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LEXICO-GRAMMATICAL COMPLEXITY IN EAP STUDENT WRITING:
A LEARNER CORPUS ANALYSIS

by

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ABSTRACT

In this descriptive linguistic study, the lexico-grammatical complexity of placement and exit English for Academic Purposes (EAP) student writing samples was analyzed using corpus linguistic methods to explore language development as a result of student enrollment in the EAP program. Writing samples were typed, matched, and tagged. A concordance software was used to produce lexical realizations of grammatical features. A comparison was made of normed frequency counts for nine phrasal and clausal features as well as raw frequencies for type to token ratio (TTR), average word length, and word count. In addition, the contribution of variables such as advanced grammar and writing course grades, LOEP scores, and the number of semesters in the EAP program to the English Learner's (EL) lexico-grammatical complexity found in exit essays was also examined.

Twelve paired parametric and non-parametric analyses of lexico-grammatical variables were performed. Dependent *t* test results showed that normed frequency counts for such features as pre-modifying nouns, attributive adjectives, adverbial conjunctions, coordinating conjunctions, TTR, average word length, and word count changed significantly, and students produced more of those features in their exit writing than in their placement essay. Non-parametric Wilcoxon test indicated that such a change was also observable with noun + *that* clauses. The frequencies of verb + *that* clauses and subordinating conjunction *because*, though non-significant, actually decreased.

A split plot ANOVA allowed to see whether a change in above mentioned statistically significant lexico-grammatical features could be attributed to grammar instruction in EAP 1560. The results showed that there was no statistically significant difference between those who took

EAP 1560 class and those who did not on pre-modifying nouns, coordinating conjunctions, TTR, average word length, and word count. On the other hand, those students who did not take EAP 1560 class had higher counts of attributive adjectives but lower of adverbial conjunctions, both statistically significant results, than those students who took the class.

Lastly, five multiple linear regression analyses were conducted to predict frequencies of exit pre-modifying nouns, attributive adjectives, noun + *that* clauses, adverbial conjunctions, and TTR from EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters students spent in the EAP program at SSC. The only significant regression analysis was with TTR, and 28% of its variance could be explained by the independent variables. LOEP Language Usage score was the only significant individual contributor to the model. Even though exit adverbial conjunctions were not predictable from the chosen IVs, LOEP Sentence Meaning score proved the only significant contributor to that model.

The results indicate that compressed phrasal features are indicative of higher complexity and EL proficiency, while clausal features are acquired earlier and signal elaboration, as previously described in the literature.

ACKNOWLEDGMENTS

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LIST OF ACRONYMS

- *AE* – Academic English

- *EAP* – English for Academic Purposes

- *EL* – English Learner

- *ELS* – English Language Studies Department at Seminole State College of Florida

- *ESOL* – English for Speakers of Other Languages

- *ESL* - English as a Second Language

- *ESP* – English for Specific Purposes

- *ICLE* – International Corpus of Learner English

- *L1* – First Language

- *L2* – Second Language

- *LC* – Learner Corpus

- *LCA* – Learner Corpus Association

- *LOEP* – Levels of English Proficiency Test

- *P.E.R.T* – Postsecondary Education Readiness Test

- *POS* – Part of Speech

- *SLA* – Second Language Acquisition

CHAPTER ONE: INTRODUCTION

People from all over the world immigrate to the United States of America, where English is a primary language. According to the U.S. Census Bureau (Ryan, 2013), in 2011, there were over 60.6 million speakers of languages other than English in the U.S., one-fifth of the entire population. In order to successfully integrate into the American society, some English language proficiency is required. Sadly, the 2011-2015 American Community Survey 5-Year Estimate showed that more than 10% of Florida estimated population, i.e., more than 2.17 million people, speak English less than "very well" and could be considered English Learners (EL). The term EL was used as early as 1974 in the U.S. Supreme Court case *Lau vs Nichols*, which mandated schools to provide simultaneous English and general education instruction to students whose first language (L1) was not English.

Because English is also the medium of higher education instruction in the U.S., academic institutions require adults whose L1 is not English to demonstrate English language proficiency. In the field of Second Language Acquisition (SLA), the basic definition of a language learner continues to evolve as SLA researchers broaden the scope and encourage interdisciplinary inquiries into bilingual education, sociolinguistics, linguistics, and related fields (Ellis, 1999). For years, researchers referred to students learning English in deficit-oriented terms such as English as a Second Language (ESL) students, English Language Learner (ELLs), or Limited English Proficiency (LEP), often not taking into account one or several languages other than English spoken at home. A previously dominant mindset that every non-native speaking student should learn English, often to the detriment of his/her other language(s), gave way to the idea that English language instruction should be *subtractive* or replacing the L1. However, recently,

the focus has shifted to *additive* or supporting the L1 language instruction (Cummins, 2000; Lambert, 1981), which lead to a more inclusive and acceptable term for children, i.e., *emergent bilinguals* (Garcia, Kleifgen, & Falchi, 2008), underscoring learners' already existing language(s) and adding English as yet another medium of communication.

For adult learners, ELs is the most neutral but admittedly not perfect term as monolinguals are also learning English as their L1. An EL is defined according to Florida Statutes, Section 1003.56(2)(a) (http://www.leg.state.fl.us/statutes/), as "an individual who was not born in the United States and whose native language is a language other than English; an individual who comes from a home environment where a language other than English is spoken in the home; and who, by reason thereof, has sufficient difficulty speaking, reading, writing, or listening to the English language to deny such individual the opportunity to learn successfully in classrooms where the language of instruction is English."

It is expected that an emergent bilingual will benefit from years of exposure to English in the K-12 system, whereas adult ELs need to improve their English language proficiency as quickly as possible to be able to take advantage of higher education opportunities, provide for their families, and integrate into the English speaking society at large. Adult ELs may choose to attend community based classes (e.g., library, places of worship, etc.) or enroll in the English for Speakers of Other Languages (ESOL) courses, where English language instruction varies greatly based on learner needs. ESOL programs focus on day-to-day conversational language, civics, and career paths, whereas English for Academic Purposes (EAP) programs, housed in state colleges in Florida, "defined by its focus on teaching English specifically to facilitate a learner's study or research through the medium of English" (Hamp-Lyons, 2011, p. 89), prepare adult ELs

to pursue undergraduate and graduate degrees. EAP has widely been recognized as a subfield of English for Specific Purposes (ESP), taught to prepare a wide variety of professionals (i.e., nurses, construction workers, fast food industry employees, law and business students, etc.) as well as to satisfy sociocultural needs of the learner (i.e., family literacy, citizenship, etc.) (Belcher, 2006).

There is a small group of researchers that believes that academic English is field specific and fluid as it includes multiple dynamic literacies (McKay & Weinstein-Shr, 1993; Valdez, 2000). However, the traditional view of academic English (AE) is that AE is "characterized by the specific linguistic features associated with academic disciplines" as well as specific tasks such as "reading abstracts, getting down the key ideas from lectures, and writing critiques, summaries, annotated bibliographies, reports, case studies, research projects, expository essays" (Scarcella, 2003, p. 9). For adult ELs, limited AE proficiency may have dire academic consequences ranging from their inability to successfully complete coursework and produce assignments that meet college professor expectations to linguistic discrimination (Gee, 2002; Scarcella, 2003; Wong Fillmore & Snow, 2000). Azar (2007) stated that "students with numerous problems in structure usage but without grounding in grammar concepts were, unfortunately and heartbreakingly, often unable to reach the level of academic language skill they needed to continue their university studies" (p. 4). Because in the traditional view of AE, writing proficiency is the cornerstone of a long-term academic success (Schleppegrell & Colombi, 2002), SLA researchers often do not examine all four language underpinnings (i.e., ability to read, write, listen, and speak) to look at an EL academic proficiency but isolate writing,

mostly in the form of essays, for empirical analysis (Bulté & Housen, 2014; Crossley & McNamara, 2014; di Gennaro, 2013; Doolan, 2011, 2014; Ferris, 1994, 2009; Matsuda, 2003).

Statement of the Problem

In the past three decades or so, linguistic accuracy and complexity have returned to the forefront of adult EL writing research as both practitioners and researchers, disillusioned by the primary focus on the comprehensible input (Krashen, 1982), started reexamining grammatical competence of their students (Chan, 2010; Chandler, 2003; Christison, Christian, Duff, & Spada, 2015; Polio, 1997; Polio & Shea, 2014), while the emphasis on grammatical form and function returned to the ESL classrooms (Hinkel, 2002, 2003, 2011; Larsen-Freeman, 2009, 2014; Larsen-Freeman & Celce-Murcia, 2015). In the last two decades of the 20th century, English grammar was rarely explicitly taught in ESL classrooms as it was incorporated into communicative activities in the forms of "teachable moments." Moreover, the importance of grammar correction in writing was disputed (Truscott, 1996).

From a practical point of view, every writing instructor and language program should be asking two questions regarding the teaching of writing today. First, is ELs' writing proficiency improving over time? Second, how can those improvements be measured and explained?

Researchers first focused on linguistic accuracy, and Polio (1997) identified three types of such measures: holistic, number of error-free units, and number of errors in a meta-analysis of linguistic accuracy measures published in seven journals between 1984 and 1995. Later, having reviewed 35 studies published between 2000 and 2011 in nine top-tier peer-reviewed journals, Polio and Shea (2014) added two more types: number of specific error types and measures that

take into account error severity. Polio (1997) and Polio and Shea (2014) concluded that intra- and inter-rater reliability of most measures was low, or none was reported at all. Reliability of any kind was reported for only 45% of the measures, which allowed Polio and Shea (2014) to question the rigor and replicability of the published research. Only four studies reported both types of reliability, while 21 out of 44 reviewed measurers were not statistically significant. Gradually, the research focus shifted from accuracy to the analysis of linguistic complexity in second language (L2) writing (Biber, Conrad, & Cortes, 2004; Biber, Gray, & Poonpon, 2011; Bulté & Housen, 2014; Chen & Baker, 2010; Crossley & McNamara, 2014; Norris & Ortega, 2009; Ortega, 2003; 2015; Staples & Reppen, 2016).

Reliability issues were compounded by the fact that linguistic complexity as a construct continued to be ill-defined. Scarcella (2003) provided a description of the linguistic components of AE by including phonological, lexical, grammatical, sociolinguistic, and discourse features. Next, building on Norris and Ortega's (2009) suggestion that linguistic complexity is multidimensional and includes various sub-constructs, levels, and aspects, Bulté and Housen (2012) developed a taxonomic model of L2 complexity, which also included such linguistic components as lexis, morphology, syntax, and phonology. Currently, there exists a robust and mostly quantitative body of literature on linguistic complexity in L2 writing (Bulté & Housen, 2012; Norris & Ortega, 2009; Verspoor, Schmidt, & Xu, 2012; Staples & Reppen, 2016; Taguchi, Crawford, & Wetzel, 2013; Wolfe-Quintero, Iangaki, & Kim, 1998); nevertheless, complexity measures vary greatly.

Strengthening of computer aided analysis and accessibility to diverse digital texts, or corpora, allowed for a more naturalistic and data driven approach to L2 writing research and

eliminated inter- and intra-rater reliability issues. Sinclair (2005) defined corpus as "a collection of pieces of language text in electronic form, selected according to external criteria to represent, as far as possible, a language or language variety as a source of data for linguistic research" (p. 16), while McEnery, Xiao, and Tono (2006) defined corpus as a "collection of machine-readable authentic texts (including transcripts of spoken data) which is sampled to be representative of a particular language or language variety" (p. 5). Original corpora, e.g., Brown Corpus, British National Corpus (BNC), Corpus of Contemporary American English (COCA), include written texts produced by native speakers; however, the realization that language produced by learners is also a valuable source of data prompted educators and researchers to start compiling Learner Corpora (LC), of which the *International Corpus of Leaner English* (ICLE) is the largest and most widely recognized (Granger, 2003; Granger, Dagneaux, Meunier, & Paquot, 2009).

Few corpus researchers undertook analyses of lexical complexity (Chen & Baker, 2010; Olinghouse & Wilson, 2012; Yu, 2010), while others focused on the syntactic (i.e., grammar) complexity (Bulté & Housen, 2014; Crossley & McNamara, 2014; Lu, 2010, 2011). Unfortunately, even fewer studies have looked at the relationship between grammar and lexis as a measure of L2 writing proficiency (Granger & Paquot, 2008; Paquot 2008, 2010; Staples & Reppen, 2016) even though the existence of such interrelationship, referred to as lexico-grammar, was first suggested by a systemic functional linguist M. A. K. Halliday some six decades ago (1961). Clearly, lexico-grammatical complexity of L2 writing needs to be examined further using corpus linguistics methods and learner corpora.

Rationale for the Study

The rationale for this study had both a global and a local aspect, which overlapped. Globally, the analysis of current corpus research in L2 academic writing revealed a void in studies that analyzed lexical-grammatical complexity using learner corpora, included in both Scarcella (2003) and Bulté and Housen (2012) models. Moreover, from the Learner Corpus Association (LCA) bibliography of 1,200 learner corpus-related citations initially obtained in May of 2017 and later searched in September of 2017, there were 91 results for "lexical," 45 results for "grammatical," 19 results for "complexity," and zero results for "lexico-grammatical","lexico grammar", or "lexicogrammar" and only one result for "lexicogrammatical" searches respectively. Very few researchers conducted empirical studies on lexico-grammatical complexity using learner corpora (Aktas & Cortes, 2008; Granger & Paquot, 2008; Staples & Reppen, 2016; Taguchi et al., 2013).

This study aimed to analyze lexico-grammatical features investigated by Staples and Reppen (2016) and continue the conversation about the importance of such analysis of L2 academic writing through the use of learner corpora. It has been established that nouns as pre-modifiers (e.g., *carbon [bonds]*) and attributive adjectives (e.g., *sufficient [bonds]*) "help writers to package an increasing amount of information in a more concise way than through clausal elaboration" (Staples & Reppen, 2016, p. 21), while various clausal features have been used as constructs in L2 academic writing research for decades (Bulté & Housen, 2014; Wolfe-Quintero et al., 1998).

Locally, at Seminole State College of Florida (SSC), with an average size but academically rigorous EAP program, there was a need for empirical evidence of EAP students'

academic English development to inform potential curricula revisions in advanced grammar and writing courses. The EAP program at SSC was put into place in 2001, and its curricula underwent only minor revisions in the past 16 years. The instructional sequences for EAP 1640 (Advanced Writing) and EAP 1560 (Advanced Grammar) classes, where Azar & Hagen (2009) was used for about ten years, is given in Table 1 (see Appendices A and B for more information about course progression in the EAP program at SSC).

Table 1

EAP 1560 and EAP 1640 Instructional Sequences

Week #	EAP 1560	EAP 1640
1	Review of Verb Tenses	Developing main idea
2	Passive Voice	Developing thesis statements
3	Subject Verb Agreement	Sentence Variety
4	Sentence Coordination	Supporting Details
5	Introduction to Clauses	Essay Outlining/ First Draft
6	Noun Clauses	Descriptive Essay
7	Noun Clauses	Classification Essay
8	Adjective Clauses	Classification Essay
9	Adjective Clauses	Comparison or Contrast Essay
10	Adverb Clauses	Comparison or Contrast Essay
11	Adverb Clauses	Cause or Effect Essay
12	Adverb Clause Reductions	Argumentative Essay
13	Connectives	Timed writing (50 minutes)
14	Conditional Clauses	Timed writing (50 minutes)
15	Conditional Clauses	Round 1 Exit Exam (50 minute essay)
16	Round 1 & Round 2 exams	Round 2 Exit Exam (100 minute essay)

In EAP 1640 (Advanced Writing) class, students were learning how to write five-paragraph academic essays to pass the final timed writing exam and thereby exit out of the EAP program. Even though the transfer of grammar knowledge into writing was expected, the lexico-

grammatical complexity of student writing was never empirically analyzed. Therefore, this study sought to analyze linguistic *complexity* of EAP student writing, defined as "the more advanced grammatical structures that students exhibit as they progress in their language proficiencies" (Biber, et al., 2011, p. 6). Grammatical features analyzed by Staples and Reppen's (2016) (e.g., nouns as pre-modifiers, attributive adjectives, noun + *that* clause, verb + *that* clause, and adverb clauses) closely aligned with EAP 1560 (Advanced Grammar) curriculum (see Table 1). To obtain a fuller picture of lexico-grammatical complexity, both phrasal and clausal features were considered. Moreover, Biber et al. (2011) hypothesized five developmental stages for complexity features, and the features chosen for analysis in this study demonstrated complexity progression in the following order: verb + *that* clause (stage 1), finite adverbial clauses and attributive adjectives (stage 2), and noun + *that* clause and pre-modifying nouns (stage 3).

Furthermore, the researcher was not familiar with any local learner corpora complied in a Florida EAP program even through 15 out of 28 state colleges had EAP programs; thus, the learner corpus complied in this study might have been the first of its kind. Gilquin (2015) pointed out that with most learner corpora, often referred to as quasi-longitudinal, spoken or written texts were collected at one point in time. Another unique feature of this study was that a written EAP longitudinal learner corpus was built using the best practices of corpus construction (Sinclair, 2005), and placement and exit essays produced by the same student were analyzed. Unlike argumentative essays, used in *ICLE*, or rhetorical analysis and long arguments, used by Staples and Reppen (2016), essays in the current study were mostly of descriptive/narrative rhetorical genre. Another advantage of Seminole State College of Florida Learner Corpus was that it was local, a potential benefit to the ELS Department instructors and EAP students in the

program. Local corpora "invite teachers and students alike into the field of learner corpus research by making them both providers and beneficiaries, thus resulting in learner corpora being directly useful to those for whom, ultimately, they have been compiled" (Gilquin, 2015, p. 29).

Research Questions

To establish whether there was a change in frequency counts of the lexico-grammatical features (Staples & Reppen, 2016) between placement and exit writings in a local EAP corpus, and as a result, obtain empirical evidence of English language development at various stages (Biber et al., 2011), the following questions were investigated.

1. Is there a statistically significant difference in lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count) in placement and exit EL writing in an EAP program?

2. Can lexico-grammatical complexity (pre-modifying nouns, attributive adjectives, noun + *that* clause, adverbial conjunctions, and TTR) of ELs' exit writing be predicted from EAP 1640 and EAP 1560 course grades, LOEP scores, and the number of semesters in an EAP Program?

Hypotheses

Hypothesis for Research Question One

- H_0: There is no significant difference in lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating

conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial

conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio,

average word length, and word count) in placement and exit EL writing in an EAP

program.

- H_1: Lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that*

  clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional

  subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions

  (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count

  in exit EL writing will be different than that in placement writing produced by the ELs in

  an EAP program.

Hypothesis for Research Question Two

- H_0: In exit EL writing in an EAP program, EAP 1560 and EAP 1640 course grades,

  LOEP scores, and the number of semesters in an EAP program are not significant

  predictors of lexico-grammatical complexity (pre-modifying nouns, attributive adjectives,

  noun + *that* clause, adverbial conjunctions, and TTR).

- H_1: In exit EL writing in an EAP program, EAP 1560 and EAP 1640 course grades,

  LOEP scores, and the number of semesters in an EAP program are significant predictors

  of lexico-grammatical complexity (pre-modifying nouns, attributive adjectives, noun +

  that clause, adverbial conjunctions, and TTR).

Significance of the Study

The underlying principle of this study was that lexico-grammatical complexity in L2 writing should have increased given exposure to grammar instruction thus indicating the increase in English proficiency. The following reasons made this study meaningful.

First, essays elicited by given topics and produced as part of the placement and exit requirements in an EAP program constituted *natural* or spontaneous and unscripted forms of written language in the language learning context of a college classroom (Granger et al., 2009) and were samples of authentic written production. A longitudinal corpus where two writing samples produced by the same student were analyzed "made it possible to investigate learners' progress (or lack of thereof) over time and were therefore a precious resource" (Gilquin, 2015, p. 14). In addition, a local learner corpus of Seminole State College of Florida placement and exit writings was program specific; therefore, the findings served to inform curricular revisions at the 1500 and 1600 level of EAP courses at the ELS Department, as advocated by McCarthy (2015), and may be shared with the Florida EAP Consortium, an advisory organization that oversees matters of academic English assessment, placement, curriculum standardization, and financial aid in Florida state colleges.

Last, because the entire accessible population of EAP 1640 students in Fall 2016 and Spring 2017 semesters was used in this study, the findings may be generalizable to other EAP students with comparable backgrounds and language proficiency in the state of Florida and beyond. To advance any field of study, it is a common practice to make empirical findings available to other researchers, which will be done after publication as a contribution to the LCA bibliography, housed in Zotero.

Potential Limitations of the Study

Although the researcher took several steps to maximize the reliability and validity of measurements used in this study, there were still some potential limitations associated with the design. Various topics were used for placement and exit writing samples, which did not allow the researcher to control for content; however, because text files were clearly labeled with topic information, pre- and post- analysis on topics may also be conducted. In addition, students often produced placement writing after potentially spending hours on college placement P.E.R.T and LOEP testing, which meant that physical and mental fatigue may have impeded their writing performance. Furthermore, timed (50 minutes) conditions may have produced anxiety for some students (Kroll, 1990), which was also beyond the researcher's control.

There were potential limitations associated with the accuracy of data collection, entry, and analyses because multiple procedures were performed (e.g., matching of participants' data, part-of-speech tagging, sample clean-up, etc.). Placement and exit essays were matched and typed, while student background information was obtained from Seminole State College *PeopleSoft* System. Although the researcher employed a person who double checked data collection and entry, occasional errors may have occurred due to the complex dual nature of this research study: learner corpus building and data analysis. Every effort was made to follow best practices in learner corpus construction (Sinclair, 2005; Wynne, 2005), but because this was the researcher's first attempt at a corpus construction and complex data analyses (using the Biber tagger and *AntConc*), inaccuracies might have occurred. Next, Biber, Conrad, and Reppen (1998) indicated that "for many common grammatical features Biber (1990) finds that counts are relatively stable across 1,000-word samples from a text. However, some grammatical features

(such as subject position *that*-clauses) are so rare that they would require much larger samples"

(p. 249). Text size could potentially be another limitation because student produced writing

under timed conditions yielded texts that varied in word length but did not exceed 700 words.

Lastly, only two writing samples were collected from each participant, a potential

limitation because extraneous circumstances may have prevented the students from performing

their best just as variables outside of the researcher's control (e.g., age of English onset,

motivation, ease of language learning, etc.) may have contributed to the anticipated increase in

lexico-grammatical complexity in writing. Lastly, breaking a complex phenomenon such as

English language academic writing complexity into smaller pieces may have provided an

incomplete view of the phenomenon under the investigation.

Definition of Terms

The following constructs are used in the proposed study and are defined as follows:

- *Academic English (AE)* – a genre of English language used in publication, research, colleges, and universities

- *A concordance line* – a line of text from a corpus

- *English for Academic Purposes (EAP)* – teaching of English to advance learners of AE

- *English Learner (EL)* – a person learning English as another language

- *Generation 1.5* – a language learner who spent his/her adolescent years in an American high school

- *Learner Corpora (LC)* – a systematic collection of texts produced by language learners

- *Linguistic Complexity* – a combination of lexical, syntactic, morphological, and phonological features of a language

- *Second Language (L2)* – an additional language learned after the learner's mother tongue

- *Type-Token Ratio (TTR)* - a measure of lexical diversity obtained by dividing the total number of different words (i.e., types) by the total number of words (i.e., tokens). A lower TTR indicates limited lexical variation.

- *A clause* – a unit of language consisting of a subject and a predicate

- *An independent clause (IC)*– a clause that may stand alone, i.e. simple sentence

- *A dependent clause (DC)* – a clause that must be attached an independent clause to make a complete sentence

- *A T-Unit* – one independent clause with all of its dependent clauses or "shortest allowable grammatical units that can be punctuated at the sentence level" (Crossley & McNamara, 2014, p. 68).

- *A finite clause* – an independent or dependent clause containing a verb which shows tense

- *A nonfinite clause* – a dependent or embedded clause which may contain infinitives, particles, and gerunds, and does not show tense (i.e. a verb phrase)

- *A phrase* – a unit of a sentence consisting of a group of words without a subject and a verb

- *A noun phrase (NP)* – a phrase where a noun or an indefinite pronoun is its head word

- *A prepositional phrase (PP)* – a phrase which contains a preposition, a noun or pronoun (i.e., object), and any of its modifiers

- *An attributive adjective* – an adjective which directly modifies a noun

- *A pre-modifying noun* – a noun which serves as an adjective to describe another noun

- *An adjective (or relative) clause* – a dependent clause that modifies a noun

- *A noun clause* – a dependent clause that complements a verb

- *An adverb clause* – a dependent clause that contains a subordinating conjunction and expresses either time, condition, contrast, cause, etc.

CHAPTER TWO: RESEARCH AND LITERATURE REVIEW

It is necessary to briefly review the theories of Second Language Acquisition (SLA) so that this study could be positioned within an appropriate theoretical framework. The need for such grounding has been expressed by various researchers in the field (Ellis, 1999; Hasko, 2013) and is considered a good research practice (Gall et al., 2007). Hasko (2013) lamented that some corpus researchers lack SLA backgrounds and focus heavily on frequencies and statistics rather than interpretation of the findings, contributing to understanding of L2 acquisition within any chosen, if at all, theoretical framework.

> While big can be beautiful in SLA research and the need for testing acquisitional hypotheses on extended datasets is pressing, purely quantitative approaches largely based on frequency counts are not sufficient to provide a satisfying account of L2 learning. This is where the disciplinary heritage of SLA can lend the necessary subject matter base to LC researchers for examining and interpreting the complex nature of L2 development beyond the bare statistics of occurrence (Hasko, 2013, p. 3).

Thus, a review of major SLA theories is an appropriate starting point to ground the proposed corpus lexico-grammatical complexity analysis of L2 academic writing.

Relevant Second Language Acquisition Theories and Major Concepts

Marked by "research-then-theory" and described in its early stages as an "amorphous field of study with elastic boundaries" by Rod Ellis (1999), the field of SLA was positively influenced by the rigors of theoretical work and constructs in linguistics. Ellis (1999) also saw "the study of 'learning' and of 'learners' as separate areas within SLA research" (p. 2). Focusing on the language and discounting the learner, Universal Grammar (UG) is the notion that all languages share certain foundational principles while some grammatical "parameters" may vary

from discipline to discipline (Chomsky, 1975). Once ELs familiarize themselves with those parameters, they learn the grammar of the language, i.e., the language itself. Noam Chomsky (1975) also introduced the idea that humans are born with an innate ability for language acquisition, i.e., Language Acquisition Device (LAD), and criticized earlier behaviorist views hypothesizing that humans learn any behavior, including the language (i.e., ability to communicate) through the S-R-R process, which stands for stimulus, response, and negative or positive reinforcement (Skinner, 1957). Regrettably, LAD could not explain why young children make developmental language mistakes. Even though children acquire the phonetic, morphological, and syntactic structures of their mother tongues by age five, societal demands and language expectation of an EL entering college, for example, are much higher than those of a five-year old, thus factors other than language itself clearly influence the acquisition process.

Research and theory construction in SLA has come into prominence in the early 1970s with Selinker's (1972) seminal publication in the *International Review of Applied Linguistics*, in which he postulated that a language learner develops *interlanguage*, a highly individualized form of language, representing a continuum from L1 to the target language. Interlanguage is affected by the L1 interference or negative transfer and fossilization, a developmental language plateau, which is once reached, holds the learner back from achieving the target language proficiency. *"Overgeneralization* (i.e., the extension of an L2 rule to a context in which it does not apply in the target language) and *simplification* (i.e., the reduction of the target language system to a simpler form)" (Ellis, 1999, p. 30) are other terms associated with interlanguage theory, which inspired early empirical analyses of language development and student errors. Even though the theory accounted for individual differences of each learner based on his or her L1, it did not take

into consideration factors such as age, gender, age of onset (i.e., first exposure to English), identity, and motivation, all of the constructs that would enter SLA research in the later part of the 20th and early 21st centuries thanks to the work of Bonny Norton, Anita Pavlenko, and Suresh Canagarajah.

By the 1980s, the field of SLA became dominated by the acquisition versus learning dichotomy and the input i+1 hypothesis, where *i* is interlanguage and *+ 1* is how much new knowledge a learner can absorb (Krashen, 1981) as well as natural order hypothesis, which stated that grammatical features are acquired in a certain set way (Pienemann, 1984). Explicit grammar instruction was deemed ineffective and detrimental to the natural order of acquisition. Surprisingly, the term "learning" gained a negative connotation as Krashen believed that a student should acquire the language through extensive pleasure reading, interactions with English speaking peers, and massive amounts of comprehensible input (see Littlewood (1984) for more on the distinction between learning and acquisition). Almost every English as a Second Language and English as a Foreign Language instructor became familiar with Krashen's hypotheses and tried hard not to raise the affective filter of his/her students or, in other words, downplay negative intrinsic factors such as boredom, loneliness, anxiety, and alienation that could interfere with the comprehensible input.

Without a doubt, K-12 teachers have years and years to provide the necessary linguistic input, and, therefore, continue to accept Krashen's theories. Teachers of adult ELs, on the other hand, after years of communicative instructional approach with zero grammar, acutely felt the need for explicit grammar instruction and returned to teaching form and function (Christison et al., 2015; Hinkel, 2002, 2011; Larsen-Freeman, 2002, 2014; Larsen-Freeman, & Celce-Murcia,

2015). Once again reminding about learner needs, Ellis (2002) commented that "for some learners at least, talking about grammar may be more meaningful than talking about kinds of general topics often found in communicative language courses" (p. 165).

Two more influential concepts in the field of SLA are BICS (basic interpersonal communicative skills) and CALP (cognitive academic language proficiency), proposed by Cummins (1984; 2008). The basic premise of Cummins' theory is that informal language could be acquired in as little as two years, while reaching academic proficiency may take up to seven years. With his *Interdependence Theory*, Cummins (1981) suggested that cross-lingual transfer from L1 to L2 and back to L1 is a natural bilateral literacy development process, with both languages benefiting from literacy advances. Surface components of the two languages (e.g., pronunciation) differ, but the underlying cognitive proficiency is shared, making the transfer of conceptual elements (i.e., understanding), metacognitive and metalinguistic strategies (i.e., visualizing, graphic organizers, & vocabulary), pragmatics, morphology, and phonological awareness possible. Also, Cummins (1984) insisted that reading a chapter in a course textbook or writing an essay are academic literacy practices, in which students engage most often, and which are "context reduced and cognitively demanding." Register differences and the linguistic features associated with academic versus interpersonal tasks were later studied extensively through corpus linguistic methods (Biber, 1988; Biber, 2006; Biber et al., 2011; Biber, Johansson, Leech, Conrad, & Finegan, 1999). Cummins also advocated that solid academic literacy and conceptual knowledge in L1 aides L2 literacy, achievable with print access and literacy engagement, two factors promoting reading compression. Cummins (2012) remained

consistent with his views for over three decades, recently adding the role of societal power relations as a factor influencing literacy development among immigrant and minority groups.

Another influential hypothesis, which resulted in decades of error analysis studies is Robert Lado's (1957) Contrastive Analysis Hypothesis (CAH), which suggested that L2 errors are a direct result of L1 "habits." Lado also noted that ELs should not have difficulties with elements of the L2 language similar to their L1. In his seminal book *The Study of Second Language Acquisition*, Ellis (1999) stated that "in its strongest form, the CAH claimed that all L2 errors could be predicted by identifying the differences between the learners' native language and the target language" (p. 307), which is exactly what Error Analysis (EA) research has been focusing on since the 1960s.

Building on a previously developed contrastive analysis (CA) theory, Granger (1996) suggested a methodological approach to learner corpus analysis, Contrastive Interlanguage Analysis (CIA), which consisted of two ways EL language production could be analyzed. First, interlanguage (IL) (Selinker, 1972) of an EL could be compared to what was considered the ultimate production by native speakers. Second, IL data from speakers of various L1s could be compared against each other. In 2015, Granger offered revisions to her original CIA model by acknowledging current tendencies towards wider acceptance of language varieties in SLA research and practice. Thus, a more inclusive term "reference" speaker of the language rather than native speaker was applied, which allowed for proficient non-native speakers to be used as references as well. The comparison of various L1s is now the analysis of "interlanguage varieties." The earlier extension of the CAH theory manifested itself in L2 writing as *contrastive rhetoric* (Kaplan, 1966), the notion that EL's L1 and culture influence thought processing,

development of ideas, and grammatical accuracy in L2. The concept has been largely abandoned

with the switch to the socially situated writing genres in L2 writing research and instruction.

As the field of SLA matured, a plethora of peer-reviewed journals dedicated to the L2

research has emerged, some more specialized that others. To illustrate, Hamp-Lyons (2011)

noted that "the appearance on the scene in 2002 of the JEAP was a clear indication that EAP had

come of age as an independent academic field" (p. 93). The journals that have made the greatest

impact on establishing research traditions and provided platforms for researchers and

practitioners alike are listed in Table 2 in alphabetical order. The year when the first issue went

into print, publisher, an h-index (a metric of productivity and a citation impact of an academic

journal as listed on www.scimagojr.com), and Journal Impact Factor (JIF) for 2015 are also

included in Table 2. JIFs are calculated annually and published in the Journal Citation Reports

sourced from the Web of Science data.

Table 2

Top Peer-Reviewed Journals in SLA

Title	Year	Publisher	H Index	JIF 2015
English for Specific Purposes	1980	Elsevier	44	1.143
Journal of English for Academic Purposes (JEAP)	2002	Elsevier	31	1.558
Journal of Second Language Writing	1992	Elsevier	51	1.744
Language Learning	1948	Wiley-Blackwell	62	1.869
Modern Language Journal	1916	Wiley-Blackwell	46	1.188
Second Language Research	1985	SAGE Publications	34	1.568
Studies in Second Language Acquisition	1978	Cambridge University Press	34	2.234
TESOL Quarterly	1967	TESOL	59	1.513

Also, first published in 2015, the *International Journal of Learner Corpus Research* (https://benjamins.com/#catalog/journals/ijlcr/main), is a peer-reviewed journal that has given learner corpus researchers a venue to share their research related to SLA and linguistic theory as well as language teaching and acquisition.

Academic English (AE)

Over the years, classroom teachers as well as researchers have been making a distinction between general English and a more specialized English, occupational or academic, each with certain linguistic features. An advocate of a broad academic English (AE) view, Scarcella (2003) proposed a framework that included phonological, lexical, grammatical, sociolinguistic, and discourse components as part of the AE linguistic competence. Listening to lectures and note taking, reports and reflections, summary writing and research projects, annotated bibliographies and expository essays are some of the activities in which college students may engage, and in order to complete them successfully, they should be linguistically competent. In a policy report produced by University of California Linguistic Minority Research Institute, Hakuta, Goto Butler, and Witt (2000) stated that "academic English proficiency refers to the ability to use language in academic contexts" (p. 1) and may take four to seven years to develop, a notion that Cummins (1981, 1984, 2008, 2012) called cognitive academic language proficiency (CALP).

Until the second half of the 20th century, the primary focus of English instruction around the world and in the United States was on general English. As specific language learner needs beyond the classroom came into focus together with understanding that language needs of a

nursing professional, for instance, are different from those of a lawyer, faculty and researchers made a step towards individualized instruction in the form of English for Specific Purposes (ESP). ESP is taught to prepare a wide variety of professionals (e.g., nurses, construction workers, fast food industry employees, law and business students, etc.) as well as satisfy sociocultural needs of the learner (e.g., family literacy, citizenship, etc.) (Belcher, 2006). English for Academic Purposes (EAP) has widely been recognized as a subfield of English for Specific Purposes (ESP) whose intent is to prepare language learners to continue their education with English as the medium of higher education instruction.

Considering various types of academic English as an integral part of ESP, Johns and Dudley-Evans (1991) provided an overview of definitions starting with the original one, offered by Strevens (1988). Strevens stated that ESP's absolute characteristics included learner and content specific design as well as targeted syntactical, discourse, and lexical components. ESP is English for business, engineering, plumbing, or any other field where students may be employed, and as such, its curriculum and materials are designed for specialized language instruction.

In ESP/EAP classrooms, such specialized language instruction is often achieved through task-based language teaching (TBLT). Curriculum design for these courses often begins with needs assessment in real world scenarios. If ESP is to be taught to future pediatric nurses, linguistic data could be collected in the forms of authentic on-the-job reading and listening materials, recordings of interactions between medical personnel and patients in an occupational social context (e.g., doctor's office, hospital, etc.). Then, professionals in the field often help English language instructors create educational tasks simulating the real world scenarios, complete field specific vocabulary lists, and generate task-based syllabi.

Taking sociocultural aspirations of language learners into account, Cadman (2002) suggested that the EAP acronym be interpreted as "English for academic possibilities" (p.101), which did not become widely accepted.

College Writing Tasks and EL Experiences with Them

In late 80s and 90s, task-based language teaching was focused on general academic English in EAP, and the researchers primarily investigated L2 written literacy tasks (Horowitz, 1986; Johns, 1995; Leki, 1995; Spack, 1988). One study that stands out is both quantitative and qualitative analysis of types of listening and speaking tasks that EAP students are required to perform in three universities (public and private) and one community college (Ferris & Tagg, 1996). In this study, the researchers surveyed 234 undergraduate and graduate faculty from business, engineering, music, and natural sciences departments, 56% of whom provided additional written comments and 18 even sent copies of their listening and speaking assignments and explained how they fit into the larger picture of the course. The results showed that class sizes and class participation varied considerably. Small group discussions rarely occurred in engineering courses but were used *often* to *sometimes* in business and science. Working with classmates on graded assignments almost never happened in science, while occurred *often* to *sometimes* in business and engineering. Assignments where ELs interacted with native speakers were nonexistent in science yet common in business just as oral presentations were. Also, the importance of having good note taking skills was highly apparent in engineering and science but not so much in business.

Lastly, Ferris and Tagg (1996) noted that higher AE linguistic competence was required in graduate courses and suggested that "besides bearing in mind the specifications of particular

genres, course/materials developers and teachers must also consider whether their students are currently preparing to take large lower-division classes or small graduate classes" (p. 50). Pedagogical recommendations included context-specific EAP courses, peer work, oral presentations, lecture comprehension practices as well as native speaker and college professor interactions. Classroom EAP instructors may take away from this study the need to expose ELs to various types of group work and presentation scenarios as well as make students aware of rigors and differences of college work at graduate and undergraduate levels.

One of the earliest research projects attempting to identify typical writing tasks that EAP students face once they enter college was undertaken by Horowitz (1986) at Western Illinois University. In his study, five percent ($n = 36$) of faculty responded to the original letter of request to submit recent assessments that contained writing components as well as guidelines for any out-of-class writing assignments (e.g., take home exams, book and article reviews, etc.). The majority of the reviewed courses was undergraduate, and assignments fell into the following seven categories: summary of/reaction to a reading (9 samples), annotated bibliography (only in biology), report on a specified participatory experience (9 samples), connection of theory and data (10 samples), case study (5 samples), synthesis of multiple sources (15 samples), and research project (5 samples). Horowitz (1986) noted that "the most striking feature of the sample, taken as a whole, was the controlled nature of much of the writing called for" (p. 452) as in many cases, detailed instructions were provided along with lists of sources to be read.

The researcher suggested that writing tasks for ELs should "simulate university writing tasks in a particular way" (p. 455) and embedding real course content is one way to achieve it. To reach a broader spectrum of students and stimulate their future academic interests, "topic-

centered units of general interest, perhaps chosen by the students themselves" (p. 456) were

suggested. In addition, Spack (1988) noted that L2 writing teachers should explain to their

students how to employ "appropriate inquiry strategies, planning, drafting, consulting, revising,

and editing" (p. 45) and teach them how to write from sources in general rather than focusing on

writing in particular disciplines, which is problematic as EAP faculty may lack knowledge in

subject specific genre of writing. Lack of such knowledge could be remedied by "adjunct

model" (Shih, 1986), or collaboration (i.e., team teaching) with content faculty, which even

thirty years later is relatively rare today as instructors and administration may not be ready to

involve several departments and commit to ongoing sharing of information. Moreover, course

designation problems, financial aid issues, varied expectations, and diverse grading criteria have

prevented colleges and universities from entering into such partnerships more actively.

Furthermore, a detailed account of two undergraduate and three graduate ESL student

experiences during their first semester in an American university was provided by Leki (1995).

English language proficiency of four female and one male students from Taiwan, France,

Finland, and China, ages 21-34, was measured by the Test of English as a Foreign Language

(TOEFL). TOEFL scores ranged from 527 (minimum of 525 was required for admission) to 627

(maximum possible 677 on a paper-based test), and students majored in business, speech,

education, and political science. Qualitative data were collected from interviews with

participants and professors, writings produced by the students, journals, and classroom

observations. Leki found that students used clarifying strategies (e.g., talking to the instructor,

classmate, and asking for specific feedback), focusing strategies (e.g., rereading, rewriting

questions, reading published literature), relied on past writing experiences, took advantage of L1

background knowledge, looked for models, and at times, resisted professors' demands. Ultimately, all students succeeded in their courses, but they struggled with assignments they did not understand or could not relate to due to cultural differences. One of the unfortunate consequences that Leki (1995) reported was that "the professors had no indication of anything amiss, and yet from the students' point of view, the experiences varied from meaningless and a waste of time to actively destructive" (p. 254).

Adding to the body of qualitative research on student experiences with written AE tasks, Riazantseva (2012) questioned whether strong writing skills or something else contributed to the academic success of three Generation 1.5 participants (two female and one male Russian-speaking middle-class college students with GPA of 3.5 or above) in her study. The term Generation 1.5 was first used by Rumbaut & Ima (1988) to describe the youth "who were born in their countries of origin but … are completing their education in the U.S. during the key formative periods of adolescence and early adulthood" (p. 1). Riazantseva (2012) succinctly summed up previous research findings, highlighting that Generation 1.5 students often do not reach highest levels of English proficiency "due to the concurrent linguistic, cognitive and social demands of secondary education, interrupted (or lacking) L1 literacy experiences, inadequacy of literacy instruction provided prior to their enrollment in mainstream classes, and limited years of exposure to L2" (p. 185), a statement very similar to Azar's (2007).

In addition to informal student evaluations collected from instructors, Riazantseva conducted semi-structured interviews with the students, administered background questionnaires, and collected samples of their undergraduate writing, transcripts, and current course syllabi. She discovered that writing assignments accounted for ten to twenty percent of coursework, and no

rubrics were included in syllabi. Moreover, the researcher looked at language use, organization, and content of the student timed writing samples, written in Russian and English. Thick descriptions of the students (age of immigration from 11 to 16) revealed various levels of exposure to Russian in their daily lives in the US and high academic aspirations. Participants liked college education, were avid readers in both L1 and L2, and had active social lives. Qualitative analysis of data revealed that "an arsenal of linguistic, cognitive, and socio-academic behaviors (e.g., assertiveness, self-confidence, and display of ambition), attitudes, strategies and skills that they utilized for dealing with the demands of academic work" (p. 191) ultimately made ELs successful.

In contrast, their English writing samples contained "inappropriate lexical choices, sentence fragments, errors in subject-verb agreement, article and preposition use, lack of textual cohesion at the sentence level and problems with coherence at the discourse level" (p. 188), lacked development and support, and even included plagiarism. Clearly, the problem of inadequate preparation in writing for ELs has persisted over the years. Johns (1995) reported that some college faculty working with such L2 students considered them *illiterate*, "for they were not prepared for the discourse structures, linguistic precision, objectivity, or critical thought necessary for academic exposition or argumentation" (p. 183). Ultimately, Riazantseva (2012) demonstrated that written linguistic proficiency, the focus of EAP faculty and the source of complaints for content area professors, did not contribute to ELs' college success as much as their socio-academic behaviors.

Certain conclusions could be reached about academic writing tasks and student experiences outside of an ESP/EAP classroom. Clearly, a contradiction between EAP practices

and college professors' expectations and types of assignments has emerged. On one hand, researchers advocate to expose ELs to various academic scenarios within EAP courses, teach them to take control of their learning, and become empowered participants of the academic contexts through writing (Cadman, 2002; Ferris & Tagg, 1996; Riazantseva, 2012), which does yield positive academic results even with less than perfect written linguistic proficiency in English. On the other, college faculty, who seem to tightly "control" the writing, are often unaware of EL struggles and choice of strategies and continue to expect linguistic precision (Horowitz, 1986; Leki, 2005; Spack, 1988). Now that the types and EL experiences with writing in college have been reviewed, it is time to take a closer look at what writing looks like inside an ESL or EAP classroom.

L2 Academic Writing

Early L2 writing materials were greatly similar to those used to teach writing to native speaker of English (Spack, 1988). ELs were expected to produce pieces of writing following models written in various rhetorical modes (e.g., narrative, classification, comparison/contrast, cause/effect, argumentative, etc.), and this practice largely persists today. In the past, materials included native speaking contexts, which were often foreign to non-native speakers, and no special accommodations were made for language needs (e.g., common errors, grammar explanations, academic vocabulary considerations, etc.). Later non-native speaker composition textbooks focused on the cognitive process of writing, and students were encouraged to write about things that they knew well (i.e., a favorite restaurant, a great place to visit on vacation, a happy memory, etc.). Spack (1988) argued that "since the personal essay as a genre informs the discipline known as English literature, this kind of writing can be considered academic", and it

"serves as a vehicle for reflection and self-expression for specialists in many other fields, including science, medicine, and engineering" (p. 32). Some may come to the conclusion that most types of writing that ELs will be required to produce in college are evidence-based pieces, requiring higher order analysis and synthesis of multiple sources and solid citation practices (Cadman, 2002; Ferris & Tagg, 1996; Horowitz, 1986; Riazantseva, 2012). However, recent work by Biber, Reppen, and Staples (2016), as part of an ongoing project, showed that it might not be so. Because ELs mostly choose to study sciences rather than humanities, Biber et al. (2016) took a closer look at other disciples and correlated the results of TOEFL iBT integrated and independent scores to disciplines such as humanities, social sciences, applied linguistics, law, business, natural sciences, and engineering. The researchers found that independent iBT tasks, similar to open-ended opinion based essay writing done in EAP 1640 at Seminole State College of Florida, were better predictors of academic paper scores in engineering, applied linguistics, and business in terms of the language. Interestingly, the results were similar for both undergraduate and graduate contexts. Furthermore, argumentative essays (112 count) were the most popular register category among academic papers in their study, followed by informative essays (89 counts), and the third category of case studies (36 counts), which clearly shows that independent writing assignments should not be excluded from L2 writing curricula.

For decades, instructional approaches to writing focused on writing as a *process*, with its four critical steps of prewriting, drafting, revising, and editing, or writing as a *product*, with "the emphasis on correctness and the adherence to and copying of models, both language and text" (White, 1988, p. 5). Researchers and practitioners have criticized overreliance on either approach. Murray (1972) noted that most English teachers were trained to perceive writing as a

product, and that is what they expect of their L2 writers. However, as students continue to submit poor writing assignments, and faculty continue to offer feedback on grammar and organization, "much of it brilliant, some of it stupid, and all of it irrelevant", there is little improvement. "We are as frustrated as our students, for conscientious, doggedly responsible, repetitive autopsying doesn't give birth to live writing" (p. 3). Murray suggested teaching writing as imperfect, often incomplete, but exploratory, when every word choice is savored, and 85% of the process is spent on *prewriting*, something that EAP students resist and dislike, partly because it forces them to engage in extensive cognitive searching of specific supporting details within often limited lexical resources.

In contrast, Horowitz (1986) noted that process approach is often criticized for "its almost exclusive concern with psycholinguistic, cognitive, and affective variables," whereas writing teachers often ignore "many forces outside of an individual writer's control which define, shape, and ultimately judge a piece of writing" (p. 446). Later, Johns (1995) added that the goal of process approach to writing was to turn ELs into "*authors* when they were not yet ready to be second language *writers*." She argued that register and argumentation were not receiving the necessary attention and "in promoting the *author's purposes* while minimizing understanding of *role, audience, and community* have put our diverse students at a distinct disadvantage as they face academic literacy tasks" (p. 181). Certain aspects of product approach remain popular to this day, and ELs are often asked to dissect various essay samples by turning them into outlines and later produce a similar written product. A familiar five-paragraph format (i.e., introduction, three body, and conclusion) continues to be taught, and the correct use of grammar is expected.

One of the most respected and informative publications in the field of second language writing has been Ferris and Hedgcock's (2014) *Teaching L2 Composition: Purpose, Process, and Practice*, in which the authors address composition pedagogies, genre awareness, writing curriculum design and assessment as well as error correction and the development of language skills in the writing class. In its third edition, the volume is a comprehensive resource of L2 writing aspects where Ferris and Hedgcock (2014) stated that "no one would argue that attention to language issues should be the only concern or even the primary focus of a writing course" (p. 310). The researchers also cautioned that L2 writing instructors should be aware of the importance of rhetorical grammar, genre awareness, and lexical variation. Therefore, it is important to look at how grammar correction, in particular, has been dealt with in L2 writing.

Grammar Correction in L2 Writing

One of the world's most respected and best-selling practitioners of ESL grammar, Betty Azar, advocated that L2 teachers should focus their attention on both fluency and accuracy of the grammar structures underscoring the difference between practitioners, who tend to work "towards eclecticism and pragmatism in blending various practices and principles" and academics who "divide the subject of study into component parts so that they can be measured and compared" (2007, p. 2). She went on to lament that "almost nothing is more difficult than trying to explain to a student with no concept of grammar where to put a period or why a certain verb form is needed" (p. 3) and pointed out that lack of grammatical knowledge negatively affects both writing and reading proficiency.

Mulroy (2003) expressed a language axiom that resonates with every language teacher:

Sentences always have and always will consist of clauses with subjects and predicates and of words that fall into classes fairly well described as verbs, nouns, adjectives, adverbs, pronouns, prepositions, conjunctions, and interjections. Individuals who understand these concepts have a distinct advantage over others where the use of language is involved—and that means everywhere (p. 118).

As grammar returned into the L2 writing classroom, after a few decades of absence due to Krashen's (1982) comprehensible input, natural language, and acquisition versus learning hypotheses, researchers once again turned their attention to empirical analyses of error free production or written accuracy. In the field of SLA, there has always existed an undeniable, widely accepted, and rarely questioned notion that grammar correction in writing results in grammatical accuracy.

Nonetheless, Truscott's (1996) highly influential publication in *Language Learning*, in which he advocated to abandon grammar correction in L2 writing classes but accepted the value of grammatical accuracy, originated a heated academic debate that continues until today. Truscott (1996) defined *grammar correction* as "correction of grammatical errors for the purpose of improving a student's ability to write accurately" (p. 329). One of the reasons that he offered in support of non-correction was the idea that students might not be developmentally ready to comprehend the correction because instructional sequences often differ from the language developmental ones. Another reason was that students may be unable to internalize correction the first time it is given and produce error free writing thereafter. To assume that such absorption is possible goes against the Truscott's own arguments that students are all different in age, background knowledge, and length and types of exposure to English. Therefore, an EL is likely to notice a mistake with a particular grammar point after it has been pointed out once, twice, or even a few more times, whereas if an error is not corrected, there can be no awareness

as to the student, the error is invisible. Schmidt's (1990) Noticing Hypothesis, consisting of three types of consciousness: *awareness* (basic focused noticing), *intention*, and *knowledge*, is based on the same premise that once an EL is able to consciously compare his/her production to the target form, or notice the gap, corrective feedback is internalized.

Citing works by various researchers, some neither empirical nor rigorous, Truscott (1996) insisted that variations of grammar correction (e.g., comments on mistakes, corrections of errors, underlining of erroneous parts of text, use of correction symbols, etc.) were inefficient and even harmful. Arguing against comprehensive correction, Truscott stated that lack of thereof would make "classes more pleasant (or at least less unpleasant) both for students, who would not have to confront so many criticisms, and for teachers, who would not be so overwhelmed with unpleasant work" (p. 352). Both language learners and English teachers may find such reasoning troubling. Grammatical accuracy is a skill that requires polishing, which is impossible without considerable effort on the part of the learner and feedback provided by the instructor, which may not and should not always be "pleasant." Although Truscott admitted that future methods of correction and research could prove to be successful, he failed to offer a viable alternative to what he called the "pseudoknowledge" of grammar correction. Therefore, empirical research on linguistic accuracy and error correction continued, serving as a precursor to writing complexity studies. To that extent, Ellis (1999) pointed out that in SLA "initially the main approach was the study of learners' errors, but this was rapidly superseded by the study of developmental patterns and, a little later, variability. The study of L2 pragmatic features is a more recent phenomenon" (p. 43).

Linguistic Accuracy and Error Analysis in L2 Writing

Rarely do any researchers or classroom teachers question the importance of linguistic accuracy in their students' writing, and literature actually offers proof of its importance in a number of studies that have been published on this issue in the last two decades. Polio (1997) conducted a meta-analysis of such studies in the twelve years between 1984 and 1995 and reviewed 35 additional studies in the first eleven years of the 21st century (Polio and Shea, 2014). The types of linguistic measures were reviewed along with intra- and inter-rater reliability. Not surprisingly, the results were disappointing as reliability measures were not included for 55% of the measures of linguistic accuracy. The interrater reliability in Polio and Shea's (2014) review varied from the lowest .54 for lexical errors to .90 for vocabulary holistic score, with error-free unit measures being the most stable from .84 to .88, which prompted the researchers to recommend rater norming and setting of specific rater guidelines. Besides, having reviewed 34 studies that used a measure of written accuracy, Wolfe-Quintero, Inagaki, & Kim (1998) identified three types of such studies: longitudinal, cross-sectional, and correlational. Unfortunately, only seven of those reported either intra- or interrater reliability, and holistic scoring with some sort of a rubric was highly favored.

Research has also been conducted using holistic measurers that have focused on concrete aspects such as coherence, sentence complexity, and grammar (Hamp-Lyons & Henning, 1991; Hedgcock & Lefkowitz, 1992; Tarone et al., 1993; Wesche, 1987). Hamp-Lyons and Henning (1991) used a holistic scale of linguistic accuracy, which ranged from the highest 9, earned if the reviewer did not observe any errors in grammar, punctuation, spelling, or vocabulary, to a 1, assigned to a writer whose work was copied or utterly incomprehensible. Zero was assigned for

no writing at all. Highly subjective terms such as *significant, aware, occasional,* and *lack of control* were used in the scale, which resulted in a low inter-rater reliability, ranging from .33 to .79 between pairs of raters. Hedgcock and Lefkowitz (1992) writing assessment scale included mechanics (2 = very poor to 5 points = excellent), vocabulary (7-9 = very poor to 18-20 = excellent to very good), and grammar (5-10 = very poor to 22-25 = excellent). Within the grammar band, raters focused on agreement, number, tense, word order, articles, and prepositions. It is unclear how scores were discriminated for the adjacent numbers, and how the phrase *relatively complex structures* was interpreted, but inter-rater reliability among the four raters was relatively high at .88.

Next, a six-point holistic rating scale was used by Tarone et al. (1993) and included phrases such as *still limited*, *some breakdowns in verbs, real gaps in syntax,* and *hit or miss*, while Wesche (1987) used a seven-point holistic scale, focusing on mechanics and vocabulary range, with an average score given for a highly subjective *quite a few errors*. Undoubtedly, carefully designed and field-tested holistic writing rubrics could yield reliable results, but seemingly arbitrary phrases, used in the reviewed scales, do not allow for replicability of such studies. Even through holistic scales were widely used by the researchers, variability and reliability of measures remained a concern. Moreover, with holistic scales, it is impossible to discriminate between concrete grammatical aspects, the knowledge necessary to inform any curricular revisions in an EAP program.

The fact that the length of exposure to English, the age of onset, and the instructional setting influence written linguistic accuracy has long been accepted in the field (Ferris & Hedgcock, 2014). How students receive linguistic input and its effects on written accuracy have

long interested SLA researchers. Making a distinction between ELs who are first exposed to English in a classroom setting as they are learning to read and write the language and ELs who acquire the language communicatively, Reid (2006) coined the terms "eye learners" and "ear learners." Looking at the adult EL writing, and using the error-counting method, Doolan (2011) examined the difference between Generation 1.5 (i.e., "ear learners") and L1 writers as measured by 25 linguistic variables as well as compared Generation 1.5 and L2 errors and linguistic development. In a subsequent analysis of data, collected in 2009-2010 academic year in six community colleges and two universities, Doolan (2014) explored textual features of Generation 1.5, L1, and L2 (i.e., "eye learners") student writing to determine whether Generation 1.5 expository writing differed from L1/L2 writing within developmental writing courses. Error analysis involved ten variables such as wrong word, verb tense, verb form, run-ons, fragments, prepositional phrases, determiners, word form, subject-verb agreement, and spelling. The first nine were grouped into 4 composites. The analysis allowed Doolan to ascertain that Generation 1.5 students may be more similar to L1 students than previously thought, and that placing them into ESL language courses would be a disservice to them.

Continuing the work on EL writing, di Gennaro (2013) researched linguistic accuracy by comparing writing samples of 67 Generation 1.5 students (average length of residence in the U.S. 6 years) against the same number of L2 samples (average length of residence in the U.S. less than 1 year) and found that L2s did better as a group on five components (e.g., grammatical, cohesive, rhetorical, socio-pragmatic, and content). The interaction effect between groups was observed with the grammatical component, suggesting grammar as the area of primary difference between the two groups. While grammar was found to be the easiest component for L2 students,

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socio-pragmatic control was the second most difficult one. The findings were reversed for the Generation 1.5 participants. An analytic scoring rubric with scores ranging from 0-5 was used within each component. Pearson product-moment correlations (.679 to .818) of the raters were reported. Doolan's (2011, 2014) and di Gennaro's (2013) findings demonstrated that linguistic accuracy differed when the type of learner was considered. Linguistic accuracy of an EL who has spent a few years in an American high school is different from that of a learner who has just come into the United States. Arguably, the number of semesters that an adult EL student spends in an EAP program is a variable that should be considered when writing development is being analyzed.

The issues of linguistic accuracy gave way to new forms of data analyses, and the focus shifted to complexity and usage as researchers became interested in computer-assisted explorations of L2 writing, and corpus linguistics methods became widely accessible.

Corpus Linguistics

Brief History of Corpus Linguistics

One might think that corpus linguistics is a relatively new field of language inquiry; however, it is not so. Historically, linguists looking for patterns in any language and compiling dictionaries have been collecting natural texts for further analyses. The availability of electronic corpora and advances in computer technologies in the 1980's allowed researchers to employ "automatic and interactive techniques" (Biber, Reppen, & Friginal, 2010, p. 548) to analyze lexical, grammatical, and/or lexico-grammatical patterns as well as "non-linguistic associations

of the features: distribution of registers, dialects, and across time periods" (Biber et al., 1998, p. 6).

Modern corpus linguistics is a branch of linguistics that performs computer-assisted analyses of texts. One of the seminal publications in modern corpus linguistics was Henry Kucera and Nelson Francis' (1967) *Computational Analysis of Present-Day American English*, where they described the Brown Corpus, which originally contained over one million words from 500 published American English texts with 2,000 words each from 15 categories (e.g., learned, belles-lettres, popular lore, press, skills and hobbies, fiction, etc.), printed in 1961. In the decades that followed, the Brown Corpus lay-out was replicated several times. Biber and Gray (2016) stated that "parallel corpora with this same design have been constructed for 1992 AmE (the Frown Corpus), 1961 BrE (the LOB Corpus), 1991 BrE (the F-LOB Corpus)" (p. 44). While the Frown Corpus was diachronic (1990 vs Brown 1960), F-LOB was the counterpart of LOB Corpus. Modern day corpora vary in size (e.g., super-corpora, large corpora, small corpora), language (e.g., monolingual, multilingual), medium of text (e.g., written, spoken), field (e.g., academic English, engineering, science, etc.) and availability to the researchers (e.g., free, downloadable, accessible online, on a CD, commercial and not available for general use, etc.). In Table 3, the top six mega corpora are listed (as reviewed by Mark Davies at corpus.byu.edu) along with the information about the developer and form of access.

Table 3

World's Mega Corpora

Name	Size #words	Language	Time period
NOW (News on the Web)	4.5 billion +	20 countries	2010-now
COBUILD (Collins Corpus)	4.5 billion +	English	1980-now
GloWbE (Global Web-Based English	1.9 billion	20 countries	2012-13
Wikipedia Corpus	1.9 billion	English	up to 2014
Hansard Corpus (British Parliament)	1.6 billion	British	1803-2005
COCA (Corpus of Contemporary American English)	520 million	American	1990-2015
COHA (Corpus of Historical American English)	400 million	American	1810-2009

Corpus research in the 1980s mostly focused on frequency comparisons across genres. Later, Sinclair (1991) published a seminal book with corpus-based studies of collocation, and Biber et al.'s (1999) corpus-based lexical research on *the Longman's Grammar of Spoken and Written English* also made a significant contribution to the understanding of collocations, which led to positive and negative distinctions in semantic prosody (Partington, 1998). Research continued with the exploration of sequences of words, i.e., lexical bundles in spoken and written academic language, mostly in university settings (Biber et al., 2004; Biber & Barbieri, 2007; Cortes, 2004). Biber et al. (2010) provided a concise overview of corpus studies with a grammatical focus:

> Within descriptive linguistics, there have been numerous book-length studies over the past 20 years reporting corpus-based investigations of grammar and discourse: for example, Tottie (1991) on negation, Collins (1991) on clefts, Mair (1990) on infinitival complement clauses, Meyer (1992) on apposition, several books on nominal structures (e.g., de Haan, 1989, Geisler, 1995, Johansson, 1995); Mindt 1995 on modal verbs; Hunston & Francis, 2000 on pattern grammar; Lindquist & Mair, 2004 on grammaticalization and Mair, 2006 on recent grammatical change within American English and British English – i.e., during the 20th century (p. 515).

The International Archive of Modern and Medieval English (ICAME) Association held

its 25th Conference at the University of Verona in May of 2004, which resulted in two historic

books of proceedings *Corpus-based studies of diachronic English* (Facchinetti & Rissanen,

2006) and *Corpus Linguistics 25 years On* (Facchinetti, 2007). The first volume included

historical linguistic corpus-based research focusing on general and specialized English as well as

geographical varieties (i.e., British, Australian). The researchers claimed that the processes

taking place in the modern English language needed to be reviewed through the historical lens,

and centuries of language development should be taken into account. *Corpus Linguistics 25*

years On focused on synchronic research and provided a broad overview of studies and corpora

developments.

As corpora continued to be developed, academic English corpora were being compiled,

which revolutionized computer-assisted research in SLA in the later part of the 20th century. In

her *TESOL Quarterly* article, Conrad (2000) shared her thoughts on the effects of corpus

research on grammar instruction. She noted that L2 teachers were starting to use *concordancing*

(i.e., the lines of text with naturalistic examples of language use) in their classrooms, while the

publication of corpus-based *Longman Grammar of Spoken and Written English* by Biber et. al.

(1999) marked a new era of grammar research. Conrad (2000) also saw the directions of such

research as register-specific (i.e., academic written English, spoken, newspaper) and vocabulary

intertwined, with a "shift from structural accuracy to the appropriate conditions of use for

alternative grammatical constructions" (p. 549).

Some of the most popular academic corpora are listed in Table 4 in alphabetical order.

Table 4

Various Large Academic English Corpora

Name	Medium, Text Type	Size	Developed by	Access
BASE (British Academic Spoken English)	Transcriptions of spoken English from University of Warwick	160 lectures and 40 seminars	Hilary Nesi & Paul Thompson	Available via files page
BAWE (British Academic Written English)	Student writing of 500 to 5000 words at universities in UK in Arts and Humanities, Social Sciences, Life Sciences and Physical Sciences, 4 measured proficiency levels	2,761 pieces of student writing 6,5 million	Nesi, Gardener, Alsop, Thompson, Wickens, Leedham, etc.	Free for non-commercial researcher
Longman/Lancaster English Language Corpus	Written in literature, magazines, papers, etc.	30 million words	Douglas Biber and NAU team	
MICASE (Michigan Corpus of Academic Spoken English)	Spoken, academic English context transcripts	1,848,364 words	Rita Simpson	Free and open
MICUSP (Michigan Corpus of Upper-Level Student Papers)	Student A papers in Humanities and Arts, Social Sciences, Biological and Health Sciences, and Physical Sciences data from US universities	2.6 million words (829 texts)	Ute Romer	Free and open (copyright held by the Regents of the UM)
T2K-SWAL (TOEFL 2000 Spoken and Written Academic Language)		2.7 million words	Douglas Biber and NAU team	

Learner Corpora

As academic corpora construction continued, researchers realized that spoken and written language produced by students is an invaluable resource. Consequently, Gilquin, Granger, Meunier, and Paquot, who worked on the *ICLE* (International Corpus of Learner English) over the years, created the Learner Corpus Association (LCA), based at the Centre for English Corpus Linguistics of the Université Catholique de Louvain in Belguim. The LCA mission is to advance learner corpus research by providing an up-to-date list of existing learner corpora (LC), bibliography, as well as a platform for educators and researchers to exchange ideas, discuss concerns, and collaborate on projects.

On the LCA website (www.learnercorpusassociation.org), there are links to 158 Learner Corpora around the world with various target languages (e.g., Arabic, Chinese, Czech, Dutch, English) as well as different first languages (e.g., Arabic, Belarusian, Brazilian Portuguese French, Catalan, Finnish, German, Greek, Hebrew, Hungarian, Indonesian, Italian, Japanese, Korean, Malay, Norwegian, Polish, Romanian, Russian, Slovak, Spanish, Swedish, Ukrainian, etc.). For the overwhelming majority of LC, the target language is English. Interestingly, "written learner corpora are still more numerous than spoken learner corpora – they are over twice as common according to the list of Learner Corpora around the World (LCW) compiled by the University of Louvain" (Gilquin, 2015, p. 12).

As popularity of learner corpora grew, the numbers and types of LC increased around the world. Some of the largest LC are listed in Table 5, starting from the largest in size measured by the number of words. From the six listed LC, only one is spoken, and a few have Chinese and Korean as the L1 of English learners, while English is the target language.

Table 5

Sample Learner Corpora with English as a Target Language

Name	Medium/ Text Type/ L1	Approximate Size in words	Developed by	Access
CLC (Cambridge Learner Corpus)	Written, various languages	50 million	Cambridge University Press and Cambridge ESOL, UK	Commercial
HKUST (The Hong Kong University of Science & Technology Learner Corpus)	Written, mostly Cantonese, university and advanced high school students	25 million	John Milton	
The Longman Learners' Corpus	Written, essays and exam scripts	10 million	Longman	Commercial
ICLE (International Corpus of Leaner English)	Written, argumentative and literary essays, various languages	3 million	Sylviane Granger	CD-ROM + handbook, order online
The Gachon Learner Corpus	Written, Korean, Chinese & Spanish speakers	2.5 million	Brian Carlstrom	Free
NICT JLE (The Japanese Learner English Corpus)	Spoken, English oral proficiency interview test	2 million	Emi Izumi, Kiuotaka Uchimoto, & Hitoshi Isahara	Free and downloadable

Types of Corpus Research

The importance and relevance of corpus research, and learner corpus research in particular, has been emphasized time and again (Biber et al., 1998; Hinkel, 2011). The publication of *the Cambridge Handbook of Learner Corpus Research* (2015), edited by Granger, Gilquin, and Meunier, serves as additional proof of that. In Chapter 2, Callies (2015)

distinguished *corpus-informed, corpus-based*, and *corpus-driven* approaches to learner corpora

methodology which vary by the extent of corpora use. In *corpus-informed* research, corpora are

used as reference rather than data source, in clear contrast to *corpus-based* research where

naturally occurring language patterns are derived from corpora and used as data sources.

Corpus-driven research "presupposes the least degree of involvement on the part of the

researcher in that [it] is strictly based on computer techniques for data extraction and evaluation"

(Callies, 2015, p. 36), and original hypotheses are not tested in corpus-driven research. Corpus-

driven research analysis (e.g., lexical bundles) assumes that "the words come … with its

attendant phraseology" (Hunston & Francis, 2000, p. 2). Thus, for instance, the word *matter* will

most likely be followed by *of -ing*, and a similar grammar pattern may be determined for any

word in the English language. Hunston and Francis (2000) also believed that "the corpus is a

concrete replacement for the rather vague previous experience of language" (p. 3). Another

researcher who should be mentioned for his corpus work on collocations is Sinclair (1991), who

is considered one of the founding fathers of modern day corpus linguistics due to his work in

phraseology.

The types of studies that corpus researchers undertake could be sub-divided further into

cross-sectional, *longitudinal*, and *quasi-longitudinal*. *Cross-sectional* studies, where data are

collected at one point in time, represent the majority of corpus-based research. *Longitudinal*

learner corpora are relatively rare because they imply the collection of data from the same

subjects over expended periods of time. In *quasi-longitudinal* studies, researchers collect data at

one point in time but from participants with varied degrees of English proficiency. Callies

(2015) stated that "arguably, the general methodology and procedure employed in LCR to date has mostly been corpus-based, quantitative, cross-sectional, and comparative" (p. 38).

Putting Corpora Together

While some corpus researchers refer to already existing corpora (see examples in Tables 3, 4, and 5) for their empirical analyses, others choose to construct their own corpora for various reasons. One of such reasons may be that a researcher is interested in a corpus that reflects a local context (e.g., Seminole State College of Florida) and allows to answer program specific questions. Another reason may be that the type of specialized corpora (e.g., engineering, nursing, biological science, construction) does not exist, so before conducting corpus-based research, such subject specific corpora have to be compiled.

Approaches to corpus construction vary. Sinclair (2005) proposed the following ten basic principles for solid corpus construction: 1. communicative function; 2. representativeness, (a language sample rather than the whole language); 3. the use of independently contrastive components; 4. application of limited structural criteria; 5. separate storage of text and metadata; 6. inclusion of complete texts; 7. a record of decisions made during corpus composition stage; 8. representativeness and balance; 9. external controls of subject matter; and 10. homogeneity of texts. Furthermore, Sinclair (2005) advocated that a corpus without annotations, such as part-of-speech tagging (POS) is free from potential human error, while the majority of corpus researchers share the view that "adding annotation to a corpus is giving "added value," which can be used for research by the individual or team that carried out the annotation, but which can also be passed on to others…" (Leech, 2005, p. 17).

Because Leech (2005) viewed corpus annotation as absolutely necessary, he proposed the following annotation standards. He suggested keeping annotations separately along with detailed logs of how, where, when, why, and by whom they were done. Employing the same annotation and coding schemes across the board is also crucial as well as recording how linguistic consensus was reached. Also, he referred anyone looking for guidance in marking up text corpora to the EAGLES (Expert Advisory Group on Language Engineering Standards), initiated by the European Commission in the early 1990s. The EAGLES guidelines provide recommendations for *de facto* standards and are considered solid practice for corpora annotation. On the other hand, Leech (2005) cautioned that automated POS tagging is only 95 to 98% accurate, thus a closer examination of all of the tags may be required. With large and mega corpora, considerable representative portions should be sampled and verified for better accuracy by the researcher or teams of individuals.

In addition to POS annotations, other types may include syntactic (phrases and clauses), semantic (word meaning), discourse (anaphoric links, i.e., pronoun references), lexical (lemmas or base forms of the word; for example, *crying* has the lemma *cry*). Researchers may choose to further expand the types of annotations to match their needs. In learner corpora, in particular, error tags may be used to indicate the deviation from the norm and identify the types of produced errors (Granger, Hung, & Petch-Tyson, 2012); however, the notion of the "norm" has been contested as researchers have indicated that dialectal and speech community varieties should also be considered. Advances in digital technology allowed corpus researchers to develop and share a standardized coding system using SGML/HTML/XML; however, currently, there is no

expectation that every corpus researcher is also an experienced computational linguist, a lexicographer, or a coder as a wide variety of computer-assisted tools is easily accessible.

Linguistic Complexity in Corpus-based L2 Writing Research

Measures of linguistic complexity used in L2 writing research vary, allowing for coherence, content, sentence complexity, and sentence variety to be analyzed alongside grammatical errors. Referencing their taxonomic model of L2 complexity, Bulté & Housen (2012) emphasized that linguistic complexity is composed of system and structure complexity (formal and functional), while system complexity is further subdivided into lexical, morphological, syntactic, and phonological. Over the last twenty plus years, corpus-based research into L2 writing primarily focused on either grammatical or lexical aspects of complexity and much less on the interaction of the two. Bulté and Housen (2014) identified about "40 different complexity measures in a sample of 40 empirical L2 studies published between 2005 and 2008 (e.g., word/T-units, clause/sentence, number of subordinate clauses, dependent clauses/total clauses, word types/word token, number of passive forms, number of relative clauses)" (p. 44) and concluded that most studies focus on one or a few "popular" complexity measures (e.g., T-units, type/token ratios, subordination ratios), and called for more empirical studies investigating linguistic complexity changes over time as proof of L2 development.

Earlier research into L2 syntactic development was conducted with the underlying assumption that syntactic complexity was a solid indicator of L2 writing proficiency (Ortega, 2003; Wolfe-Quintero et al., 1998); therefore, *syntactic complexity* was defined as an increased use in range or variety of syntactic forms (Lu, 2011, Ortega, 2003). In their publication, Wolfe-

Quintero et al. (1998) reviewed L2 writing development research in the last decade of the 20th century and concluded that T-unit-based measures and clausal subordination were the two most commonly used measures up to that point in time, a finding corroborated by Ortega (2003) in her meta-analysis of 27 studies, where 65% failed to discriminate proficiency between low and high groups based on the MLTU (mean length of T-unit), a measure of written grammatical complexity. Moreover, Wolfe-Quintero et al. (1998) reported that only 39% of those studies (seven out of eleven) found a statistically significant relationship between T-unit complexity ration and written proficiency. As a result, for decades, L2 writing instructors as well as teacher educators believed that academic writing was structurally complex, elaborate, and explicit due to the abundance of clausal structures, number of T-units, etc. Biber and Gray (2010) proved that a similar "stereotypical" view was reflected in the literature by searching in ERIC database "114 published research articles where 'writing' and 'elaborate/ elaborated/ elaboration' appeared together, and 367 articles where 'writing' and 'explicit' occurred together" (p. 3). Such assumptions were stated but rarely tested in those publications.

Historically, grammatical complexity of the text was linked to the number of dependent clauses, allowing some researchers to count T-units, independent plus all related dependent clauses (Li, 2000; Wolfe-Quintero et al., 1998). Biber and Gray (2016) argued that "the stereotype that there is only one type of grammatical complexity – associated with clausal embedding – fails to capture the differences between conversational discourse and many sub-registers of informational written discourse" (p. 17). The researchers proved that the text was still complex even without multiple embedded clauses when phrasal devices such as noun as a pre-modifier of another noun, appositive noun phrases, and prepositional phrases were present,

all features of language compression rather than elaboration. A brief overview of some

complexity studies published in the last decade is provided in Table 6.

Table 6

Brief Overview of Complexity Studies

Authors/ Date	Source/Type of Data	Constructs	Measured/ Analyzed	Tools Used
Aktas & Cortes (2008)	corpus-based, 166 professional texts & 28 learner texts in 7 academic disciplines	lexico-grammar (nouns, conj., adv. phrases)	frequencies of shell nouns, top 6 nouns (Hinkel, 2004), chi-square	MonoConc Pro
Granger & Paquot (2008)	expert & learner writers ICLE (3 mil. words) argumentative MicroConcord & Baby BNC (2 mil. words) expository	EAP use of verbs (forms vs lemmas)	frequencies and collocations	Perl program CLAWS C7 WordSmith Tools 4
Lu (2010)	essays ($n = 40$), advanced proficiency, Written English Corpus of Chinese Learners	syntactic complexity	14 measures: length of production, sent. complexity, subord., & coord. F scores/ANOVAs	a system to measure synt. complexity
Biber et al. (2011)	academic research 429 articles (3 mil. words) in four disciplines vs 723 conversations with about 4 mil. words	grammatical complexity & type +function (adverbial, complement, and noun modifier)	finite and nonfinite clauses & phrases; independent = register; dependent = 28 features ANOVA	Biber tagger checked by hand (prepositions *in, on, with, for*)
Taguchi et al. (2013)	116 placement argumentative essays, learner corpus, US college, 2 topics, 850-1300 words	content, language, organization, vocabulary	clausal & phrasal levels, content	two raters manual coding Biber tagger

Authors/ Date	Source/Type of Data	Constructs	Measured/ Analyzed	Tools Used
Bulté & Housen (2014)	first and last essay (4 months in between), longitudinal, randomly selected, 45 adult ESL learners; MSU corpus	short-term changes in L2 writing complexity	10 syntactic & 3 lexical complexity measures Connor-Linton and Polio (2014) subjective rating of writing quality	human coding CLAN (*D*) RANGE (*AG*) 3 raters (85%-100% inter-coder agreement)
Crossley & McNamara (2014)	57 participants with beginning, middle, and end of semester timed descriptive essays each, L2 learners, MSU corpus, longitudinal	syntactic complexity (sentence variety, syntactic transformation, syntactic embedding, phrase types, phrase length)	Connor-Linton and Polio (2014) subjective rating of writing quality, repeated measures ANOVA	Coh-Metrix human rating - two raters Charniak (2000) parser
Staples & Reppen (2016)	Rhetorical analysis & long argument assignments from 1st year writing course L1 Chinese, Arabic, English 400,000 words	lexico-grammatical complexity:	TTR, attributive adjectives, nouns as pre-modifiers, verb + *that* clauses, noun + *that* clauses, adverbial clauses Factorial ANOVAs	Biber tagger

A brief and by no means extensive overview of empirical research on L2 writing complexity published in the last decade (see Table 6) demonstrated that a vast number of data sources, constructs, measures, and tools were being used by corpus researchers. From such diversity of variables and methods, it is clear that both lexical and grammatical aspects as well as clausal and phrasal features are fundamental to complexity analyses.

Lexico-Grammatical Complexity Analyses

Lexico-grammatical complexity of L2 writing has been studied using corpus-linguistics methods since 1980s. Over the years, several prominent researchers and their followers focused on lexical variations across register, genre, and style (Biber, 1988; Biber et al., 1998; Biber & Conrad, 2009; Laufer, 1994), collocations (Sinclair, 1991), pattern grammar and its lexical realizations (Hunston & Francis, 1999), and academic vocabulary in L2 writing (Granger & Paquot, 2008; Paquot, 2010).

Earlier studies showed that the use of nouns and nominalization was more important than the focus on verb tenses in academic writing (Fang et al., 2006). Later, Biber and Gray (2010) demonstrated that grammatical characteristics of professional academic writing differed from those in spoken English, challenging the stereotype that academic writing was elaborate and explicit. The researchers found that in writing, the language is "much more compressed" and "subordinate clauses – especially finite dependent clauses – are much more common in conversation than in academic writing", while "phrasal modifiers embedded in noun phrases" (Biber & Gray, 2010, p. 3) contribute the most to the grammatical complexity in writing. Furthermore, complement (e.g., finite: *that*-clauses, *WH*-clauses; non-finite: *to*-clauses, *ing*-clauses) and adverbial clauses (e.g., finite: *because*-clauses, *if*-clauses) appeared less often in academic writing, while relative clauses were found more often than in spoken genre. Moreover, phrases embedded in noun phrases (e.g., adjective modifying a head noun such as *a large number, unusual circumstance*; noun pre-modifying a head noun such as *surface tension, liquid manure*) rather than clauses were main carriers of information in academic writing.

Continuing the conversation about different complexity measures in academic writing and spoken English, Biber et al. (2011) advocated that evaluation of writing by grammatical complexity features, more commonly associated with speaking genre (e.g., clausal structures), should be abandoned. Their data showed that "the complexity of conversation is clausal, whereas the complexity of academic writing is phrasal" (p. 22). The comparison of r^2 statistics for finite dependent clauses revealed that verb + *that* clause and verb + *WH* clause structures explained 66% and 55% of the variance respectively; thus, finite dependent clauses were more prevalent in conversation than in academic writing. When the use of dependent phrase types was compared, total prepositional phrases as nominal postmodifiers had the highest r^2 value of .94, of which *of* as postmodifiers accounted for 89% of the variance, closely followed by attributive adjectives with r^2 value of .84, dominant in academic writing. Consequently, the researchers concluded that "complexity is not a single unified construct, and it is therefore not reasonable to suppose that any single measure will adequately represent this construct" (p. 29). Based on their research findings, Biber et al. (2011) hypothesized that complexity features were developmental in the following order: finite complement clauses controlled by common verbs (e.g., *think, know, say*), finite complement clauses controlled by a wider set of verbs, finite adverbial clauses, nonfinite complement clauses controlled by common verbs (e.g., *want*), the phrasal embedding in the clause in the nine possible forms isolated by the researchers, nonfinite complement clauses (stages 4a-4i), and finally preposition + nonfinite complement clause, etc.

Taguchi, Crawford, and Wetzel (2013) analyzed 116 placement essays, written by ELs in a private American university in summer of 2011 and isolated linguistic features that separated proficient writers from less proficient ones. Prospective students chose one of two given topics,

read the opposing views on that subject, and were tasked to produce an 850-1300 word argumentative essay. Essays were scored by three raters (inter-rater reliability .93) who looked at content and language, which accounted for 55% of the score, as well as organization and vocabulary (20% each) with 5% reserved for mechanics. Anyone scoring 90% or higher was placed into the native speaker composition course, while those scoring 80% or lower were referred to non-native speaker writing courses. Using the Biber tagger, researchers compared *language use* between high (*n* = 30) and low (*n* = 24) rated essays at clausal (e.g., subordinating conjunctions, verb complements, noun complements, adjective complements, *that*-relative clauses, *wh*-relative clauses) and phrasal (pre-qualifiers, pre-quantifiers, post-determiners, demonstrative determiners, singular definite and indefinite articles, singular or plural determiners, paired conjunctions, attributive adjectives, and post-noun modifying prepositional phrase) levels. Taguchi et al. (2013) found that "lower rated essays are slightly more "complex" than the higher rated essays. That is to say, the lower essays (with the exception of *that*-clause verb complements) have either higher or similar frequency counts than the higher essays" (p. 424). The researchers concluded that clause-level complexity features are inadequate measurements of proficiency in writing. However, higher frequencies of post-determiners, attributive adjectives, and post-noun modifying prepositional phrases were observed in high-rated essays, providing additional support to the earlier research claims (Biber & Gray, 2016; Biber et al., 2011) that phrasal-level complexity in writing was indicative of higher proficiency.

Whether or not ELs demonstrated syntactic development in writing over a course a semester and whether or not such development could predict human scores were two research questions that Crossley and McNamara (2014) set out to investigate using 11 Coh-Metrix clausal

and phrasal indices. Researchers concluded that even though syntactic complexity growth was observed through the automated indices, it did not seem to affect the expert rater scoring. Towards the end of the semester, L2 writers produced fewer clauses but more complex (i.e. longer) noun phrases, which did not reflect in higher human rating scores where dependent clause features (found to be more prevalent in spoken register by Biber et al., 2011) were favored by the raters. The opposite was true about verb phrases, "indicative of fewer embedded clauses" (Crossley & McNamara, 2014, p. 74). Increased use of noun phrases and greater phrasal modifications corroborated similar findings by Bulté and Housen (2014).

Recently, Biber and Gray (2016) reported that there was a clear difference in frequent grammatical structures between everyday English and academic language. Researchers found that passive voice and attributive adjectives (adj+ N) were much more common in humanities than in science writing, which favored N+N structures. In the analyzed sample of literary criticism, no examples of noun plus participle as noun pre-modifier were found, while in a biochemistry sample, appositive noun phrases were observed. Both samples contained six sentences. Humanities sample included multiple dependent noun, adverb, and adjective clauses, often embedded, while the science article only contained two dependent clauses. Biber and Gray (2016) concluded that "rather than being homogenous, consideration of actual text examples shows that there are systemic grammatical differences in the research writing from different academic disciplines" (p. 14), thus weakening the myth that all academic writing is the same.

Questioning whether comparing EAP writing to native speaker texts was "adequate and fair" and looking at both learner (*ICLE*) and professional corpora (MicroConcord & the Baby British National Corpus), Granger and Paquot (2008) compared the use of lexical verb lemmas

and word forms in EAP versus novice native-speaking and expert non-native speaking writing. Professional corpora contained over 2 million words of expository text, while *ICLE* included over 3.2 million words of argumentative writing. Granger and Paquot (2008) cautioned that "special care needs to be taken to interpret results in the light of genre analysis as some differences between learner essays and expert texts may simply reflect differences in their communicative goals and settings" (p. 197). First, the researchers used CLAWS C7 tag set to lemmatize and POS tag the texts. Only using lemmas would have resulted in "losing important information as each word form has its own individual patterning" (p. 198). Then, WordSmith Tools 4 was used to create lists of word forms and lemmas plus POS tags. The use of word forms allowed the researchers to observe that EAP students used certain verbs 47% percent in one form only. For example, verbs *associate, base, confine,* and *link* mostly appeared in the –ed form, verbs *lack* and *comprise* in the –ing form, and *entail* and *reveal* in the 3rd person singular form. Moreover, as Granger and Paquot (2008) compared the lists of the top 100 verb lemmas across corpora, they found that from 148 verbs, only 52 (35%) were the same, whereas differences in ranking and frequency were observed (e.g., *want* ranked 8 in *ICLE* vs 46 in professional corpora; *try* 19 versus 49; *help* 21 versus 66). Repeating the same analysis with verb forms, the researchers discovered that "similar frequencies at the lemma level hide over- and/or underuse at the verb form level; overuse or underuse at the lemma level affects only some of the verb forms" (Granger & Paquot, 2008, p. 202). For a closer look at the lexico-grammatical patterns, the use of lemmas and word forms of *conclude* and *argue* was compared. It was reported that EAP students overused the infinitive form of *conclude*, used the lemma of *argue* 50 percent of the time as compared to professional writers, and overused its base form.

This study revealed that lexico-grammatical analysis of EAP student writing "gives us a more precise picture of the diversity of form-meaning mappings that characterize the use of EAP verbs" (p. 210), while comparability of genres may be a limitation.

Research has shown that academic writing was not as grammatically "complex" as previously thought, however, certain embedded phrases and nominalization as well as nouns in all positions were indicative of grammatical complexity in L2 writing. On the other hand, adverbial clauses, previously considered as indicators of increased complexity and as a result of L2 proficiency, were indicative of earlier often conversational stages of language development. Only a fewer studies have looked at lexico-grammatical features of phrasal and clausal complexity of L2 writing in learner corpora at several stages of its development (Bulté & Housen, 2014; Crossley & McNamara, 2014; Granger & Paquot, 2008; Staples & Reppen, 2016; Taguchi et al., 2013). Clearly, there is a void in that type of research, which this study intended to fill.

CHAPTER THREE: RESEARCH METHODOLOGY

Orientation to Research Design

This study was a non-experimental descriptive longitudinal analysis of lexico-grammatical complexity (LGC) of English for Academic Purposes (EAP) student placement and exit writing at Seminole State College of Florida that used corpus linguistics methods and analyzed phrasal and clausal features investigated by Staples and Reppen (2016), which aligned with the instructional sequence of the EAP 1560 Advanced Grammar class. The orientation to research design of this study is presented in Figure 1 below.
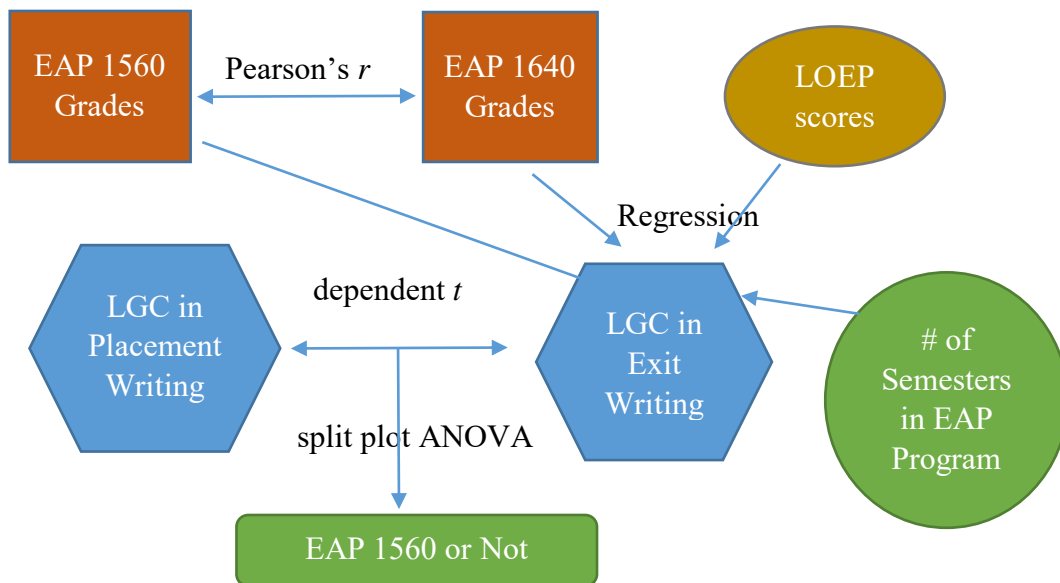
Figure 1. Orientation to research design

EAP in Florida State Colleges

Fifteen out of 28 state colleges in the state of Florida had EAP programs in the academic year 2017-2018. These programs include Broward College, College of Central Florida, Eastern

Florida State College, Florida State College at Jacksonville, Florida SouthWestern State College, Hillsborough Community College, Miami-Dade College, Palm Beach State College, Polk State College, Santa Fe College, Seminole State College of Florida, State College of Florida, St. Petersburg College, Tallahassee Community College, and Valencia College. A common state EAP course numbering system used in Florida was a result of the Sunshine State TESOL (SSTESOL) professional initiative in the late 1990s. In 2001, Florida EAP Consortium, linked to the Florida College System (FCS) Council on Instructional Affairs (CIA), was established in the state. In 2017, the EAP Consortium continued to meet twice a year to discuss EAP learner needs, academic English assessment, placement issues, curriculum standardization, and other educational components.

Historically, the four traditionally instructed linguistic dimensions of academic language have been reading, writing, listening, and speaking. Instructional models in various institutions isolated these skills as well as blended some. For example, at Seminole State College of Florida, EAP 0485 was a six-credit combined skills class where grammar and writing were taught to students with intermediate English proficiency (see Appendix A). In the Florida EAP course numbering system, any course ending in 00 is a combined speech and listening course (e.g., EAP 0300, 0400, 1500). Each Florida college that had an EAP program chose at what level to start offering EAP courses. While Miami Dade College offered level 1 and 2 courses (100 and 200 non-credit classes), the lowest level of EAP at Seminole State College of Florida was level 3 with EAP 300 (Low Intermediate Listening & Speaking), EAP 320 (Low Intermediate Reading), and EAP 385 (Low Intermediate Grammar and Writing Combined Skills) courses.

Placement into EAP

Among the 15 state colleges that offered EAP programs, there was no consensus on what measures of English language proficiency to use in order to place ELs into their respective programs. Hamp-Lyons (2011) commented that EAP placement and assessment were "the least-developed areas of the field" (p. 95) even though many EAP programs in the United States and around the world use standardized tests for placement purposes. American and Canadian institutions most often accept tests such as Test of English as a Foreign Language (TOEFL), produced by Educational Testing Services (ETS), and the International English Language Testing System (IELTS), which is jointly owned by the British Council, IDP: IELTS Australia, and Cambridge English Language Assessment. Another ETS product is the Test of English for International Communication (TOEIC), which is mostly used in Asia. Valid and reliable assessments, TOEFL and IELTS are focused on academic English.

The results of a survey conducted by the Florida EAP Consortium in 2015 indicated that only nine out of 15 EAP programs required a prospective student to provide a writing sample (seven handwritten and two computerized), while ACCUPLACER ESL was used by 70% of the respondents to test English language proficiency. Each college set its own cut-off scores. Scoring below the cut-off score prevented an EL from being admitted into degree programs, and ELs may have been required to take additional English classes. Table 7 shows which test was being used to measure English proficiency for placement purposes in some Florida colleges that offered EAP programs in the 2017-2018 academic year.

Table 7

EAP English Language Placement in Florida Colleges

College	English Placement Test	Test Sections	Cut off scores for in-house tests
Valencia College	Switched from COMPASS ESL to ACCUPLACER ESL	Essay (30 min.) Sentence Meaning, Reading Skills, & Language Use	76-85/300 level 86-95/400 level 96-105/1500 level 106-115/1600 level 116 or higher – use PERT
Seminole State College of Florida	LOEP (older version of ACCUPLACER)	Reading Skills, Sentence Meaning, & Language Use	70-84/300 level 85-94/400 level 95-104/1500 level 105-120/1600 level
Miami Dade College	COMPASS/ESL (before 02/2016) ACCUPLACER ESL (now)	Grammar, Reading, & Listening + a writing sample	Composite score 70-78/400 level 79-92/1500 level 93-99/1600 level above exempt
College of Central Florida	CPT accepts TOEFL & IELTS	Reading Comprehension and Sentence Skills	49 or below EAP Level 1 (300) 50-60 EAP Level 2 (400) 61-71 College Prep 1 72-82 College Prep 2
Broward College	LOEP accepts TOEFL & IELTS	Listening Skills Reading Skills Writing Sample	Except from EAP Listening = 101+ Reading = 114+

Research Setting and Population

The research setting for this study was Seminole State College of Florida, one of the 28 state colleges in the state and the ninth largest in the Florida College System in 2016/2017. Serving 29,014 students, Seminole State College offered six Bachelor's degrees and multiple

two-year degrees such as A.A., A.S., and A.A.S in addition to career certificates, continuing professional education, and adult education with programs such as Adult High School, AB/GED, ESOL, EAP, and Language Institute. Classes were held on four campuses in Central Florida, and programs were offered by four Schools: Arts and Sciences, Business, Health, and Public Safety, Engineering, Design, and Construction, and Academic Foundations. As per the data from Institutional Effectiveness and Research Office (https://www.seminolestate.edu/ir/), Seminole State employed 1,528 individuals in the fall of 2016, 224 of whom were full-time faculty, while 519 were part-time faculty. In 2016-2017 academic year, the gender composition of the student body was about 55% female and 43 % male. Racial and ethnic composition was as follows: Caucasian 46%, Hispanic 27%, Black 17%, Asian 4%, Two or More 3%, and Unknown 3%. Lastly, in the same academic year, 54% of the students at Seminole State College of Florida were of ages 18 to 24, whereas 25% were 25-24 years old, followed by 11 % of 35-44 year olds. There were only 6 % of 45 or older just as there were only 4% of students under the age of 18 that academic year.

The study was conducted at the English Language Studies (ELS) department at Seminole State College of Florida and, in particular, in its English for Academic Purposes Program, housed in the School of Academic Foundations, which served 1,040 students in the academic year 2015-16, accounting for about 3% of the entire college population. The ELS department had two additional programs: ESOL for residents and LI for F-1 visa holders, neither of which was the focus of this study. Seminole State College was chosen because in 2017-2018 academic year two of its full-time faculty continued to be active members of the EAP Consortium, and one of them had been its President for over a decade. In addition, English language learner

population was diverse both in age and country of origin thus allowing for a broader application of findings. Also, EAP Program at Seminole State was well-established and in existence for about 17 years by the time of the study, and it offered a wide range of courses at four levels of proficiency (see Appendices A and B). Lastly, the primary investigator for this study was a full-time EAP faculty member at the ELS Department, hired in 2008.

English Learners at Seminole State College of Florida

In the third edition of their book *Teaching L2 Composition*, Dana Ferris and John Hedgcock (2014) devoted the entire Chapter 2 to the understanding of student populations and instructional contexts of language learners. Ferris and Hedgcock (2014) identified four groups of students (i.e., international (visa) students, English as a Foreign Language (EFL) students, recent immigrants, and Generation 1.5), analyzed their writing strengths and weaknesses, and offered several generalization about each group's language potential. EFLs were those who learn English outside of the United States in their home countries, where the medium of English instruction was often students' L1. For the purpose of comparison, the Ferris and Hedgcock (2014) grouped international and EFL students together and looked at the following characteristics of academic language and literacy development across three EL populations: L1 literacy, primary cultural identification, knowledge of L2 culture, socioeconomic status, motivation to learn L2, formal knowledge about L2, L2 oral/aural skills, L2 academic reading skills, and L2 writing skills.

Using characteristics proposed by Ferris and Hedgcock (2014), the following types of EAP learners at Seminole State College of Florida were considered: Language Institute (LI) students (i.e., international/visa holders), Generation 1.5, and immigrant adult students. The last

group included both recent immigrants as well as those who enrolled into EAP classes having lived in the United States for decades.

LI Students. Usually, these students (17 years of age and older) came to Seminole State College from their home countries, held F-1 student visas, and attended face to face classes on a full-time basis. Because the LI program enjoyed a recent enrollment surge, LI students were not being placed into EAP courses as before but taught reading, writing, listening/speaking, and grammar skills separately. Culturally, LI students strongly identified with their L1 and had rather limited knowledge of American culture. The cost of out-of-state tuition at Seminole State College for the year 2017-2018 was $2,800 per one 15-week term. When one added the cost of room, board, books, etc., it became apparent that most of LI students came from middle or upper-middle class families. Their motivation to learn English may have varied from job advancement to family requirement to personal improvement, and they often had strong L1 literacy skills. In many cases, these students had prior exposure to EFL and studied English in a classroom before. Thus, LI students may have had adequate reading and writing skills, which they fine-tuned in the program. Most often, these students returned to their country of origin or chose to take college placement tests to further their education in the U.S once they were done with LI classes at Seminole State College.

Generation 1.5. This term is used to describe language learners who spend their adolescent years in American high schools. Alternative terms such as early-arriving resident students (Ferris, 2009), developmental immigrant students (Crosby, 2009), U.S.-educated multilingual writers (Nakamaru, 2010), and resident nonnative speakers of English are also used to refer to these students. Writing researchers and classroom instructors had debated for decades

whether academic language needs of these students were better served in college writing courses designed for native speakers, or whether they were more like second language learners in their language development and could potentially benefiting from ESL/EAP classes. At Seminole State College of Florida, such students enrolled in EAP classes with little or no literacy skills in their L1, and their cultural identification may have varied (Ferris and Hedgcock, 2014). Coming from working to middle class families, with extensive knowledge of American culture, they were often reluctant to take EAP classes as they saw them as a "waste of time." They might have been exposed to ESOL programs in K-12 system but may have lacked formal knowledge of English grammar structures. Fluent in oral English skills, they were weaker in reading but better in writing than immigrant adults.

Immigrant Adult Students. This group of students was probably the most diverse as it may have included older people with various levels of education, socioeconomic status, and time spent in the U.S. Their ties to the countries of origin also varied greatly. Some students traveled back regularly to visit family and friends and socialized in similar cultural, religious, and language groups in the U.S., while others preferred to remove themselves from contexts and discourses where their L1 was being used. As per Ferris and Hedgcock (2014), these students may have had some knowledge of L2 culture, were motivated to learn English for "survival and integrative purposes" (p. 38), and may have been exposed to English in a classroom before. Even though their L2 academic reading skills varied considerably, their L2 writing skills were usually weak, while their English speaking proficiency was adequate. At Seminole State College of Florida, these students were often married, with or without children. Coming from all walks of life, some were former military personnel (e.g., an army veteran from Dominican Republic

who wants to get a degree in Construction Management), business owners (e.g., a beauty salon owner from Venezuela who wants to become a registered nurse), or professionals who were looking to change fields or continue their education (e.g., a computer programmer from Syria who wants to get a degree in Information Management Systems). These students were highly motivated and aware of their strengths and weaknesses. They actively engaged in classroom discussions, were organized, and looked at EAP courses as an investment in themselves and the future of their families.

EAP Placement Testing at Seminole State College of Florida

Students were placed into the program based on three instruments, administered sequentially: 1). Reading and Writing sections of the Postsecondary Education Readiness Test (P.E.R.T); 2). Reading, Sentence Meaning, and Language Use sections of the Levels of English Language Proficiency test (LOEP), an older version of the ACUPLACER ESL; and 3). a writing sample, evaluated by full-time faculty members.

According to the Florida Department of Education website, "the P.E.R.T. is aligned with the Postsecondary Readiness Competencies identified by Florida faculty as necessary for success in entry-level college credit coursework" (http://www.fldoe.org/). If students indicated that they spent all or part of high school studying in English and scored over 106 on P.E.R.T Reading and over 103 on P.E.R.T. Writing, they were college-ready and exempt from any EAP courses. If students scored below the above mentioned cut-offs, they took LOEP and were placed according to their scores as per Table 7.

Taken by prospective EAP students at Seminole State College of Florida, LOEP test consisted of three sections with 20 questions each and did not have a time limit. The Reading

Skills section accessed reading comprehension through a series of short passages followed by questions about main ideas, supporting details, inferences, etc. The aim of the Sentence Meaning section was to analyze an EL vocabulary by asking a test taker to fill in the blanks with one of the four given words to correctly complete the sentences. The Language Use section of LOEP accessed the students' English grammar skills through a series of fill-in-the-blank multiple choice questions covering various aspects of grammar (e.g., gerunds/infinitives, verb tenses, word order, comparative/superlative adjectives, prepositions, etc.).

The final component of placement testing, a placement writing sample was produced in the testing center under timed conditions. Prospective EAP students were given a choice of two topics and 60 minutes to complete their writing. A sample placement form is included in Appendix C, while Appendix D lists placement guidelines. In addition, all placement writing topics used in this study are provided in Appendix E. One full-time faculty member, familiar with the scope and sequence of the EAP program, and regularly teaching writing and grammar courses at the upper levels of proficiency evaluated placement writing holistically, without a rubric. Essay organization, development of ideas, and language use were being considered and compared to P.E.R.T and LOEP scores before a placement recommendation was made. In case of unusual placements, where test scores seemed to contradict each other, either a second full-time faculty or the Dean of the ELS Department looked at the placement to recommend the most beneficial course sequence in the EAP program for that particular EL. Occasionally, students may have started taking classes with a split placement due to their greater proficiency in skill areas.

It is important to acknowledge that former ESOL students and Language Institute students could have potentially made up the EAP population at Seminole State College of Florida; however, the majority were direct placements. Advanced ESOL students were encouraged to take P.E.R.T and LOEP tests and transition into the EAP program. On the placement form (Appendix C), L1 data were self-reported together with years in a U.S. high school and may have been missing if students chose not to provide it. Once placement testing was completed, the level of education was verified, and transcripts were collected as part of college admission process because the minimum requirement for admission to Seminole State College of Florida is a high school diploma or its equivalent from a US or foreign academic institution.

EAP Program Exit Writing at Seminole State College of Florida

The exit writing was a handwritten exit essay examination taken by the students as part of the EAP 1640 (Advanced Writing) course requirement. In order to pass the EAP 1640 course, students had to pass the exit writing, and they were given two attempts to do so. For Round 1, students chose one of the two topics and wrote for 50 minutes. Exit exam instructions are provided in Appendix F along with exit topics used in this study, which are listed in Appendix G.

Each exit essay was read by two full-time faculty with the third rater brought in as a tie-breaker, if necessary, and was assigned a P (pass) or NP (non-pass) holistic score based on the considerations of format, paragraph structure, grammatical accuracy, and ability to produce accurate topic and thesis statements as well as sufficiently developed ideas. No rubric was being used at the time of the study. Adjunct instructors did not rate exit essays just as full-time instructors who taught EAP 1640 did not participate in the reads of their own exit exams. Those

students who did not pass Round 1 were notified by their instructors, came for an individual consultation, and took Round 2 a week later when they were allowed to write for 100 minutes. In EAP 1640, students learned how to write five-paragraph academic essays, and this was what they wrote during the exit examination.

Placement and exit essays were compared in this study because both were handwritten, produced under timed conditions, and were a part of normal operating procedures in the EAP program. Moreover, in both instances, ELs chose from two rhetorically similar topics, and one could argue that their placement and exit writing samples were a pre- and post- scenario with an exposure to EAP instruction in between.

Research Population & Sampling Procedures

EAP Pathways to English Proficiency flowchart (Appendix A) includes all EAP courses offered at Seminole State College of Florida. The analysis conducted by the Institutional Effectiveness and Research Office at Seminole State College demonstrated that students were placed and began the EAP program with various courses, as demonstrated in Table 8.

Table 8

Percentage of EAP Start Course for Those Taking EAP1640 2001-Present

Courses	300 level	400 level	1500 level	1600 level[b]
Listening/Speaking	6.44	21.65	23.69	-
Reading	.15	.83	1.92	9.71
Writing/Grammar[a]	.19	1.4	-	-
Grammar			23.23	-
Writing			1.28	9.53
Total	6.78	23.88	50.12	19.24

[a] combined skills; only at 300 & 400 levels
[b] only EAP reading and writing courses at this level

Since the inception of the program, more students started at the 1500 level than at any other level; however, the search for the appropriate sample started with the students exiting the program. For the purpose of this study, EAP students who took Round 1 of the EAP1640 Exit exam in Fall 2016 (78 students) and Spring 2017 (72 students) semesters at Seminole State College of Florida were considered *accessible* population, "all individuals who realistically could be included in the sample" (Gall et al., 2007, p. 167). The completion rate, "the proportion of the sample that participated as intended in all of the research procedures" (Gall, et al, 2007, p. 169), was 86% because only 129 students out of150 were eligible for the study.

Sampling Size Determinations

To determine the actual sample size, G*Power 3.1.9.2 was used (Faul, Erdfelder, Buchner, & Lang, 2009). Because a placement essay and an exit essay were written by the same student, these samples were treated as dependent or related for the purpose of statistical analysis in this study. A priori two-tailed analysis of difference between two dependent means using G*Power (2009) indicated that statistically significant results were achievable with alpha of .05, a medium effect size of .5 as per Cohen's (1992) guidelines, and power of .95 with the total sample of 54, which was considerably smaller than $n = 129$ used in this study.

Data Collection Procedures

This study met federal guidelines defined in Title 45 Code of Federal Regulations Part 46, Protection of Human Subjects, and was exempt from the Institutional Review Board (IRB) review at Seminole State College of Florida (Appendix I) and at the University of Central Florida (Appendix J) because it used educational tests, already existing data, and student records.

Sinclair's (2005) criteria for corpus text selection were followed. Gilquin (2015) also suggested that in any learner corpus (LC), the environment and learners should be described in extensive detail. Both writing samples were produced in formal academic environments (testing center and classroom) under timed conditions, and reference tools were not available to the writers as the tasks did not require evidence based support. The assembled learner corpus was originally handwritten, and both samples were later digitized. The last aspect of the LC, the learner, undoubtedly, offered the greatest variability to the data because learner variables such as age, gender, mother tongue, level of education, course grades, number of semesters in the EAP program, placement LOEP scores, etc. differed considerably from student to student.

Placement essays were downloaded from the college network folder by a full-time career service employee at Seminole State College of Florida, compensated for her work, who also created an Excel spread sheet with the biographical data necessary for this study. The following information about each student was entered into an Excel spread sheet: student number, age, gender, country of origin, time in the U.S., language use in high school, highest level of education, placement term, start term, date of the placement test, LOEP scores on Reading Skills, Sentence Meaning, and Language Use, the date of placement writing, placement referral, the term when EAP 1560 was taken, EAP 1560 grade, the term when EAP 1640 was taken, EAP 1640 grade, enrollment status, and number of semesters in the program. The initial data mining was double checked for accuracy. Exit essays were obtained from the department where they were kept for several semesters in case a student challenged a grade. Two adjunct instructors at SSC were paid to type placement and exit essays. The primary investigator for this study was also involved in the typing process.

Four sections of EAP 1640 were taught in Fall 2016, and four more sections were given in Spring 2017, with the total of 150 students. Two Fall 2016 classes were taught by the same full-time professor, while the other two were taught by two more full-time faculty members at the ELS department. In Spring 2017, three EAP 1640 classes were taught by adjuncts, while the fourth one was taught by a full-time faculty who also had this course in Fall 2016. Once data collection process began, a decision was made to keep students rosters intact and assign numbers from 1 to 150 to the students rather than list all students in alphabetical order.

Only the students whose placement and exit writing samples were available and who took EAP 1640 in Fall 2016 and Spring 2017 semesters were considered an accessible population for this study. Once matching of placement and exit essays started, it became apparent that certain essays and/or data could not be found or did not exist. Therefore, the following students could not be included in the analysis. A student number 10 was withdrawn from EAP 1640 class, so he never completed the exit essay. A student number 27 was a transient student from another college, and his placement scores and writing sample were not available. In addition, he transferred to Seminole State College of Florida to take only one class, EAP 1640, which he probably failed several times in another college, which further disqualified him from being a participant in this study. Students numbered 33 and 75 chose to withdraw from EAP 1640 and, as result, did not complete the exit writing. For the student number 43, placement essay was never found. Students numbered 53, 59, and 128 were transfer students and also did not take LOEP or wrote a placement essay, which made them ineligible for the pre and post analysis. Two students ended up being listed twice because they failed EAP 1640 in Fall 2016 semester and re-enrolled in the Spring 2017, thus numbers 54 and 124 were excluded from the analysis.

In addition, numbers 62 and 132 were assigned to the same person who enrolled in EAP 1640 in Fall 2016 and Spring 2017 but never took an exit test.

Once exit essay data started to be typed, it was determined that Round 1 writing samples for students 80, 87, 88, and 115 were missing. Round 2 samples for students 80, 87, and 88 were available, but because they were produced in 100 minutes instead of 50 minutes as required for Round 1 essays, they were inadmissible, and those four students were excluded from the analysis. In addition, student number 111 withdrew from the EAP 1640 class and never took the exit exam. After essay data were collected and processed, the number of participants eligible for the study stood at 129.

Next, placement and exit essays were matched to the same student. All identifiers (i.e., names, student IDs) were removed. When placement and exit essays were typed, they were saved in plain .txt format. Word choice, syntax, spelling, and grammar were preserved. Also, guidelines outlined by Reppen (2010) for corpus data collection were followed. Each file was given a recognizable name of up to 8 characters. For example, a placement essay written by a Spanish speaking female in Summer of 2015 was saved as p12fsp54.txt, where *p* stood for placement, *12* was the number assigned to this student in the Excel spread sheet, *f* for female, *sp* for Spanish, and 67 was a partial code used at Seminole State College to indicate Fall 2016, which was 2167. The following headers were included at the beginning of each corpus file inside angle brackets (< >): file name, placement or exit writing, date when the sample was written, topic/prompt, semester, L1, gender, age, and name of the typist. Reppen (2010) also recommended "using backup software and keeping copies of the corpus in multiple locations" (p.

33), which was done. Files were stored on the researcher's laptop computer, in Google Drive, and on a Seagate Backup Plus portable drive.

Instrumentation

Modern corpus researchers use a variety of computation and annotation tools, but the two types that are used the most are taggers (e.g., Biber Tagger, Brill Tagger, CLAWS, CLL POS tagger, Stanford Log-linear POS Tagger, the Stuttgart-Tubingen Tagset (STTS) TreeTagger, TOSCA-ICLE) and concordance line software programs (e.g., AntConc, MonoConc Pro, Simple Concordance Program, WordSkew, WordSmith). All above mentioned text analysis tools are reviewed next and listed below in alphabetical order. While searching for appropriate automated text analysis instruments for this study, the researcher had the following criteria in mind. Tools chosen needed to be *Windows* based, user friendly, field-tested in English, and free or easily accessible. In addition, its use had to be well-documented in peer-reviewed literature.

Part of Speech Taggers

Biber Tagger. Developed by Biber almost three decades ago, this *Windows*-based software program has probabilistic and rule-based components, lemmatizes, and uses multiple large-scale dictionaries. The Biber tagger has been used in a variety of empirical multidimensional studies (Biber et al., 2011; Friginal & Weigle, 2014; Staples & Reppen, 2016; Titak & Roberson, 2014) as well as large corpus investigation projects such as *Longman Grammar of Spoken and Written English* (Biber et al., 1999) and a comparison of university spoken and written registers (Biber, 2006). Reported to be over 97% accurate, comparable to other taggers, the Biber tagger analyzes 168 various linguistic features, yet it is not available

online. However, it may be accessed by contacting Douglas Biber or Randi Reppen at Northern Arizona University.

Brill Tagger. This was an "error-driven transformation-based" POS tagger, created by Brill (1992). The first process in its operational sequence was initialization when POS tags were assigned to words based on probability (e.g., girl is a noun). Then, the unknown words were assigned provisional tags and dealt with through the iterative application of context rules until a provisional tag was replaced with the accurate one. Brill's codes are no longer available online, and the original tagger is no longer in use. A modified English version is available for free at http://cst.dk/online/pos_tagger/uk/index.html, where 97% accuracy with very finite set of features is reported; however, that accuracy could be achieved with a corpus that exceeds 250,000 words, which is much larger than the estimated 80,000 word corpus in this study.

CLAWS. Developed by UCREL (University Center for Computer Corpus Research on Language) at Lancaster University, CLAWS stands for the Constituent Likelihood Automatic Word-tagging System and is available free at http://ucrel.lancs.ac.uk/claws/trial.html in its simplified web form. The latest version, CLAWS 7, continuously developed since the early 1980s and available for purchase as a single user or site license, has been used to tag the British National Corpus (BNC) with reported 96-97% accuracy, which varies based on the text type and sets of reported features. Several tagsets have been used over the years, from 166 basic wordtags in 1983 to 60 tags (C5 tagset) used in the BNC project. The current standard C7 tagset contains 160 tags. The use and functions of CLAWS tagger have been documented over the years (Garside, 1987, 1996; Garside & Smith, 1997). Various tagging guidelines, useful for tag accuracy decisions, may be accessed from the CLAWS website.

CLL POS Tagger. Maintained by the Computational Linguistics Laboratory at Katanov State University of Khakasia in Russia and accessible for a free download at http://yatsko.zohosites.com/cll-tagger.html, CLL POS-tagger was created there in 2002 for non-commercial use and uses probabilistic or bi-directional inference algorithm, which considers a part of speech of the token before and after the one to which a POS is being assigned. As per information listed on the website, it takes the tagger six seconds to analyze 1000 KB of text, which is fast. Publications describing the use of CLL POS tagger and its functions appeared in *Automatic Documentation and Mathematical Linguistics* journal regularly since 2007, most often written by Yatsko (also spelled Iatsko) and a few other Russian researchers. However, no other publications in peer-reviewed English journals were found, thus making this tagger not suitable as per the previously stated criteria.

Stanford Log-linear POS Tagger. Using Java 1.8+ to operate and originally released in 2004, this system produces POS tags as well as more specific tags, e.g., noun-plural. Created by Toutanova, the tagger has been improved by a team of researchers (Toutanova, Klein, Manning, & Singer, 2003) over the years. Licensed under the GNU General Public License, it is available for download in its basic (English with the Penn Treebank tag set) and full versions (plus Arabic, Chinese, French, and German) at https://nlp.stanford.edu/software/tagger.shtml. About a dozen articles using the Stanford Tagger were found in peer-reviewed journals; nonetheless, most of them used it for analyses in Arabic, Chinese, or Hindi, and accuracy data were not reported.

STTS TreeTagger. This POS tagger works with many languages and generates POS tags and lemma data. Originally developed by Schmid (1994) at the Institute for Computational Linguistics of the University of Stuttgart, TreeTagger is freely available for non-commercial use

and may be downloaded at http://www.cis.uni-muenchen.de/~schmid/tools/TreeTagger/.

Parameter files for various languages are also available online. Even though this tagger is free

and comparable to others in procedural terms, it was originally designed for German language,

and its accuracy and use have not been described in the peer-reviewed literature published in

English.

TOSCA-ICLE. This automatic POS tagger and lemmatizer (i.e., software which isolates

lemmas, base forms of the words without affixes) was developed by the researchers at the

University of Nijmegen in the Netherlands for tagging of the ICLE project, started by Granger in

1993. Its tagset consists of 16 major word classes and 219 different tags for syntax, semantics,

and morphology with the non-native material accuracy of 95% for written texts containing errors

(de Haan, 2000). The program sets sentence boundaries through tokenization, and its lexicon

contains about 160,000 token-tag pairs. The statistical component produces "probability of a

token-tag pair in view of its context" (p. 70) results. de Haan (2000) also reported that the tagger

may produce inaccurate results in verb complement identification at attributive level, and when a

token may be attributed to several parts of speech, or when words are misspelled. The fact that

POS tagging does not come first in TOSCA-ICLE may explain its difficulty dealing with learner

errors, which would make it unsuitable in this research project. In addition, no information about

its availability to public was found.

Concordance Line Software

Biber et al. (1998) indicated that "concordancing" software programs "allow the user to

search for specific target words in a corpus, providing exhaustive lists for the occurrences of the

word in context. They thus unable the analysis of lexical collocations (i.e., lexical-lexical

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association patterns), and also provide frequency information" (p. 15). The majority of such programs produce Key Word in Context (KWIC) concordances as well as various alphabetical and frequency word lists. Some allow for word lists to be compared and provide various statistical, often probability, measures. In the search for a concordance line software to be used in this study, several were reviewed.

AntConc 3.3.4. This free concordance software, available at http://www.laurenceanthony.net/software/antconc/, was developed and is maintained by Anthony (2016) at Waseda University in Japan. Over 50 article citations reporting the use of AntConc with English were found. Moreover, Google Scholar indicates that AntConc has been cited 731 times, peaking in 2015 and 2016, which makes it the most used concordance software in this review. AntConc produces word and keyword lists by comparing texts against frequency lists in reference corpora (i.e., BNC, BE06 and AME06 developed by Baker [2009], and Brown Corpus). The system also generates distribution plots of occurrence for each text file and works with lemma lists. A potential drawback for researchers working with SGML/XML/HTML corpora is that the system may not perform well with such data input methods, which is not an unusual problem for concordancers. Fortunately, the data input method in this study is plain text files, which will allow researcher to avoid the issue.

MonoConc Pro (MP 2.2). Developed by Michael Barlow (2004), currently an Associate Professor of Applied Language Studies at the University of Auckland, this concordance program is easy to use, has a friendly interface, is *Windows* based, calculates corpus and collocation frequencies, and sells for $85 per single user license. *MonoConc Easy* version sells for $45 dollars and may be particularly useful to ELs (two-year site license costs $290 for up to 15

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users), but the cheaper version does not contain Advanced Sort and Corpus Comparison features. In her review of MonoConc Pro and WordSmith Tools 3.0, Reppen (2001) pointed out that both programs "create word lists (in both alphabetical order and frequency order), generate concordance output, and give collocation information" (p. 32). When it comes to the expansion of context, Reppen (2001) found *MonoConc Pro* feature of splitting the screen to provide larger context on top and the corresponding line of concordance on the bottom portion particularly helpful for researchers. Furthermore, in *MonoConc Pro,* word counts are displayed in the right bottom corner, which is critical for norming of frequency counts (Biber et al., 1998). One of the drawbacks is that additional files are as a separate corpus but could all be grouped in "workplace."

   Simple Concordance Program. Developed by Reed, this is a free concordance and word listing program (http://www.textworld.com/scp/) that produces for KWIC and Line-Based concordances, which could be saved in HTML. Word lists can be sorted, printed, and saved, while unnecessary words may be excluded once placed on a *stoplist*. Unfortunately, the most up-to-date version (May 2016) is still being developed. This program's accuracy could not be found. Moreover, the use of Simple Concordance Program in peer-reviewed literature has been limited. It was used with Korean middle school English textbooks (Lee, 2015) and a corpus of 400 plus Bob Dylan's songs (Jean-Charles, 2007). Even through the program is free, its instability and insufficient use in the field forced the researcher to continue searching for a concordance software that would meet the previously specified criteria.

   WordSkew 1.1. This is a text analysis software available free for non-commercial use, and it has taken the creator of MonoConc, Barlow (2016), over ten years to develop it. As it is

indicated on his website, http://www.michaelbarlow.com/, the program "tracks the distribution of words or phrases with respect to their position in sentences, paragraphs and texts." Specification of text formats and general search requirements should be set before multiple files may be uploaded. Next, normalization of raw frequencies should take place to ensure the accuracy of data comparisons. A POS tag search is available as a specialized feature, but concordance lines come second after the text structure in the operational sequence. Short instructional *YouTube* videos are available at http://www.wordskew.com/. WordSkew 1.1 interface is pretty basic, but the choice of features and parameters goes well beyond the needs of the current study. In addition, due to its relatively recent launch, the program requires further field testing.

WordSmith 7.0 Tools. Used in hundreds of published articles, books, and theses since its debut in 1996, and originally developed by British linguist Mike Scott, it is a *Windows*-based considerably improved product sold by Oxford University Press (OUP) for 50 British pounds plus tax for a single user license and available for Internet download. Operating quickly even on million word (tagged or untagged) corpora, the three main components of this software package are *Concord*, a concordancer, which can process up to 16,000 lines of text at once; *WordList*, a component that creates lists based on selected corpora and performs statistical analysis; and *KeyWord*, a component that creates lists of words, word forms, and compares texts. The Cluster function allows the user to select up to eight word clusters and check for co-occurrence. Even though the word search is simple (i.e., enter the word, define text, press go) and may be used in 80 different languages, some technical issues such as random crashes, difficulties with multiple screens, and problems with data transfer into SPSS or Excel have been reported. Online help pages are available at http://lexically.net/wordsmith/support/, and WordSmith Forum offers an

open platform for discussion and support with research issues using the product (Scott, 2012), where users have reported considerable improvements made to the newest versions.

Other Tools

Computational linguistics may also use a variety of other tools (e.g., morphological taggers, semantic parsers) for automated text analyses. For example, morphological taggers allow researchers to take a closer look at parts of a single word such as prefixes, roots, and suffixes. Biber et al. (1998) indicated that in addition to commonly used POS taggers and concordance software programs, various parsers, "programs that add syntactic analysis to a corpus, identifying subjects, verbs, objects as well as more complex syntactic information" (p. 260) exist.

Another computational linguistics program, Coh-Metrix 3.0, maintained by the University of Memphis team allows researcher to analyze cohesion and coherence metrics of written texts. Coh-Metrix 3.0 generates 108 indices, combinations of which have been used in hundreds of research projects (e.g., Gonzalez, 2013; also visit www.cohmetrix.com for a list of references), but only Measure of Textual Lexical Diversity (MTLD) and the VOCD-D have been identified as useful and reliable (deBoer, 2014; McCarthy & Jarvis, 2010; McNamara et al., 2014). Because lexical diversity is not one of the constructs in the proposed study, Coh-Metrix, though valuable, will not be employed in the current study.

Having reviewed automated text analysis tools, the researcher chose Biber tagger for POS tagging, which was conducted with Dr. Randi Reppen's assistance. In addition, an offline software *AntConc* was downloaded for concordance analyses and lexical realizations of the target features.

Research Questions

Given that lexico-grammatical complexity as measured by nouns as pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, (Staples & Reppen, 2016) coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count obtained from a local learner corpus for a longitudinal analysis (using the Biber tagger and *AntConc*) have not been fully examined in the body of literature, the researcher intended to answer the following two main research questions.

1. Is there a statistically significant difference in lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count) in placement and exit EL writing in an EAP program?

2. Can lexico-grammatical complexity (pre-modifying nouns, attributive adjectives, noun + *that* clause, adverbial conjunctions, and TTR) of ELs' exit writing be predicted from EAP 1640 and EAP 1560 course grades, LOEP scores, and the number of semesters in an EAP Program?

Hypotheses

Hypothesis for Research Question One

- H_0: There is no significant difference in lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating

conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial

conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio,

average word length, and word count) in placement and exit EL writing in an EAP

program.

- H_1: Lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that*

  clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional

  subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions

  (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count

  in exit EL writing will be different than that in placement writing produced by the ELs in

  an EAP program.

Hypothesis for Research Question Two

- H_0: In exit EL writing in an EAP program, EAP 1560 and EAP 1640 course grades,

  LOEP scores, and the number of semesters in an EAP program are not significant

  predictors of lexico-grammatical complexity (pre-modifying nouns, attributive adjectives,

  noun + *that* clause, adverbial conjunctions, and TTR).

- H_1: In exit EL writing in an EAP program, EAP 1560 and EAP 1640 course grades,

  LOEP scores, and the number of semesters in an EAP program are significant predictors

  of lexico-grammatical complexity (pre-modifying nouns, attributive adjectives, noun +

  that clause, adverbial conjunctions, and TTR).

Data Analysis Procedures

The first step in any corpus data analysis is *normalization*, "a way to adjust raw frequency counts from texts of different lengths so that they can be compared accurately" (Biber et al., 1998, p. 263). Thus in order to establish a normed rate of occurrence for each feature, "raw frequency count should be divided by the number of words in the text, and then multiplied by whatever basis is chosen for norming" (p. 263). In the learner corpus compiled for this study, norming was done to 100 words.

Once student placement and exit essays were typed, they were tagged using the Biber tagger. Only the features that were of interest in this study (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count) were isolated and their counts merged with the biographical data, course grades, LOEP scores, etc. into an Excel and then SPSS file. Because "no automatic tagger is 100 percent accurate," and many researchers report "accuracy in the mid to high 90 percent range" (Biber et al., 1998, p. 262), a manual random checking of tags was conducted.

A concordance line software *AntConc* 3.4.4w for *Windows* was used to analyze lexical aspects of placement and exit writing. First, the Concordance Tool was used to conduct KWIC (KeyWord in Context) basic searches, which allowed to isolate lines of concordance for all lexico-grammatical features analyzed in this study. An example of a key word *that* search is shown in Figure 2.
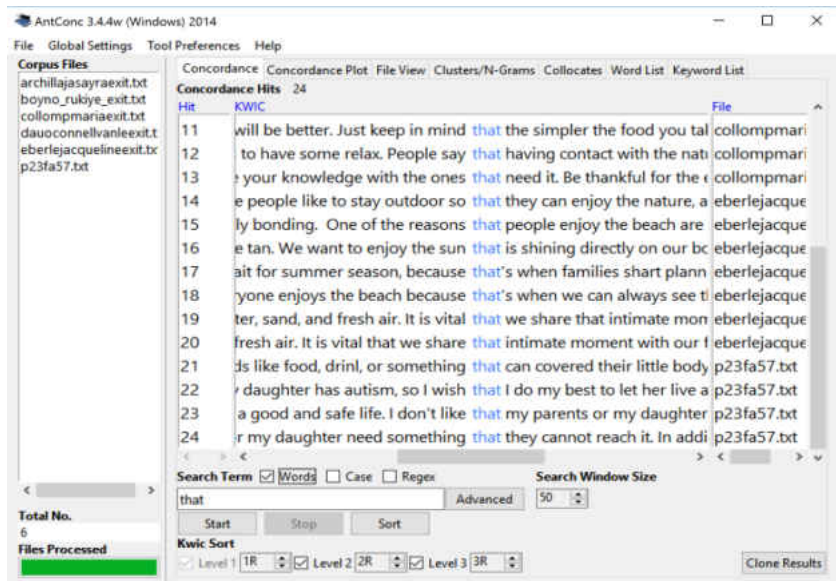
Figure 2. AntConc window with a KWIC search for that

Biber and Gray (2013) recommended a rigorous procedure for tagging accuracy evaluation, which included editing of texts affecting tagger accuracy and subsequent automatic or manual retagging, if necessary. Two of the originally typed exit and thirty placement essays were not tagging properly. Because the researcher did not have direct access to the Biber tagger, she relied on Dr. Reppen for assistance with tagging. When problems with tagging of those 32 files could not be resolved, a decision was made to retype those essays. Once retyping was completed, automatic tagging was performed successfully. Biber and Gray (2013) stated that at the Phase 2 of tagchecking, line-by-line evaluation of tags should be performed "to systematically evaluate the reliability of the automatic tags" (p.16). The researchers suggested to select a 5% sample of texts from sub corpora, which amounted to seven placement and seven exit essays in the case of this study, and review all target linguistic features. For each target feature in this study, tagger codes are provided in parentheses: pre-modifiers (n+n), attributive adjectives (atrb), noun + *that* clauses (tht+rel), verb + *that* clauses (tht+vcmp), causative

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subordinating conjunction (*because*) (cs+cos), conditional subordinating conjunctions (*if, unless*) (cs+cnd), adverbial conjuncts (rb+cnj), and coordinating conjunctions (*and, but, or*) (cls).

During the review, tagged files were uploaded to *AntConc* and wild cards (i.e., *tag code) were used to conduct line-by-line evaluation. It was noted that, in one instance, the tagger misidentified a noun as in a harmful ^nn element ^nn+nom sequence. The word *harmful* should have been labeled as an adjective. In the case where a student violated a subject verb agreement and wrote *the body need fruits*, the tagger labeled all three words as nouns and most likely counted two pre-modifying noun sequences. Tagchecking of attributive adjectives, noun + *that* clauses, and verb + *that* clauses did not reveal any problems. The search for causative subordinating conjunction (*because*) produced both clausal (*because* they need money) and phrasal (a better life *because of* its services) items with about 6:1 ratio. Both features were causative but only *because* + SV was clausal, which could have affected the results. No issues were found with the tagging of conditional subordinating conjunctions and adverbial conjuncts.

During tagchecking for coordinating conjunctions, the researcher realized that the tagger only labeled *but, and,* and *or* as such leaving out *yet, nor, for,* and *so*, which also function as coordinating conjunctions connecting two independent clauses in English. For example, because *for* may be used as a preposition and as a coordinating conjunction, the tagger did not pick it up as a clausal coordinating conjunction in the only example found in exit essays, as shown in Figure 3. In the provided example of tagged text, the first *for* is a preposition, while the second *for* is a coordinating conjunction, which was not correctly punctuated by the student. Due to such low frequency and the fact that the tagger labeled 894 instances of the use of *and, but,* and *so* correctly, this was considered a non-issue.

```
A ^at++++=A
good ^jj+atrb+++=good
destination ^nn+nom+++=destination
for ^in++++=for
a ^at++++=a
vacation ^nn+nom+++=vacation
is ^vbz+bez+vrb++=is
Orlando ^np++++=Orlando,
, ^zz++++=EXTRAWORD
for ^in++++=for
it ^pp3+it+++=it
has ^vbz+hvz+vrb++=has
the ^ati++++=the
best ^jjt+atrb+++=best
ammusement ^nn+nom+++=ammusement
parks ^nns++++=parks
in ^in++++=in
the ^ati++++=the
world ^nn++++=world,
```

Figure 3. *An Example of FOR in Tagged Text*

Lastly, the wordlist analysis using *AntConc* revealed that high frequency words such as articles (a, the), prepositions (of, in, for, with, etc.), auxiliary verbs in various forms (have, be) weren't being misspelled and thus did not affect the word count. However, in both placement and exit portions of the corpus, considerable number of words were misspelled as illustrated in Table 9, where examples of a few words starting with letters A and B are listed. Frequencies are provided in parenthesis. For the word itself, the first number is the frequency in the placement portion of the corpus, while the second one is the frequency in the exit writings. The removal of misspelled words would most likely have changed the results of the subsequent TTR analysis; however, the decision was made to proceed without any data clean up because there was value even in the misspelled words, which occurred naturally in this learner corpus. Also, the analysis of automatic tagging was deemed satisfactory, having met the suggested accuracy rate of 90%.

Table 9

Sample Spelling Variations in Placement and Exit Essays

Word (P/E)	Placement	Exit
about (110/118)	aboot (1); abote (1); abouth (1)	abot (1);
addition (6/60)	addition (1); adition (1)	addision (1)
amazing (19/24)	amaizing (2); amazin (2), amaising (1); amaixing (1)	amaizing (1)
beautiful (50/38)	beaultiful (3); beauritiful (1); beautiful (1), beuatiful (1), beutiful (1)	beatiful (2), beautifu (1), beautifull (1), becautiful (1), beutiful (1)
because (195/225)	becuase (4); becaus (1);	beacsue (1), beacuse (1)
business (4/18)	bussines (1), bussiness (2); business (1)	busines (1), business (16), bussines (2), bussnise (1)

The reliability of scores obtained from the writing samples and other measures collected from each student was tested. Mean scores and standard deviations were computed for each feature just as inferential statistics were employed to test for significance and strength of difference, where appropriate. In addition, effect sizes were reported to assist in understanding of the practical significance of the proposed study. All the necessary statistical assumptions were tested for, and outliers were identified and removed, if necessary (Gall, Gall, & Borg, 2007). The results are reported in Chapter 4.

Ethical Considerations

One of the major ethical considerations for this study was the anonymity of the participants. Every possible precaution was taken to ensure that all identifying features such as names and student ID numbers were removed. Numbers were assigned to reference the participants in the study, and data files were password protected. As per UCF IRB requirements, de-identified data are to be stored for five years. In addition, email communication between the

primary investigator and others involved in data collection and processing was conducted using a secure SSC server, and files were password protected. The focus of any corpus study is on the language in the writing samples and not the participant per se; however, various steps were taken to ensure the anonymity of the students whose placement and exit writing sample were analyzed.

Conclusion

The lexico-grammatical complexity of student writing was the focus of this study which required a local learner corpus construction. Data collection procedures did not interfere with the instructional process. Because students at Seminole State College of Florida produced EAP placement and exit writing as part of the normal operating procedures, collection and analyses of such writing samples was a beneficial non-intrusive procedure, which may have added to the understanding of EL writing development and informed the ELS department practices. Previous studies focused on grammatical complexity (Biber et al., 2011; Biber & Gray, 2016; Chan, 2010; Chandler, 2003, Crossley & McNamara, 2014; Doolan, 2014; Ferris, 1994; Hedgcock & Lefkowitz, 1992; Polio, 1997) as well as lexical complexity (Biber et al., 2004; Biber & Conrad, 1999; deBoer, 2014; Graesser et al., 2004; McCarthy & Jarvis, 2010; McNamara et al., 2014) in writing. However, fewer studies analyzed lexico-grammatical aspect of writing using learner corpora (Aktas & Cortes, 2008; Granger & Paquot, 2008; Staples & Reppen, 2016; Taguchi et al., 2013). This study was undertaken to advance this line of research.

CHAPTER FOUR: RESULTS

In this chapter, the findings of the current study are presented. First, learner corpus size and descriptive statistics about the student sample are provided along with the results of *AntConc* concordance analyses of placement and exit data. Then, research questions and respective hypotheses are restated. Descriptive statistics for each appropriate variable are listed, and the results of assumption testing are reported. The last portion of this chapter contains the results of paired samples testing and five multiple linear regressions.

The local Seminole State College of Florida learner corpus of essay writings built for the purpose of this study consisted of 258 essays produced by 129 students, each of whom wrote a placement and an exit essay. The word count for the placement essays was 34,769, while the exit writing samples had 49,100 words, putting the total word count for the learner corpus used in this study at 83,869 words. Additional information about word counts is presented in Table 10.

Table 10

SSC Learner Corpus Word Counts

	N of texts	Range	Min	Max	*M*	*SD*
Placement Word Count	129	740	17	757	269.53	124.02
Exit Word Count	129	497	214	711	380.62	97.13

In addition, average word lengths were calculated for both placement and exit writings, and the results are presented in Table 11. It is clear that in exit essays, EAP students at SSC in this sample used slightly longer words.

Table 11

SSC Learner Corpus Word Length

	N of texts	Range	Min	Max	*M*	*SD*
Placement Word Length	129	1.4	3.6	5.0	4.14	.24
Exit Word Length	129	1.5	3.8	5.3	4.39	.26

Grammatical variables included in this study and samples of their lexical realizations are included in Table 12. Original spelling, punctuation, and accuracy have been preserved in all of the corpus examples henceforth.

Table 12

Grammatical Variables and Their Lexical Realizations

Grammatical Variable	Lexical Realization
Pre-modifying nouns	body (cells), blood (pressure), energy (supply), heart (attack), ski (slope), health (care), food (program), seafood (restaurant)
Attributive adjectives	good (diet), proper medical (check-up), important (way), daily (exercise), early (detection), past (summer), older (cousins)
Noun complement clauses	Texting and driving is a bad *habit* **that** (subject) should be avoid but people continue to do this action … The best *thing* **that** (object) my children enjoy is the fireworks..
Verb complement clauses	Research **has shown** *that people who smoke …* We **can** clearly **see** *that the best schools and hospitals are located in large cities.*
Causative subordinating conjunction (*because)*	Living in a large city is so lovely **because** you name it and its always available to your hands. I'd do it **because** young people love them. Because of using phone he can not drive normal.
Conditional subordinating conjunctions (*if, unless)*	Money does not last forever **unless** you do a good invertion with it. One probably considers the neighbors like family and ask them to watch over one's house **if** one is going out of town.
Coordinating conjunctions connecting clauses and phrases (*and, but, or*)	Early detection can help us take care of any form of sickness in out body, **and** also we can prevent.. If you have time to go to a gym is the best way, **but** you can do it anywhere If we like having party on the beach, **or** if we like to swimming on clear water …

Grammatical Variable	Lexical Realization
Adverbial conjuncts (*besides, hence, finally, also, firstly, secondly, clearly, probably, maybe, else, furthermore, so, recently, lately, actually, indeed, yet, often, especially, eventually, nowadays, lastly, etc*.)	There are also cheap options **besides** the fast food. In addition, the area of services need more workers; **hence,** it is a good opportunity… **Finally,** another advantage of living in a big city… **Thus** people should try and avoid some bad habits. **Firstly,** lying is a situation whereby people do not tell the truth. **Secondly,** laziness is another habit that … **Lastly,** stealing is another very major habit …. **However,** living in a big city present certain disadvantages… Since everyone is trying to live in the city, any one bedroom apartment cost a lot of money; **therefore**, one usually have a lot of neigbors. **Indeed,** some people like to watch movies… **Probably,** they are struggling in their countries to find a job. **Furthermore,** while driving if the driver is talking with someone..

Total frequency counts of both phrasal and clausal-level complexity features, normed to 100 words, are included in Table 13.

Table 13

Frequency Counts of Complexity Features in Placement and Exit Essays

Feature	Placement	Exit
Pre-modifying nouns	214.32	337.37
Attributive adjectives	446.67	542.44
Noun + *that* clause	78.16	98.66
Verb + *that* clause	31.2	28.79
Subordinating conjunction (causative)	72.78	69.68
Subordinating conjunctions (conditional)	48.71	49.81
Adverbial conjunctions (all)	67.52	105.66
Coordinating conjunctions	116.77	154.31
All conjunctions	339.25	371.4

Lexical Realizations in Placement Essays

AntConc was used for a closer analysis of the phrasal and clausal feature frequencies and their lexical realizations. Phrasal features such as pre-modifying nouns and attributive adjectives were analyzed first. File view of *AntConc* was used to review nn + nn sequences to locate pre-modifying nouns. When a word was tagged as a noun and was followed by another word with the same nn tag, a pre-modifying noun sequence was observed. Some of the examples of such sequences were *blood pressure, energy supply, family weekend,* and *family trip.* Top ten lexical choices in the placement sub corpus for attributive adjectives, noun +*that*, verb + *that*, and adverbial conjunction features are shown in Table 14. Raw frequencies are included in parentheses.

Table 14

Top Ten Lexical Choices in Placement Sub Corpus

Top	Attributive adjectives	Noun+*that*	Verb+*that*	Adverbial conjuncts
1	great (234)	people (30)	know (30)	first (of all) (23)
2	good (206)	person (24)	say (11)	also (20)
3	best (107)	things (22)	think (8)	however (14)
4	new (89)	place (18)	see (8)	finally (10)
5	different (86)	time (14)	feel (8)	second (10)
6	beautiful (70)	season (12)	understand (4)	so (6)
7	favorite (68)	way (10)	remember (4)	therefore (4)
8	important (56)	country (8)	ensure (4)	furthermore (4)
9	bad (54)	work (7)	believe (4)	else (4)
10	big (47)	job (7)	learn (3)	yet (3)
Total counts	1234	207	95	156

Adjectives on this list "are both attributive and predicative; that is, they occur both before nouns (a <u>happy</u> man) and after link verbs (he is <u>happy</u>) (Hunston & Francis, 2000, p. 40), but these adjectives were considered attributive for the purpose of this study because they modified

nouns without linking verbs. In the placement sub corpus, there were 207 concordance line hits for noun complement clauses or adjective clauses controlled by *that*, while verb complement clauses, or noun clauses controlled by *that*, were observed 95 times. Furthermore, there were 194 concordance hits for subordinating conjunction *because,* 26 of which were followed by a preposition *of*, and a search for conditional subordinating conjunctions came back with 123 concordance hits, all of which were the usages of *if.* No uses of *unless* were recorded in placement sub corpus.

When ELs are taught coordinating conjunctions, an acronym FANBOYS is often used to refer to the seven coordinating conjunctions, which are *for, and, nor, but, or, yet,* and *so.* A search for all the coordinating conjunction tags yielded 321 concordance lines hits that included conjunctions *but* (30%)*, and* (60%)*,* and *or* (10%)*.* Only two times did *nor* come up in the placement sub corpus, with one occurrence being classified as negative coordinating conjunction (e.g., none of which have the exclusivity *nor* the sense of fun that I get from events) and the other as negative causal coordinating conjunctions (e.g., I did not practice exercise, *nor* study English). Out of eight times that *yet* was observed, it was used as an adverbial conjunction three times. From 306 times that *so* was observed, it was tagged as a qualifier (*so* good, *so* much) most of the time and as an adverbial conjunct only six times (… *so* birthday is very important).

Lexical Realizations in Exit Essays

A separate lexical realization analysis was conducted with the exit portion of the Seminole State College learner corpus. A random check of files with high counts of pre-modifying nouns revealed that grammatical inaccuracies may have affected the counts. For

example, in the phrase *guided me to anothe center*, where the word *another* was misspelled, the

tagger treated it as a nn with a question mark. The same happened in the phrase *eat more*

proteins instead of carbs, where *instead* was labeled as a questionable noun. These findings were

consistent with the placement sub corpus analysis. As such instances were rare, they were noted

and will be addressed as limitations in Chapter 5. A random review of attributive adjectives tags

did not present any problems. Exit corpus produced 2,060 concordance hits when searching for

the wild tag *atrb, all attributive adjectives. All of the attributive adjectives in this sub corpus

could also function as predicative ones. Top ten lexical choices for attributive adjectives, noun +

that, verb + *that*, and adverbial conjunction features in the exit sub corpus are shown in Table 15.

Raw frequencies are included in parenthesis.

Table 15

Top Ten Lexical Choices in Exit Sub Corpus

Top	Attributive Adjectives	Noun+*that*	Verb+*that*	Adverbial Conjunctions
1	good (138)	activity/-ies (72)	think (32)	also (67)
2	young (105)	thing/-s (35)	say (20)	first (of all) (55)
3	different (95)	habit/-s (29)	know (16)	finally (36)
4	big (78)	people (20)	show (16)	however (20)
5	large (76)	ways (13)	feel (11)	furthermore (19)
6	new (72)	party/-ies (12)	see (8)	therefore (18)
7	best (71)	place/-es (11)	wish (6)	so (17)
8	bad (45)	time/-s (11)	state (6)	second (16)
9	important (44)	friend/-s (8)	notice (4)	lastly (14)
10	great (43)	culture (5)	mind (4)	secondly (12)
Total counts	2,060	384	109	387

The *AntConc* search in the tagged exit sub corpus produced 384 concordance hits for

that+ relative clause as either subject (134) or object (187), while the remaining 63 cases were

simply *that* + relative clause (e.g., stores *that* one could may need; effects *that* most people do

not know; a city *that* large can have many places to go). Closer analysis of causative subordinating conjunctions revealed 255 concordance hits with the word *because*. Fifty-two of those hits were for a *because of* followed by a noun phrase (e.g., *because of* its potential damage, *because of* a simple text message, *because of* lottery). The search for conditional subordinating conjunctions in the tagged exit portion of the corpus using *cnd returned 196 concordance hits with only two cases of *unless*.

Moreover, in all of the exit essays, there were 1,382 concordance hits for *for* and all but one were prepositions. There were 403 concordance hits for *and* connecting both independent clauses and phrases in exit essays, while *nor* as a clausal coordinating conjunction was used twice (e.g., If people are lazy meaning they do not complete their homework *nor* do they study for the exams, the college might as well remove them; if we don't like either running *nor* dancing). *Nor* was identified as a negative coordinating conjunction by the tagger and not included in the frequency count. Next, there were 119 concordance hits for *but*, both as clausal and phrasal connectors, 608 concordance hits for *or* used to connect mostly phrases. In cases where *or* connected clauses (e.g., what day and time your purchase will ariive *or* you can choose a special day), it was labeled as coordinating connector by the tagger 54 times. *Yet* may be used as an adverb or as a clausal coordinating conjunction of contrast. In the exit portion of the learner corpus, there were 10 concordance hits for *yet*, seven of which were adverbs (e.g., they haven't visited *yet*; I am not home *yet*), but in the cases when it was used a coordinating clausal conjunction (e.g., In the news people can see how harmful texting and driving could be for sociaty *yet*, individuals proceed with this bad habit; Everyone has 24 hours equally, *yet* if someone spend lots of time to sleep..), it was tagged as adverbial conjunct.

In addition, there were 360 concordance hits for *so* with the majority used as a part of a qualifying phrase such as *so many diseases* or *so much time*. Even though they were some cases of *so* being used as clausal coordinating conjunctions (e.g., Others without thinking it twice, decide that is a good place to live, *so* they stayed; And they want to get rid of their student loans as soon as possible, *so* they don't have to pay it off after finishing school), the tagger labeled them as qualifiers. Therefore, a review of concordance lines along with tags demonstrated that only *and, but*, and *or* were included in the coordinating conjunctions clausal connector counts, which was confirmed by the tagged corpus search in *AntConc* with 581 concordance hits. When lexical analyses of data were completed, quantitative analyses of data began.

Descriptive Data About the Sample

The accessible population (i.e., sample) for this study included the students enrolled in EAP 1640 courses at Seminole State College of Florida in Fall of 2016 and Spring of 2017 semesters. The students whose placement and exit writings were analyzed in this study were 18 to 61 years of age ($M = 29.35$, $SD = 10.09$). While some students joined the EAP program as soon as they arrived in the United States, others had lived in the country for a while by the time they applied to Seminole State College of Florida. The longest self-reported time in the U.S. was 36 years, whereas the mean duration of stay was 5.02 years ($SD = 6.72$). In addition, out of 129 students, 84 were female, while 45 were male.

On the EAP program placement form at SSC, students were asked two country/language related questions: 1. In what country did you study in high school? 2. What language did you use in high school? (see Appendix C). Students in this sample reported studying in 15 distinct

languages in high school (Arabic, Bengali, Chinese, Haitian Creole, English, Farsi, French, Korean, Portuguese, Russian, Spanish, Tagalog, Thai, Turkish, and Vietnamese) as well as in a combination of their native language plus another language, most commonly English (Arabic and English, Chinese and English, English and Creole, English and Spanish, English and Turkish, French and Creole, Spanish and English, Tagalog and English, Vietnamese and English) or even several languages as in the case of Arabic, French, and English. Such combination of languages may be attributed to the fact that some students may have started their high school education abroad but completed it in the United States. Because students were not asked directly what their native or best language was, based on the self-reported data of languages used in high school, Figure 4 was complied, showing language distribution of the sample. Four students did not report any language information.
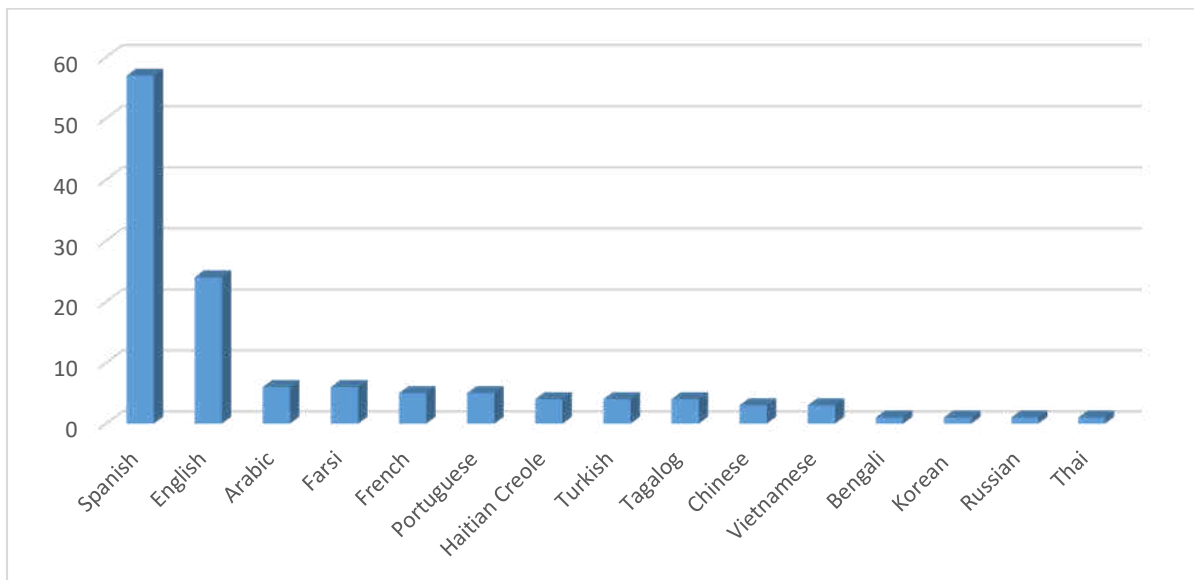
Figure 4. *Language Distribution*

The numbers and percentages of languages spoken were as follows: Spanish 57 (45.6%), English 24 (19.2%), Arabic 6 (4.8%), Farsi 6 (4.8%), French 5 (4%), Portuguese 5 (4%), Haitian

Creole 4 (3.2%), Turkish 4 (3.2%), Tagalog 4 (3.2%), Chinese 3 (2.4%), Vietnamese 3 (2.4%),

and the remaining languages (Bengali, Korean, Russian, and Thai) had one speaker each, which

was .8 percent of 125 students for whom language data were available. Due to the self-reported

nature of language data, it should be noted that in some cases students may have reported a

language they considered more prestigious (French) versus their native language (Haitian

Creole), for example. Also, a high percentage of English speakers was not surprising because

about 18% of the students were from the U.S. territory of Puerto Rico (as shown below in Table

16), and as American citizens, they may have listed English as the language used in high school.

In addition, some students may have spent all of their high school years in the United States.

One hundred twenty-eight students in the sample were from 33 different countries and

one U.S. territory, as shown in Table 16 in descending order. One student's place of origin was

unknown.

Table 16

Places of Student Origin

Place of Origin	#	%	Place of Origin	#	%	Place of Origin	#	%
Puerto Rico	23	17.97	Philippines	4	3.12	Morocco	1	0.78
Colombia	14	10.94	Turkey	4	3.12	Nigeria	1	0.78
Haiti	8	6.25	Vietnam	4	3.12	Pakistan	1	0.78
Egypt	7	5.46	Argentina	3	2.34	Russia	1	0.78
Peru	7	5.46	India	3	2.34	Saudi Arabia	1	0.78
Brazil	6	4.68	El Salvador	2	1.56	South Korea	1	0.78
Dom. Republic	6	4.68	Bangladesh	1	0.78	Sri Lanka	1	0.78
Iran	6	4.68	Congo	1	0.78	Taiwan	1	0.78
Cuba	5	3.9	Ecuador	1	0.78	Tanzania	1	0.78
Venezuela	5	3.9	France	1	0.78	Thailand	1	0.78
China	4	3.12	Hong Kong	1	0.78	Yugoslavia	1	0.78
			Laos	1	0.78			

Furthermore, the highest level of education for students in this sample varied considerably from GED to graduate degrees as it may be seen in Table 17.

Table 17

Highest Level of Education of Students in the Sample

Degree	Frequency	Percent
GED	8	6.2
High School	71	55
Technical Certificate	4	3.1
Some College	23	17.8
AA or AS	4	3.1
BA or BS	17	13.2
Two Bachelor's Degrees	1	.8
Graduate Degree	1	.8
Total	129	100

Enrollment status as well as the number of semesters spent in the EAP program at Seminole State College of Florida also varied. Out of 129 students, 73 (56.6%) were enrolled full-time, which meant that they were taking four classes or 12 undergraduate credit hours in any given semester. The remaining 56 (43.4%) students were enrolled part-time, taking one to three classes each semester.

In addition, 102 (79%) were direct placements into EAP, 25 (19.4%) were ESOL students at SSC before taking EAP placement, and 2 (1.6%) were former Language Institute students. Those students who were placed into the program at 1600 level were not required to take EAP 1560 advanced grammar class; therefore, EAP 1560 grade was not available for 37 (28.7%) out of 129 students. Missing EAP 1560 grades affected multiple regression analyses, which will be explained further in this chapter.

Research Question One

As previously mentioned, written lexico-grammatical complexity obtained from a local learner corpus for a longitudinal analysis has not been fully examined in the body of literature. Therefore, a decision was made to focus on both phrasal and clausal features of lexico-grammatical complexity and analyze nouns as pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count (Staples & Reppen, 2016). The following first question needed to be addressed.

1. Is there a statistically significant difference in lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction [*because*], conditional subordinating conjunctions [*if, unless*], adverbial conjuncts, coordinating conjunctions [*and, but, or*], all conjunctions, type to token ratio, average word length, and word count) in placement and exit EL writing in an EAP program?

It was hypothesized that some change in frequency counts for the target lexico-grammatical features would be observed. The assumptions of independence, normality, and homogeneity of variance were tested before a paired samples analysis was conducted.

Assumptions Testing

The assumption of independence was satisfied because writing samples in this study were not randomly selected but collected from a total accessible population of students who took EAP 1640 in Fall 2016 and Spring 2017 semesters. While testing for normality, the skewness statistics for the difference variables ranged between -2.01 for *type to token ratio (TTR)* to 1.885

for *adverbial conjunctions*. Nine kurtosis statistics for the difference variables were between .064 for *word length* and 2.10 for *subordinating conjunctions (causative)*; however, kurtosis for *word count* was 2.89. A much higher kurtosis statistics of 7.05 for *TTR* and 8.58 for *adverbial conjunctions* prompted further exploration. The analysis of stem and leaf plots revealed two extreme low (<=-2.0) and two extreme high values (>2.2) for *subordinating conjunctions (causative)* (*M* = .02, *SD* = .721). *Adverbial conjunctions* (*M* = -.30, *SD* = .91) had seven extreme cases (>1.5), upper outliers, while *TTR* (*M* = -1.93, *SD* = 4.85) had nine low outliers. The analysis of the histogram and stem and leaf plot for *word count* (*M* = -111.09, *SD* = 137.96) showed two lower and four upper outliers.

Thereafter, placement and exit variables were analyzed separately in order to identify potential outliers. After the removal of case 83 (*M* = 3.79, *SD* = .56, value = 6.25), which was affecting *placement adverbial conjunctions* the most, and case 30 (*M* = 26.17, *SD* = 4.08, value = .3), which was affecting the *placement TTR* the most, normality testing continued. Case number 125 was also removed because it was a low outlier in the *placement TTR* (*M* = 26.17, *SD* = 4.08, value = 17), in the *placement subordinating conjunctions (conditional)* (*M* = 3.79, *SD* = .56, value = 0), and in *placement adverbial conjunctions* (*M* = 3.79, *SD* = .56, value = 0) data, while it was also an upper outlier for *placement pre-modifying nouns* (*M* = 1.68, *SD* = 1.32, value = 7.89).

After the removal of three cases (30, 83, 125), skewness and kurtosis statistics were rerun for the difference variables, and *TTR* kurtosis was 3.53, while *word count* kurtosis rose slightly to 2.96. The rest of the skeweness and kurtosis values for difference variables were within the range of the absolute 2.0. Even after the removal of three outliers, the formal and robust test of

normality (Shapiro & Wilk, 1965), measuring whether current sample distribution was different from a normal distribution, suggested non-normality with most *S-W* statistics being significant (as shown in Table 18). The results of the *S-W* test indicated that only *pre-modifying nouns*, *all conjunctions,* and *average word length* variables might have been considered normally distributed.

Table 18

S-W Test of Normality for Difference Variables Without Outliers

Variable	*S-W*	*df*	*p*
Pre-modifying nouns	.990	126	.519
Attributive adjectives	.975	126	.018
Noun + *that* clause	.970	126	.007
Verb + *that* clause	.954	126	.000
Subordinating conjunction (causative)	.977	126	.032
Subordinating conjunctions (conditional)	.965	126	.003
Adverbial conjunctions (all)	.959	126	.001
Coordinating conjunctions	.977	126	.032
All conjunctions	.980	126	.054
TTR	.907	126	.000
Average word length	.980	126	.056
Word count	.961	126	.001

Furthermore, the observation of normal Q-Q plots for all difference variables showed that in most cases, non-normality was observed in lower and upper tails, where outliers were reported, while the rest of the values mostly fell on the diagonal line. Several indicators of normality such as skewness and kurtosis statistics, stem and leaf as well as Q-Q plots, and *S-W* statistics for the difference variables were examined; however, the assumption of normality was not fully met.

Variances as well as other descriptive statistics for all twelve phrasal, clausal, and lexical features are reported in Table 19.

Table 19

Descriptive Statistics for Dependent Variables

Variable		N	*M*	*SD*	Variance	Min	Max
Pre-modifying nouns							
	Placement	126	1.64	1.21	1.46	.00	7.11
	Exit	126	2.61	1.47	2.17	.00	6.48
Attributive adjectives							
	Placement	126	3.45	1.69	2.86	.00	9.49
	Exit	126	4.19	2.01	4.02	1.16	11.58
Noun + *that* clause							
	Placement	126	.620	.711	.505	.00	3.39
	Exit	126	.769	.653	.427	.00	2.60
Verb + *that* clause							
	Placement	126	.264	.353	.125	.00	1.80
	Exit	126	.223	.308	.095	.00	1.30
Sub. conjunctions (*because*)							
	Placement	126	.577	.612	.375	.00	2.96
	Exit	126	.524	.485	.236	.00	2.31
Sub. conjunctions (*if, unless*)							
	Placement	126	.381	.566	.320	.00	3.67
	Exit	126	.392	.515	.265	.00	2.36
Adverbial conjunctions							
	Placement	126	.486	.662	.439	.00	3.20
	Exit	126	.811	.568	.323	.00	2.57
Coordinating conjunctions							
	Placement	126	.912	.898	.807	.00	5.08
	Exit	126	1.17	.712	.508	.00	4.25
All conjunctions							
	Placement	126	2.66	1.29	1.69	.00	6.54
	Exit	126	2.84	1.21	1.46	.66	6.28
TTR							
	Placement	126	26.24	4.02	16.18	11.8	34.5
	Exit	126	27.87	2.41	5.79	22.0	34.0
Average word length							
	Placement	126	4.14	.247	.061	3.6	5.0
	Exit	126	4.39	.265	.070	3.8	5.3
Word count							
	Placement	126	273.63	122.21	14934.79	59	757
	Exit	126	381.88	97.56	9516.89	214	711

To test for homogeneity of variance of difference scores, the procedure suggested by Lomax and Hans-Vaughn (2012) was followed. "A rough benchmark for having met the assumption of homogeneity of variance when conducting the dependent t test is that the ratio of the smallest to largest variance of the paired samples is no greater than 1:4" (p. 191). In addition, Lomax and Hans-Vaughn (2012) also stated that in SPSS, "there are no tests available for inferences about a single variance or for inferences about two dependent variances" (p. 252). The biggest differences in variance were observed with *TTR* and *word count* scores; nonetheless, they were still within the 1:4 ratio. Thus, homogeneity of variance was a reasonable assumption.

Having concluded the assumptions testing, the researcher decided to run both parametric (dependent t test) and non-parametric (Wilcoxon) statistical procedures and compare the results of the two because the assumption of normality was not completed satisfied.

Results

First, a dependent samples t test was conducted using an alpha of .05 to determine whether there was a statistically significant difference in the means of lexico-grammatical complexity features exhibited in placement writing as compared to the means of those lexico-grammatical complexity features found in exit writings. The results of the dependent t test indicated that means of seven out of 12 analyzed pairs were statistically significantly different, while the other five were not (as listed in Table 20). Therefore, the researcher failed to reject the null hypotheses for noun +*that*, verb+ *that*, subordinating conjunctions (*because, if, unless*), and all conjunctions.

Table 20

Dependent t Test Results

Variable	*M*	*SD*	*t*	*df*	95 % CI		*p*	*d*
					LL	UL		
Pre-modifying nouns	-.96	1.84	-5.90	125	-1.29	-.64	.000	.53
Attributive adjectives	-.73	2.28	-3.60	125	-1.14	-.33	.000	.32
Noun + *that* clause	-.14	.84	-1.97	125	-.30	.01	.051	.18
Verb + *that* clause	.041	.45	1.02	125	-.04	.12	.309	.09
Sub. conjunction (*because*)	.052	.68	.86	125	-.07	.17	.388	.08
Sub. conjunctions (*if, unless*)	-.01	.73	-.17	125	-.14	.12	.863	.02
Adverbial conjunctions	-.32	.78	-4.61	125	-.46	-.18	.000	.41
Coordinating conjunctions	-.25	1.02	-2.84	125	-.44	-.08	.005	.25
All conjunctions	-.17	1.67	-1.18	125	-.47	.12	.237	.26
TTR	-1.62	4.25	-4.29	125	-2.38	-.88	.000	.38
Average word length	-.25	.34	-8.34	125	-.314	-.19	.000	.74
Word count	-108.2	137.3	-8.84	125	-132.4	-84.03	.000	.79

The means of pre-modifying nouns ($t_{(125)}$ = -5.690, $p < .001$), attributive adjectives ($t_{(125)}$ = -3.60, $p < .001$), adverbial conjunctions ($t_{(125)}$ = -4.61, $p < .001$), coordinating conjunctions ($t_{(125)}$ = -2.84, $p = .01$), TTR ($t_{(125)}$ = -4.29, $p < .001$), average word length ($t_{(125)}$ = -8.34, $p < .001$), and word counts ($t_{(125)}$ = -8.84, $p < .001$) were statistically significant different between placement and exit writing. Even though there was a mean difference between adverbial and coordinating conjunctions, there was no mean difference between subordinating conjunctions (*because* or causative), coordinating conjunctions (*if, unless* or clausal), and all conjunctions. The means of "*that*" verb complement clauses and "*that*" relative clauses did not differ significantly.

When interpreting Cohen's *d* (1988) effect size, using the guidelines where .20 is small, .50 is medium, and .80 is a large effect size, based on the *d* statistics listed in Table 20, it was concluded that large effect sizes were observed with average word length and word count. On

the other hand, with pre-modifying nouns and adverbial conjunctions, a medium effect size was recorded. In addition, for the TTR and attributive adjectives, the effect size was small to medium. Lastly, even though the means of coordinating conjunctions were statistically significantly different, based on the $d =.25$, the difference was small and trivial.

To further test the difference between the means because the assumption of normality continued to be questioned, a non-parametric Wilcoxon statistic was calculated for the pairs of variables with three cases removed. The significant results, shown in Table 21, aligned with the results of the dependent t test reported in Table 20 except for the noun plus "*that*" clause statistic, which was significant here but had a p value of .05 in the parametric dependent t test.

Table 21

Wilcoxon Results

Variable	Z	p
Pre-modifying nouns	-5.166	.000
Attributive adjectives	-3.662	.000
Noun + *that* clause	-2.247	.025
Verb + *that* clause	-.933	.351
Subordinating conjunction (*because*)	-.433	.665
Subordinating conjunctions (*if, unless*)	-.132	.895
Adverbial conjunctions	-5.025	.000
Coordinating conjunctions	-2.973	.003
All conjunctions	-.880	.379
TTR	-3.525	.000
Average word length	-6.861	.000
Word count	-7.585	.000

Using G*Power (2009), a two-tailed post hoc power analysis was conducted for all statistically significant pairs (dependent t) of lexico-grammatical complexity (LGC) variables with alpha of .05 and total sample size of 126. The results, shown in Table 22, demonstrated the absolute power of 1.0 with average word lengths and word counts, and other power statistics

were also extremely robust. For the pre-modifying nouns and adverbial conjunctions "the probability of rejecting the null hypothesis when it is really false will be greater than 99%, about the strongest power that can be achieved" (Lomax & Hans-Vaughn, 2012, p. 194).

Table 22

Post Hoc Power Analysis

Significant LGC variables	Power
Pre-modifying nouns	.99
Attributive adjectives	.94
Adverbial conjunctions	.99
Coordinating conjunctions	.80
TTR	.98
Average Word Length	1.0
Word Count	1.0

Next, repeated measures analysis of variance (ANOVA) with a between independent groups factor (whether or not the student took EAP 1560 grammar class) was conducted on the statistically significant variables to explain the change in score ($n = 129$). There was a statistically significant difference in placement pre-modifying nouns ($M = 1.661$, $SD = 1.333$) and exit pre-modifying nouns ($M = 2.615$, $SD = 1.471$) scores ($F_{1,127} = 21.399$, $p <.001$). About 14% of the variance in scores can be accounted for pre-modifying nouns ($\eta^2 = .144$). There was no statistically significant difference in pre-modifying nouns ($F_{1, 127} = .986$, $p = .323$) between those who took EAP 1560 grammar class ($M = 2.081$) and those who did not ($M = 2.280$). There was no statistically significant interaction effect ($F_{1, 127} = 1.332$, $p = .251$).

Moreover, there was a statistically significant difference in placement attributive adjective ($M = 3.462$, $SD = 1.766$) and exit attributive adjective ($M = 4.205$, $SD = 1.994$) scores ($F_{1,127} = 17.504$, $p <.001$). About 12% of the variance in attributive adjectives can be accounted for ($\eta^2 = .121$). There was a statistically significant difference in attributive adjectives ($F_{1, 127} =$

6.772, $p = .010$) between those who took EAP 1560 grammar class ($M = 3.626$) and those who did not ($M = 4.350$). There was a statistically significant interaction effect ($F_{1, 127} = 4.785$, $p = .031$).

A statistically significant difference in placement adverbial conjunction ($M = .523$, $SD = .831$) and exit adverbial conjunction ($M = .819$, $SD = .566$) scores ($F_{1,127} = 11.405$, $p = .001$) was observed. About 8.2% of the variance in adverbial conjunctions could be accounted for ($\eta^2 = .082$). There was a statistically significant difference in adverbial conjunctions ($F_{1, 127} = 5.317$, $p = .023$) between those who took EAP 1560 grammar class ($M = .740$) and those who did not ($M = .500$). There was no statistically significant interaction effect ($F_{1, 127} = .038$, $p = .846$).

Also, there was a statistically significant difference in placement coordinating conjunction (clausal) ($M = .905$, $SD = .898$) and exit coordinating conjunction (clausal) ($M = 1.196$, $SD = .741$) scores ($F_{1,127} = 16.21$, $p < .001$). About 11% of the variance in coordinating conjunctions (clausal) scores could be accounted for ($\eta^2 = .113$). There was no statistically significant difference in coordinating conjunctions (clausal) ($F_{1, 127} = .180$, $p = .672$) between those who took EAP 1560 grammar class ($M = 1.036$) and those who did not ($M = 1.088$). There was a statistically significant interaction effect ($F_{1, 127} = 6.830$, $p = .010$).

In addition, there was a statistically significant difference in placement TTR ($M = 25.937$, $SD = 4.67$) and exit TTR ($M = 27.869$, $SD = 2.39$) scores ($F_{1,127} = 12.285$, $p = .001$). About 9% of the TTR variance in scores could be accounted for ($\eta^2 = .088$). There was no statistically significant difference in TTR ($F_{1, 127} = .431$, $p = .513$) between those who took EAP 1560 grammar class ($M = 26.8$) and those who did not ($M = 27.16$). There was no statistically significant interaction effect ($F_{1, 127} = 1.971$, $p = .163$).

Average word length was considered next, and there was a statistically significant difference in placement average word length ($M = 4.139$, $SD = .248$) and exit average word length ($M = 4.395$, $SD = .263$) scores ($F_{1,127} = 49$, $p < .001$). About 28% of the average word length variance in scores can be accounted for ($\eta^2 = .278$). There was no statistically significant difference in average word length ($F_{1, 127} = .490$, $p = .485$) between those who took EAP 1560 grammar class ($M = 4.259$) and those who did not ($M = 4.285$). There was no statistically significant interaction effect ($F_{1, 127} = 2.878$, $p = .092$).

Finally, there was a statistically significant difference in placement word count ($M = 269.53$, $SD = 124.025$) and exit word count ($M = 380.62$, $SD = 97.131$) scores ($F_{1,127} = 61.577$, $p < .001$). About 33% of the variance in scores can be accounted for by word count ($\eta^2 = .327$). There was no statistically significant difference in word count ($F_{1, 127} = 3.215$, $p = .075$) between those who took EAP 1560 grammar class ($M = 316.391$) and those who did not ($M = 346.662$). There was no statistically significant interaction effect ($F_{1, 127} = .996$, $p = .320$).

The means of all lexico-grammatical variables based on taking or not-taking EAP 1560 were also analyzed and are listed in Table 23.

Table 23

Means Based on EAP 1560 Enrollment

Feature	Took EAP 1560 M	Didn't Take EAP 1560 M	p
Pre-modifying nouns	2.081	2.280	.323
Attributive adjectives	3.626	4.350	.010
Noun + *that* clause	.702	.645	.585
Verb + *that* clause	.242	.236	.901
Sub. conjunction (*because*)	.607	.415	.023
Sub. conjunctions (*if, unless*)	1.036	1.088	.672
Adverbial conjunctions	.740	.500	.023
Coordinating conjunctions	1.036	1.088	.672

Feature	Took EAP 1560 M	Didn't Take EAP 1560 M	p
All conjunctions	2.841	2.539	.099
TTR	26.8	27.16	.513
Average word length	4.259	4.285	.485
Word count	316.391	346.662	.320

The results of the split plot analyses are mixed, and the recommendation that every student who is placed into the program at the 1600 level should take EAP 1560 advanced grammar class is unlikely. Students who did not take EAP 1560 grammar class exhibited higher counts of phrasal features in their writing, but only the means difference for attributive adjectives was statistically significant. The results of clausal features indicate that students who took EAP 1560 grammar class in the program produced significantly more adverb clauses starting with *because* and adverbial conjunctions. The means for pre-modifying nouns, attributive adjectives, subordinating conjunctions *if* and *unless*, coordinating conjunctions, TTR, average word length, and word count were greater for those students who did not take EAP 1560, but the differences were not statistically significant in most cases. The results of the statistical analyses for question one are interpreted further in Chapter 5. Variables involved in the second research question were studied next.

Research Question Two

Measures of lexico-grammatical complexity used in research question one included not only composite scores (all conjunctions) but several unique linguistic features. To further investigate the relationship between lexico-grammatical complexity and variables such as grades,

numbers of semesters in the EAP program, and LOEP placement scores, the second research question was formulated.

>2. Can lexico-grammatical complexity (pre-modifying nouns, attributive adjectives, noun + *that* clause, adverbial conjunctions, and TTR) of ELs' exit writing be predicted from EAP 1640 and EAP 1560 course grades, LOEP scores, and the number of semesters in an EAP Program?

To cover the instructional sequence of EAP 1560 with a few grammatical features, phrasal features such as pre-modifying nouns and attributive adjective were chosen in addition to the clausal features such as adjective clauses and a composite of all conjunctions. Hypotheses related to the research question two were two-tailed as the expectations were that certain predictions about the lexico-grammatical dependent variables could be made given the above stated independent variables.

Initial Data Analysis

The dependent lexico-grammatical variables (DVs) chosen for multivariate linear regression analyses were pre-modifying nouns, attributive adjectives, noun + *that* clause, adverbial conjunctions, and TTR, all exhibited in exit writing essays and all continuous variables. The independent variables (IVs) for research question two were EAP 1560 and EAP 1640 grades, Levels of English Proficiency (LOEP) placement scores on all three sections of Reading Skills, Sentence Structure, and Language (continuous), and the number of consecutive semesters students spent in the EAP program at Seminole State College of Florida.

In the instructional sequence of courses at the EAP program (Appendices A and B), EAP 1560 (Advanced Grammar) class is a pre-requisite or a co-requisite to EAP 1640 (Advanced

Writing) class. In general, students who were placed into the program were very rarely exempt from taking EAP 1560; however, descriptive analysis of the EAP 1560 grades showed that 37 cases were missing, meaning that those students a). were except from EAP 1560, b). never took it as a prerequisite or a co-requisite to EAP 1640. Further data analysis revealed that in 36 out of 37 cases, students were recommended for placement into 1600 level and were exempt from EAP 1560. Only one student was placed into 400 level and did not take EAP 1560 by the time he or she took EAP 1640. A closer look at the data showed that 34 out of 37 students who never took EAP 1560 only spent one semester in the program by the time of this study and were enrolled full time. Three out of 37 students were part-time students and took EAP courses for two semesters by the time of the study. The following EAP 1560 grades were earned by the 92 students who took the class: 20 (21.7%) As, 41 (44.6%) Bs, 29 (31.5%) Cs, one (1.08%) D, and one (1.08%) F.

In EAP 1640 Advanced Writing class, all 129 students received grades, and there were 62 (48%) As, 54 (41.9%) Bs, 12 (9.3%) Cs, and one (0.77%) D. A Pearson correlation coefficient was calculated to investigate a possible relationship between EAP 1560 and EAP 1640 grades, and a positive correlation ($r = .321$, $n = 92$, $p = .002$) with a relatively small effect size was observed (Cohen, 1988), which was somewhat surprising considering that grammar and essay development were the two components that contributed the most to essay grades in EAP 1640 and to the passing or non-passing of the exit exam. The expectation was that grades in EAP 1560 and EAP 1640 classes would have a stronger correlation.

Descriptive statistics for LOEP placement test in Reading Skills, Sentence Structure, and Language were also analyzed. Data were available for 127 out of 129 students. One of the

students missing LOEP scores tested out on P.E.R.T and was recommended to go into ENC 1101, so he/she never took LOEP. No details were provided about the second student. The assumption of normality of distribution for LOEP test scores was tested, and the skewness and kurtosis statistics fell within the acceptable range of the absolute value of 2.0. Stem and leaf plots revealed five low outliers in the Reading Skills score, eight low outliners in the Sentence Structure score, and two low outliers in the Language score, while on the Q-Q plot, the data appeared to deviate slightly from the diagonal line, and Shapiro-Wilk's tests were all statistically significant indicating a certain non-normality. The *S-W* results were as follows: Reading Skills (*SW* = .941, *df* = 127, *p* < .001), Sentence Structure (*SW* = .867, *df* = 127, *p* < .001), and Language (*SW* = .912, *df* = 127, *p* < .001). The descriptive statistics for LOEP scores are shown in Table 24.

Table 24

Descriptive Statistics for LOEP scores

Test Section	*M*	*SD*	*N*
LOEP Reading Skills	98.81	13.675	127
LOEP Sentence Meaning	103.61	13.178	127
LOEP Language Usage	99.73	15.238	127

The analysis of Pearson's *r* showed that all three sections of the test correlated significantly at p<.001. LOEP Reading Skills scores correlated with LOEP Sentence Meaning scores at .661 and with LOEP Language Usage scores as .637, while LOEP Language Usage scores correlated with LOEP Sentence Meaning scores at .601, which was expected because these were three sections of one language proficiency test.

Students in this study spent anywhere from one to 12 semesters in the EAP program at SSC, which was contingent upon their initial placement and completion of EAP course sequence (Appendix A). About 79 % of the students completed the program in up to four semesters as shown in Table 25. Students who were studying part time, struggling with content, and repeating courses might have studied in the program longer.

Table 25

Number of Semesters in EAP Program

# of semesters	Frequency	Percent	Cumulative %
1	51	39.5	39.5
2	20	15.5	55.0
3	15	11.6	66.7
4	16	12.4	79.1
5	6	4.7	83.7
6	7	5.4	89.1
7	7	5.4	94.6
8	1	.8	95.3
9	2	1.6	96.9
10	1	.8	97.7
11	2	1.6	99.2
12	1	.8	100.0

The number of participants for the regression analysis went down from 129 to 91 because 37 students were missing EAP 1560 grades, of whom students number 39 and 42 were also missing LOEP scores.

Assumptions Testing and Results

According to Lomax and Hans-Vaughn (2011), the assumptions for multiple linear regression "are concerned with (a) independence, (b) homogeneity, (c) normality, (d) linearity, (e) fixed X, and (f) noncollinearity" (p. 671), which are addressed below together with the results for each of the five individually run multiple linear repression analyses.

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Pre-modifying Nouns in Exit Essays

The first multiple linear regression analysis was performed to answer the question whether EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters in the EAP program were significant predictors of the pre-modifying nouns in exit student essays. During the assumptions testing phase of the analysis, simple scatter plots of unstandardized predicted values over studentized residuals as well as descriptive statistics for standardized DFBETA were analyzed. The highest unstandardized residual was 3.91, greater than an absolute value of two, which suggested some non-linearity, while all standardized DFBETA values were within the acceptable range. Two upper outliers were visible on the box plot of the unstandardized residuals, but no cases outside of the three standard deviations were singled out by the casewise diagnostic procedure. Cook's maximum distance of .056, Shapiro-Wilk's test of normality (SW = .980, df = 91, p = .175) as well as skewness (.431) and kurtosis (-.141) of the unstandardized residuals indicated that normality was a reasonable assumption. Durbin-Watson statistic equaled 1.764, suggesting that the assumption of independence was met. The assumption of multicollinearity was satisfied as collinearity tolerance fell between .499 for LOEP Reading Skills and .867 for EAP 1640 grades with the variance inflation factor statistics ranging from 1.154 for EAP 1640 grades to 2.003 for the LOEP Reading Skills score.

Once all of the assumptions were tested for and met, a multiple linear regression was calculated to predict exit pre-modifying nouns based on the EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters in the EAP program. The results of the regression were non-significant ($F_{(6, 84)}$ = .550, p = .769) with R^2 = .038, and the researcher failed to reject

the null hypothesis. Also, as demonstrated in Table 26, none of the IVs tested were significant

predictors of the exit pre-modifying noun scores.

Table 26

Coefficients for Exit Pre-modifying Nouns

Model	B	Beta	t	p
(Constant)	.594		.338	.736
Grade in 1560	.166	.088	.731	.467
Grade in 1640	.044	.019	.167	.868
LOEP Reading Skills	.027	.241	1.591	.115
LOEP Sentence Meaning	.000	-.003	-.023	.982
LOEP Language Usage	-.010	-.106	-.747	.457
Number of Semesters	.018	.030	.263	.794

a. Dependent Variable: Exit Pre-Modifying Nouns (NN sequences)

Attributive Adjectives in Exit Essays

A multiple linear regression was conducted to determine whether exit attributive

adjective scores could be predicted from EAP 1560 and EAP 1640 grades, LOEP test scores, and

the number of semesters a student spent in the EAP program at Seminole State College of

Florida. The review of partial scatterplots of the DV attributive adjectives in exit essays versus

predicted values and IVs (EAP 1560 and EAP 1640 grades, LOEP scores, and number of

semesters in the program) suggested that linearity might be a reasonable assumption; however,

the analyses of scatterplots of unstandardized residuals revealed that certain values fell outside of

the absolute value of two, suggesting that linearity might not have been achieved. The

assumption of normality was tested through unstandardized residuals. Once casewise

diagnostics were reviewed, three outliers outside of two standard deviations were identified and

removed (see Table 27). The resulting skewness (.534) and kurtosis (.-505) suggested that

normality was a reasonable assumption; nonetheless, *S-W* test of normality for unstandardized

residuals was statistically significant ($SW = .955$, $df = 88$, $p = .004$).

Table 27

Casewise Diagnostics for Exit Attributive Adjectives

Case Number	Std. Residual	Exit Attributive Adjective	Predicted Value	Residual
8	3.991	11.58	3.9296	7.65039
10	2.623	9.57	4.5411	5.02888
74	2.436	8.99	4.3201	4.66995

Maximum Cook's distance of .130, considerably lower than one, suggested that

normality was a reasonable assumption. Durbin-Watson statistic, testing independent residuals,

was at 2.305, which served as an indication that the assumption of independence was met, while

a random display of points on the studentized residuals scatterplots suggested that the

homogeneity of variance assumption was met. Collinearity tolerance ranged from .501 to .875,

and the variance inflation factor statistics fell between 1.143 for the number of semesters in the

EAP program and 1.996 for LOEP Reading Skills score, all less than 10, which provided

additional evidence that multicollinearity assumption was met.

With $n = 88$, a multiple linear regression was calculated to predict exit attributive

adjective score based on EAP 1560 and EAP 1640, LOEP test scores, and the number of

semesters spent in the EAP program. A non-statistically significant regression was found ($F_{6,81}$

$= 1.232$, $p = .299$) with $R^2 = .084$, and the researcher once again failed to reject the null

hypothesis. Therefore, none of the IVs was a statistically significant predictor of exit attributive

adjectives as shown in Table 28.

Table 28

Coefficients for Exit Attributive Adjectives

Model	B	Beta	t	p
(Constant)	5.109		2.903	.005
Grade in 1560	-.247	-.128	-1.079	.284
Grade in 1640	.147	.063	.555	.580
LOEP Reading Skills	.028	.247	1.645	.104
LOEP Sentence Meaning	-.025	-.221	-1.541	.127
LOEP Language Usage	-.012	-.120	-.850	.398
Number of Semesters	-.056	-.092	-.795	.429

a. Dependent Variable: Exit Attributive Adjectives

Noun + *that* Clause in Exit Essays

In the next multiple linear regression analysis, a relationship between frequencies of noun + *that* clause feature in exit essays and EAP 1560 and EAP 1640 grades, LOEP placement scores, and the number of semesters in the EAP program was investigated. The review of unstandardized predicted value and independent variable plots showed that data points were mostly randomly distributed, but a few fell between 2.00 and 3.00, suggesting that linearity might have been a problem. No outliers were observed in the boxplot of the unstandardized residuals, while on the Q-Q plots data points fell along the diagonal line except for the tails. Even though S-W statistic of the unstandardized residual ($SW = .940$, $df = 91$, $p < .001$) was statistically significant indicating some non-normality, skewness (.695) and kurtosis (-.164) of the unstandardized residual as well as Cook's maximum distance of .056 indicated the opposite. The Durbin-Watson statistic was 1.778, an acceptable evidence of independence. None of the Pearson *r* correlations were statistically significant and ranged from -.004 to -.081. Moreover,

tolerance was greater than .499, and the variance inflation factor was less than 2.003, both

indicating that multicollinearity was not a problem with these data.

A multiple linear regression analysis to predict noun + *that* clause (i.e., "*that*" relative

clauses) from EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters in the

EAP program did not produce any statistically significant results ($F_{(6, 84)}$ = .504, *p* = .804) with

R^{2} = .035. All relevant statistics are shown in Table 29, and the null hypothesis was not rejected.

Table 29

Coefficients for Exit That *Relative Clauses*

Model	B	Beta	t	p
(Constant)	.867		1.129	.262
Grade in 1560	-.008	-.010	-.079	.937
Grade in 1640	.004	.004	.031	.975
LOEP Reading Skills	.011	.226	1.488	.141
LOEP Sentence Meaning	-.009	-.190	-1.303	.196
LOEP Language Usage	-.002	-.048	-.337	.737
Number of Semesters	.003	.011	.094	.926

a. Dependent Variable: Exit *That* Relative Clauses

Adverbial Conjunctions in Exit Essays

Next, assumptions for a multiple linear regression predicting exit adverbial conjunctions

based on the same IVs (grades, LOEP scores, and the number of semesters in the program) were

tested. During the review of simple scatterplots of standardized residuals for each variable,

values above 3.00 were observed, suggesting that linearity might not have been a reasonable

assumption. As a result of casewise diagnostic review, case 66 was identified as a potential

outlier, but it was not excluded from further analysis because the unstandardized residual

skewness (.829) and kurtosis (.409) statistics were indicating normality. S-W's statistic (SW =

.947, df = 91, p = .001), however, suggested some potential non-normality of the distribution.

Maximum Cook's distance of .135 further suggested that normality was a reasonable assumption. The assumption of independence was satisfied with Durbin-Watson statistic of 2.341. Multicollinearity was not an issue because tolerances and variance inflation factors for the IVs were the same as described in the section on exit pre-modifying nouns earlier in this chapter.

The results of the multiple linear regression suggested that a significant portion of the exit adverbial conjunctions could not be predicted ($F_{6,84} = 1.612$, $p = .154$) from the EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters in the EAP program, and the R^2 equaled .103 with about 10% of the variation in exit adverbial conjunctions explained by all IVs. Most independent variables were not statistically significant predictors of exit adverbial conjunctions as shown in Table 30 except one, LOEP Sentence Meaning score, for which the unstandardized partial slope (.-014) and standardized partial slope (-.334) were statistically significantly different from 0 ($t = -2.384$, $df = 84$, $p = .019$). With every one point increase in LOEP Sentence Meaning score, exit adverbial conjunctions will change approximately 1/100 of one point when controlling for the IVs.

Table 30

Coefficients for Exit Adverbial Conjunctions

Model	B	Beta	t	p
(Constant)	2.300		3.648	.000
Grade in 1560	.028	.039	.340	.735
Grade in 1640	-.127	-.149	-1.346	.182
LOEP Reading Skills	.000	.005	.036	.971
LOEP Sentence Meaning	-.014	-.334	-2.384	.019
LOEP Language Usage	.001	.030	.220	.827
Number of Semesters	-.004	-.018	-.164	.870

a. Dependent Variable: Exit Adverbial Conjunctions

Type to Token Ratio in Exit Essays

As part of the research question two, the last multiple linear regression analysis was conducted to determine whether an exit TTR score could be predicted based on the independent variables EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters students were enrolled in the EAP program at Seminole State College of Florida. Linearity was a reasonable assumption with random display of points. After the review of extreme values, cases 55 and 116 were excluded from the analysis as they were affecting multiple variables with highest values. Once the outliers were removed, the descriptive analysis of unstandardized residuals, skewness (-.163), kurtosis (-.235), and Shapiro-Wilk's statistics ($SW = .985$, $df = 89$, $p=.416$) suggested that normality was a reasonable assumption, which was further observed with the Cook's maximum distance was .167. Durbin-Watson's statistic was 2.389, pointing to the fact that the assumption of independence of errors was met. With the removal of the outliers and $n=89$, collinearity statistics improved slightly. With tolerance no less than .478 and no greater than .862 and variance inflation factors between 1.160 for EAP 1640 grades and 2.093 for LOEP Reading Skills score, multicollinearity was not an issue.

The results of the regression suggested that a significant portion of the total variation in exit TTR was predicted by the EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters in the EAP program, $F_{(6, 82)} = 5.256$, $p < .001$ with R^2 of .278, which indicated that approximately 28% of the variance in the exit TTR could was predicted by the IVs, a relatively small effect size when using Cohen's (1988) interpretation guidelines. The researcher rejected the null hypothesis for this regression analysis. Additionally, most of the independent variables were non-significant predictors of the exit TTR (Table 31) except for LOEP Language Usage

score, for which the unstandardized partial slope (.064) and standardized partial slope (.427) were statistically significantly different from 0 ($t = 3.374$, $df = 82$, $p = .001$). With every one point change in LOEP Language Usage score, the exit TTR was predicted to change less than one-half of one point when controlling for other IVs. The post hoc power analysis using G*Power (2012) with alpha of .05, sample size of 89, and six predictors was .97.

Table 31

Coefficients for Exit Type/Token Ratio

Model	B	Beta	t	p
(Constant)	18.991		8.115	.000
Grade in 1560	.390	.136	1.286	.202
Grade in 1640	.359	.103	1.023	.309
LOEP Reading Skills	.002	.010	.073	.942
LOEP Sentence Meaning	.015	.091	.716	.476
LOEP Language Usage	.064	.427	3.374	.001
Number of Semesters	-.110	-.119	-1.173	.244

a. Dependent Variable: Exit Type/Token Ratio

Conclusion

To address research questions posed in this study, all appropriate statistical analyses were performed and described in detail in this chapter. Twelve paired parametric and non-parametric analyses of lexico-grammatical variables were conducted. Dependent *t* test results showed that frequency counts for such features as pre-modifying nouns, attributive adjectives, adverbial conjunctions, coordinating conjunctions, TTR, average word length, and word count changed significantly, and students produced more of those features in their exit writings than in their placement essays. Non-parametric Wilcoxon test indicated that such a change was also

observable with noun + *that* clauses. The frequencies of verb + *that* clauses and subordinating conjunction *because*, though non-significant, actually decreased.

A split plot ANOVA allowed to see whether a change in above mentioned statistically significant lexico-grammatical features could be attributed to grammar instruction in EAP 1560. The results showed that there was no statistically significant difference between those who took EAP 1560 class and those who did not on pre-modifying nouns, noun + *that* clauses, verb + *that* clauses, subordinating conjunctions (*if, unless*), coordinating conjunctions, TTR, average word length, and word count. On the other hand, those students who did not take EAP 1560 class did statically significantly better on attributive adjectives but worse on subordinating conjunction (*because*) and adverbial conjunctions than those students who took the advanced grammar class.

Lastly, five multiple linear regression analyses were conducted to predict frequencies of exit pre-modifying nouns, attributive adjectives, noun + *that* clauses, adverbial conjunctions, and TTR from EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters students spent in the EAP program at SSC. The only significant regression analysis was with TTR, and 28% of its variance could be explained by the independent variables. LOEP Language Usage score was the only significant individual contributor to the model. Even though it was not possible to predict exit adverbial conjunctions from the chosen IVs, LOEP Sentence Meaning score proved the only significant contributor to that model. In Chapter 5, the results of statistical analyses are discussed in detail along with practical applications of the findings. Also, potential limitations of this study are considered, and the directions for future research are explored.

CHAPTER FIVE: DISCUSSION

The results of this longitudinal descriptive study on lexico-grammatical complexity in L2 writing using corpus linguistics methods are discussed in this chapter. The findings are summarized, and LGC developmental gains or lack thereof are explained within the framework of the most current lexico-grammatical research. In addition, limitations of the study as well as implications for practice and recommendations for future research are explained.

Purpose of the Study

The purpose of this study was to investigate both phrasal and clausal lexico-grammatical features as evidence of writing development for L2 students exiting the EAP program at Seminole State College of Florida. This research project was largely guided by the basic assumption of learner corpus research (Conrad, 2000) that an increase in frequency counts and variety of structures marks the development of ELs' language proficiency. Twelve lexico-grammatical features (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count) were chosen for the analysis because they were previously described in the literature (Staples & Reppen, 2016; Taguchi et al, 2013), aligned with the curriculum of EAP 1560 Advanced Grammar class taught at SSC, and allowed the observation of the progression of complexity development as hypothesized by Biber et al. (2011): verb + *that* clause (stage 1), finite adverbial clauses, phrasal embedding in the clause

(adverbs as adverbials), and attributive adjectives (stage 2), and noun + *that* clause and pre-modifying nouns (stage 3).

Furthermore, the purpose of this study was "to gauge proficiency, to describe performance, and to benchmark development" (Ortega, 2012, p. 128) using a local learner corpus at Seminole State College of Florida. Proficiency was gauged as EAP students were entering and exiting the program, and their performance was described through lexical realization of grammatical features in both placement and exit writings provided in Chapter 4.

In addition, the purpose of the study was not only to advance the chosen line of research, but to provide concrete practical recommendations to the ELS department at SSC pertaining to placement and exit procedures as well as EAP 1560 and EAP 1640 courses. Two empirical objectives were set to achieve these goals. The first objective was to provide quantitative evidence of change in the selected phrasal and clausal lexico-grammatical complexity features between placement and exit essays and to investigate whether instruction at the advanced grammar class (EAP 1560) could explain the differences in scores. The second goal was to predict five measures of lexico-grammatical complexity (pre-modifying nouns, attributive adjectives, noun + *that* clause, adverbial conjunctions, and TTR) using EAP 1640 and EAP 1560 course grades, LOEP scores, and the number of semesters student spent in the EAP Program at SSC. The two instruments used in his study to facilitate observation of these measures were the Biber part of speech grammatical tagger and concordance software *AntConc*.

Summary of the Findings

In this study, the first research question investigated whether EAP students exhibited higher counts of the following twelve lexico-grammatical features from the time they entered the EAP program at SSC until the time they exited it: pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word counts.

Research question one. Paired samples statistical analyses of individual lexico-grammatical variables (*n* = 126) produced mixed results. Between placement and exit EAP writing, there was no statistically significant change in normed-to-100 words frequency counts of the clausal features such as noun + *that*, verb + *that*, subordinating conjunctions *because, if, and unless* as well as all conjunctions when parametric tests were run.

Actually, the usage of verb + *that* clauses and subordinating conjunction *because* decreased between placement and exit writing. This change could be explained by the fact that "clausal complexity features (e.g., adverbial clauses and verb complement clauses) tend to be more strongly associated with personal, spoken task types" (Biber, Gray, & Staples, 2016, p. 663); therefore, a conclusion may be drawn that even though EAP students were producing written work, they were employing linguistic devices more commonly associated with conversational genre. In addition, no change between placement and exit writing in verb + *that* clause (stage 1) and finite adverbial clauses (stage 2) (Biber et al., 2011) may suggest that students have already mastered those structures. An interesting observation, made by Staples, Egbert, Biber, and Gray (2016), could explain current non-significant findings even further. The

researchers suggested that "writing development during the college years is not restricted to learning new genres or specific disciplinary expectations. Rather, development also occurs in the underlying grammatical structures that writers use as they move toward the discourse styles of successful professional academic writers" (p. 154).

Biber et al. (1998) compared the use of verb + *that* clause in conversation and academic writing. They listed the most common verbs *show, say, find, suggest,* and *see* controlling complement clauses counting 100 occurrences per million words in academic prose. *Show* had 300 occurrences, while *say, find, suggest* and *see* had 200 each. The findings of this study demonstrated that the most frequent verbs controlling complement clauses in the local EAP corpus at SSC were *know* (46), *think* (40), *say* (27), *feel* (19), *see* (16), with frequency counts listed in parenthesis. According to Biber et al. (1998), "the extremely high frequency of that-clauses in conversation is directly linked to the frequent co-occurrence of these clauses with three matrix verbs *think*, *say,* and *know*" (p. 103). Clearly, when it came to verb + *that* clauses in their writing, EAP students in this study favored spoken rather than written register. The verb *show*, which topped the academic prose list for Biber et al. (1998), only showed up six times in the verb + *that* position in this study.

On the other hand, a statistically significant change in the means of phrasal features such as pre-modifying nouns and attributive adjectives was found in this study. Also, the use of adverbial conjuncts in their exit writing almost doubled, while the means for coordinating conjunctions, TTR, average word length, and word count increased significantly. These findings seem to be supported by earlier research. In their study of spoken and written TOEFL iBT responses, Biber et al. (2016) reported that phrasal structures such as pre-modifying nouns and

attributive adjectives "are much more strongly associated with informational, written task types" (p. 663), lending more support to earlier findings that phrase-level complexity is truly characteristic of written academic discourse (Biber et al., 2011; Biber & Gray, 2016). Because phrasal features such as pre-modifying nouns and attributive adjectives indicate structural compression in the English language, while clausal structures signal structural elaboration (Biber & Gray, 2010), it may be suggested that by producing more of the compressed features, EAP students demonstrated improved English language proficiency by the end of the program.

In addition, Byrnes, Maxim, and Norris (2010) along with Norris and Ortega (2009) predicted that linguistic complexity of the EL writing at the intermediate levels of proficiency gave way to phrasal elaboration. At the upper-intermediate level of English proficiency, Bulte and Housen (2014) found increased phrasal elaboration but no changes in subordination. In this study, significant changes in phrasal structures (pre-modifying nouns and attributive adjectives) and no significant changes in the use of subordinating conjunctions seem to corroborate previous findings (Bulte & Housen, 2014; Byrnes et al. 2010; Norris & Ortega, 2009).

Taguchi et al. (2013) also used the Biber tagger to analyze several measures of clausal and phrasal complexity, among which were subordinating conjunctions, verb + *that* clause, noun + *that* clause, and attributive adjectives, three of the features used in this study. Their analysis of low-rated versus high-rated essays demonstrated that "the lower rated essays had more subordinating conjunctions and *that*-relative (i.e., noun + *that)* clauses, while higher rated essays had more that-clause verb complements" (p. 424). If one were to consider placement essays in this study as similar to low-rated essays, exit essays could hypothetically serve as an equivalent to Taguchi et al.'s (2013) high-rated essays. When looking at phrasal structures, Taguchi et al.

(2013) found that attributive adjectives had higher counts in high-rated essays (466 versus 343.9, normed to 10,000 words), which was also the case in this study: 542.44 in exit essays versus 446.67 in placement essays. As for the clausal level complexity features, the findings in this study showed that noun + *that* clauses had lower counts in placement essays, while both verb + *that* clauses and subordinating conjunction *because* counts had greater counts in placement essays, which partially contradicted Taguchi et al. (2013) findings where noun + *that* clause and subordinating conjunction counts were higher in low-rated essays, but verb + *that* clause counts were greater in high-rates essays. Therefore, Taguchi et al. (2013) conclusions seem partially applicable to the results of this study:

> (1) higher proficiency writers do not necessarily produce more complex language at the clausal level, (2) measuring subordination as the sole indicator of complexity is an over-simplification of complexity, and (3) complexity measured by the use of dependent clauses does not characterize academic writing. In fact, excessive subordination can be problematic (p. 426).

One of the explanations why the current findings differed from those of Taguchi et al. (2013) might have been higher proficiency of their writers as demonstrated by the most frequent verbs in verb+ *that* clause (*believe, argue, claim, say, state, mean*). At the SSC local corpus, the verb *say* was used 11 times in placement and 13 times in exit essays in verb + *that* clauses, while the verb *believe* was used only four times in the placement essays. The verbs *argue, claim, state,* and *mean* were not used as anchors for *that*-clause verb complements at all by the writers in this study.

With a non-parametric Wilcoxon test, an additional statistically significant change in the means of noun + *that* clauses was observed. Biber et al. (2011) hypothesized that "*that* relative clauses, especially with animate head nouns (…*the guy that made that call*)" (p. 30) belonged to

grammatical features of the third stage, while "complement clauses controlled by nouns (the *hypothesis that female body weight was more variable*" (p. 31) were indicative of academic language at the highest 5th stage. In the total learner corpus in this study, there were 590 concordance hits for the wild card *tht+rel search, some of which were tht+ rel + obj (e.g., *the respect that you show them; so many years that I don't go there; the place that I choose to visit*) while others were tht + rel + subj (eg., *I know many people that worked in TV; Different styles music show different emotions that attract different groups of people*). Nonetheless, lexical choices for complements controlled by nouns in this study were not indicative of advanced academic proficiency. Hunston and Francis, (2000) indicated that "some of the nouns that are found in this pattern indicate a reaction to a situation" (p. 98), and closer analyses of collocates revealed that the most frequent nouns (*activities, things, people, time, habit*; see Appendices E and G) were taken directly from the topics that students were assigned. Overall normed counts for this feature increased from placement (72.78) to exit (98.66) writing, which may serve as an indication of some increased complexity.

The researcher was also interested in determining whether there was a difference in means of lexico-grammatical variables between the students took EAP 1560 advanced grammar class (*n*=92) those who did not (*n*=37). The fact that there were almost two and a half times more takers than non-takers might have influenced the results, which showed that only the means of attributive adjectives, subordinating conjunction *because*, and adverbial conjunctions differed significantly when EAP 1560 enrollment was taken into account. One could hypothesize that because explicit instruction of adverbial conjunctions is taking place in EAP 1560 class for several weeks, it might have made a difference. Even though frequency counts of only a few

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grammatical constructs were analyzed in this study, these findings may serve as an indicator that grammar instruction should not only take place in a language classroom, but it should be more focused and targeted. Focusing on the structures (Biber et al., 2011) from higher stages of hypothesized proficiency, devoting more time to reductions rather than dependent clauses, and highlighting the importance of vocabulary choices should be the direction of the 21st century EL grammar classroom.

A much more interesting and practically significant result was that the students who did not take EAP 1560 grammar class produced more instances of pre-modifying nouns, attributive adjectives, subordinating conjunctions *if* and *unless*, and coordinating conjunctions. In this study, those students who placed out of EAP 1560 had higher TTR, slightly larger average word length, and wrote, on average, 30 more words than those students who took EAP 1560 class. Although those mean differences were not statistically significant, there is a possibility that higher counts of those features were produced by the EAP 1560 non-taker because their English language proficiency was already higher when they applied to the EAP program. Thus, this could serve as an indication that EAP placement procedures at SSC are working as they should. Because TTR, word length, and word count are lexical rather than grammatical features, such findings may not be surprising. On the contrary, students who took EAP 1560 grammar class used slightly more of noun + *that* clauses, verb + *that* clauses, and all conjunctions, but the mean differences were not significantly different. Based on the reviewed data, there is not enough evidence to suggest that taking EAP 1560 advanced grammar class benefits students with higher language proficiency (as exhibited by LOEP scores and in the holistically rated writing sample)

at the time of EAP program placement; however, grammar instruction to students who need it (as evidenced by their placement scores) is working and should be continued.

   Research question two. The second research question sought to determine whether additional factors such as EAP 1560 and EAP 1640 course grades, LOEP scores, and the number of semesters in the EAP program could be used to predict pre-modifying nouns, attributive adjectives, noun + *that* clause, adverbial conjunctions, and TTR. The first surprising finding was that only a relatively small effect size was observed between EAP 1560 and EAP 1640 grades when Pearson's *r* was calculated ($r = .321$, $n = 92$, $p = .002$). Because EAP 1560 advanced grammar class was a pre-requisite or a co-requisite of EAP 1640 and grammatical accuracy is an important factor in the holistic evaluation of exit writing, the researcher assumed that a greater correlation between grades would be observable. The fact that grades in both classes correlate but not as strongly as expected should result in the review of grading practices since the ratio of As in 1640 (writing) to As in 1560 (grammar) in this sample is 3:1, while Bs are comparable at 42% in the advanced writing class versus 45% in the advanced grammar class. Students in the advanced grammar class also earned 3 times more Cs than in the writing course. In the past, students could only earn a C in EAP1640 if they failed Round 1 but passed Round 2 of the exit exam. Currently, a grade reduction penalty has been removed, but perhaps it should be reinstated considering the disproportionately higher grades in the advanced writing class.

   Next, five multiple linear regressions were run to determine whether certain exit lexico-grammatical constructs could be predicted from the independent variables such as EAP 1560 and EAP 1640 grades, LOEP placement scores, and the number of semesters spent in the EAP program. The summary of regression analyses is presented in Table 32.

Table 32

Summary of Regression Statistics

Exit Construct	*df*	*F*	*p*	R^2
Pre-modifying Nouns	6,84	.550	.769	.038
Attributive Adjectives	6,81	1.232	.299	.084
That Relative Clauses	6,84	.504	.804	.035
Adverbial Conjunctions	6,84	1.612	.154	.103
Type/Token Ratio	6,82	5.256	.001	.278

The results of multiple linear regression analyses demonstrated that TTR was the only dependent variable 28% of whose variance could be explained by the independent variables. Nonetheless, caution should be exercised in interpreting practical significance of these findings. Historically, TTR has been a very popular construct in lexical diversity studies as shown in Chapter 2; however, in this study, concordance analyses using *AntConc* allowed the researcher to observe multiple cases of misspelled words, which have affected TTR counts because of the nature of the ratio. To calculate TTR, the number of word types used by a writer is divided by the total number of words. To preserve the authenticity of the learner corpus, misspelled words were not correct. Therefore, if a word *addition* was written as *adition* and then *addision* in the same essay, it got counted as two different words. For more examples of misspelled words refer to Table 9 in Chapter 3. The sum of TTR counts increased from placement (3,345.9) to exit writing (3,595.1), and although the regression results indicated that 28% of the exit TTR could be explained by the IVs, potentially inflated TTR scores due to the misspelled words in both placement and exit sub corpora in this study clearly affected this statistic.

In addition, LOEP Language Usage score was the only significant individual contributor to the model (see Table 31 in Chapter 4). Although exit adverbial conjunctions were not

predictable from the above listed independent variables, LOEP Sentence Meaning score proved

the only significant contributor to that model (see Table 30 in Chapter 4). The following

findings may suggest that during EAP placement procedures at SSC, a closer attention could be

paid to scores on the two sections of the LOEP test, i.e., Language Usage and Sentence Meaning.

These findings might also be explained by fact that the Language Usage section of the LOEP is

designed to test various aspects of English grammar such as verb forms, verb tenses, word order,

punctuation, coordination as well as subordination. The Sentence Meaning section is a lexical

fill-in-the blank test. The results of this study demonstrated that grammar and vocabulary

sections of LOEP were well correlated ($r = .601$, $n = 127$, $p < .001$), whereas the relationship

between LOEP scores and lexico-grammatical complexity in the local corpus context at SSC

may need to be investigated further.

Significance of the Findings

The results of this study provide empirical evidence of linguistic complexity of phrasal

and clausal features in the local learner corpus of placement and exit writing essays at the EAP

program at Seminole State College of Florida. The researcher found statistically significant

difference in "compressed" grammatical structures such as pre-modifying nouns and attributive

adjectives (Biber & Gray, 2010; Biber et al., 2011), which indicated an increase in English

language proficiency of EAP students. Clausal grammatical structures associated with nominal

style, i.e., noun + *that* clauses, provided inconclusive evidence due to statistically significant

results with the dependent *t* test because data might have been non-normally distributed. The

change in adverbial and coordinating conjunctions as well as TTR, average word length, and

word count was also statistically significant. Non-statistically significant results with clausal features such as verb + *that* clauses, clausal and conditional subordinating conjunctions offered some support to the idea that students might have plateaued in their use of these "elaborated" grammatical structures also associated with lower stages of complexity (Biber & Gray, 2010; Biber et al., 2011).

In addition, a local annotated learner corpus of 258 texts and 83,869 words was constructed at the EAP program at a large community college in Central Florida, which was used for the purposes of this research project and will be used in the future for instructional purposes. Certain recommendations to the EAP program, listed in the *Implications for Practice* section of this chapter, will be made to relevant administrators and faculty as well as discussed during a departmental EAP meeting. The results of this study might also be shared with the EAP Consortium in the state of Florida.

Limitations of the Study

There are several potential limitations to this study associated with data collection and analyses. Because both placement and exit writing samples were produced by EAP students at Seminole State College of Florida as part of normal day to day operational procedures, and the researcher had no interaction with the students as a researcher even though she taught one section of the EAP 1640 class in Fall of 2016, content control was not possible. Students wrote on different topics (see Appendices E and G) that started with the verbs *discuss, describe,* and *explain*. Some other topics asked the students to express their opinion and preferences. The variability of topics was greater with placement writings, which might have affected lexico-

grammatical choices. Topics were labeled in each file for potential in-depth analysis of genre influence on the frequencies of grammatical and lexical features. Had more careful control of the topics been possible, perhaps certain aspects of the study's results would have been different.

Other aspects that might have affected student writing were related to the timed testing conditions and potential stress and anxiety associated with it (Kroll, 1990). When students were placed into the EAP program, the writing sample was the last component of placement testing that they completed after potentially spending hours on P.E.R.T and LOEP in the testing center; therefore, fatigue might have been an added variable that could have influenced ELs' written performance. Similarly, the previously mentioned psychological factors might have also affected the students' exit writing, done in 50 minutes and under the pressure of doing well to pass the exit and consequently pass the EAP 1640 class.

In addition, there may be potential limitations associated with the accuracy of data collection, entry, and analyses because multiple procedures were performed by hand (e.g., essay typing, matching of participants' data, part-of-speech tagging, data entry, etc.). Although extensive guidelines for corpus construction, annotation, and storage were carefully followed (Sinclair, 2005; Wynne, 2005), this was the researcher's first attempt at corpus construction and learner corpus data analysis using the Biber tagger and *AntConc* as instruments. Furthermore, frequency counts in this study had to be normed to 100 words per standard corpus procedure, but placement texts in the current study averaged 269.53 words ($SD = 124.02$) with an average word count for exit essays of 380.62 ($SD = 97.13$), which is much lower than the 1,000 words suggested by Biber (1990) and Biber et al. (1998) when analyzing less common grammatical features. Moreover, Biber & Gray (2013) recommended a detailed tag checking process, and

spot checking of the tagger accuracy produced some inconsistencies as described in Chapter 3. Lastly, the research design decision to preserve the authenticity of student spelling in the local learner corpus affected the TTR counts and the accuracy of statistical analysis including TTR as a construct due to a large number of words being misspelled in both placement and exit sub corpora.

Implications for Practice

There are several general implications of this study as well as come program specific ones. First, learner corpus analysis allows researchers to gain insight into L2 language and writing development, which ultimately benefits the learner. Hunston & Francis (2000) stated that corpus linguistics research "can be used to raise to consciousness information about words which a learner may already have, but in an implicit and unfocused way, as well as to fill gaps in that information.   Alternatively, a learner may be consciously directed towards researching a list of words.." (p. 263). Therefore, one of the first practical implications of this study is the need for teachers to raise students' awareness of the vocabulary that they are using in writing as well as the register. The results of this study indicate that students favor conversational grammar and lexicon choices. The use of learner corpora and even larger corpora in the classroom will allow the students to make more advanced vocabulary choices thus focusing on their individual needs as learners. Also, when learners are made aware of typical and frequent grammatical and/or lexical mistakes through negative evidence gathered from their own writing (Schmidt, 1990 - Noticing Hypothesis), they are better able to take more control of their own learning.

No instructor would argue with Lewis (2000) that "teaching is, on the whole, organized, linear, and systematic, but it is a mistake to think that learning is the same" (p. 11). Therefore, the results of learner corpus research allow students to take a more systematic approach to learning, which has already been described in the literature. To investigate the effects of corpus-based (BNC and BNC Baby) lexico-grammatical instruction, Liu and Jiang (2009) surveyed 206 students with upper-intermediate and advanced English proficiency in an EFL (a university in China) and an ESL (two universities in the U.S.) contexts. The post study survey demonstrated that ELs felt that they had better command of the analyzed lexicogrammatical patterns, greater appreciation for context, and increased understanding of grammar as a result of corpus use. Moreover, ELs reported being more engaged and responsible for their own individualized learning. Clearly, corpus-based assignments should find their way to the syllabi of every ELs instructor. It should not be difficult to convince classroom teachers to introduce new and effective ways of learning grammar and vocabulary as they are usually eager to help their students master the English language as quickly as possible.

In addition, local learner corpus research offers invaluable information to the instructor. deBoer (2014) noted that "an understanding of how language learners utilize a diverse vocabulary in their language production can help instructors guide their teaching, particularly in contexts such as a college writing classroom where formal vocabulary instruction is rare" (p. 139). Corpus research studies have informed not only materials writing but also daily lesson plans through the use of data-driven learning (DDL). Although DDL has been slowly increasing in its popularity, it should be noted that some faculty may still find it time-consuming and may feel unprepared for its successful application (Urzua, 2015). To aid those doubting but willing to

try DDL, practical guides such as *Using Corpora in Language Classroom* (Reppen, 2010) and *Teaching Collocations* (Lewis, 2000) are available. Instructors may use local learner corpora to create word lists, including lexico-grammatical info, for their students.

Conrad (2000) suggested that because lexical choice guides the grammatical choice in English, they should be taught to ELs together, based on accurate corpus-informed lists rather than intuition-driven materials of the past. Moreover, Folse (2015) advocated a lexico-grammatical approach to classroom English language instruction, e.g., the creation of a list of the most common verbs associated with a particular verb tense. The results of this study also demonstrate that moving away from the most overused conversational verbs *know*, *think*, and *say* and encouraging students to use more written genre verbs such as *argue, claim, state,* and *mean* is an important first step in the direction of more proficient writing. Verb + *that* clausal structures are indicative of level one complexity (Biber et al., 2011), and the choice of verbs matters. Undoubtedly, students could benefit from creating not only verb lists but also lists of nouns, adjectives, and adverbs so that painstaking work of vocabulary expansion through synonyms and antonyms could take place. For instance, instead of learning a random word of the day offered by the Merriam Webster dictionary website (www.m-w.com), students could focus on adding more academic and low frequency vocabulary words to their own lexicon.

EL teachers should not only understand the importance of combining lexical and grammatical instruction, but also focus on the needs of individual learners (Ferris & Hedgcock, (2014). In the context of an EAP classroom, Generation 1.5 learners, international students, and immigrant students could all benefit from the individualized approach to learning grammar and vocabulary. Lexico-grammatical analysis of their own written work will demonstrate to all

students, regardless of their proficiency level, that there is room for improvement and in which specific grammatical or lexical areas. At the advanced level of proficiency, combined grammar and writing instruction will allow faculty to focus on both grammar and vocabulary. One possible activity could include asking the students to type up an essay or a paragraph, save it as a .txt file and run it through *AntConc*, most useful features of which should be explained by the instructor. The use of this free concordance program will empower the students as they will be able to clearly see the words they are using, how many times each word gets repeated, which words are misspelled, etc. Students can not only engage in lexical but also grammatical analysis of their writing to determine how many sentences they have written, which clauses were produced, how many punctuation errors were made, etc. Once students create a baseline profile of the first assignment, they can then work on improving grammatical and lexical aspects through future written work. This approach does not only allow for individualized instruction, but it also provides students with observable and measurable aspects of the language they should focus on and improve.

Based on the findings of this study and lexico-grammatical research published in the last decade (Biber et al., 2011; Staples & Reppen, 2016; Taguchi et al, 2013), grammar instruction for writing should focus less on adjective, adverb, and noun clauses and more on phrasal modification, especially of the embedded noun phrases (Biber & Gray, 2010). In addition, teaching of appositives, adverbial phrases, and avoidance of dangling modifiers could produce more proficient writers than continued instruction of finite adverbial clauses.

EAP Program Recommendations

Based on the results of this study, some recommendations may be made to the EAP program, housed in the English Language Studies (ELS) Department at the School of Academic Foundations at Seminole State College of Florida. Course enrollments (several students could be enrolled in more than one course) in this EAP program have fluctuated slightly over the past several years (e.g., 2014-15 academic year 1,258; 2015-16 academic year 1,242; and 2016-17 academic year 1,179). Summer semesters have seen the sharpest drop in enrollment from 227 in 2016 to 165 in 2017, while other semester enrollments have ranged from 470 in Spring 2017 to 544 in Fall 2017. Continued decline in enrollment caused the administration to reevaluate placement, instructional, and exit practices and procedures, which made this descriptive linguistic study exploring phrasal and clausal lexico-grammatical complexity of L2 English writing timely and necessary. Based on the findings in this study, the following placement and exit testing suggestions might be made.

1. The review of placement recommendations and course completion sequences for the sample of 129 students in this study revealed that EAP pathways to success are followed rather closely. Only one student was found to have placed in a lower level and not having taken EAP 1560, which will be investigated upon the completion of this study. Such positive outcomes may be attributed to an ongoing cooperation of the department with the testing center as well as student counselors that highlight the importance of the EAP program when it is being recommended even to the students who test out.

2. LOEP Sentence Meaning and Language Usage scores should be considered closely in case of problematic and split placements as indicated by the regression analyses in this study.

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3. EAP 1560 recommendations should continue the same way they have been done because based on the results of this study, students with a higher level of proficiency who test out of EAP 1560 already exhibit higher stages of lexico-grammatical complexity than those students who take EAP 1560 class.

4. The use of a holistic rubric for both placement and exit writing evaluation is highly recommended. The implementation of such a rubric may require additional time but will provide a system all raters can rely on in their decision making process. Specific rating guidelines as well as a rubric should be developed or adopted. Norming of the raters by using a set of previously ranked essays is also recommended and has been suggested by the peer-reviewed literature (Polio & Shea, 2014). Then, rater reliability could be tested. Due to the fact that such a rating rubric was not used during the semesters chosen for analysis in this study (Fall 2016 and Spring 2017), it was unfortunately impossible to compare the assigned binary passing and non-passing scores and predict passing or non-passing of the EAP 1640 exit writing exam based on lexico-grammatical complexity.

The following are instructional recommendations for EAP 1560 and EAP 1640 courses.

1. Currently, instructional sequence in EAP 1560 is clause heavy. Because the results of this study supported previous findings that finite adverbial clauses are "elaborated" grammatical structures characteristic of lower EL proficiency, EAP 1560 curriculum should be revised. Such revisions may include the elimination of conditional clauses and shortening of the instruction of other dependent clauses. The gained instructional time could be used to teach embedded clauses and reductions (modifiers, appositives, etc.).

2. Because pre-modifying nouns is one of the features of advanced language proficiency, which often gets excluded from grammar instruction in favor of participial or predicative adjectives (Biber & Reppen, 2002), it should be taught explicitly because noun + noun sequences are relatively common in the academic and news genre. Statistically significant change in pre-modifying nouns, a phrasal indicator of increased written proficiency, was observed in this study; however, phrasal structures should have a greater presence in a high-intermediate and advanced grammar classroom as "it seems obvious that students at intermediate and advanced levels need greater exposure to these commonly encountered forms than comparatively rate forms like participial adjectives" (Biber & Reppen, 2002, p. 203).

3. A full-time and part-time EAP faculty training should be scheduled to familiarize the instructors with classroom activities (e.g., don't correct – collect; don't explain – explore; if in doubt, point them out, etc.) on teaching collocations (Lewis, 2000). In addition, best practices of corpus informed teaching methods of lexico-grammar could be shared. Both writing and grammar instructors will benefit from this information.

4. To build lexico-grammatical awareness of EAP 1640 students, collocation searches for the target words in their brainstorming and outlining assignments could be completed online using free tools.

5. A creation of the most widely misspelled words list at the EAP at SSC may be recommended. Lower frequency band words such as *responsibility, electronic, entertainment, experience, frequently* were most often misspelled in the exit sub corpus.

Recommendations for Future Research

In the volume *Corpus-based Research in Applied Linguistics: Studies in Honor of Doug Biber*, Urzua (2015) described a collaborative corpus project done at ULCAE. ESOL faculty received training, guidelines, and ongoing support to create a local learner corpus, which was later used to inform curricular revisions (e.g., pronominal choices). The researcher would like to continue adding texts to the current EAP at SSC learner corpus and ultimately make it accessible to faculty and students in the department. Such a practice will allow for the "prolonged tracking of contextualized indices of L2 development" (Hasko, 2013, p. 6) as well as renewed engagement of sometimes apathetic EAP students.

Biber et al. (2016) strongly suggested that both clausal and phrasal complexity features should be examined in future studies undertaking analyses of grammatical complexity; therefore, it would be interesting to investigate additional phrasal features such as nominalizations and prepositional phrases as well as clausal features such as noun complements, adjective complements, and wh-relative clauses, using the already built learner corpus and continue such analyses once more texts are added.

When a final/exit EAP 1640 exam rating rubric gets implemented, a logistic regression analysis to predict which lexico-grammatical features load the most on passing or non-passing of the exit could be conducted. The results of that study would allow to target the grammar instruction at the EAP program at SSC even further. Finally, the fact that exit TTR could be predicted from the EAP 1560 and EAP 1640 grades, LOEP scores, and the number of semesters students were enrolled in the EAP program should be reexamined once all spelling errors in the corpus have been corrected. Because TTR is a type to token ratio of the words used, it is highly

sensitive to misspellings. Each misspelled word is treated as a new word. A further and deeper analysis of the EAP at SSC learner corpus targeting certain features such as misspelled words, most frequent nouns, etc. might be necessary for the purpose of compiling lists.

Conclusion

The goal of this study was to describe phrasal and clausal lexico-grammatical complexity of placement and exit essays produced by EAP students at Seminole State College of Florida. The results show that compressed phrasal features are indicative of higher complexity and EL proficiency, while clausal features are acquired earlier and signal elaboration, as previously described in the peer-reviewed literature. Therefore, at higher proficiency levels, EL grammar and writing teachers as well as curriculum developers should dedicate more classroom time to reduced and phrasal structures in conjunction with corpus-informed lexico-grammatical choices.
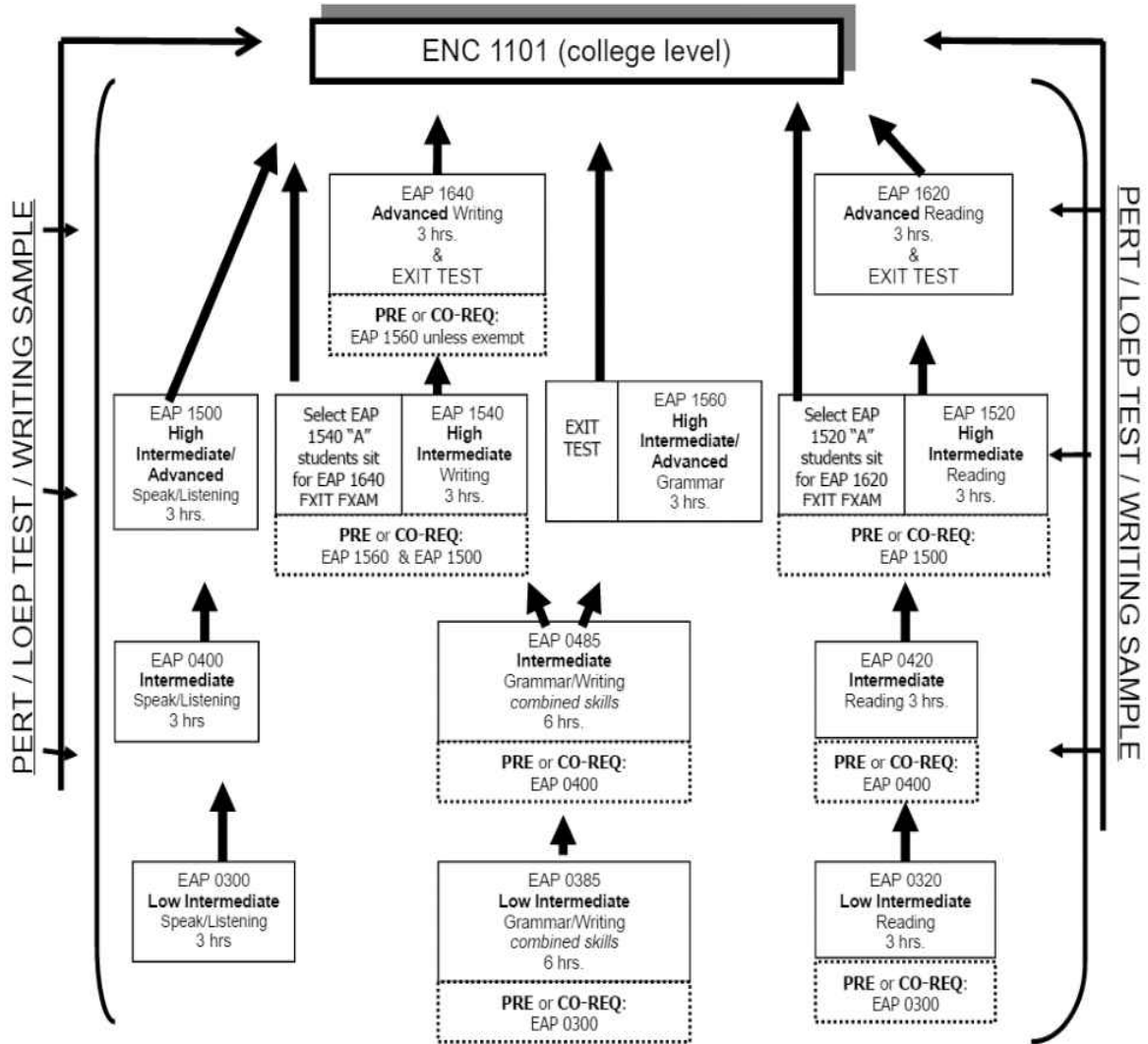
APPENDIX A: EAP PATHWAYS

Figure 5. *EAP Pathways to English Proficiency*

APPENDIX B: COLLEGE CREDIT EAP COURSES OFFERED AT SEMINOLE STATE COLLEGE OF FLORIDA

#	Description	Special Requirements	Course Objectives
1500	High Intermediate/Advanced Strategies for Academic Speaking and Listening	stand alone	To prepare students to be successful in college credit courses, which require lecture listening, and provide some practice in presentation and speaking skills.
1520	High Intermediate Reading	stand alone	To build college level reading skills for the non-native English speakers through focus and strategies specific to EAP students' needs.
1540	High Intermediate Writing	1560 co-req	To write basic, structured academic paragraphs and essays with an emphasis on increased language accuracy and development.
1560	High Intermediate/Advanced Grammar	1540 co-req	To aid students to identify and correct their written English language errors. Special focus will be placed on the form, use, and meaning of sentence structures and syntax that are traditionally challenging for students of English as a second language.
1620	Advanced Reading	1520 pre-req	To build college level reading skills for the non-native English speaker. Students who successfully complete the course will be able to read and comprehend most college level textbooks, test prompts and classroom activity instruction.
1640	Advanced Writing	1560 co- or pre-req, 1540 pre-req	To develop the ability to write a variety of college-level essays with sophistication, fluency, and accuracy and to execute other academic writing tasks.

APPENDIX C: SAMPLE PLACEMENT FORM

Seminole State College of Florida
Placement in English Language Programs

Date_____

> →**STUDENTS:** Please answer **ALL** questions very carefully. This information and the evaluation of your test scores and writing sample will determine how many and which English courses you need to take.

LAST Name _____   **FIRST** Name_____

ID#_____   **Tel #**_____

Status: U.S. citizen _____   **Perm. Res.** _____**Asylum** _____**Other**_____

F-1 student visa_____ **Are you applying for English Language Institute? Yes**_____ **No** _____

What COUNTRY are you from?_____**How long in the United States?**_____

ESOL or English Language Institute Information

Have you ever attended ESOL at Seminole State College?   yes___ no ___

✓Highest level of ESOL **completed** was _____   year _____

Have you ever attended English Language Institute at Seminole State College? yes ___ no ___ year _____

✓Highest level of English Language Institute **completed** Intermediate I ___Intermediate II___Advanced ___

High School Information

Number of years in high school in the United States?   1____   2____   3____   4____

Number of years of ESOL in high school in U.S.?   1____   2____   3____   4____

In what country did you study high school? _____

What language did you use in high school? _____

College Information

List the highest level of college English or EAP courses you have taken in the United States and at which school. (You will be asked for transcripts before placement is completed.)

Course Level	Course Title	College

STUDENT'S NAME:_____ **ID #:**_____

ASSESSMENT/TEST RESULTS

PERT _____ _____ _____
      Date   Reading   Writing

LOEP _____ _____ _____ _____
      Date   Reading Skills Sentence Meaning Language Usage

_____ Writing Sample

ESSAY	**Organization**	**Development of Ideas**	**Language**

_____ non-existent or ineffective thesis	_____ weak support for thesis	_____ incorrect punctuation	
_____ non-existent or ineffective topic sentences	_____ disconnected ideas	_____ incorrect grammar	
_____ non-existent or ineffective conclusion	_____ unrelated ideas	_____ weak or incorrect vocabulary	

Comments_____
_____

A. Student Demonstrates Some Non-Native English Language Issues

   1. _____ Consider for ENC 1101 after EAP 1620
       _____ Consider for ENC 1101
       Refer to English Department
    ▶ If not approved for ENC 1101, place in course(s) checked
    here: **EAP 1560** _____ **EAP 1640** _____

   2. _____ Student will benefit from EAP courses; see course placement below.

   3. _____ Student not currently eligible for EAP. Please refer to ESOL.

_____ Approved for ENC 1101

_____ Not approved for ENC 1101

English Dept. Signature: _____ Date: _____

B. Student Does Not Demonstrate Non-Native English Language Issues

   _____ Refer to Counseling/Advising; place according to PERT scores.

ELS Signature: _____ Date: _____

Student Placement Information

- EAP speaking placement is based on lower reading or writing score and is required at that level.
- Students must complete all EAP courses in the series beginning at the point of original placement.
- Writing skills may impact course placement.

English for Academic Purposes (EAP)

	EAP 0300	**Low Intermediate** Strategies for Academic Speaking and Listening (3)
	EAP 0320	**Low Intermediate** Reading (3)
	EAP 0385	**Low Intermediate** Grammar and Writing (6)
	EAP 0400	**Intermediate** Strategies for Academic Speaking and Listening (3)
	EAP 0420	**Intermediate** Reading (3)
	EAP 0485	**Intermediate** Grammar and Writing (6)
	EAP 1500	**High Intermediate/Advanced** Strategies for Academic Speaking and Listening (3)
	EAP 1520	**High Intermediate** Reading (3)
	EAP 1540	**High Intermediate** Writing (3)
	EAP 1560	**High Intermediate/Advanced** Grammar (3)
	EAP 1620	**Advanced** Reading (3)
	EAP 1640	**Advanced** Writing (3)

English Language Institute Program (ELI)

	Fundamentals I	S/LM only
	Fundamentals II	S/LM only
	Intermediate I	S/LM only
	Intermediate II	S/LM only
	Advanced	S/LM only

ELS Dept. Signature _____ Date_____

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APPENDIX D: PLACEMENT WRITING GUIDELINES

I. Given in class to ESOL students

II. Given in the testing center

I.   II.

ESOL
Writing Placement for PERT/LOEP

Are you taking the PERT? Yes (X) No ( )

Date: 4-20-15

Name: _____ _____

Level: ADVANCED Instructor: Brooks Campus: ALTA

Select one topic from the list below and circle the topic you have chosen. You will have 60 minutes to write. Use lined notebook paper and double space. Do not use a dictionary.

1. Some people think that family is the most important influence on young adults, while other people think that friends are the most important influence. What do you think?

(2) Explain the main reasons people drop out of college.

3. Explain what the most important event in your life was.

FORM 2

ENGLISH LANGUAGE PROGRAMS

Seminole State College of Florida

Writing Placement Test

Name: _____ Date: OCT/31/15

This test is very important for your placement in the most appropriate English course for you. Please choose the topic that you think is the most appropriate for your level of English and write a composition of 4-5 paragraphs about it on the attached paper. You will have 50 minutes to complete it. Do not use a dictionary.

Select ONE topic to write about. Circle the number of that topic.

1. Describe a great place to visit.

2. Discuss how to make friends.

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APPENDIX E: PLACEMENT WRITING TOPICS

PLACEMENT WRITING TOPICS

- Describe a person you admire
- Describe a teacher you will never forget
- Describe a great job
- Describe a good place to shop
- Describe a great place to visit
- Describe a great weekend
- Describe a great party
- Describe your last birthday celebration
- Describe the way your life has changed since you moved to Central Florida

- Discuss ways to stay healthy
- Discuss why you want to go to college
- Discuss the factors to consider when choosing a job
- Discuss your favorite season
- Discuss how to make friends
- Discuss a problem in your hometown
- Discuss ways to learn a language

- Explain some ways you learn a language quickly
- Explain what the most important event in your life was
- Explain why travel is (or is not) important
- Explain why you like (or dislike) living in Central Florida
- Explain why a certain place you have visited should be visited by other people

- What things do you think about when you are choosing a car to buy?
- What qualities do you consider to be important in a person you would choose for a friend?

- Do you prefer to vacation on the beach or in the mountains? Why?
- Do you plan to live in the US the rest of your life, or do you plan to some day return to your country of origin? Explain why or why not.
- How do you prefer to spend your weekends?

Note: A student is only give TWO to choose from.

APPENDIX F: EXIT EXAM INSTRUCTIONS

Seminole State College of Florida

Fall 2016

EAP 1640 Exit Examination

Name _____

DO NOT PUT YOUR NAME ON THE ESSAY

Student Number _____

Contact Telephone Number _____

You have 50 minutes to plan, write, and proofread an essay on ONE of the following topics:

Topic 1 Discuss the benefits of owning a cell phone.

Topic 2 Discuss why Florida attracts so many visitors.

In your writing you should

      * Establish your main idea clearly

      * Develop you main idea with adequate and relevant support

      * Organize your ideas logically and coherently

      * Make effective choices in vocabulary and sentence structure

      * Use standard English grammar, spelling, capitalization, and punctuation

Take a few minutes to think about what you are going to write. Leave yourself a few minutes at the end to proofread and make corrections. You may cross out or add information as necessary, but please write as neatly and clearly as possible.

Good Luck

Note: Topics vary from semester to semester as well as from class to class

APPENDIX G: EXIT WRITING TOPICS

EXIT WRITING TOPICS

- Describe some bad habits to avoid
- Describe advantages or disadvantaged of living in a large city
- Discuss a good destination for a vacation
- Discuss advantages of shopping online
- Discuss why people enjoy the beach
- Discuss types of friends
- Discuss some ways that many young people waste time
- Discuss what you would do if you won a million dollars
- Discuss why people visit Florida
- Discuss causes of car accidents
- Discuss types of parties
- Discuss leisure activities people enjoy

APPENDIX H: SEMINOLE STATE IRB LETTER OF APPROVAL

Title of Research Project	Lexico-grammatical Complexity in EAP Student Writing: A Learner Corpus Analysis
Name of Principal Investigator	Ekaterina Goussakova
Phone number	407-404-6085
Email address	goussakovae@seminolestate.edu
Please describe the proposed study, including the research question, hypotheses, and methodology.	In this descriptive longitudinal study, placement and exit English for Academic Purposes (EAP) student writing samples at Seminole State College of Florida are collected and its lexico-grammatical complexity analyzed using corpus linguistic methods to explore language development as a result of student enrollment in the EAP program. Writing samples are typed, matched, and tagged using Biber tagger. A concordance software AntConc is used to produce lexical realizations of grammatical features. The research questions are as follows: 1. Is there a statistically significant difference in lexico-grammatical complexity (pre-modifiers, attributive adjectives, noun + *that* clauses, verb + *that* clauses, causative subordinating conjunction (*because*), conditional subordinating conjunctions (*if, unless*), adverbial conjuncts, coordinating conjunctions (*and, but, or*), all conjunctions, type to token ratio, average word length, and word count) in placement and exit EL writing in an EAP program? 2. Can lexico-grammatical complexity (pre-modifying nouns, attributive adjectives, noun + *that* clause, adverbial conjunctions, and TTR) of ELs' exit writing be predicted from EAP 1640 and EAP 1560 course grades, LOEP scores, and the number of semesters in an EAP Program? Hypotheses are two-tailed with the assumption that some change will be observed, and dependent *t* and multiple linear regression analysis are performed.
Describe the target audience of participants, including the anticipated number of participants.	The sample is 129 students who were enrolled in EAP 1640 course in Fall 2016 and Spring 2017 semesters
Describe the location of participants and how you will acquire access.	Participants were students in the EAP program at SSC. Their placement and exit writings are kept by the ELS department, so writing samples were obtained there.
Describe if participants are subject to any risk or harm from the study.	There is no direct contact with students in this study, so there is no risk or harm to them from the study
Projected start date for study.	January 2017
Projected end date for study.	December 2017
Targeted audience of participants.	EAP 1640 students in Fall 2016 and Spring 2017
Provide details on how you will protect the rights of participants, particularly how you will ensure that subjects may elect NOT to participate without consequence.	Rights of participants are protected as all identifies are removed as soon as pre-and post- writing samples are matched. Data are password protected and is not in open access. This is a non-intrusive study analyzing placement and exit writing sample collected as part of normal operating procedures at the ELS Department at SSC.
Provide details on how you will verify informed consent and that participants are at least 18 years old (or provide attachments of consent forms).	The proposed research study meets federal guidelines in Title 45 Code of Federal Regulations Part 46, Protection of Human Subjects since it involves the use of educational tests and already existing data, student records, benefits the ELS department, and may inform curricula revisions. Informed consent is not necessary for this study. Verification of age is done when students apply to Seminole State College.
Provide details on who will have access	Placement essays were obtained from the ELS network at SSC, while

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to research data and how you will protect the data.	handwritten exit tests were obtained from Jan Hallaway at the ELS department and will be returned to her for record keeping. Michele Wallace, ELS Success Coach, assisted with data collection. Data will be stored digitally in Excel, .txt files, Word doc and SPSS formats on the researcher's personal lap top and Seagate Backup Plus Portable Drive.
Provide details on the questions or instruments used in your study (or provide attachments).	The instruments used in this study are Biber part of speech tagger and a concordance software *AntConc*, http://www.laurenceanthony.net/software/antconc/ used to obtain lexical realizations of the analyzed grammar features.
Provide information on any other organizations, agencies, or departments involved in the study.	The proposed research is a dissertation study conducted to fulfill partial requirements of the PhD in Education program at UCF, TESOL track and is being carried out under the guidance of the following dissertation committee members: Dr. Keith Folse – Chair (Modern Language and Literatures Dept., College of Arts and Humanities); Dr. Randi Reppen – outside member (Northern Arizona University), Dr. David Boote – member (Secondary Education Dept., College of Education), and Dr. Eleanor Witta – member (Methodology & Measurement Analysis, College of Education)
Principal Investigator's signature.	K. Gusakova
IRB Review	
Exempt from Review	X - USES EXISTING RECORDS WITH NO STUDENT CONTACT
Approved without Conditions	
Approved with Conditions	
IRB Chair Signature	*(signature)*
Date	11/17/2017

RESPONSIBILITIES OF THE PRINCIPAL INVESTIGATOR:
- Any additions or changes in procedures in the protocol will be submitted to the IRB for written approval prior to changes being implemented.
- Any problems connected with the use of human subjects once the project has begun must be communicated to the IRB Chair.
- The principal investigator is responsible for retaining informed consent documents for a period of three years after the project.

APPENDIX I: UCF IRB LETTER OF APPROVAL

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Determination of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Ekaterina Goussakova**

Date: **November 17, 2017**

Dear Researcher:

On 11/17/2017, the IRB reviewed the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination, Category 1 & 4
Project Title:	LEXICO-GRAMMATICAL COMPLEXITY IN COLLEGE EAP STUDENT WRITING: A LEARNER CORPUS ANALYSIS
Investigator:	Ekaterina Goussakova
IRB Number:	SBE-17-13490
Funding Agency:	
Grant Title:	
Research ID:	N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

This letter is signed by:

Renea Carver

Signature applied by Renea C Carver on 11/17/2017 01:47:57 PM EST

Designated Reviewer

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