulary they have available but do not use (Malvern, Richards, Chipere, & Durán, 2004; McCarthy & Jarvis, 2007). As an aspect of lexical complexity, this dimension has been found to be associated with writing quality, lexical proficiency, general characteristics of speakers' or writers' language competence, and accommodation adjustments that show audience awareness.

Although the importance of lexical diversity as part of L1 and L2 lexical knowledge has been unanimously recognized by both teachers and researchers, there have been many concerns about how to measure it. The type-token ratio (TTR)—that is, the ratio of the number of different words (word types) to the total

number of words (tokens) in a text—is a simple measure that has been widely used in both L1 and L2 lexical studies for a long time. However, the measure (and its various transformations) has been rightly criticized in recent years for its sensitivity to text length: The ratio tends to substantially decrease as the size of the text increases, because the longer the text, the less varied vocabulary speakers use (e.g., Lu, 2012; Malvern et al., 2004; McCarthy & Jarvis, 2007; Read, 2000; Treffers-Daller, Parslow, & Williams, 2016). For the purposes of this study, two measures will be used to evaluate the lexical diversity of students' presentations: the number of different words used and the measure of textual lexical diversity (MTLD) (for a detailed review, see McCarthy & Jarvis, 2010). In brief, MTLD is a lexical diversity index of a text, which is evaluated sequentially. The index is calculated as the mean length of sequential strings of words in a text that maintain a 0.720 TTR value—that is, each word of the text is evaluated sequentially for its TTR. This value was selected based on evidence from the testing of various narratives and expository texts, which revealed that their TTR trajectories tended to stabilize at around 0.720 (+/- 0.03) (McCarthy & Jarvis, 2010). One of the greatest advantages of the MTLD compared to other indexes of lexical diversity is that it makes use of the notion of thematic saturation—that is, it evaluates how many words it takes for a text to reach the point of stabilization after which no new vocabulary is used. Thus, the fewer words it takes to get to the point of saturation, the less diverse the text is. In sum, the selection of these two lexical diversity measures was made based on empirical evidence that they are stable with regard to longer texts (of 1,000–2,000 words), and they allow the integrity of naturally occurring texts to be preserved (i.e., no text should be discarded), since instances of natural discourse are rarely of equal length (McCarthy & Jarvis, 2010; Treffers-Daller, et al., 2016).

This study was conducted with three primary goals in mind: first, to determine whether successful L1 and L2 users' presentations (thus qualified based on the grade they received) differ in their lexical complexity; second, to establish guiding baselines of several measures associated with the three-dimensional framework of lexical complexity; and last, to ascertain the relationship between the subcomponents of lexical complexity, which will have implications for the way it is operationalized, studied, and taught. The study therefore aimed to address the following research questions:

1. How do L1 and L2 users compare on the lexical complexity of their academic presentations?
2. What is lexically "typical" of L2 users' successful presentations in terms of lexical density, lexical sophistication, and lexical diversity?
3. What is the relationship between the three subcomponents of lexical complexity (lexical density, lexical sophistication, and lexical diversity) for the L2 group of presenters?

Method

Participants

The study was based on two corpora of individually given L1 and L2 academic presentations ($n = 70$). The data were collected at several U.S. universities during regular classes in which the presentations were scheduled. The participants also completed a questionnaire with some demographic items. The L1 group ($n = 35$) consisted of senior undergraduate and newly admitted graduate students (females = 25; males = 10; $M_{\text{age}} = 25$ years old) enrolled in various programs in education, applied linguistics, international studies, and the humanities. The participants were all taking introductory-level courses in language-related areas that were relatively new to them and reported that they had to give approximately four academic presentations per term. They rated their presentation skills at 4.1 on a 6-point Likert scale and reported that they considered it very important to be able to give effective presentations both academically and professionally (5.6 on a 6-point Likert scale).

The L2 presenters ($n = 35$) were of similar composition (females = 27; males = 8; $M_{\text{age}} = 28$ years old) from the same disciplinary areas. They were speakers of 15 different languages: Arabic, Chinese, French, Goun, German, Indonesian, Japanese, Korean, Portuguese, Slovenian, Subia, Spanish, Taiwanese, Vietnamese, and Ukrainian. They had all studied English through formal instruction ($M = 9.1$ years) in their native countries before coming to the United States. In order to be admitted to degree-granting programs, the L2 students were required to satisfy the language proficiency requirement of their respective programs by having taken an English proficiency test (e.g., TOEFL) or in some other acceptable ways. The L2 students' paper-based TOEFL scores were in the range of 550 to 647 ($M = 585$) and their Internet-based TOEFL ranged from 83 to 107 ($M = 96$), corresponding to a 557–610 score on a paper-based TOEFL format. Altogether, the proficiency test scores showed that the L2 participants can be considered proficient users of English. They also reported that they had been required to give on average four presentations per term, but they rated their presentation skills lower than the L1 students, at 3.8 on a 6-point Likert scale. Like the L1 participants, they also considered it important to have good presentation skills (4.9 on a 6-point Likert scale).

Data

All presentations were given to satisfy a final project course requirement, so they were delivered toward the end of the semester to showcase students' individual research projects. The presentations were graded as successful and high quality by the respective instructors. To keep the L1 and L2 corpus comparable, several features of the presentations were kept similar to minimize their potential influence on the lexical complexity of the data. For instance, all presentations were based on library research that the students had carried out on topics of interest to them; the

topics were related to coursework typically associated with language, education, applied linguistics, and teaching; the presentations included in the analysis were limited to 15–20 minutes of presentation time ($M_{\text{presentation time}} = 15.6$ minutes); all presentations were given extemporaneously and the presenters used various visuals and support materials (e.g., PowerPoints, handouts, and flashcards). All in all, these are features that are typical of student presentations in most disciplinary areas where language is used not so much for the sake of language learning but rather for subject-area learning purposes. The presentations were audio-recorded and transcribed orthographically.

Data analysis criteria.

Naturally occurring oral data are not as “clean” and “tidy” as academic writing data. However, the integrity of the presentations was completely preserved so that the analysis could capture features that may be typical of oral academic speech but unlikely to occur in written academic prose (e.g., fillers, hesitations, inserts, and lexicalized expressions). Only the truncated (partially pronounced) words were removed from the data, either because they were part of false starts that were repaired or because the corrected and intended word was provided immediately afterward.

Each of the subcomponents of lexical complexity was captured by various measures typically associated with it:

- I. Lexical density was evaluated by
 1. the ratio of lexical/content words to the total number of words in a presentation.
- II. Lexical sophistication was evaluated by
 1. the percentage of different words (types) from the AWL (e.g., *agenda*, *basics*, *generalize*, *hostility*, and *standardized*);
 2. the percentage of lower frequency, technical, and specialized vocabulary (in word types) beyond the 2K and AWL, which included discipline-specific vocabulary (e.g., *acculturate*, *adverb*, *calligraphy*, *colloquial*, *dyslexia*, *lexicon*, and *syntactically*); names of countries, institutions, languages, scholars (e.g., *Ukraine*, *NAU*, *Hindi*, and *Goffman*); acronyms (e.g., *L2*, *NNS*, *TOEFL*, and *EFL*); foreign or other words used in examples (e.g., *hablar*, *velik*, and *ich*).
- III. Lexical diversity was evaluated by
 1. the number of different words (types) used by the presenters;
 2. MTLD score (i.e., the range and diversity of vocabulary in a text).

To determine the lexical complexity of the presentations, the data were analyzed in several ways. First, the presentations were run through Cobb’s (2002) *VocabProfile* (classic version). The classic version determines the 1K and 2K

words in relation to West's (1953) General Service List (GSL) and the AWL based on Coxhead (2000), which contains vocabulary beyond the GSL. Words beyond these three categories are placed into the off-list category, which may contain proper nouns, rare words, specialized or technical words, acronyms, abbreviations, inserts, and so on.

Based on the way different lexical categories were defined for the purposes of this study, some of the measurements were taken as calculated by the *Vocab-profiler* (e.g., total number of words, number of different words, and percentage of word types from the AWL). Others, such as lexical density and percentage of different lower frequency, technical, and specialized vocabulary, had to be recalculated in order to account for the effect of the disfluencies on the measurements—for example, mispronunciations (e.g., *Alabic* [for *Arabic*]); hesitations, fillers, and inserts (e.g., *um*, *like ah*, *ts*, *okay*, *yeah*, and *wow*); and lexicalized phonological reductions (e.g., *cuz*, *wanna*, and *kinda*). Details about obtaining the MTLTD values can be found in McCarthy and Jarvis (2010). The presentation data for the MTLTD analysis was kept fully intact and included the truncated word segments so that the obtained values were representative of the presentations as a whole language event.

Results

To address the first two research questions related to the comparison between the lexical complexity of the L1 and L2 users' academic presentations and the typical complexity characteristics that these presentations revealed, a series of analyses of variance were conducted using the group as an independent variable and the lexical complexity measures as dependent variables. Also, since most of the lexical complexity measures are influenced by text length, it was important to determine whether the L1 and L2 presentations were of similar length by comparing them on the total number of words (tokens). Means and standard deviations are presented in Table 8.1.

There were no significant differences ($p > .05$) between the two groups in the word count of their presentations, which showed that, on average, the presenters attempted to discuss the complex content of their researched topics within a similar word count. Since the presentation narratives were of similar time length ($M_{L1} = 15$ minutes and $M_{L2} = 16$ minutes), this means, by extension, that the L1 and L2 presenters maintained a similar rate of speaking—an aspect of prepared oral discourse that is important in academic settings, where many oral assignments have a time limit due to the fast-paced nature of advanced studies.

The comparison between the L1 and L2 presenters along the three lexical complexity subcomponents also showed similarities between the two groups—that is, there were no significant differences ($p > .05$) between them on any of the lexical complexity measures. Thus, the overall results revealed that high-quality

Table 8.1. Means and Standard Deviations of the Lexical Complexity Measures Used in the Study across the L1 and L2 Presentations

Subcomponents of lexical complexity	Lexical complexity measures	L1 presentations (n = 35)		L2 presentations (n = 35)	
		Mean	SD	Mean	SD
	Number of words (tokens)	1,959	508	1,994	353
Lexical density	Content/function words (in tokens)	.43	.02	.44	.04
Lexical sophistication	Percentage of AWL word types	12.06	2.89	11.26	3.10
	Percentage of lower frequency, technical, and specialized word types	13.12	2.94	14.98	6.25
Lexical diversity	Number of different words	496	97	484	89
	MTLD	36.87	3.86	36.91	9.96

L1 and L2 presentations shared very similar profiles across all three subcomponents of lexical complexity. The analyses also revealed that the pattern of what can be considered lexically “typical” of successful L2 presentations in terms of lexical density, lexical sophistication, and lexical diversity was similar to that of the presentations of the L1 group (see Table 8.1).

To address the third research question and find out what the relationship was between the three subcomponents of lexical complexity (i.e., lexical density, lexical sophistication, and lexical diversity) and the measures associated with each subcomponent for the L2 presenters, bivariate Pearson correlations were computed for this group. On the one hand, the absence of significant correlations between the measures would show that each of them captures a unique aspect of the presentation. Such a result would also reveal that the three subcomponents of lexical complexity are independent dimensions and will require that special attention, focus, and effort be devoted to each of them individually. On the other hand, the presence of significant correlations between the measures would show that some aspects are related in some ways and, perhaps, gains in one of them will result in gains in the other(s).

Using the Bonferroni approach to control for Type I error across the five variables, a p -value of less than .01 ($.05/5 = .01$) was required for significance. The results revealed only one weak, significant correlation between the number of different words and the percentage of low frequency, technical, and specialized vocabulary ($r = .440, p < .01$). This correlation suggested that the presenters’ use of different vocabulary could explain about 19% (r^2) of the variance in the proportion of their use of lower frequency and specialized vocabulary. Overall, the results

implied that the three-dimensional framework of lexical complexity does indeed capture unique aspects of complexity. The implications of the findings will be discussed in the following section.

Discussion

The value of effective and successful presentations in higher education has been fully recognized by instructors and students alike in recent years, because this genre quite often bridges students' academic life with the professional experience they prepare for. At the same time, giving an academic presentation is a linguistically, academically, and intellectually demanding task for students, especially if they have not had previous training and experience with this genre. Thus, some LPs have started to include in their curricula and assessments the development of presentational competence in a foreign language in an attempt to align the intellectual content of general education and foreign language study (see Klee, Melin, & Sonesson, 2016). Similarly, ESL programs preparing L2 learners to transition smoothly to degree-granting tertiary education programs have a unique opportunity to provide presentation-giving experience and training to these students, who will be expected to show a reasonable degree of familiarity with this genre once they begin their studies.

One of the most interesting findings from the comparison between the L1 and L2 participants was that they shared overwhelming similarities along the lexical complexity framework used in the study. The similarities suggested that successful presentations do not differ in any notable ways with regard to the choices regarding lexical density, sophistication, and diversity that presenters make regardless of their native language and the context of their previous educational experience. In this sense, the analysis allows us to establish not only the common lexical complexity ground shared by the L1 and L2 presentations but also some lexical baselines that both L2 learners and instructors can monitor in academic communication courses. However, it should be noted here that it took the L2 students an average of about nine years of language study to reach that point of shared lexical complexity of their presentations, which suggests that a solid language background is perhaps a prerequisite for developing successful presentation skills. In the rest of the sections, I will discuss each of the lexical complexity subcomponents separately with regard to the L2 presentations.

Lexical Density of Proficient L2 Academic Presentations

Lexical density is a dimension of lexical complexity that shows the proportion of content vocabulary that speakers or writers use in texts. On average, the proportion of content words in the L2 presentations was 44%, which was close to the proportion of content words found in other studies involving the oral discourse of proficient EAP users (e.g., Kao & Wang, 2014; Lu, 2012; Ure, 1971; Zareva, 2012).

It was also interesting to see that the lexical density of the presentations put this genre closer to the lexical density found in written texts—especially in narrative and expository writing—than to that of spoken texts (e.g., Morris & Cobb, 2004; Ure, 1971). In this regard, Ure (1971) has rightly pointed out that the distinction between oral and written texts can largely be attributed to “the physical conditions of the delivery of the text, in sound, in space and in time” as well as to the time available for preparing a text (p. 447). Thus, the similarity in lexical density of the presentations with written texts can be attributed to several factors. For instance, unlike spontaneous speech, which shows much lower usage of content words (lower than 36% [Ure, 1971]) than writing does, the academic presentation (a) is a prepared discourse; (b) has a content largely based on written academic texts that have been read, analyzed, and summarized in the target language; (c) is revised multiple times during the preparation stage; (d) is usually rehearsed beforehand; and (e) is a monologic speech act—that is, there is no verbal response to other speakers, which seems to be an even more powerful factor than the spoken/written distinction in determining lexical density (Ure, 1971). Overall, the lexical density of the presentations in this study revealed that proficient language users are aware that academic presentations in specialized areas should be as dense in content vocabulary as academic writing in order to convey complex discipline-specific content. However, this awareness should be explicitly developed in language courses because research on the lexical density of lower proficiency learners’ oral academic production has shown the density to be lower than the values reported here (e.g., Lu, 2012).

Lexical Sophistication of Proficient L2 Academic Presentations

Lexical sophistication of the presentations was captured by the percentage of different AWL words as well as the percentage of higher frequency, technical, and specialized content vocabulary employed by the presenters. On average, the L2 presenters’ use of different AWL vocabulary (types) constituted 11.26% of all different words in their presentations in addition to another 14.98% of lower frequency, technical, and specialized vocabulary. These percentages do not include repetitions and show that, altogether, the sophisticated vocabulary in the presentations accounted for about 26% of different words, which is a substantial vocabulary chunk that presenters need to master and use appropriately to display their subject-area knowledge and convey the complexities of their topic content. In analyzing written academic texts, Nation (2001) reported 8.5% of AWL vocabulary—a percentage that was much higher compared to speaking (1.9%), fiction (1.7%), and newspaper language (3.9%). In addition, he found that the percentage of other vocabulary (including lower frequency, technical, and discipline-specific vocabulary) also increased from 7.8% in speaking to 13.3% in academic writing, so the sum total of sophisticated vocabulary that Nation (2001) reported would be close to the percentage reported here for academic L2 presentations.

It is difficult to fully interpret the lexical sophistication results from this study in comparison to other studies because most of the lexical profiling has been done on written texts and only a few studies have focused on oral academic discourse. To my knowledge, there are only two other studies on academic presentations (Kao & Wang, 2014 and Zareva, 2012) that reported the percentages of AWL vocabulary for expert presenters in tokens (i.e., including the repetitions). Those percentages ranged between 5.6% (Zareva, 2012) and 7.25% (Kao & Wang, 2014). The important point to be made here, though, is that the heightened percentage of sophisticated vocabulary use in academic discourse (both spoken and written) sets it apart from the other registers. Further, mode of delivery (speaking vs. writing), which is generally a very strong influence on many linguistic features of texts (Biber, 2006; Swales, 2004), did not seem to impact the choice of sophisticated vocabulary in the academic register as much as it influenced the choice of other linguistic and rhetorical features.

Since the presentations were within the same disciplinary areas, it was of interest to find out more about the spread of the sophisticated vocabulary across the higher frequency bands. A further analysis revealed that the majority of the lower frequency content words—that is, words beyond the 2K vocabulary and the AWL words—came from the 3K word families (e.g., *agenda, architecture, concrete, disability, exceptionally, household, imported, novels, province, resemble, romantic, and urban*), followed by the 4K word families (e.g., *anonymous, consolidated, flaw, senator, and spouse*). The discipline- and topic-specific vocabulary was associated primarily with word families below the 3K and 4K frequency bands (e.g., *assimilation, elicitation, imperatives, intelligibility, pedagogical, phonetic, morphology, nasal, socioeconomic, slang, and vernacular*) and its repetitive use increased because there are few synonymous substitutes for this kind of vocabulary. This information suggests that for academic presentation purposes, higher proficiency L2 learners should be prompted to master vocabulary layers in the 3K and 4K frequency bands in addition to the specialized lexicon that is part of their disciplinary knowledge to be able to convey their arguments in a discipline-specific and appropriate way. Perhaps the first step in this direction would be to make students explicitly aware of the notion of word frequency and of what vocabulary falls under different frequency bands. One possible way to do so is to introduce them to software that demonstrates word frequency categories in texts (e.g., *VocabProfile* free software) or recommend dictionaries that mark the word frequency of their entries. Either approach will allow L2 learners to independently monitor their lexical choices relative to reliably predetermined frequency baselines.

Lexical Diversity of Proficient L2 Academic Presentations

The lexical diversity of the presentations was captured by two measures: number of different words and MTLTD. In presentations that were, on average, about 15 minutes long (which is typically the time limit for presentation assignments in

higher proficiency classes), the L2 presenters used on average approximately 2K words, which included repetitions, hesitations, fillers, and so on. When the repetitions were removed, the number of different words was much lower, 484, of which 72.57% were high-frequency content and function words from the 1K and 2K vocabulary bands, 26.24% were sophisticated vocabulary, and 1.19% were lexical disfluencies (e.g., hesitations, mispronunciations, and inserts). The high percentage of vocabulary from the 1K and 2K frequency bands confirms what other lexical studies have previously established: that the first 2K most frequent words (or the “basic words”) in the English language provide the greatest word coverage in texts (Laufer & Nation, 1995; Morris & Cobb, 2004; Nation, 2001; Treffers-Daller et al., 2016; Zareva, 2012). Thus, mastering the 1K and 2K lexical bands will have the greatest payoff for L2 learners across the registers. However, these learners will also need to master the academic, specialized, and technical vocabulary layers to be able to put their academic knowledge on display (Morris & Cobb, 2004; Nation, 2001) in contexts where demands for precision and disciplinary relevance are heightened (Zareva, 2012).

The second measure of diversity used in the study—MTLD—determines the lexical diversity value of texts in terms of the average number of words needed for a text to reach a point of saturation where additional repeated words or the introduction of new word types would not significantly influence the TTR (McCarthy & Jarvis, 2010). In other words, this measure accounts for the fact that a text reaches a point of saturation where no additional new vocabulary may be needed or where the rate of adding new words significantly decreases. In general, the fewer words it takes to reach the point of text stabilization, the less lexically diverse a text is in terms of sequential use of lexis. The results from this study revealed that it took L2 presenters, on average, 37 words to reach the point of text stabilization, which is in agreement with Zareva’s (2012) findings (range 33–37) for her L1 and L2 participants. This MTLD score, however, was much lower than the MTLD score found in proficient L2 writing where, for instance, Treffers-Daller et al. (2016) found an MTLD score of 88.47 for C1 and an MTLD score of 93.84 for C2-level ESL writers. The notable difference between the MTLD scores in proficient L2 users’ speech and writing suggests that the presenters were most likely not striving for lexical diversity in their delivery. Rather, under the cognitive pressures of their online production, their frequent recycling of the same vocabulary seemed to sufficiently serve the purpose of getting their content point across.

Relationship between the Subcomponents of Lexical Complexity

The last research question addressed in the study was whether or not each subcomponent of lexical complexity accounted for an independent aspect of students’ presentations. Generally, the answer to this question has implications for at least three interrelated perspectives associated with lexical complexity: theoretical,

pedagogical, and research. In other words, if, on the one hand, some of the sub-components showed strong significant correlation(s), that result would have theoretical implications regarding how lexical complexity is operationalized in terms of number of dimensions. Pedagogically, any interrelated dimensions would suggest that improving one subcomponent will contribute to the improvement of the other(s). From a research point of view, a strong, significant correlation between two variables would imply that measuring only one of them would give us indication about the other; hence, excluding one of the correlated variables from the set of measures would be justified. On the other hand, if the subcomponents of lexical complexity were not significantly correlated or only weakly correlated, this would suggest that theoretically, pedagogically, and research wise each dimension should be approached individually because only in their totality can we have a holistic picture of lexical complexity in a given oral or written text.

Interestingly, there was only one weak correlation for the L2 group between the percentage of their lower frequency, technical, and specialized vocabulary (one of the measures of lexical sophistication) and the number of different words they used in their presentations (one of the measures of lexical diversity). This suggested that the presenters' use of different vocabulary could explain about 19% (r^2) of the variance in the proportion of their use of lower frequency and specialized vocabulary. The weak correlation between the two variables, however, would not warrant excluding any one of the measures from the set of lexical complexity measures. In addition, the fact that no relationship between the second measure of sophistication (percentage of AWL vocabulary) and diversity (MTLD) was found implies that the three-dimensional framework of lexical complexity does indeed capture unique aspects of complexity in student presentations. Overall, the result confirmed findings from other studies (Lu, 2012; Zareva, 2012) and suggested that L2 students should be prompted to consciously work on and develop each dimension of lexical complexity separately (i.e., lexical density, lexical sophistication, and lexical diversity) because improving only one of them, for instance, will not contribute to the improvement of the others. However, if each of the dimensions is well developed, in their totality they create a powerful effect of discipline-specific lexical sophistication in any oral or written text.

Concluding Remarks and Implications

The study presented in this chapter was based on a three-dimensional framework of lexical complexity that can be applied to different languages, genres, and types of texts (oral or written) that L2 learners are expected to be able to produce at different levels of proficiency. The framework also offers an opportunity for LP directors and instructors to establish specific baselines associated with lexical complexity in relation to the specificities of their curricula, the language competencies they aim at developing, their students' proficiency levels and needs,

and expected outcomes. One possible way to approach this task is by conducting a critical review of the published literature for a specific target language on the issue and then using the findings to inform instructional and pedagogical decisions. Another possibility would be to collect samples of what counts as “successful” presentations in a given language, proficiency level, or area of specialization and determine the lexical features that are typical of the samples. In this regard, LP directors and faculty engaged in curricular changes and program evaluation may find the methodology used in this study useful because it offers a framework for lexical complexity analysis and a set of specific measures that can be flexibly applied to a variety of languages.

We also strongly encourage the inclusion of presentational competence as one of the main competencies in foreign language studies, insofar as the skills involved in preparing a presentation not only promote depth of learning but are also easily transferable to other areas of study. For instance, some of the skills involved in the process of presentation design include research topic selection, which usually requires some disciplinary knowledge, focused reading, and analysis of complex literature in the target language (e.g., articles, books, chapters, and monographs), as well as identification of main arguments, synthesis of research related to different arguments, establishing a logical connection between the main points, taking a stance, designing visuals, and so on. All these skills are at the core of other language competencies (e.g., interpretive competence and interpersonal competence), and they also “travel” easily across different subject areas.

By and large, the results from the current study suggested that each of the subcomponents of lexical complexity adds unique information to the overall lexical complexity profiles of student presentations. Theoretically, the finding confirmed that lexical complexity is a multidimensional notion and that the dimensions are relatively independent of each other— that is, each aspect of lexical density, sophistication, and diversity should be addressed in language instruction individually. From a research point of view, if the goal is to obtain an optimal set of variables that uniquely describe the different dimensions of lexical complexity, the results from the current study suggest that the set of five lexical measures used in the analysis will sufficiently capture various aspects of the phenomenon.

From a pedagogical point of view, one of the primary goals of the study was to determine the lexical complexity profile of successful ESL users’ academic presentations in an attempt to provide guiding baselines for this genre for advanced EAP coursework. In sum, in order to convey the complex content of their topics in a discipline-appropriate manner, the L2 presenters employed a relatively high density of content vocabulary (.44) as well as about 11% of academic vocabulary and another 15% of lower frequency, technical, and specialized vocabulary. They used 484 different words that they recycled frequently and their MTL score was relatively low (approximately 37). Overall, the effects of the oral mode of delivery were the strongest on the lexical diversity of the presentations, while the other

two aspects of lexical complexity— that is, lexical density and sophistication— were closer to values obtained for written academic prose than for speech.

Finally, we would recommend the use of Cobb's (2002) *VocabProfile* free software or other similar software in language classes, not only to raise L2 students' awareness of lexical complexity in academic speech and writing but also to engage them in monitoring different aspects of their lexical uses in texts across a variety of academic genres. *VocabProfile*, which also works with texts in French, is a user-friendly program that instructors can use to demonstrate and discuss with students desirable lexical features of a variety of texts. Students can also use it independently to analyze their own texts and monitor the lexical composition of their own language production. Such an approach can further help instructors and material designers to target specific lexical complexity aspects in content building across the genres and to set realistic vocabulary learning goals that reflect real-life language usage—after all, the way we “set the lexical bar” will strongly impact the process and the outcomes of “getting there.”

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