WRITTEN COMPLEXITY DEVELOPMENTAL STAGES OF
TURKISH EFL LEARNERS IN ARGUMENTATIVE
WRITING

A MASTER'S THESIS

BY

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THE PROGRAM OF CURRICULUM AND INSTRUCTION

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Written Complexity Developmental Stages of Turkish EFL Learners in
Argumentative Writing

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Nesrin Atak

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I certify that I have read this thesis and have found that it is fully adequate, in scope
and in quality, as a thesis for the degree of Master of Arts in Teaching English as a
Foreign Language.

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ABSTRACT

Written Complexity Developmental Stages of Turkish EFL Learners in
Argumentative Writing

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July 2019

This study aimed (a) to identify written grammatical complexity (i.e., syntactic complexity) stage(s) and grammatical functions of undergraduate Turkish EFL students based on Biber et al.'s (2011) framework for grammatical complexity developmental stages, and (b) to investigate the effect of topic on students' grammatical complexities and functions. The data were collected from 60 argumentative essays on three different topics written by second-year students studying at a foundation university in Turkey. The data were qualitatively coded through Ellis' (2008) form analysis, in which all the instances of complex forms were identified and designated to the appropriate stages and grammatical functions (adverbial, complement, and noun modifier). Frequencies of complex forms and functions were calculated for the whole group and for each topic separately. Kruskal-Wallis test was conducted to see the topic effect on students' grammatical complexity stages and grammatical functions.

The results of the study pointed out that the majority of grammatical complexity features of L2 learners were in Stage 2 and Stage 3. The findings also showed that topic affected grammatical complexities in Stage 2, Stage 4, and Stage 5. Regarding the grammatical functions, topic affected the use of noun modifiers, but not adverbials and complements.

Based on the findings, this study is in line with previous studies: L2 learners' texts demonstrate basic level phrasal modification and reflect features of conversation more than features of academic writing. To promote complexity features of academic writing, L2 writing instruction should align with current findings regarding register differences.

Keywords: syntactic complexity, grammatical complexity, phrasal complexity, L2

academic writing, register differences

ÖZET

Yabancı Dil Olarak İngilizce Öğrenen Türk Öğrencilerinin Tartışma Metinlerinin
Yazılı Karmaşıklık Gelişim Düzeyleri

Nesrin Atak

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Temmuz 2019

Bu çalışma İngilizce öğrenen Türk öğrencilerinin (a) yazılı dilbilgisel (sözdizimsel)
karmaşıklık seviyelerini ve kullandıkları karmaşık yapıların dilbilgisel işlevlerini
Biber ve diğerlerinin (2011) dilbilgisel karmaşıklık gelişim seviyeleri çerçevesini
kullanarak belirlemeyi ve (b) yazma konusunun dilbilgisel karmaşıklık seviyelerine
ve dilbilgisel işlevlere etkisini ölçmeyi amaçlamaktadır. Bu çalışmadaki veriler,
Türkiye'de özel bir üniversitede eğitim gören 2. sınıf öğrencilerinin 3 farklı konuda
yazdıkları tartışma metinlerinden (n = 60) toplanmıştır. Metinlerdeki yapılar Ellis'in
(2008) yapı analizi çerçevesinde nitel olarak kodlanmıştır. Belirlenen karmaşık
yapıların, uygun dilbilgisel karmaşıklık seviyeleri ve dilbilgisel işlevleri
(belirteçimsi, tümleç ve isim niteleyici) belirlenmiştir. Karmaşık yapıların ve bu
yapıların yerine getirdiği dilbilgisel işlevlerin sıklıkları hem bütün grup hem de her
yazma konusu için ayrı olarak hesaplanmıştır. Yazma konusunun dilbilgisel
karmaşıklık ve dilbilgisel işlevler üzerinde anlamlı bir etkisinin olup olmadığı
incelemek için Kruskal- Wallis testi uygulanmıştır.

Araştırma bulguları öğrencilerin metinlerinde kullandıkları karmaşık yapıların en
fazla Seviye 2 ve Seviye 3'e ait olduğunu göstermektedir. Ayrıca, yazma konusunun
öğrencilerin Seviye 2, Seviye 4, ve Seviye 5'teki dilbilgisel karmaşıklık yapıları, ve
isim niteleyici işlevleri üzerinde istatistiksel olarak anlamlı bir etkisi olduğunu
görülmüştür. Fakat, yazma konusunun belirteçimsi ve tümleç kullanımları üzerinde
anlamlı bir etkisi bulunmamıştır.

Bu araştırmanın bulguları önceki çalışmaların bulgularıyla benzerlik göstermektedir:
İngilizceyi ikinci dil olarak öğrenen öğrencilerin tartışma metinleri basit seviyede
isim niteleyicileri sergilemekte, ve konuşma dilinin özelliklerini, akademik yazma
dilinin özelliklerinden daha çok yansıtmaktadır. Öğrencileri akademik yazma
konusunda desteklemek için, yabancı dil öğretiminde konuşma ve yazma dilleri
arasındaki farklılıklara ilişkin son bulguların göz önünde bulundurulması
gerekmektedir.

Anahtar kelimeler: sözdizimsel karmaşıklık, dilbilgisel karmaşıklık, deyimsel
karmaşıklık, ikinci dilde akademik yazma, dil farklılıkları

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CHAPTER 1: INTRODUCTION

Introduction

Complexity has been an important dimension of development in writing. Complexity in second language (L2) research is defined as the range of forms (i.e. items, structures, patterns, and rules), the degree of sophistication of these forms, and reflecting the above-made distinction between, respectively, *absolute* and *relative* complexity (Ortega, 2003, 2012; Wolfe-Quintero, Inagaki, & Kim 1998). According to the taxonomy of complexity construct (Bulté & Housen, 2012), lexical, morphological, syntactic and phonological complexities are types of *absolute* complexity. Although the term syntactic, linguistic, and grammatical complexity has been interchangeably used in L2 written complexity research, this study will use the term 'grammatical complexity' since it hinges on Biber, Gray and Poonpon's (2011) theoretical framework for complexity features, and they adopt this term.

In L2 written complexity research, grammatical complexity has been associated with a variety of measures such as being (more) elaborate, (more) embedded, and longer (Bulté & Housen, 2012). To explore L2 learners' written complexity, researchers have mostly depended on clause-level subordination. T-unit, which is one of the clause-level subordination measures, has been used extensively as an indicative of more proficient L2 writing (Ortega, 2003; Wolfe-Quintero, Inagaki, & Kim, 1998). However, findings of some studies reveal that the writings of higher proficiency learners are not consistently marked by longer T-units (Bardovi-Harlig, 1992; Smart & Crawford, 2009). These findings lead to the conclusion that traditional

measurements of grammatical complexity may not be valid indicators demonstrating development in L2 writing.

Biber et al. (2011) conducted a large scale corpus study, and based on the findings, they challenged the use of traditional clause-level complexity measures such as T-unit measurements. By comparing the linguistic features of speech and academic writing in their extensive corpus study, they concluded that both spoken and written discourse are complex; however, the complexity features of speech and writing are remarkably different. Despite being commonly accepted as an indicator of grammatical complexity, T-unit analysis is not reflective of complexity in writing (Biber et al., 2011). According to Taguchi, Crawford, and Wetzel (2013) as well, extensive subordination and T-unit measurements are not sufficient in distinguishing more proficient language learners from less proficient ones. According to the findings of Biber et al. (2011)' study, phrase-level complexity reflects features of written discourse better. They proposed a framework for complexity developmental stages which is considered as a more appropriate indicator for written complexity than clause-level measurements.

Although there has been a shift in the approach to complexity measurement toward a perspective that better reflects the nature of complex writing, there is still much unknown about L2 written complexity and its development in English. The complexity developmental stages that Biber et al. (2011) proposed can help to extend the findings to L2 learners' writing and identify students' complexity stage, which may help L2 practitioners, testing and assessment unit, and curriculum design in many ways. Although current research acknowledges register differences, the corpus

is not derived from student writing samples (Biber et al., 2011). Hence, this study aims to identify undergraduate level EFL learners' grammatical complexity level in argumentative essays by adopting Biber et al.'s (2011) framework of complexity.

Background of the study

Syntactic complexity, also called as 'linguistic complexity' or 'grammatical complexity' refers to the variety of forms used in language learners' written or oral production and the extent to which these forms are complex (Ortega, 2003). In written complexity research, the predominant view has been in favor of T-units and clausal subordination to measure written complexity. Researchers have put forward that more extensive subordinate clauses (Brown & Yule, 1983; Chafe, 1982; Kroll, 1977; O'Donnell, 1974), T-unit length (Brown, Iwashita, & McNamara, 2005; Ellis & Yuan, 2004; Larsen-Freeman, 2006; Nelson & Van Meter, 2007) and/or a combination of related measures demonstrate 'more complex' and 'more elaborate' writing.

While such complexity studies as reviewed briefly above have greatly contributed to our understanding of complexity, clause-depended complexity investigation fails to satisfactorily provide grounds for the features of academic writing. There has been trenchant criticism to mainstream written complexity research on the grounds that it employs the measures of complexities of speech (Biber et al., 2011; Lu, 2011; Rimmer, 2006). These criticisms have brought about a shift from the approach that views complexity as a single unified construct to a more elaborate perspective of multidimensional analysis of measures of grammatical complexity that takes register variation (spoken and written registers) into account.

In L2 written complexity research, grammatical complexity measures such as length of production unit, amount of embedding, the variety of structural types, and the degree of sophistication have been investigated in several studies and various contexts. Researchers have heavily relied on measures such as mean length of T-unit (a main clause with all associated dependent clauses), mean length of clause, clauses per T-unit, dependent clauses per clause and their relation to proficiency levels (Wolfe-Quintero et al., 1998). However, studies have found no consistent association between grammatical complexity of writings of language learners and holistic ratings of what is considered as 'good' writing. Thus, it is crucial to note that if the conventional measures of syntactic complexity are used to evaluate L2 writing, more complexity does not necessarily show a higher language proficiency level or what is rated as 'good' writing.

Research investigating the differences between academic writing and speech views academic writing as being more linguistically elaborate and 'explicit' than spoken language. That is to say, spoken language hinges on a 'situational context' while academic writing is viewed as 'decontextualized,' 'autonomous,' or 'explicit' (DeVito, 1966; Johns, 1997; Kay, 1977; Olson, 1977). The general assumption in grammatical complexity research is that spoken discourse is characterized by 'simple and short clauses, with little elaborate embedding' in contrast to written discourse which is characterized by 'longer and more complex clauses with embedded phrases and clauses'. This perspective on complexity in learners' oral and written discourse has not taken an important aspect into account sufficiently. That is, the conventions of written and spoken language are drastically different. Some of the early researchers expand their perspective, discussing that academic writing is more

marked by a 'nominal' style than a 'verbal' one. In other words, they claim that 'nominal' style or high degree of nouns is an indicator of a 'good' academic writing while spoken discourse is more dependent on a 'verbal' style or being characterized substantially by 'verbs'. Therefore, written complexity research needs to depend on this perspective to appropriately reflect the distinctive characteristics of writing and speech.

In order to have a better and a fuller understanding of grammatical complexities of written and spoken discourse, Biber et al. (2011) undertook a large-scale corpus study. The findings of this study are especially striking to expand the views concerning 'elaborateness', 'complexity' and 'explicitness' so that these concepts can rightly be evaluated from a discourse analytic perspective by paying attention to language data. A closer look at the results of this study indicated two important claims: a) Academic writing and speech have fundamental differences in terms of their grammatical features, b) Complexity is valid for both speech and academic writing, yet the nature of the complexities differs drastically (Biber & Gray, 2010). Considering the recent shift that attempts to capture the complexities of written language better, it is important to note that Biber et al. (2011)'s study is based on native speaker discourse. Although their study provides evidence for distinctive features of complexity in speech and writing, much remains unexplored as to L2 learners' writing. Therefore, testing the complexity framework in L2 context and identifying L2 learners' written complexity stage is a critical area to be explored. Furthermore, exploring the role of topic on grammatical complexities of L2 writing by adopting this framework is a dimension that needs to be explored.

Statement of the problem

A great amount of research has been conducted in L2 written complexity. Among these studies, extensive subordination have been applied as an indicative of grammatical complexity in L2 writing (Adams, Alwi, & Newton, 2015; Ellis & Yuan, 2004; Frear & Bitchener, 2015; Kuiken & Vedder, 2008; Kuiken, Mos, & Vedder, 2005; Ruiz-Funes, 2015). That is to say, researchers interested in exploring grammatical complexity have traditionally and commonly used subordination ratio or T-unit measures to evaluate grammatical complexity of writings of language learners. However, a number of corpus studies has been conducted to critically examine the use of frequency of subordination as a measure of grammatical complexity in written production of language learners and as an indicator of L2 development, that is to say, proficiency level (Biber & Conrad, 2009; Biber & Gray, 2010; Biber et al., 2011, 2013; Biber, 1988). They put forward that grammatical complexity in academic writing is manifested by phrase level complexity rather than clausal subordination. Since subordination and T-unit measures have been found to be insufficient as an indicator of grammatical complexity in writing and L2 development, it is important to examine the new framework proposed by Biber et al. (2011) across different contexts. However, limited number of studies have been conducted to investigate grammatical complexity with noun-phrase measurements. To the knowledge of the researcher, there is only one study that tested grammatical complexity framework proposed by Biber et al.'s (Parkinson & Musgrave, 2014). However, this study only used a subset of the developmental stages and they only investigated the framework in relation to different proficiency levels with learners from different first language (L1) backgrounds. However, there is no study measuring written grammatical complexity of Turkish EFL learners' argumentative

texts and the effect of topic on grammatical complexities by adopting Biber et al.'s (2011) framework for complexity development.

Developing written complexity in a foreign language requires linguistic knowledge, familiarity to the conventions of different genres as well as topic knowledge. Turkish L2 learners might have difficulty in achieving complexity in their writing. Furthermore, since complexity is a dimension that is usually ignored in writing classrooms, L2 practitioners do not know students' level of complexity. Hence, instructors cannot provide complexity feedback to L2 learners as they do not know the complexity stage of their learners. In this regard, teachers might not be able to provide sufficient guidance and help L2 learners develop written complexity without knowing their students' complexity stages. To be able to adjust theoretical findings to pedagogic needs, it is important to identify L2 learners' written complexity level and adopt appropriate measures that are reflective of characteristics of written language.

Research questions

The current study aims to identify college-level students' written grammatical complexity stages based on Biber and Gray's (2011) framework. More specifically, it aims to investigate whether academic written texts produced by undergraduate students (argumentative essays) exhibits phrasal or nominal complexity features of writing. Furthermore, it attempts to explore whether topic has an effect in determining the grammatical complexity features of L2 academic writing. In this respect, this study aims to address the following research questions;

1. What are the written complexity developmental stages of Turkish L2 learners in their argumentative writing?

2. What grammatical functions do the written complexities of L2 learners perform in their argumentative writing?

3. Is there a statistically significant difference among topic groups in terms of grammatical complexities of L2 learners in their argumentative writing?

4. Is there a statistically significant difference among topic groups in terms of grammatical functions of L2 learners in their argumentative writing?

Significance of the study

Inasmuch as corpus findings have provided evidence on the phrasal complexity as a distinctive characteristic of academic writing, students' writings may be influenced by such factors as proficiency, the genre of the text, whether the task is achieved through process or product writing, topic and even the prompt that is provided for writing task. The theoretical framework of this study is, thus, hypothesized developmental stages for complexity which has been proposed by Biber et al. (2011). By adopting this framework, the complexity features in written discourse of Turkish learners of English as a second language will be analyzed and identified. In this regard, this study may contribute to the existing literature by various ways. First, an examination of grammatical complexity in L2 learners' writing with regard to nominal/phrasal indices can contribute to the generalizability of findings of previous research. Furthermore, exploring whether the new findings of corpus analysis apply to academic writings of L2 learners will provide the assessment field with a better understanding of how these written tasks should be implemented and evaluated with

appropriate measures and indices at an undergraduate level. Finally, L2 practitioners may provide students a fine-grained feedback if they know complexity developmental stages of their learners. This is especially a crucial consideration in instruction and developing materials. Especially in Turkey, there is still a prevalent belief that clause-level is more complex and therefore, while teaching writing, instructors tend to introduce such structures, mostly verbal ones such as "….believe that/claim that/argue that/seems that/shows that" Therefore, this study may provide insights as to an order of acquisition of complexity features and their sequence and importance in teaching.

Turkish EFL learners at undergraduate level are expected to be familiar with conventions of different genres of academic writing and realize these written text types at different levels or courses. Therefore, this study may help better understand how the discourse mode (argumentative) influences the learners' choice of linguistic structures and the complexity features in these types of texts. In this respect, the study is aimed to contribute to the recent L2 writing complexity research in Turkish EFL context and argumentative discourse mode and essay genre.

The study may also offer empirical evidence for the relationship between topic and its effect on the stages of complexity development. The findings might reveal an understanding to whether writing topic is a factor in influencing level of grammatical complexity and complexity features. Hence, it may provide insights for Biber et al.'s (2011) claims regarding phrase-level complexity in L2 writing development.

CHAPTER 2: LITERATURE REVIEW

Introduction

The aim of this chapter is to review the existing literature relevant to the current study which investigates Turkish EFL learners' written grammatical complexity stages at tertiary level. In this respect, this chapter starts with a general definition of L2 proficiency and its primary components; complexity, accuracy and fluency (CAF; Housen, Kuiken, & Vedder, 2012). After discussing what makes a language learner proficient, a categorization of L2 complexity is covered. In the next section, the literature related to grammatical complexity, also referred as syntactic complexity, is presented with a focus on its dimensions and previous studies. In the following section, grammatical complexity measurements are discussed including both traditional measurements, which are based on clause-level metrics and phrase-level metrics. The last section of this chapter presents current discussions on grammatical complexity, particularly focusing on a recent hypothesized framework for grammatical complexity development, which is also used in this study.

L2 proficiency

L2 researchers and practitioners have been concerned about the question of what makes an L2 learner a proficient language user and how the construct of proficiency can be validly and reliably measured. L2 proficiency is not viewed as a single form, but rather as a multidimensional construct reflected by the notions of complexity, fluency and accuracy, namely CAF (Housen et al., 2012). Skehan (1996, 1998) was the first to establish a proficiency model including these three components. Complexity refers to the ability of a language learner to use extensive and a variety

of elaborated structures and vocabulary in L2; accuracy is about how well a language learner can produce target-like and error-free language, and fluency is characterized by native-like speed, pausing, hesitation, or reformulation in L2 production (Ellis, 2008; Ellis & Barkhuizen, 2005; Lennon, 1990; Skehan, 1998; Wolfe-Quintero, Inagaki, & Kim, 1998). On a theoretical basis, it is argued that CAF indicates the major stages of change in learners' underlying L2 system: (a) "internalisation of new L2 elements" also called greater *complexity*, which is linked to improvements in knowledge system with increasing elaborateness and more sophistication of language; (b) "modification of L2 knowledge (as learners restructure and fine-tune their L2 knowledge, including the deviant or non-target like aspects of their interlanguage (IL) so that they become not only more complex but also more *accurate* L2 users)"; (c) "consolidation and proceduralisation of L2 knowledge (i.e. higher *fluency*, through routinisation, lexicalisation and automatisation of L2 elements" (Housen et al., 2012, p. 3). Since this study is focused on complexity aspect of CAF, it can be pondered that the more elaborate and sophisticated the learners' language is, the more developed their L2 knowledge system is.

CAF has been investigated in relation to several factors such as the impact of age on L2 acquisition, instruction, individual differences, learning context and task design (Bygate, 1996, 1999; Collentine, 2004; De Graaff, 1997; Derwing & Rossiter, 2003; Foster & Skehan, 1996; Fotos 1993; Freed 1995; Mora 2006; Norris & Ortega 2000; Robinson, 2011; Yuan & Ellis 2003). Empirical studies distinguish CAF as distinct areas of L2 proficiency (Norris & Ortega, 2009; Ortega, 1995; Skehan & Foster, 1997, 2001), indicating that if any interpretation is to be made as to L2 learners'

proficiency, all three dimensions must be examined. The focus of this study is not to investigate L2 proficiency of learners; it examines only the complexity level of L2 students as one of the indicators of L2 proficiency. Therefore, CAF has been established both empirically and theoretically as prominent and distinct measurement of L2 proficiency.

Given that complexity, accuracy and fluency are important indicators for L2 proficiency, these three concepts will be briefly discussed in the next section.

Complexity

Complexity is defined in linguistic terms and in cognitive terms. Cognitive complexity is defined as "relative difficulty with which language elements are processed during L2 performance and L2 learning as determined in part by the learners' individual backgrounds (e.g. their aptitude, motivation, stage of L2 development, L1 background)" (Housen et al., 2012, p. 4). Since the focus of this study is to determine L2 learners' complexity stages and participants of this study are of the same L1 background, it defines complexity in absolute terms (*absolute complexity*), not in relative terms (*difficulty*). More specifically, it employs the term linguistic complexity, which is part of absolute complexity.

 Linguistic complexity is about "intrinsic formal or semantic-functional properties of L2 elements or the properties of L2 elements" (Housen et al., 2012, p. 4). The subcategories of this complexity are identified as global or system complexity, and local or structure complexity. The first term refers to the extent to which a linguistic domain is elaborate and the subsequent one is interpreted as a more stable feature

which is associated with knowledge of individual linguistic items (Bulté & Housen, 2012). Towell (2012) refers to the extent of "elaboration" which is generally linked to syntax as a dimension involving a learner's capacity to create a full syntactic tree in his or her interlanguage. He defines lexical elaboration as the degree a learner is able to use lexical items successfully in diverse contexts. The depth and the stability of knowledge of syntax and lexis depend on to the extent to which procedures are represented in memory for processing the syntax and lexis, and "non-native like knowledge (intermediate interlanguage knowledge)" may also acquire depth and stability and lead to "fossilisation". The complexity of learners' L2 performance depends on the state of their declarative linguistic interlanguage (IL) knowledge (e.g. L2 patterns, rules and lexico-formulaic knowledge) as internalized under the constraints of, for example, universal grammar (*UG), markedness conditions and transfer*, hence, it has been argued that learners first develop 'simple' forms and at later stages 'complex' structures and rules (Towell & Hawkins, 1994; Wolfe-Quintero et al., 1998). However, Towell (2012) posits that this development has been poorly supported by empirical evidence. He argues that the complexity of language also hinges on the degree of *proceduralisation* of the relevant linguistic structures and rules, once acquired as explicit declarative knowledge, and become implicit. Thus, complexity is mainly related to both the learner's explicit declarative and implicit procedural IL knowledge.

Accuracy

In simple terms, accuracy is defined as "freedom from errors" (Foster & Skehan, 1996, p. 303-304) and is indicated by target-like use in terms of context and usage of the structure (Pica, 1983). In other words, higher accuracy is associated with higher

level of structural precision in appropriate contexts to communicate in both writing and speaking. According to Housen et al. (2012), accuracy refers to "the extent to which an L2 performance (and the L2 system that underlies this performance) is different from a norm" (p. 4). Towell (2012) argues that this norm can be investigated in relation to the native speakers of the language, other non-native speakers of the language (Ågren, Granfeldt, & Schlyter, 2012), or to the same individual speaker at more or less advanced stages of learning. However, there has been criticisms about measuring accuracy in relation to target language, that is native speakers, and some researchers favored measures that analyze interlanguage as a system in itself (Thomas, 1994).

Selinker (1972) proposes that language of a learner or a group of similar learners can be viewed as being systematic, and thus the learner's 'interlanguage' might be interpreted in terms of *regularities* or *systematicity*. The language of the learner might then be analyzed according to native speaker norms, to other interlanguage speakers or to the learner's own interlanguage at a later or prior stage of development (Towell, 2012). He argues that if *systematicity* is achieved to a certain degree, it can be compared to any specified norm. Hence, for a learner to become an accurate user of near-native interlanguage, the model assumes an integrated process whereby knowledge of syntax is initially triggered where necessary, learned linguistic knowledge is acquired, the two are successfully integrated and the resulting outcomes stored over time in memory in a way which represents knowledge in a way similar to that of native speakers (Towell, 2012).

According to the model of SLA discussed above, another feature of accuracy is consistency/reliability (Towell, 2012). Towell (2012) claims that a learner can achieve consistent accuracy only after a set of operations have been demonstrated in procedural memory enabling the production of proper linguistic structures in contexts in real time in a reliable way. In SLA research, this is treated as having many more or less systematic stages, each with its own norms (Ågren et al., 2012).

Measurements of accuracy can be categorized as both general and specific. Foster and Skehan (1999) name general error density measures as indicators such as the number of words per error, the proportion of error-free units in a text or the average length of error-free units. The rate of error-free units is argued to be general measurement of accuracy which is "more sensitive to detecting significant differences between experimental conditions" (p. 229).

Pallotti (2009) argue that there is a distinction between accuracy *per se and* comprehensibility. While the first term refers to the number of errors, the latter is about errors causing comprehension problems. However, there has been inconsistent results attempting to develop an error gravity framework. In his study, Fulcher (1993) aimed to find a connection between error types and L2 oral proficiency, yet error types were found to be not effective predictors of overall ratings. However, according to Burt and Kiparsky (1974), there is a need to distinguish between more disruptive "global" syntax errors and less critical "local" morphological errors (p.73), indicating that a learner could be perceived as more or less proficient depending on errors of syntax including omitting or incorrect ordering of clause constituents. In terms of language accuracy, verb phrase errors are generally viewed as more serious

than noun phrase errors (Chastain, 1981; Guntermann, 1978; Horner, 1987; Politzer, 1978; Rifkin, 1995). Also, a measurement of *lexical accuracy* is proposed in addition to measures of *lexical range* in determining the development of short-term proficiency gains (Lennon, 1995). Therefore, it is safe to assume that regardless of what measures are adopted to gauge accuracy, *lexical* and *grammatical* accuracy are important dimensions to help to analyze proficiency.

In SLA research, accuracy is the dimension of CAF that has received the most attention so far, while complexity has been the most ignored dimension. Therefore, this study will focus on complexity dimension of CAF as a predictor of proficiency. However, the link between accuracy and complexity should be noted as they are viewed as interdependent constructs. Towell (2012) proposes that "…as more elaborate knowledge of the elements of the syntactic tree develops it must be complemented by detailed knowledge of the properties of the lexical items which will fit into that tree" (p.59). He expresses that the extent to which complexity and accuracy are acquired depends on the interaction between the two constructs.

Fluency

According to Schmidt (1992), fluency is about "the processing of language in real time" (p. 358), therefore it is fundamentally related to communicating a message in writing or speech, and as Foster and Skehan (1996) state, it hinges on "primacy of meaning" (p. 304). Housen et al. (2012) define fluency as "mainly a phonological phenomenon" unlike accuracy, and complexity dimensions of language, which can be represented at "all major levels of language structure and use (the phonological, lexical, morphological, syntactic, socio-pragmatic level" (p. 5). They argue that

fluency can be investigated in relation to three components: speed fluency, breakdown fluency, and repair fluency.

Towell (2012) refers to speed fluency as a process for storage and recall. Breakdown and repair fluency are about the degree a learner believes the knowledge which has been stored is reliable and the extensiveness of procedures a learner can operationalize to use repair mechanisms in case of a communication breakdown of any sort (O'Malley & Chamot, 1990). Hence, the underlying processes of fluency depend on the way linguistic information has been stored and the extent to which it can be recalled from memory systems.

Towell (2012) argues that when a learner can fully access to the knowledge through practicing procedures, a fluent production is possible. He points out that although native-speaker-like accuracy, complexity and fluency are desired, most L2 learners' language do not demonstrate characteristics of native like language. He defines most L2 learners as being at some intermediate stage claiming that some learners "fossilize at an intermediate level with limited accuracy and complexity but with considerable fluency" (p. 55).

L2 complexity

Housen and Kuiken (2009) identify two general approaches that complexity has a central part in. In the first one, complexity is referred as an independent variable, and its effects on dimensions of L2 proficiency and L2 performance are examined. The second approach views complexity as a dependent variable along with accuracy and fluency to gauge L2 performance and L2 proficiency. The current study adopts the

second approach, as the notion of accuracy, fluency and complexity are interdependent and can be used as indicators of L2 proficiency and performance. Figure 1 presents a taxonomy of complexity that Bulté and Housen (2012) have proposed. In SLA research, as demonstrated in Figure 1, L2 complexity has three types: *propositional* complexity, *discourse-interactional* complexity and *linguistic* complexity to measure learners' L2 performance and L2 proficiency. Propositional complexity is defined as the number of information or idea units encoded in language task to communicate a message (Ellis & Barkhuizen, 2005; Zaki & Ellis, 1999). Discourse-interactional complexity refers to learners' *dialogic* discourse. More specifically, the number and type of turn changes that learners initiate and the interactional moves and participation roles that they engage in are seen as indicators of the discourse-interactional complexity of learners' L2 performance (Duff, 1986; Gilabert, Barón, & Llanes, 2009; Pallotti, 2008). Compared to linguistic complexity, propositional complexity and discourse-interactional complexity have been investigated to a lesser extent and are relatively ignored components of complexity in L2 research.

Bulté and Housen (2012) provide two different facets of linguistic complexity: as a dynamic property of the learner's L2 system at large (*global* or *system complexity*), or as a more stable property of the individual linguistic items, structures or rules that make up the learner's L2 system (*local* or *structure* complexity). *Global* or *system complexity* is about the extent of elaboration, the size, breadth, width, or richness of the learner's L2 system or 'repertoire'. In other words, it refers to the number, range, variety or diversity of different structures and items that the learner knows or uses: whether he masters a small or a wide range of different words or different

grammatical structures, whether he controls all or only a fraction of the sound system of the L2.
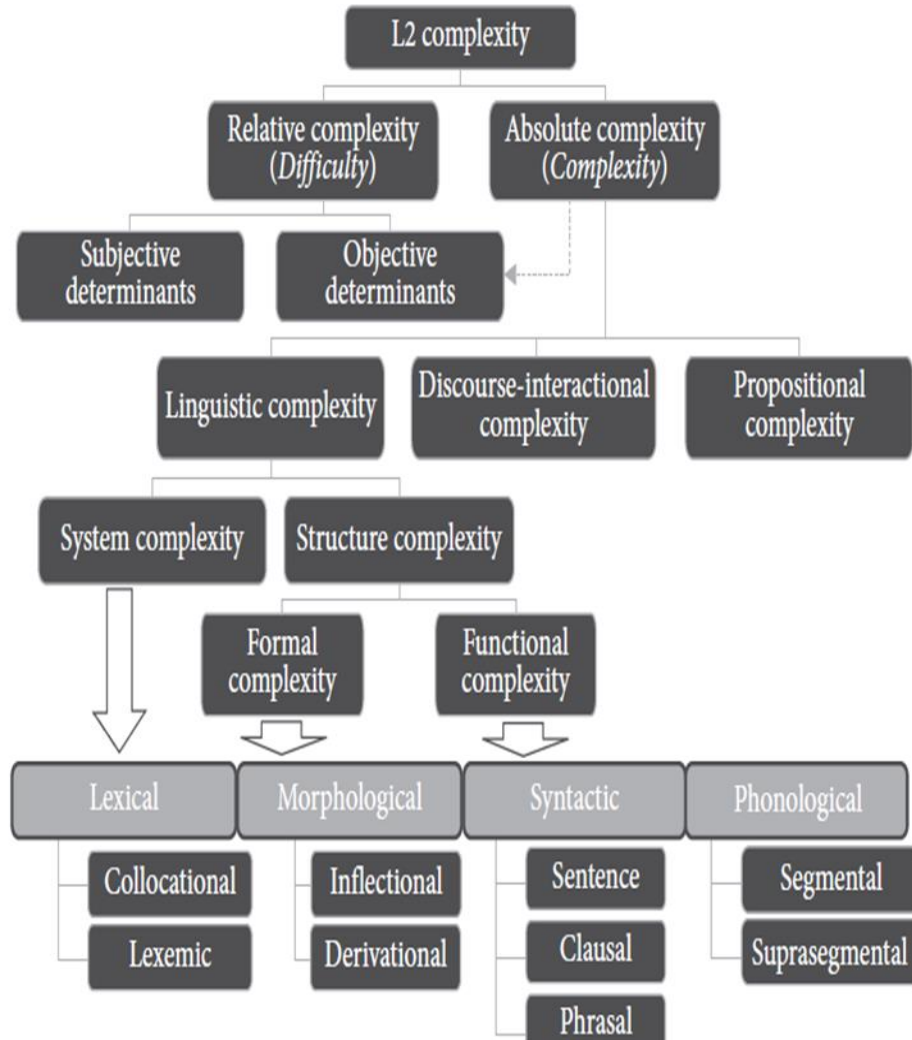
Figure 1. A taxonomy of complexity constructs (Bulté & Housen, 2012)

The second component of linguistic complexity is related to the local level of the discrete linguistic features, which is defined as *structure complexity*. They state that *structure complexity* is characterized more with *depth* than with breadth or range. Structural complexity consists of two subcategories, namely formal and functional complexity of an L2 feature (DeKeyser, 2005; Doughty & Williams, 1998; Housen et al., 2005). *Functional complexity* is about the scope of meanings and functions of

a linguistic structure and extend of "transparency, or multiplicity, the mapping between the form and meanings/ functions "of a linguistic form. *Formal complexity* can be interpreted as the structural 'substance' of a linguistic feature as indicated by the number of individual parts of a linguistic structure (e.g. simple past vs. present perfect forms in English). Furthermore, formal complexity involves the number of operations done on a base structure to attain the target structure (e.g., in the derivation of passive clauses from underlying active structures). Finally, formal complexity is linked with the *dependency distance* between a form and its nearest head or dependent (e.g. the plural *-s* form in English, which is locally determined within the NP versus the 3sg Present *-s*, which is globally determined outside the VP in which it occurs). Linguistic complexity is further analyzed across different language *domains* (phonology, lexis, morphology, syntax) and their respective subdomains (e.g. inflectional morphological and derivational morphological complexity; phrasal, clausal and sentential syntactic complexity). The focus of the current study is to analyze syntactic complexity of L2 learners, which is a constituent of *functional complexity*. Therefore, syntactic complexity of L2 learners will also inform us the extent to which learners can realize form-function mappings of a specific linguistic form.

Bulté and Housen (2012) propose that although various types of L2 complexity are categorized as separate constructs in theory, these complexity constructs may be closely intertwined in actual use of language learning and use. Therefore, distinguishing and assessing these constructs can be complicated. Also, they state that the division of complexity construct is a taxonomy, not a theory of complexity. Hence, they argue that there is a clear need for such a theory in terms of clarity and

uniformity across L2 complexity research. Furthermore, it has been suggested that L2 researchers have applied different criteria to make a distinction between simple and complex features, resulting in inconsistent representation and classifications of the same feature (Bulté & Housen, 2012). For instance, the 3sg Present -*s* in English has been categorized as simple feature both formally and functionally (Krashen, 1994), a formally simple yet functionally complex feature (Ellis, 1990) and a formally and functionally complex feature (DeKeyser, 1998).

Given that syntactic complexity, which is also called grammatical complexity, is the focus of this study, a detailed discussion will be presented in the next sections.

Grammatical complexity

Grammatical complexity is defined as the degree learners' language demonstrate "the range and the sophistication of grammatical resources," which is generally also referred as "variety, diversity, and elaborateness" in the use of grammatical constituents (Ortega, 2015, p. 82). While such a definition highlights the level of elaboration and sophistication in the way learners use grammatical features, Wolfe-Quintero et al. (1998) emphasize accessibility of grammatical forms by referring to grammatical complexity as a wide variety of both basic and elaborate structures that are available and easily accessible by a learner. They point out that lack of complexity is about learner's limited repertoire of such sophisticated structures, in other words, only a limited variety of basic forms are available and accessible to a learner. Furthermore, they argue that evidence of grammatical complexity can be represented in writing mainly through elaborateness and grammatical variation, which also resonates with Ortega's (2015) definition. Also, they claim that analyzing

grammatical complexity is not based on the number of production units in writing (such as clauses, T-units and sentences), but on variety and sophistication of these production units. In line with this argument, Foster and Skehan (1996) also define grammatical complexity as "progressively more elaborate language" and a "greater variety of syntactic patterning" (p. 303). As a learner's syntactic repertoire has a prominent role in his/her development in the language (Ortega, 2003), grammatical complexity is viewed as an important dimension of L2 writing and research.

Restructuring is recognized as a process which leads to development of grammatical complexity through "the evolution of increasingly abstract representations of knowledge" (Foster & Skehan, 1996; Schmidt, 1992, p. 369). Schmidt (1992) distinguishes *restructuring* from *automaticity* in a distinctive way, but restructuring can be considered as a natural by-product of automaticity if the former is defined as reinforcement of memory for chunks sequences in gradually complex patterns (Wolfe-Quintero et al., 1998). According to Wolfe-Quintero *et al.,* being increasingly exposed to instances is a prominent part of learning and generalizations about structure is formed as a result of memory for these instances. Therefore, a learner can progressively develop a complex mental representation of "instances" including both regular and irregular ones resulting in automaticity in access to a variety of structures.

Grammatical complexity has been studied in relation to various aspects including the effect of L1, task and/or topic, and instruction. Since studies exploring the role of instruction are more related to developmental aspect in grammatical complexity, they will be discussed in written grammatical complexity development section. However,

regarding grammatical complexity, Lu and Ai (2015) carried out a study to investigate the differences in grammatical complexities of learners from seven different L1 backgrounds. They compared argumentative essays of native speakers (NS) and non-native speakers (NNS) of English across 14 different grammatical complexity measures including metrics of length of production unit, amount of subordination, amount of coordination, and automatically analyzed with L2 Syntactic Analyzer (Lu, 2010). Their findings revealed that there were significant differences in grammatical complexities of college-level learners across several aspects of grammatical complexity and concluded that before any conclusions are made as to the relationship of proficiency and grammatical complexities, L1 should be taken into consideration.

In a longitudinal study, ESL learners' gains in terms of accuracy, syntactic and lexical complexity was observed after one year of study at an L2 medium university (Knoch, Rouhshad, & Storch, 2014). The researchers found that students' writing showed no observed development in terms of accuracy, grammatical and lexical complexity. However, indices used in this study to gauge complexity are limited to the measures of words per T-unit (W/T), clauses per T-unit (C/T) and words per clauses (W/C).

In another study, Rahimi and Zhang (2018) investigated effects of task complexity and pre-task planning conditions on L2 argumentative writing with 80 learners of upper-intermediate proficiency level. They concluded that increased task complexity and pre-task planning improved only one dimension of grammatical complexity,

namely subordination, which is measured by the number of subordinate clauses per clause.

Grammatical complexity features might also vary depending on different topics. Yang, Lu, and Weigle (2015) investigated grammatical complexity in relation to writing quality. They also investigated impact of topic on grammatical complexity features in 190 ESL graduates argumentative essays on two different topics. They measured grammatical complexity with "mean length of sentence (MLS), T-units per sentence (TU/S), mean length of T-unit (MLTU), mean length of clause (MLC), dependent clauses per T-unit (DC/ TU), coordinate phrases per clause (CP/C), complex noun phrases per clause (CNP/C), and non-finite elements per clause (NFE/C)" (p. 58). The analyses of learners' texts were done automatically with L2 syntactic complexity analyzer (L2SCA) (Lu, 2010). However, they made some slight adaptations. While they used six measures—MLS, MLTU, MLC, TU/S, DC/TU, and CP/C— in the same way as defined in Lu's (2010, 2011) original version of L2SCA, they adapted Biber et al.'s (2011) definition of complex noun phrases, referred as noun phrases that are composed of at least one of the following modifiers: "pre-modifying adjectives, post-modifying prepositional phrases, and post-modifying appositives," to calculate CNP/C (p. 58-59). Since the purpose of this study is to test Biber et al.'s (2011) framework of grammatical complexity development, their findings related to noun phrases (CNP/C) are specifically important to note. However, since DC/TU and NFE/C measures encompassed relative clauses and non-finite clauses modifying nouns, their findings of CNP/C did not reflect all noun modifiers. Their results revealed that no significant topic effect was observed on global complexity measurements as shown by MLS and MLTU. However, for local

complexity measures, it was found that topic had significant effects on grammatical

complexity features, except clausal coordination (TU/S). The texts on one topic were

found to be more elaborate with regard to the finite clause level, which was

associated with more occurrence of coordinate phrases and complex noun phrases.

More subordination at both finite and non- finite clauses was recorded for the other

topic. Hence, Biber et al. (2011) expressed, "specific topics may naturally elicit more

use of certain syntactic complexity features" (p. 62).

Grammatical complexity measurement

Most studies investigating complexity in academic writing are mainly based on T-

unit-based measures or clause-level indices such as clausal subordination (Beers &

Nagy, 2009; Casanave, 1994; Elder & Iwashita, 2005; Ellis & Yuan, 2004; Jiang,

2012; Larsen-Freeman, 2006; Stockwell & Harrington, 2003). Tonkyn (2012)

categorizes grammatical complexity measures into two; metrics hinging on whole

units of speech, and those depending on specific intra-unit features. Speech units are

primarily related to syntax, with the T-unit (Hunt 1970), the C-unit (Loban, 1963)

and AS-unit (Foster, Tonkyn, & Wigglesworth, 2000). In his study, Mendelsohn

(1983) used a simple length metric (words/unit) to investigate the differences

between native and non-native speakers. In another study, the same metric was used

to distinguish higher and lower-rated non-native-speakers (Halleck, 1995; Iwashita,

Brown, McNamara, & O'Hagan, 2008). Researchers have investigated many general

complexity metrics which are based on intra-unit complexity features. In one such

study, Cheung and Kemper (1990) examined three syntactic complexity measures a)

Yngve Depth, b) Frazier's Count, and c) the Botel, Dawkins, and Granowski (BDG).

These measures were reported to have high inter-correlation and be better estimates

than simple length or subordination metrics for assessing L1 grammatical complexity as they are sensitive smaller structures such as 'complexifying' but "compressing grammatical structures such as complex noun phrases, passives, and non-finite constructions" (Tonkyn, 2012, p. 223).

A number of studies have utilized more specific measurements of grammatical complexity. One such prevalently used metric depends on the number of subordinate clauses in a unit. This metric has also been referred as a 'general measure' by some researchers (Robinson, Cadierno, & Shirai, 2009). This metric has been observed to analyze the differences between native and non-native conversation in English (Mendelsohn, 1983) and in French (Van Daele, Housen, & Pierrard, 2008). The same metric has been identified to distinguish planned from unplanned speech (Foster & Skehan, 1996; Mehnert, 1998; Skehan & Foster, 1997). In a range of longitudinal studies of oral L2 complexity development during the duration of study abroad, it has been found to measure progression in some sorts of subordination (Towell, 1994; Towell, Hawkins, & Bazergui, 1996).

Several other researchers have analyzed grammatical complexity in terms of intra-clausal features. Modification in the noun phrase has been found to measure grammatical complexity and/or syntactic maturity (Akinnaso, 1982; Garman, 1990; Hunt, 1970). In their investigation of task-based performance, Foster and Skehan (1996) came to the conclusion that greater *verb* phrase complexity was a reflective feature of planned speech, and of more elaborate conversational exchanges in interactive task types. Lennon (1987) found out that advanced learners increased their use of modal verb over time. Similarly, Towell (1994) identified a parallel

pattern of increase in verbs in his investigation of advanced learner of French after spending some time in France. These studies have provided evidence that grammatical complexity features of speech are more *verbal* rather than phrasal.

Written grammatical complexity development

 SLA researchers have been employing different grammatical complexity measurements in relation to three major aims: "(a) to gauge proficiency, (b) to describe performance, and (c) to benchmark development" (Ortega, 2012, p. 128). However, although the first and second aims have received considerable attention in the L2 writing literature, the least studied aspect compared to proficiency and performance is development in L2 writing. As Ortega (2012) has put it, we have "considerably less systematic knowledge" of development dimension (p. 128). Furthermore, Manchón (2012) pointed out the limited attention that the development aspect of L2 writing has received and suggested that it was "an issue of the utmost theoretical, methodological, and pedagogical relevance" which was not "systematically approached in the otherwise abundant research in the field" (p. 3). Therefore, how L2 learners' grammatical complexities progress over time is a dimension that is as important as the complexity measures.

Mazgutova and Kormos (2015) conducted a study to measure the effect of instruction on the development of grammatical complexity features. They designed one-month intensive pre-sessional course (60 hours) for English for Academic Purposes (EAP) program and asked students to write two argumentative essays, both in the beginning and at the end of course. The participants of the study were of two different proficiency levels. The first group were graduate students with different L1

backgrounds, namely Chinese, Japanese and Thai (N = 25), and the second group

were Chinese undergraduate students studying in the U.K. (N = 14). At the end of the

course, they found undergraduate group (with a mean score of 5.8 in IELTS writing)

showed more development in grammatical and lexical complexity. The lower

proficiency group showed improvement in "noun-phrase complexity, specifically in

the frequency of complex nominals and noun-phrase modifiers, the use of relative

clauses as postmodifiers and the frequency of complex postmodifiers overall" (p.

12). In contrast to their lower proficiency group, their higher proficiency learners did

not show significant improvement in the use of complex noun phrases. They

concluded that at this level, students employed grammatically less complex forms to

express their ideas because they used more conceptually abstract lexis. Based on the

findings of Mazgutova and Kormos (2015), instruction for grammatical complexity

seems more effective at intermediate level than advanced level.

In order to investigate grammatical complexity development in learners of an L2

different than English, Vyatkina, Hirschmann, and Golcher (2015) conducted a

longitudinal study with 12 beginner level German L2 learners. The proficiency level

of learners were much lower than the level of the learners in Mazgutova and

Kormos's (2015) study. However, Vyatkina et al. (2015) investigated the effect of

instruction on the development of grammatical complexity in writing. They

measured grammatical complexity with "fine-grained measures," which they

operationalized as "syntactic modification" (p. 28). They determined seven modifier

categories: "prenominal (attributive) adjectives, cardinal numbers, predicative and

adverbial adjectives, adverbs, adverbial subordinate clauses, relative clauses" (p. 33)

and analyzed through frequency measures. Their findings showed that L2 learners of

German used simple, yet various modifier categories over the course of 2 year instruction. This expanded their use of modifiers to more elaborate modifiers including those at the clause level. However, they demonstrated significant differences in inter- and intra-individual aspects of development.

Written grammatical complexity development can be observed in intensive but short period of time (Mazgutova & Kormos, 2015), in a longitudinal instructional setting (Vyatkina et al., 2015). As Ortega (2015) points out instruction that encompasses intensive focus on practicing writing "at the lowest and higher ends of proficiency will be reflected in a wider and more sophisticated range of grammatical resources accessible during language production, which in turn will result in written texts that exhibit variety, diversity, and elaboratedness" in grammatical complexity features (p. 84).

Register variation

T-unit based measures and dependent clause measures are more representative of the spoken language rather than academic written language, which is characterized more with phrasal complexity, especially nominal complexity (Biber et al., 2011). "In evaluating the syntactic complexity of compositions written by advanced adult second language learners, T-unit analysis does not seem to reflect accurately the knowledge of the learner" (Bardovi-Harlig, 1992, p. 391).

The way meaning is constructed in written discourse shows striking differences from the way it is communicated in spoken language (Biber, 1988, 1995; Biber, Johansson, Leech, Conrad, & Finegan, 1999; Halliday, 1985, 1989). In particular,

academic writing manifests distinctive features from speech. In accordance with this argument, recent research findings suggest that written complexity is progressively constructed in the noun phrase as learners advance in their academic studies (Biber, Gray, & Poonpon, 2011; Lu, 2011). Hence, the ability of constructing meaning in a way which is marked by the noun phrases, and producing written texts which are nominally complex is crucial for university students (Parkinson & Musgrave, 2014) and for the development of written complexity.

In order to find out the differences between complexities of spoken language and written language, Biber et al. (2011) conducted a large-scale corpus study. Academic writing corpus included 429 research articles with about 3 million words and conversation corpus consisted of 4.2 million words of American English. The findings suggest that clause-level subordination is not reflective of characteristics of written discourse despite having been traditionally relied on measuring written complexity. They propose that extensive subordination features are more prevalent in speech than in academic writing.

Noun phrase complexity

Based on the evidence of the corpus study, Biber et al. (2011) propose a developmental progression index of noun phrase complexity. They point out that both L2 and L1 learners acquire competence in academic writing developmentally late and development probably begins with the clausal complexity which is characteristic of speech to the nominal complexity which is linked with academic writing. In other words, they hypothesize that progression entails development from "conversational competence to competence in academic writing" (p. 25) and thus,

the acquisition of features of written academic complexity happens in later developmental stages. In more detail, Biber et al. (2011) posit that progression starts:

> from finite dependent clauses functioning as constituents in other
>
> clauses, through intermediate stages of nonfinite dependent clauses
>
> and phrases functioning as constituents in other clauses, and finally
>
> to the last stage requiring dense use of phrasal (nonclausal)
>
> dependent structures that function as constituents in noun phrases.
>
> (p. 29)

As proposed by Biber et al., (2011), grammatical complexity development should advance from finite to non-finite dependent clauses, and extensive elaboration at dependent noun phrases is acquired last. Thus, to identify L2 learners' complexity developmental stages, and to see if their texts demonstrate features of academic writing, the current study adopts Biber et al.'s framework for grammatical complexity developmental stages.

Conclusion

This chapter has presented the related literature on L2 proficiency, with a focus on one of CAF's three components; complexity. Definition of terms, a categorization of L2 complexity construct, previous studies on written grammatical complexity, and a range of measurements to assess grammatical complexity have been provided. The next chapter will cover the methodology of the current study providing information about the setting, participants, data collection tools, procedure and data analysis.

CHAPTER 3: METHODOLOGY

Introduction

The purpose of this study is to investigate whether college-level L2 learners' writing demonstrates grammatical complexities that are indicative of academic writing. To realize this purpose, the researcher analyzed 2nd year university students' argumentative essays. In this respect, the study aims to address the following research questions:

1. What are the written complexity developmental stages of Turkish L2 learners in their argumentative writing?

2. What grammatical functions do the written complexities of L2 learners perform in their argumentative writing?

3. Is there a statistically significant difference among topic groups in terms of grammatical complexities of L2 learners in their argumentative writing?

4. Is there a statistically significant difference among topic groups in terms of grammatical functions of L2 learners in their argumentative writing

This chapter provides methodological information in four sections. The first section presents information related to the participants of the study, the setting and the sampling. In the second section, a detailed description of the learner corpus is given. In the third section, data coding and the framework used for coding the data are explained. In the last section, data analysis is described.

Research design

This study employs a mixed-method research design. Creswell and Plano Clark (2011) define a mixed-method research design as a process of collecting and/or analyzing both qualitative and quantitative methods in a single study. In other words, mixed-methods research requires employing both qualitative and quantitative methods either in data collection or data analysis process or both. According to Creswell (2002), using this design requires extensive data collection and analysis, and doing this is a time-consuming procedure, yet it yields a "better understanding of your research problem" (p. 535). In this study, analyzing the data included both qualitative and quantitative methods. First, qualitative method was employed in data coding process since it required identifying complex forms in students' writings and functions that these complex forms realize. This process lasted more than one month for the researcher. Second process included quantitative method for analyzing, identifying, and reporting the results. The qualitative data were analyzed through manual coding, while the quantitative data were analyzed on SPSS v.24.To determine students' complexity developmental stages, grammatical functions, and the effect of topic on students' grammatical complexities, descriptive and inferential statistics were used. Therefore, this study benefited from strengths of both qualitative and quantitative methods.

Setting and participants

The participants of this study were 60 Turkish EFL students studying at a foundation university in Ankara, Turkey. Students' majors were in Business, Computer Engineering, Civil Engineering, Economics, Industrial Engineering, Information Systems Engineering, Mathematics, Psychology, and Software Engineering. The

number of females were 29 (n = 29), and the number of males were 31 (n = 31). The age range of the students was between 21 and 28 ($M = 22$).

The researcher used convenience sampling in this study. According to Fraenkel, Wallen and Hyun (2011), convenience sampling is sampling method that includes a group of individuals or participants that are available for the study. The sample of individuals were chosen from the university that the researcher was working at. However, the argumentative essays were randomly selected out of 40 sections of the same course, from about 911 students. Data in this study were chosen from three random topics for argumentative essays.

Although in convenience sampling many sources of bias exist (Fraenkel, Wallen, & Hyun, 2011), considering the nature of this study, it can be considered as an advantage. Major rationale is that different schools or institutions have different curriculums and different expectations from students' writing. Also, 2nd year students in different universities may not have the same proficiency level or passed the same Proficiency exams or prerequisite courses. Thus, the parameters that would affect the result of this study would be too many if random universities were selected. Also, the researcher was also one of the instructors at this university and taught the course previously; therefore, she knew the institution policy, curriculum and expectations from the course well. While the results of this study cannot be considered as representative of any population, it allows replication of the study as the researcher carefully included demographic information.

The data were collected from a 2nd year course, English for Academic Purposes III (ENG201) offered by instructors of Department of Modern Languages during 2018-2019 academic year. The aim of this course is to help learners improve their critical thinking skills, critical reading skills, and academic writing skills, especially in the argumentative genre. Prior to this course, students successfully completed English for Academic Purposes I (ENG101) and English for Academic Purposes II (ENG102) courses with a minimum of CC (60) grade. They are expected to be B2 level upon successful completion of ENG201 according to the Common European Framework (CEFR).

ENG201 adopts a process writing approach in which students produce two drafts for each writing task. Throughout one semester, students write two argumentative essays, each essay with two drafts. They receive feedback on grammar, content, and organization in their first draft, and these first drafts are not graded. Then, students develop their final (i.e., second) drafts based on the feedback they have received. The first writing task is on a given topic, thus students do not have a choice for topics. The second writing task includes prompts for learners to choose from two or three different topics provided by course instructor.

ENG201 adopts a flipped learning approach to help learners become more autonomous and use the classroom time for hands-on argumentative essay practice. For argumentative essays, students watch videos shot by DML instructors before coming to class and they take notes and write down their questions. The class session starts with a discussion of the video which is about the conventions, organization of argumentative essay and its parts. After the discussion and analyzing sample essays,

students write their first drafts in class. Before the second argumentative essay writing, students get feedback on the first draft of their first argumentative essays.

In this institution, students submit their essays as a hard copy including all the drafts to the instructors, and they also upload a soft copy of their final draft to Moodle platform. Course instructors use *Turnitin* program to check originality of essays and to prevent any case of plagiarism. First drafts of essays were written during regular course hours and learners were allowed to get peer support if they needed. However, they were not allowed to use any electronic devices such as cell phones, computers or tablets. The students were provided feedback on grammar, specifically accuracy vocabulary, organization and content of their essays. No complexity feedback was provided throughout the process. Students were correcting their second and final drafts at home based on the feedback. The argumentative essays were expected to have an introduction paragraph, which should cover an introduction of the topic, the significance of the topic, opponents' ideas and a thesis statement. At least three body paragraphs were expected comprising of two pro-argument paragraphs and one counter-argument paragraph. The concluding paragraph should cover a restatement or a summary of pro-arguments and counter arguments, and final thoughts.

During second argumentative writing, each course instructor was free to provide students two or three prompts out of 22 different topics. These prompts were not given to the students beforehand so that they would not get prepared at home. During the first drafts, students were provided two lesson hours (100 minute) to write a five-paragraph argumentative essay. To ensure the originality of students' writing, that is

to make sure that students actually wrote the essays themselves, they were not allowed to use any electronic devices.

Data set

The learner corpus consists of final drafts of 60 argumentative essays written by 60 L2 learners in an English for Academic Purposes III (ENG) course in 2018-2019 academic year. The essays were written in three different topics: "Death penalty should/should not be legalized" (n = 20), "Online learning is/is not better than traditional learning" (n = 20), "Cell phones should/should not be banned in schools" (n =20). In this study, topic refers to the phrases used in the prompt of writing task. Yang, Yu and Weigle (2015) defined topic as "actual wording of the writing task" (p. 56). Therefore, this study will use the term topic as what learners are asked to elucidate in particular from writing prompt as Yang et al.'s (2015) study did. In this study, topic groups include Topic 1 (students who wrote to Prompt 1: "Cell phones should/should not be banned in schools."), Topic 2 (students who wrote to Prompt 2: "Death penalty should/should not be legalized."), and Topic 3 (students who wrote to Prompt 3: "Online learning is/is not better than traditional learning.").

Students' final drafts were chosen for the analyses because their first drafts generally included grammatical errors which would make the complexity analysis difficult. Students only received grammar, content, and organization feedback on their drafts but no feedback was provided on complexity. Table 1 presents number of argumentative essays, total number of words and sentences, and mean length of argumentative essays.

Table 1
Dataset

Learner corpus	Total
Number of argumentative texts	60
Mean length of texts	403
Total number of words	24183
Total number of sentences	1581

Form-function analysis

Data coding in this study draws upon form-grammatical function analysis. Methods of analysis that view language as a formal system comprised of grammatical features hinge on formal characteristics of language (Ellis & Barkhuizen, 2005). However, conceptualization of language requires both grammatical forms and a system of "form-function mappings" (p. 62). The starting point of analysis was Ellis' (2008) *form analysis*. In a form analysis, all instances of a specific form are identified in a data. In this respect, all instances of grammatical complex forms were identified in the data. Then, these complex forms were designated a *grammatical function* (adverbial, complement, and noun modifier) according to Biber et al.'s framework for complexity.

Data coding

LeCompte and Schensul (1999) refer to *codes* as names or symbols used to stand for a group of similar items, ideas, or phenomena" in a dataset (p. 55). Thus, coding helps researcher organize data into themes and categories or similar items for analyzing, interpreting and drawing conclusions (Ellis & Barkhuizen, 2005). Data coding is based on Biber et al.'s (2011) framework for grammatical complexity

stages (see Table 2). For lists of common verbs that control finite complement clauses (1a&1b) and nonfinite complement clauses (2d&2e), *Longman Grammar of Spoken and Written English* (Biber et al., 1999) was used. Lists of most common and less common verbs were obtained from Longman Spoken and Written English Corpus (the LSWE Corpus).

Table 2
Framework for grammatical complexity stages by Biber et al. (2011)

Stage	Grammatical structure (s)	Example(s)
1	Finite Complement Clauses (*that* and WH) controlled by extremely common verbs (e.g., think, know, say)	1a we never quite **know** what to make of him (conv). 1b just **think** that he didn't pay attention (conv).
2	Finite complement clauses controlled by a wider set of verbs Finite adverbial clauses Nonfinite complement clauses controlled by common verbs (especially want) Phrasal embedding in the clause: adverbs as adverbials Simple Phrasal embedding in the noun phrase: attributive adjectives	2a I'd **forgotten** that he had just testified on that one (conv). 2b if you're sitting next to me and you want ninety degrees, and I want sixty degrees, we're just gonna be battling each other…(conv). 2c I'm assuming I gained weight because things are a little tighter than they used to be (conv). 2d I don't **want** to fight with them about it (conv). 2e I **hate** watching the people interact (conv).

Table 2 (cont'd)
Framework for grammatical complexity stages by Biber et al. (2011)

		2f He's so confused <u>anyway</u> (conv).
		2g It certainly has a <u>nice</u> flavor (conv)
		2h Tom Jones is apparently a <u>real</u> name (conv).
3	Phrasal embedding in the clause: prepositional phrases as adverbials	3a He seems to have been hit <u>on the head</u> (fic).
	Finite complement clauses controlled by adjectives	3b It seemed quite **clear** <u>that no one was at home</u> (fic).
	Nonfinite complement clauses controlled by a wider set of verbs	3c I was **sure** <u>that I could smooth over our little misunderstanding</u> (fic).
	That relative clauses, especially animate head nouns	3d The snow began <u>to fall again</u> (fic).
	Simple phrasal embedding in the noun phrase: nouns as premodifiers	3e ...the guy <u>that made that call</u> (fic).
		3f ...some really obscure <u>cable</u> channel (fic)
	Possessive nouns as premodifiers	3g <u>Tobie's</u> voice (fic)
	Of phrases as postmodifiers	3h **editor** <u>of the food section</u> (fic)
	Simple PPs as postmodifiers, especially with prepositions other than *of* when they have concrete/ locative meanings	3i **house** <u>in the suburbs</u> (fic)
4	Nonfinite complement clauses controlled by adjectives	4a These will not be **easy** <u>to obtain</u> (acad)

Table 2 (cont'd)

Framework for grammatical complexity stages by Biber et al. (2011)

	Extraposed complement clauses	4b **It is clear** <u>that much remains</u>
	Nonfinite relative clauses	<u>learned...</u> (acad)
	More phrasal embedding in the	4c In that case **it is useful** <u>to phrase</u>
	NP =attributive adjectives, nouns	<u>sustainability in terms of</u> … (acad)
	as premodifiers	4d the **method** <u>used here</u> should
	Simple PPs as postmodifiers,	suffice…(acad)
	especially with prepositions	4e **Studies** <u>employing</u>
	other than *of* when they have	<u>electrophysiological measures</u> (acad)
	abstract meanings	4f The prevalence of <u>airway</u>
		<u>obstruction</u> and <u>self-reported disease</u>
		<u>status</u> (acad)
		4g <u>Positive propagule size effects</u> have
		been demonstrated for both <u>plant</u> and
		<u>animal systems</u>
		4h with half <u>of the subjects in each</u>
		<u>age/instructional condition</u> receiving
		each form (acad)
		4i The specific growth rate <u>at small</u>
		<u>population sizes…</u>
5	Preposition + nonfinite	5a The **idea** of <u>using a Monte Carlo</u>
	complement clause	<u>clause approach</u> (acad)
	Complement clauses controlled	5b The **hypothesis** <u>that female body</u>
	by nouns	<u>weights was more variable</u> (acad)
	Appositive noun phrases	5c **The CTBS** <u>(the fourth edition of</u>

Table 2 (cont'd)
Framework for grammatical complexity stages by Biber et al. (2011)

Extensive phrasal embedding in the NP: multiple prepositional phrases as postmodifiers, with levels of embedding	the test) was administered in 1997-1998 (acad) 5d the [presence of [[layered structures] at the [[[borderline]] of cell territories]]] (acad)

To identify the sub-stages of learners, the examples in the framework for grammatical complexity were matched with appropriate category. For stage 1, only 1 sub-stage was identified and the code was called *1a/1b*. For stage 2, there were 5 sub-stages; finite complement clauses (*2a*), finite adverbial clauses (*2b/2c*), nonfinite complement clauses (*2d/2e*), adverbs as adverbials (*2f)*, simple phrasal embedding in the noun phrase: attributive adjectives (*2g/2h*). For stage 3, 8 codes were used to mark the subcategories; *3a* for prepositional phrases as adverbials, *3b/3c* for finite complement clauses controlled by adjectives, *3d* for nonfinite complement clauses, *3e* for relative clauses (that), *3f* for nouns as pre-modifiers, *3g* for possessive nouns as pre-modifiers, *3h* for *of* phrases as post-modifiers, and *3i* for simple PPs as post-modifiers. Furthermore, for stage 4, five codes were used; *4a* for nonfinite complement clauses controlled by adjectives, *4b/4c* for extraposed complement clauses, *4d/4e* for nonfinite relative clauses, *4f/4g* for attributive adjectives, nouns as pre-modifiers, and *4h/4i* for simple PPs as post-modifiers. Finally, in stage 5, there were 4 codes for each sub-stage; *5a for* nonfinite complement clause controlled by preposition, *5b* for complement clauses controlled by nouns, *5c* for appositive noun phrases, and *5d* for multiple prepositional phrases as post-modifiers, with levels of embedding. In total, 23 codes were used to identify each sub-stage of the framework.

Students' essays were transferred to an excel sheet sentence by sentence. Students'

texts were given an ID and coded manually for both grammatical complexity form

and grammatical function. For the coding of grammatical complexity forms, complex

grammatical forms were identified in each sentence and coded into the subcategories

of each complexity developmental stage. When a sentence involved more than one

complex grammatical form, new rows were added for the same sentence and all

complex forms were coded. The number of total complex grammatical forms

identified was 3130 (n = 3130). For the coding of grammatical functions of identified

forms, the complex forms were coded with three grammatical functions as adverbial,

complement and noun modifier. Table 3 presents the coding of five sample sentences

for the coding of complex grammatical forms and grammatical functions as well as

the identification of complexity developmental stages each form belong to.

Table 3
Sample data coding

Student ID	Text ID	Sentences	Complex form	Stage	Grammatical Function
S1	SI	There are a lots of ongoing arguments about an issue whether death penalty should be legalized or not	an issue whether death penalty should be legalized or not	5b	complement
			ongoing arguments	2g/2h	noun modifier
			death penalty	3f	noun modifier
S1	S2	Everyday new	deserve to be	3d	complement

Table 3 (cont'd)
Sample data coding

		crimes are committed and some criminals deserve to be sentenced to death	sentenced to death	3a	adverbial
S1	S3	However execution is not a solution, execution is sometimes seen as an escape route for some cases	an escape route for some cases	4h/4i	noun modifier
S1	S4	Some criminals are rather be dead then to suffer in prison	in prison	3a	adverbial
S1	S5	But on the other hand opponents support legalization of death penalty since they believe if someone gets out of prison that person is more likely to do the	legalization of death penalty	3h	noun modifier
			since they believe if someone gets out of prison	2b/2c	adverbial
			the same thing	2g/2h	noun modifier

Table 3 (cont'd)
Sample data coding

same thing again.

Sentences which were not clear structurally due to grammatical errors were coded as "0gerror." These sentences were excluded from the data analysis. Table 4 below presents some examples of inaccurate forms that were coded as "0gerror" and were not assigned a stage because of lack of clarity.

Table 4
Sample inaccurate structures identified in the analysis

Student ID	Text ID	Sentences	Complex form	Stage	Grammatical Function
S2	S2	These people is different kinds of punished by the judgement.	different kinds of punished by the judgement	0gerror	
S3	S18	So these should be an alarm of to make you aware of your own life.	an alarm of to make you aware of your own life	0gerror	
S13	S21	These websites have very low costs and high qualify lessons.	high qualify lessons	0gerror	

Inter-coder reliability

In order to ensure the reliability of data coding, 20% of the learner data were coded for both grammatical complexity stages and grammatical functions by a second coder, who worked as an assistant professor in the Department of English Language Learning and Literature at a Turkish state university, and had expertise in L2 written complexity.

The first two students' texts were used for training and calibration purposes by the researcher and the second coder to make sure that they both had a common understanding of the stages and grammatical complexities in Biber et al.'s (2011) framework. Because the framework was clear with straightforward complexity features and grammatical functions, two texts were found to be enough for the training of the second coder.

In order to randomly choose 20% (12 texts) of the remaining learner data, random numbers were created on Excel for student texts, and those with the first highest 12 numbers were chosen for coding. Out of 12 texts, 531 grammatical complexity forms were identified and assigned to their stages and grammatical functions by the second coder. The two coders' codes for both grammatical complexity stages and grammatical functions were compared, and inter-coder reliability was calculated through percentage agreement.

For the grammatical complexity stages, the inter-coder percentage agreement was found to be 0.87 (87% of agreement with 463 identical and 68 different codes). For the grammatical functions, the inter-coder percentage agreement was 0.95 (95% of

agreement with 505 identical and 26 different codes). Given that 80% is commonly the target agreement between coders (Creswell, 2013), both percentages are considered to be good, ensuring the reliability of data coding.

Data analysis

The coded data were analyzed through descriptive and inferential statistics on SPSS v.24. For the first research question, descriptive statistics were used to identify L2 learners' written complexity developmental stages. Frequencies, means, standard deviations were calculated for complexity forms, complexity stages, and grammatical functions for the whole group and for the three topics separately. For the second research question, the topic effect on L2 learners' grammatical complexities was analyzed through Kruskal-Wallis test after the normality values of the data were checked.

Conclusion

This chapter presented general information regarding research design, setting, and participants of the study. After providing information on context and the participants, learner corpus and data sources were described. Then, data coding process was explained in detail. Finally, data analysis procedure was discussed. The next chapter will report findings of the analysis of students' academic writing and their grammatical complexity stages in depth.

CHAPTER 4: RESULTS

Introduction

This study aimed (a) to identify grammatical complexity stages of college-level students and (b) investigate the topic effect on the students' grammatical complexities. Grammatical complexity features were coded manually based on the framework for grammatical complexity stages by Biber et al. (2011). All instances of specific form(s) in the data were identified and coded following Ellis' (2008) form analysis and were assigned to the corresponding main stages and sub-stages. The identified forms were also coded for grammatical functions.

The study addressed the following research questions:

1. What are the written complexity developmental stages of Turkish L2 learners in their argumentative writing?

2. What grammatical functions do the written complexities of L2 learners perform in their argumentative writing?

3. Is there a statistically significant difference among topic groups in terms of grammatical complexities of L2 learners in their argumentative writing?

4. Is there a statistically significant difference among topic groups in terms of grammatical functions of L2 learners in their argumentative writing?

The participants of this study consisted of 60 2nd year university students studying at a foundation university in Ankara, Turkey. The data came from 60 argumentative essays on three different topics: cell phones should/should not be allowed in schools

(n = 20), death penalty should/should not be abolished (n = 20), and online learning is/is not better than traditional learning (n =20).

The learner data included a total number of 1581 sentences and 24183 words. As a result of data coding, a total number of 3130 grammatical forms and the same number of grammatical functions were identified. Some structures were grammatically incorrect, and interfered with complexity. Thus, such structures were excluded from complexity coding. A total number of 117 forms were identified as grammatical errors that interfered with surface meaning, and 87 simple sentences were excluded from the analysis. A total number of 2924 grammatically complex forms were used for analysis. Apart from inter-coder reliability, which was found to be 87% for grammatical stages and 95% of agreement for grammatical functions, complexity forms that were questionable to the researcher were discussed and negotiated with the second coder, who is an experienced researcher on L2 written complexity.

In this chapter, the findings of data analysis will be discussed in relation to four research questions. First, grammatical stages of L2 learners' argumentative texts will be discussed and sub-stages that occurred with highest and lowest frequencies will be presented. Second, frequency analysis of grammatical functions (adverbial, complement and noun modifiers) that were performed by complex forms will be presented. In the third section, the role of topic on L2 learners' grammatical complexity stages will be covered and any cases of statistically significant differences among the three topic groups will be reported. After the comparison of writing topics across complexity stages, the final section will provide whether there

is any statistically significant differences in the way L2 learners perform grammatical functions in their argumentative essays based on writing topics.

Grammatical complexity developmental stages of L2 learners

In order to identify grammatical complexity developmental stages of L2 learners, students' sentences in their argumentative essays were coded for the complex features and relevant stages and sub stages according to the framework by Biber et al. (2011). Using SPSS v.24, the coded data were analyzed through descriptive statistics (e.g., mean, standard deviations, skewness, and kurtosis values) for all five stages. Frequencies and percentages were also calculated in an excel spreadsheet. Table 5 presents the findings for L2 learners' grammatical complexity developmental stages.

Table 5
Descriptive statistics for grammatical complexity developmental stages of L2 learners

Grammatical Complexity Stage	Frequency	Percent	Mean	Std. Deviation
Stage 1	130	4.45	2.16	1.61
Stage 2	1431	48.94	23.85	10.58
Stage 3	1198	40.97	19.96	7.40
Stage 4	127	4.34	2.11	2.02
Stage 5	38	1.30	0.63	0.90
Total	2924	100		

As shown in Table 5, out of a total 2924 grammatically complex forms that were used in argumentative texts, L2 learners' grammatical complexities belongs to Stage

2 (48.94%, n = 1431), and Stage 3 (40.97%, n = 1198). The numbers of Stage 1

(4.45%, n = 130) and Stage 4 (4.34%, n = 127) complex forms were approximately

the same. The lowest number of grammatically complex forms was in Stage 5, with a

percentage of 1.30 (n = 38).

Grammatical complexity developmental sub-stages of L2 learners

Since each stage in the framework (Biber et al., 2011) includes sub-stages of

complex grammatical forms, the frequency of occurrence and percentages for each

sub-stage was calculated. Through descriptive statistics, mean, standard deviation,

skewness and kurtosis values were analyzed for 23 sub-stages of complex forms.

Table 6 presents findings regarding sub-stages of each stage of complexity in the

framework by Biber et al. (20119. As demonstrated in Table 6, the highest frequently

occurring sub stages were 2g/2h with 26.71% (n = 781), and 2b/2c with 14.67% (n =

429). The highest frequency of complex forms in L2 learners' argumentative texts

were found to be attributive adjectives modifying a head noun (*2g/2h*), and finite

adverbial clauses (*2b/2c*).

Table 6
Descriptive statistics for grammatical complexity sub-stages of L2 learners

Sub-stage	Frequency	Percent	Mean	Std. Deviation
1a/1b	130	4.45	2.16	1.61
2a	141	4.82	2.35	1.48
2b/2c	429	14.67	7.15	2.88
2d/2e	44	1.50	0.73	1.01
2f	36	1.23	0.60	0.93
2g/2h	781	26.71	13.01	9.46

Table 6 (cont'd)
Descriptive statistics for grammatical complexity sub-stages of L2 learners

3a	359	12.28	5.98	3.90
3b/3c	2	.07	0.03	0.18
3d	74	2.53	1.23	1.57
3e	43	1.47	0.71	1.15
3f	364	12.45	6.06	5.43
3g	69	2.36	1.15	1.56
3h	145	4.96	2.41	2.12
3i	142	4.86	2.36	1.90
4a	29	.99	0.48	0.85
4b/4c	1	.03	0.01	0.12
4d/4e	12	.41	0.20	0.57
4f/4g	1	.03	0.01	0.12
4h/4i	84	2.87	1.40	1.68
5a	28	.96	0.46	0.74
5b	6	.21	0.10	0.30
5c	0	.00	0.00	0.00
5d	4	.14	0.06	0.25
Total	2924	100		

The results also showed that the sub stages *3f* (nouns pre-modifying a head noun) and *3a* (prepositional phrases functioning as adverbials) were frequently used by L2 learners with 12.45% (n = 364) and 12.28% (n = 359) respectively. While these two grammatical sub types occurred almost equally in L2 learners' texts, they show characteristics of conversation and fiction more than characteristics of academic

writing. The findings indicated that L2 learners overused attributive adjectives and nouns as pre-modifiers, finite adverbial clauses and prepositional phrases functioning as adverbials.

The lowest frequency of sub stages were in Stage 5 and Stage 4 respectively. A surprising finding was that all the sub types of Stage 4 and Stage 5 occurred with less than 1% (n < 30) except *4h/4i* (2.87%, n = 84). Based on this finding, simple abstract prepositional phrases that modify a head noun occurred with highest frequency of all sub-types in Stage 4 and Stage 5. Although the numbers in these two higher complexity stages (Stage 4 and Stage 5) were rather low to make generalizations, prepositional phrases at postposition seems relatively easier for L2 learners to deploy in their argumentative writing.

The lowest frequency in Stage 2, which is the main stage of overall group, was recorded in *2d/2e* with 1.50% (n = 44), and *2f* with 1.23% (n = 36). An interesting finding across sub types of Stage 2 is that finite complement clauses, *2a* with 4.82% (n =141) were used approximately 3 times more than nonfinite complement clauses (*2d/2e*).

Regarding sub stages of Stage 3, the lowest frequencies were obtained in *3b/3c* with .07% (n = 2), *3e* with 1. 47 % (n = 43), *3g* with 2.36% (n = 69). Finite complement clauses controlled by verbs (1a/1b with 4.45% and 2a with 4.82%) occurred with considerably higher frequencies than finite complement clauses controlled by adjectives (*3b/3c*) and by nouns (*5b*, .21%). While L2 learners overused verb modification at finite clause level, they underused adjective and nouns modifying a

finite complement clause. *That* relative clauses (*3e*), and possessive nouns as pre-modifiers (*3g*) were also the least frequently occurring sub types at Stage 3.

Main findings related to complexity stages, high frequency and low frequency sub-stages including their types (finite-non-finite, noun phrase) have been explained. The next section will report findings for grammatical functions that these complex forms serve.

Grammatical functions of L2 learners

Grammatically complex forms serve three major grammatical functions in writing; adverbials, complements and noun modifiers. In order to explore grammatical functions used in L2 learners' texts, frequency and percentages were calculated and using descriptive statistics, means, standard deviations and skewness, kurtosis values were analyzed for three grammatical functions.

Table 7 demonstrates findings related to grammatical functions that were used by L2 learners as shown in their argumentative texts. There were 2924 instances of adverbials, complements and noun modifiers in total. As demonstrated in Table 7, out of 2924 instances, the highest frequency of occurrence was in noun modifiers with 57.22% (n =1673, $M = 27.88$). This was followed by the use of adverbials with 28.18% and 824 frequency of occurrence ($M =13.73$). A surprising finding was related to low frequency of complements with only 14.60% (n = 427, $M = 7.11$). While there were 8 categories of complements and only 3 categories of adverbials in the framework by Biber et al. (2011), adverbials occurred almost two times higher than complements.

Table 7

Descriptive statistics for grammatical functions of L2 learners

Grammatical Function	Frequency	Percent	Mean	Std. Deviation
Adverbial	824	28.18	13.73	4.81
Complement	427	14.60	7.11	3.30
Noun modifier	1673	57.22	27.88	10.44
Total	2924	100		

Overall frequency, percentages and means of grammatical functions were explained.

Since each grammatical function has also subtypes (23 total), each grammatical

function will be analyzed in relation to their sub-types.

Adverbials

Figure 2 presents L2 learners' adverbial use in their argumentative texts in relation to

the complexity stages. As shown in Figure 2, L2 learners' most frequently used

adverbials belong to Stage 2 and Stage 3. More specifically, they most commonly

used *2b/2c* (52%, n = 429) subcategory of adverbials, which includes finite adverbial

clauses with subordinating conjunctions such as if, because, or although, and *3a*

(44%, n = 359), which includes prepositional phrases as adverbials. The least

frequently used category of adverbial was *2f*, which includes adverbs as adverbials,

with only 4% (n = 36) of occurrence. This finding reveals that L2 learners'

argumentative essays did not demonstrate phrasal embedding in the use of

adverbials.
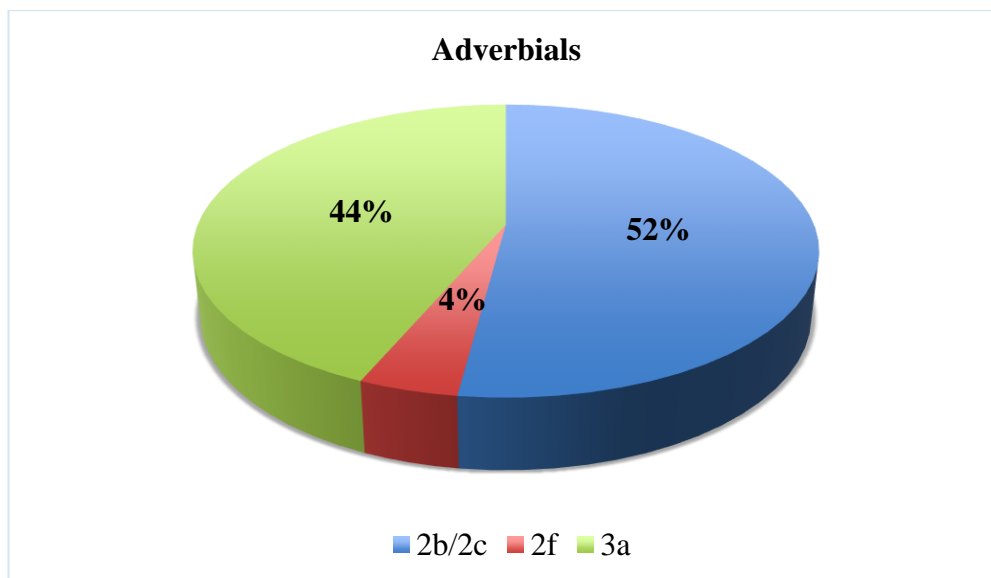
Figure 2. Adverbial use in L2 learners' argumentative texts

Complements

Grammatical function of complements has 8 categories in the framework. Figure 3

presents L2 learners' use of complements in their argumentative texts. As

demonstrated in Figure 3, the highest frequency of occurrence in the category of

complements was 2a, which includes finite complement clauses with less common

verbs (33.02%, n = 141) and 1a/1b, which includes finite complement clauses with

extremely common verbs (30.44%, n = 130). This was followed by *3d*, which is

nonfinite complement clauses controlled by less common verbs with 17.33% (n = 74)

and *2d/2e,* which is nonfinite complement clauses controlled by wider set of verbs,

with 10.30% (n = 44). This is in line with the finite complement findings, as L2

learners seem to use less common verbs more both with finite and non-finite

complement clauses. While the complexity features that occurred in complement

category were more *verbal (1a/1b, 2a, 3d, 2d/2e)* than *nominal,* students favored a

wider set of verbs than extremely common verbs. The least frequently used

complements were in *4b/4c* (extra-posed complement clauses, 0.23%, n = 1), *3b/3c*

(finite complement clauses controlled by adjectives, 0.47%, n = 2) and *5b*

(complement clauses controlled by nouns, 1.41%, n = 6). It might be pondered that

L2 learners' academic writing did poorly demonstrate features such as extra posed

complement clauses, finite complement clauses controlled by adjectives, and

complement clauses controlled by nouns.
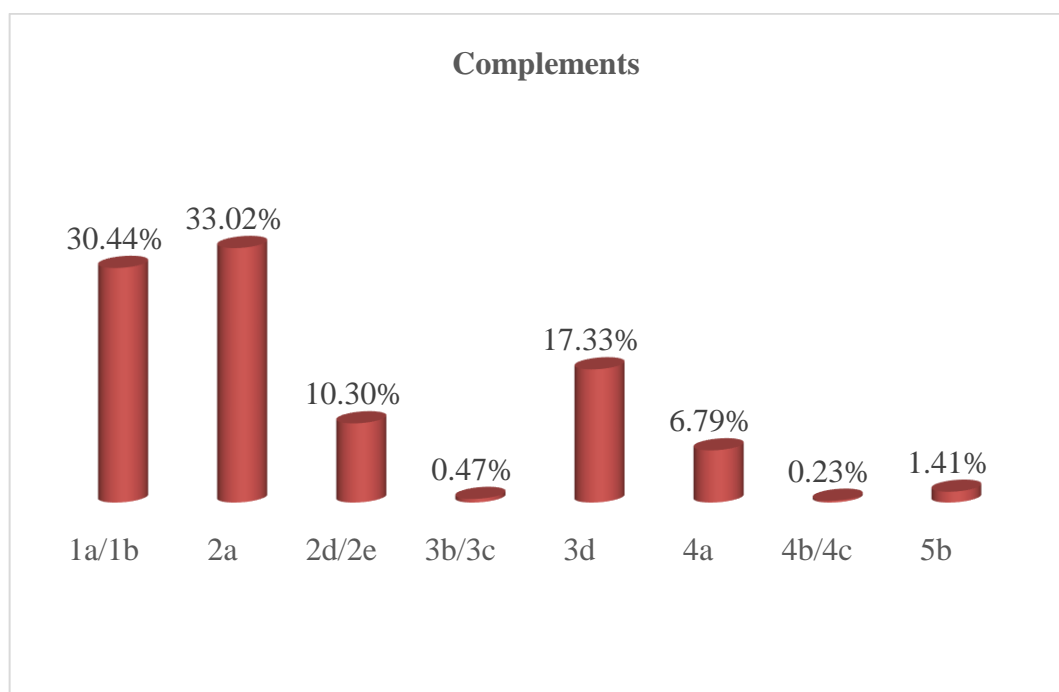
Figure 3. Complement use in L2 learners' argumentative texts

Noun modifiers

A total number of 1673 complex noun modifiers were coded. Figure 4 presents how

L2 learners' argumentative texts displayed noun modifiers. As displayed in Figure 4,

L2 learners used 2g/2h (attributive adjectives modifying nouns) category of noun

modifiers most with 46.68% (n = 781). This was followed by 3f (nouns as pre

modifiers) with 21.76% (n = 364), 3h (*of* phrases as post modifiers) with 8.67% (n =

145) and 3i (simple prepositional phrases as post modifiers with concrete/locative

meaning) with 8.49% (n = 142). The least frequently used noun modifiers were 4f/4g

(phrasal embedding with attributive adjectives, nouns as pre-modifiers, 0.06%, n =
1), 5d (multiple prepositional phrases as post-modifiers with levels of embedding,
0.24%, n = 4), 4d/4e (nonfinite relative clauses, 0.72%, n = 12), and 5a (preposition
+ nonfinite complement clause, 1.67%, n = 28). There were no instances of 5c
appositive noun phrases.
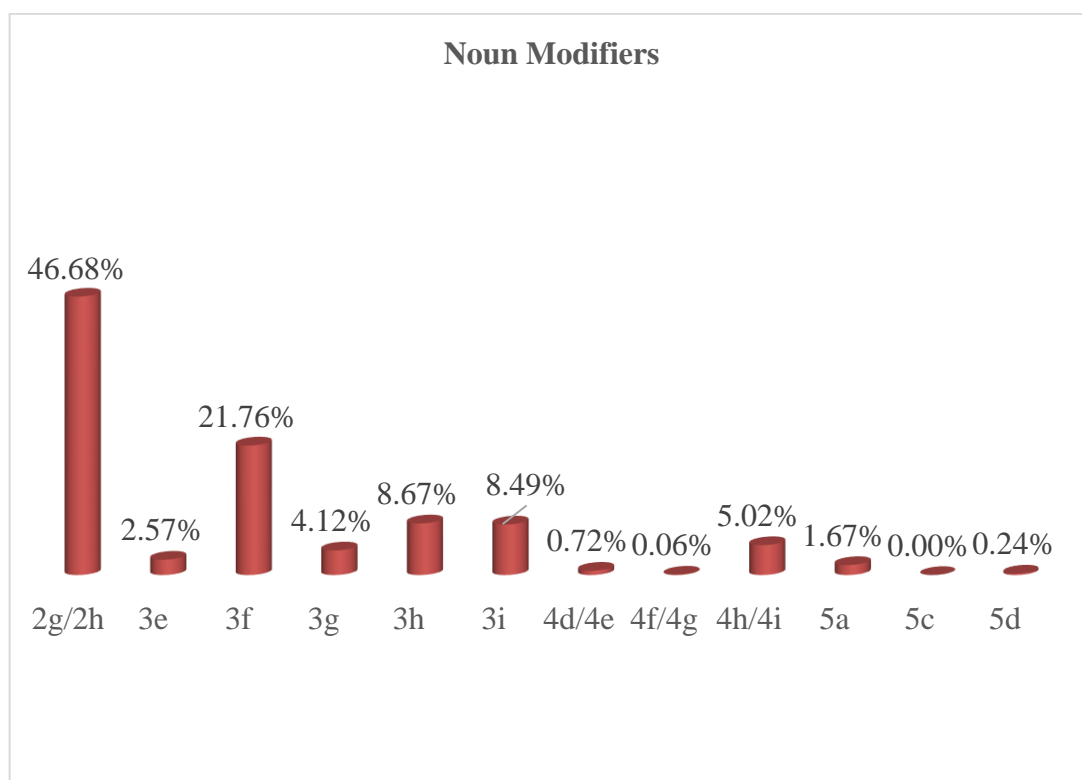
Figure 4. Noun modifier use in L2 learners' argumentative texts

The role of topic in grammatical complexity stages of L2 learners

One of the purposes of this study was to explore whether topic have any effect on the
grammatical complexity features of L2 learners. The prompt for the first topic was
"cell phones should/should not be allowed in schools" (hereafter, cell phones).
Figure 5 presents grammatical complexity developmental stages for Topic 1, namely
cell phones. As shown in the Figure 5, L2 learners' grammatical complexities for cell

phones topic belonged to Stage 3 with 47% (n = 409) and Stage 2 with a percent of 44 (n = 378). The lowest frequency was in Stage 5 (n = 13) and Stage 4 (n = 23). It was also found that learners that wrote about cell phones topic did not rely much on the lowest stage of complexity, Stage 1 (5%, n = 46).
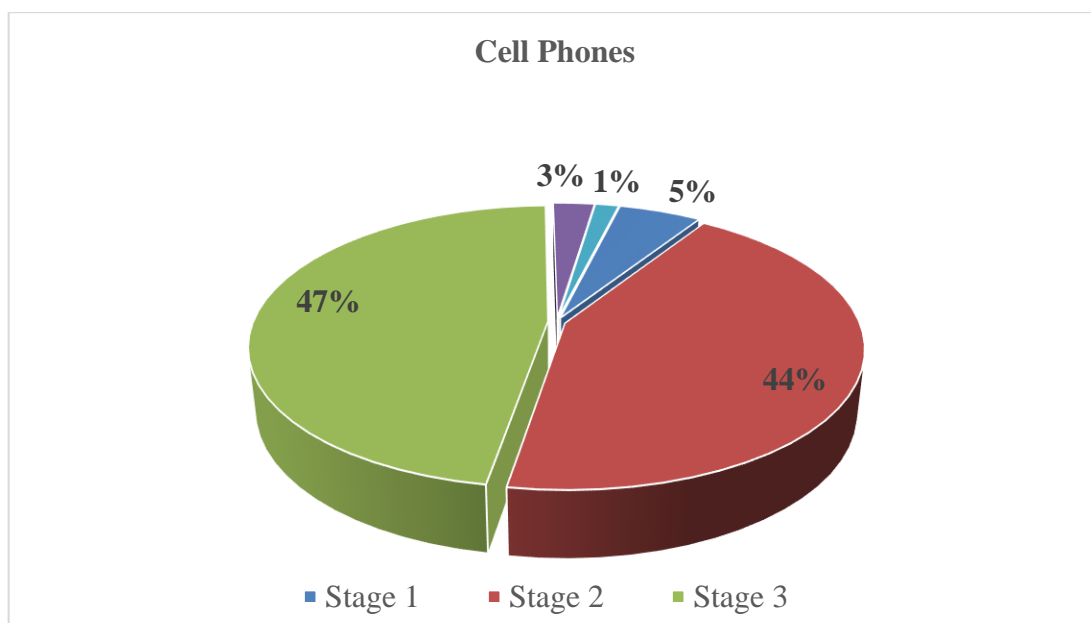
Figure 5. Grammatical complexity developmental stages for Topic 1 (i.e., cell phones)

For the second topic, students were asked to write about whether "death penalty should/should not be abolished" (hereafter, death penalty). Figure 6 demonstrates grammatical complexity developmental stages for Topic 2, death penalty. As shown in the Figure 6, grammatical complexities of Topic 2 group were in Stage 3 with 47% (n = 440), and Stage 2 with a percent of 39 (n = 373). While the percentage in Stage 2 is lower than Topic 1 group, the frequencies in this stage were actually very close. However, written texts of Topic 2 group demonstrated higher frequencies than Topic 1 group in Stage 4 (6%, n = 55) and Stage 5 (2%, n = 21). While main stages for both groups were the same (Stage 3), Topic 2 group used more grammatically complex forms than Topic 1 in higher developmental stages.

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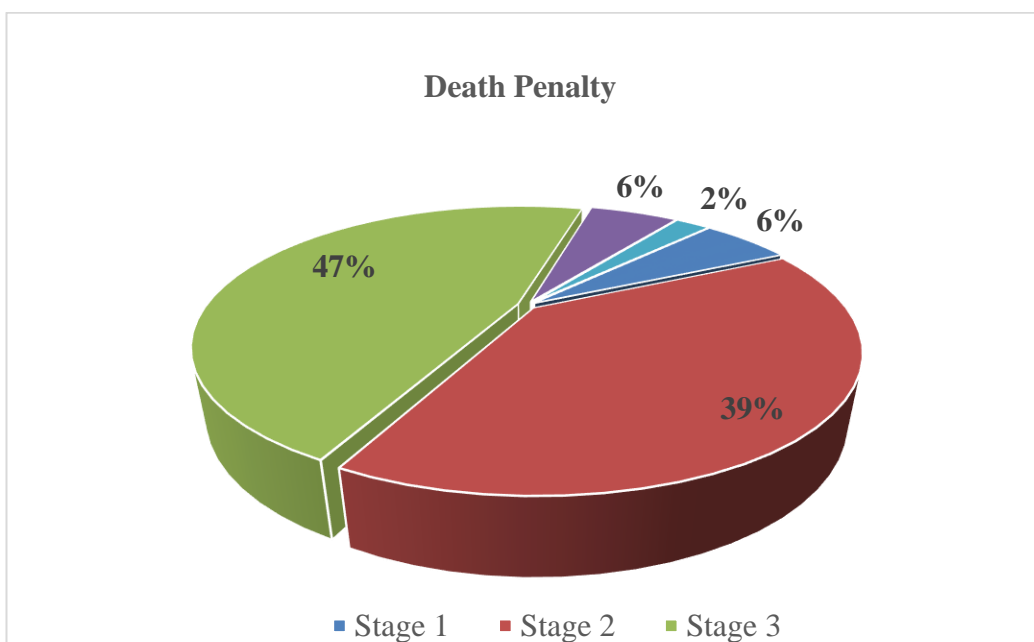
Figure 6. Grammatical complexity developmental stages for Topic 2 (i.e., death penalty)

For the third topic, students wrote about whether "online learning is/is not better than traditional learning" (hereafter, online learning). Figure 7 presents findings for grammatical stages of online learning group. As shown in Figure 7, the highest frequency of grammatical complexity features of this group were in Stage 2 (61%, n = 680), and Stage 3 with 31% (n = 349). The lowest frequencies in this group were observed in Stage 5 with 0% (only 5 instances of complex forms) and Stage 1 (3%, n = 30). Stage 4 occurred with 5% (n = 49), higher than Topic 1 group, close to Topic 2 group. Overall, the main developmental stages of Topic 3 group were lower than Topic 1 and Topic 2 group. Written texts of this group demonstrated grammatical features of Stage 2 considerably higher than the other groups.
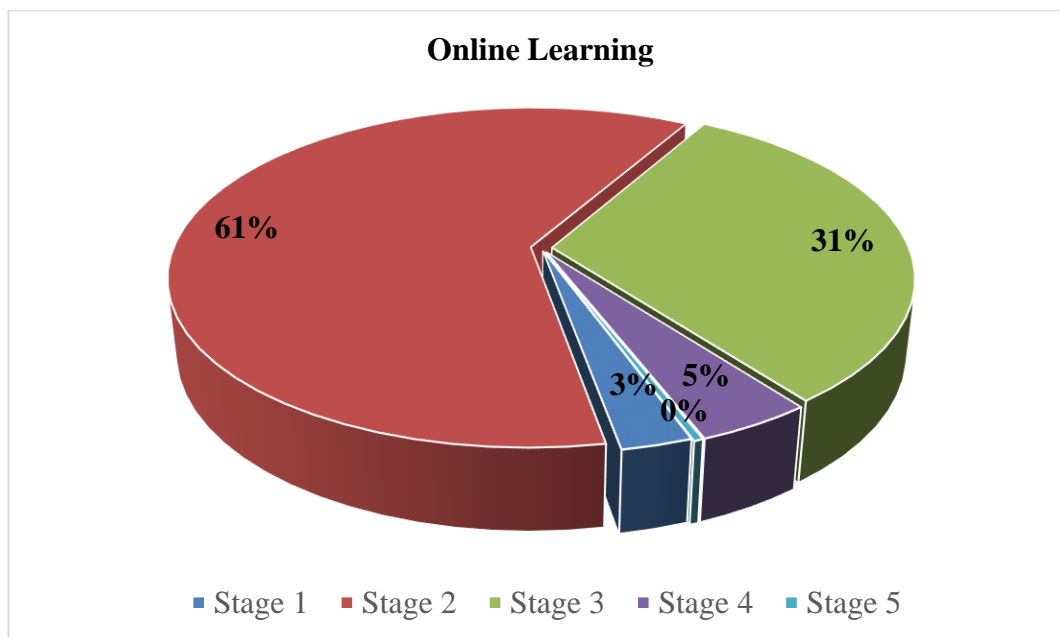
Figure 7. Grammatical complexity developmental stages for Topic 3 (i.e., online learning)

Measuring the difference among the topic groups in terms of grammatical complexity stages

In this study, the role of topic on grammatical complexity features was measured as an independent variable by examining students' argumentative writing. Qualitative data was collected from L2 learners' essays and coded in accordance with the 5 complexity stages in Biber et al.'s (2011) framework. For the analysis, -2 and +2 were considered as acceptable rule of thumb in order to measure normal univariate distribution (George & Mallery, 2010). Sample sizes were small, and based on skewness and kurtosis values, assumptions of normal distribution could not be tested adequately. Therefore, the Kruskal-Wallis test, a non-parametric one-way ANOVA by ranks (Daniel, 1990), was used to test for the differences between grammatical complexity stages across three independent topic groups: Topic 1 (cell phones), Topic 2 (death penalty), and Topic 3 (online learning). Table 8 demonstrates the findings regarding the effect of topic on grammatical complexity stages.

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Table 8
Kruskal-Wallis test for the role of topic on grammatical complexity stages

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Chi-Square	5.20	26.26	4.11	7.07	9.96
df	2	2	2	2	2
Asymp. Sig.	.07	.00	.12	.02	.00

Stage 1

The results of Kruskal-Wallis test showed that there was no statistically significant difference in grammatical complexities of students' writing in Stage 1 among the three topic groups ($\chi^2(2)$ = 5.20, p = .074). Since no statistically significant difference was observed among topic groups in Stage 1, no further post-hoc analysis was conducted.

Stage 2

The Kruskal-Wallis test results revealed that the topics significantly affected students' grammatical complexities in Stage 2 (χ^2 (2) = 26.26, p = .000). Since p-value was less than the significance level of 0.05, the null hypothesis was rejected, and it was concluded that there were statistically significant differences among the topic groups in terms of their grammatical complexities in Stage 2.

Stage 3

The Kruskal-Wallis test results showed that there were no statistically significant differences among the three topic groups (χ^2 (2) = 4.11, p = .128). In other words, the null hypothesis was failed to reject as the p-value was higher than 0.05. Since no

statistically significant differences were found among topic groups in their grammatically complex features in this stage, no post-hoc analysis was conducted.

Stage 4

The Kruskal-Wallis test results showed that there were statistically significant differences among three topic groups in their grammatical complexities in Stage 4 (χ^2 (2) = 7.07, p = .029).

Stage 5

The Kruskal-Wallis test results revealed that the topic groups had statistically significant differences in terms of grammatical complexity features in Stage 5 (χ^2 (2) = 9.96, p = .007).

Comparison of the significant topic groups for grammatical complexities

The results of Kruskal-Wallis test indicated statistically significant differences among three topic groups in Stage 2, Stage 4 and Stage 5. To explore patterns across topic groups, Mann Whitney-*U* tests were conducted to further investigate the effect of topic on complexity features across stages.

Table 9 presents a comparison within topic groups in grammatical complexity Stage 2. As demonstrated in Table 9, regarding students' grammatical complexities in Stage 2, there were statistically significant differences between Topic 1 (cell phones) and Topic 3 (online learning) (z = -4.38, p = .000), and Topic 2 (death penalty) and Topic 3 (z = -4.42, p = .000). However, no significant differences were observed for Topic 1 and Topic 2 (z = -0.52, p = .59).

Table 9

Mann Whitney-*U* test for the comparison of topic groups in stage 2

Stages	Topics	N	Mean Rank	Sum of Ranks	Mann Whitney-*U*	Z score	Significance value
	Topic 1	20	21.48	429.50	180.50	-0.52	.59
	Topic 2	20	19.53	390.50			
Stage 2	Topic 1	20	12.40	248.00	38.00	-4.38	.00
	Topic 3	20	28.60	572.00			
	Topic 2	20	12.33	246.50	36.50	-4.42	.00
	Topic 3	20	28.68	573.50			

Note. Topic 1: "cell phones should/ should not be allowed in schools" Topic 2:"death penalty should/should not be abolished." Topic 3: "online learning is/is not better than traditional learning."

Table 10 presents results of Mann Whitney-*U* test by comparing topic groups in terms of grammatical complexity developmental Stage 4. As shown in Table 10, grammatical complexities of students who wrote on Topic 1 differed significantly from those that wrote about Topic 2 and Topic 3 in Stage 4. There were statistically significant differences between Topic 1 and Topic 2 (z = -2.27, p = .023) and between Topic 1 and Topic 3 (z = -2.33, p = .019) in terms of grammatical complexity features used in Stage 4. In other words, Topic 1 differed significantly from both Topic 2 and Topic 3 in terms of the way they used grammatical complexity features in Stage 4. However, no statistically significant differences were found between Topic 2 and Topic 3 (z = -.08, p = .934) in terms of grammatical complexity features found in Stage 4.

Table 10
Mann Whitney-*U* test for the comparison of topic groups in stage 4

Stages	Topics	N	Mean Rank	Sum of Ranks	Mann-Whitney-*U*	Z score	Significance value
Stage 4	Topic 1	20	16.40	328.00	118.00	-2.27	.02
	Topic 2	20	24.60	492.00			
	Topic 1	20	16.28	325.50	115.50	-2.33	.01
	Topic 3	20	24.73	494.50			
	Topic 2	20	20.65	413.00	197.00	-.08	.93
	Topic 3	20	20.35	407.00			

Note. Topic 1: "cell phones should/ should not be allowed in schools" Topic 2:"death penalty should/should not be abolished." Topic 3: "online learning is/is not better than traditional learning."

Table 11 demonstrates findings of Mann Whitney-*U* test regarding differences among topic groups in grammatical complexity developmental Stage 5. In other words, Table 11 shows which topic groups differed in terms of grammatical complexities found in stage 5. As indicated in Table 11, the results of Mann-Whitney-*U* test revealed that students' complexities in Topic 2 (death penalty) differed significantly from their complexities in Topic 3 (online learning). In other words, there were statistically significant differences between Topic 2 and Topic 3 grammatical complexity features (z = -3.10, p = .002). No statistically significant complexity differences were obtained between Topic 1 and Topic 2 (z =-1.51, p = .13) and between Topic 1 and Topic 3 (z = -1.78, p = .07).

Table 11
Mann Whitney-*U* test for the comparison of topic groups in stage 5

Stages	Topics	N	Mean Rank	Sum of Ranks	Mann-Whitney-*U*	Z score	Significance value
	Topic 1	20	17.90	358.00	148.00	-1.51	.130
	Topic 2	20	23.10	462.00			
Stage 5	Topic 1	20	23.20	464.00	146.00	-1.78	.075
	Topic 3	20	17.80	356.00			
	Topic 2	20	25.60	512.00	98.00	-3.10	.002
	Topic 3	20	15.40	308.00			

Note. Topic 1: "cell phones should/ should not be allowed in schools" Topic 2:"death penalty should/should not be abolished." Topic 3: "online learning is/is not better than traditional learning."

The Role of topic on grammatical functions of L2 learners

Table 12 summarizes mean, standard deviation, minimum and maximum values for the grammatical functions that were performed by the students' grammatical complex forms. As displayed in Table 12, among the three grammatical functions, Turkish L2 learners used more noun modifiers (*M* = 27.88, *S.D* = 10.44) than adverbial (*M* = 13.73, *SD* = 4.81), and complement (*M* = 7.11, *S.D* = 3.30), which was the least used grammatical function.

Table 12
Descriptive statistics for grammatical functions

Function	Mean	Std. Deviation	Minimum	Maximum
Adverbial	13.73	4.81	4.0	28.0

Table 12 (cont'd)
Descriptive statistics for grammatical functions

Complement	7.11	3.30	2.0	19.0
Noun Modifier	27.88	10.44	8.0	64.0

In order to investigate the effect of topic on grammatical functions that were served by complex forms, Kruskal-Wallis test was carried out. Table 13 presents the Kruskal-Wallis test results for three grammatical functions. As Table 13 displays, there were statistically significant differences among topic groups (cell phones, death penalty, and online learning) in terms of their use of noun modifiers (χ^2 (2) = 16.09, p = .000). L2 learners' argumentative essays did not demonstrate statistically significant differences in terms of adverbials (χ^2 (2) = 1.48, p = .476), and complements (χ^2 (2) = 3.70, p = .157). The results of Kruskal-Wallis test revealed that at least one of the topic groups differed significantly in the way noun modifiers were displayed through complex grammatical forms.

Table 13
Kruskal-Wallis test for grammatical functions

	Adverbial	Complement	Noun Modifier
Chi-Square	1.48	3.70	16.09
df	2	2	2
Asymp. Sig.	.47	.15	.00

In order to find out which topic group(s) showed significant differences in noun modifier used by L2 learners, Mann Whitney-*U* post-hoc test was employed. Table 14 displays findings of Mann Whitney-*U* for comparison of topic groups in their use of noun modifiers. As shown in Table 14, statistically significant differences were

observed among all three topic groups in the way noun modifiers were used by L2

learners in their argumentative writing. Noun modifier use in Topic 1 (cell phones)

was significantly different from noun modifier use in Topic 2 (death penalty) (z = -

1.96, p = .049) and Topic 3 (online learning) (z = -3.77, p = .000). The highest

difference was also observed between Topic 1 with mean rank of 13.53 and Topic 3

with a mean rank of 27.48. Furthermore, there were statistically significant

differences between noun modifiers in Topic 2 and in Topic 3 (z = -2.43, p = .015).

Based on the results of Mann Whitney-*U* test, it can be argued that there seems to be

a close relationship between the topic and noun modifier use.

Table 14
Mann Whitney-*U* test for comparison of topic groups for noun modifiers

Grammatical Function	Topics	N	Mean Rank	Sum of Ranks	Mann-Whitney-*U*	Z score	Significance value
	Topic 1	20	16.88	337.50	127.50	-1.96	.04
	Topic 2	20	24.13	482.50			
Noun	Topic 1	20	13.53	270.50	60.50	-3.77	.00
Modifiers	Topic 3	20	27.48	549.50			
	Topic 2	20	16.00	320.00	110.00	-2.43	.01
	Topic 3	20	25.00	500.00			

Further findings

Table 15 shows the high frequency types of complex forms used in L2 learners'

argumentative texts across three topic groups. As demonstrated in Table 15, while

the highest frequency was in the use of attributive adjectives for both Topic 1 (cell

phones) and Topic 3 (online learning), nouns pre-modifying a head noun had the

highest frequency in Topic 3 (death penalty).

Table 15
High frequency types of complex forms used by L2 learners

Topic	Complex forms	Highest frequency	Total number of Complex forms
Topic 1	Attributive adjectives as premodifiers	169	869
	Finite adverbial clauses	135	
	Prepositional phrases as adverbials	138	
Topic 2	Nouns as premodifiers	188	1112
	Finite adverbial clauses	156	
	Attributive adjectives as premodifiers	152	
Topic 3	Attributive adjectives as premodifiers	459	942
	Finite adverbial clauses	139	
	Prepositional phrases as adverbials	137	

Conclusion

 In this chapter, the findings of descriptive statistics and frequency analysis revealed

that overall grammatical complexity of L2 learners were in Stage 2 and Stage 3

respectively. Moreover, L2 learners' argumentative essays demonstrated phrasal

complexities more as noun modifiers had the highest frequency of occurrence than

adverbials and complement clauses. The results of the analysis of the tests regarding the effect of topic on grammatical complexities showed that topic had a significant effect on complexity features of essays in Stage 2, Stage 4, and Stage 5. Moreover, analysis of the effect of topic on grammatical functions revealed that different topics elicited different levels of elaboration in phrasal features, namely noun modifiers. However, no statistically significant differences were found among topic groups in terms of the use of adverbials and complements. In the next chapter, findings, pedagogical implications, limitations of the study and suggestions for further studies will be presented in relation to grammatical complexity development of Turkish L2 learners.

CHAPTER 5: DISCUSSION

Introduction

The purpose of this study was twofold: it aimed to (a) determine syntactic complexity stages of college-level L2 learners, and (b) explore the effect of writing topic on students' grammatical complexities and the functions served by these complex forms. Regarding the aim of the study, the following research questions were addressed:

1. What are the written complexity developmental stages of Turkish L2 learners in their argumentative writing?

2. What grammatical functions do the written complexities of L2 learners perform in their argumentative writing?

3. Is there a statistically significant difference among topic groups in terms of grammatical complexities of L2 learners in their argumentative writing?

4. Is there a statistically significant difference among topic groups in terms of grammatical functions of L2 learners in their argumentative writing?

This chapter will cover major findings to and discussion of 1) main complexity stage(s) and sub stage(s), 2) the frequency and types of grammatical functions performed by complex forms, 3) the role of topic on grammatical complexities, and 4) the role of topic on grammatical functions in L2 learners' argumentative essays. Following that, the pedagogical implications will be discussed in detail. Afterwards, the limitations of this study will be addressed and finally suggestions for further research will be offered.

Major findings and conclusions

The results of this study demonstrated that L2 learners' grammatical complexities were mostly in Stage 2 (48.96%) and Stage 3 (40.99%) respectively. Stage 2 includes grammatical complexities such as finite complement clauses (*that* or *WH* clauses controlled by verbs), finite adverbial clauses (*if, because, although, when* etc. clauses), non-finite complement clauses following a common verb (e.g., want <u>to leave</u>), adverbs as adverbials, and attributive adjectives modifying a noun (simple embedding in the noun phrase). As indicated in Biber et al.'s (2011) framework, these complexities in Stage 2 reflect characteristics of conversation more than characteristics of academic writing. Therefore, it can be concluded that the writings of L2 learners who participated in this study do not show complexities of academic writing since they were developmentally in Stage 2 and Stage 3 of grammatical complexity stages.

As for the grammatical functions, it was found that noun modifiers were the most frequently used category of grammatical functions (57%). While students' essays were distinguished with phrasal complexity (especially noun modifiers) more than clause-level complexity, their writing was not at a high level of complexity (i.e., Stage 4 and Stage 5) since most of the noun modifiers they used belonged to Stage 2 and Stage 3.

As for the role of topic on learners' complexity stages, different topics produced different complexities across stages. Different topics might require different levels of complexity specifically in Stage 2, Stage 4, and Stage 5. The overall complexity stage for Topic 1 (cell phones) was found to be Stage 3 (47%) with 409 occurrences

of complex forms in this stage only. The main stage of Topic 2 (death penalty) was also Stage 3 (47%) with 440 occurrences of complex forms. Topic 3 (online learning) was identified to be Stage 2 (61%) with a total of 680 complex forms. Although there was homogeneity of proficiency among topic groups, students in Topic 1 and Topic 2 groups wrote in a greater complex way compared to students who wrote in Topic 3 group. Finally as for the effect of topic on grammatical functions, significant differences were obtained in noun modifiers. Thus, phrasal complexity can be argued to be sensitive to dimensions of writing topic.

Grammatical complexity developmental stages of L2 learners

L2 learners' grammatical complexity stages were found to be under Stage 2 (48.96%) with 1431 complex forms used in this stage, and Stage 3 (40.99%) with 1198 complex forms in this stage. The highest frequency of Stage 2 was in sub-stage 2g/2h, attributive adjectives as pre-modifiers (26.68%, n = 780). This was followed by the sub-stage 2b/2c which includes finite adverbial clauses (14.71%, n = 430). These findings are similar to Parkinson and Musgrave's (2014) study comparing noun-phrase complexity of two groups of students: first group consisted of undergraduate students, and the second group was graduate students enrolled in a master's degree program. They found that undergraduates, reported to be upper-intermediate level and less proficient than the M.A. group, depended on attributive adjectives (2g/2h sub stage of the framework) heavily and "favored structure for EAP students" (p.53). The participants in the current study were B2 level according to CEFR. The current study also confirms that attributive adjectives modifying nouns (*2g/2h*) are used extensively by EAP students. The findings are also in line with Biber et al.'s (2011) hypothesis that the acquisition of attributive adjectives happens

earlier than other noun modifying features: nouns as pre-modifiers and prepositional phrases as post-modifiers. Hence, the high frequency of noun modifiers by L2 learners does not show embeddedness. Regarding the sub stage *2b/2c* (finite adverbial clauses), Turkish L2 learners seemed to rely heavily on such structures. More specifically, finite adverbial clauses might be at the easy disposal of L2 learners' linguistic repository.

Grammatical functions of L2 learners

Out of 2923 grammatical functions, L2 learners most frequently used noun modifiers with 57% ($M = 27.92$), and adverbials with 28% ($M = 13.77$). The least frequently used grammatical function was complements (15%, $M = 7.05$). The findings also reveal that phrasal complexity, specifically through the use of noun modifiers, should be viewed as indispensable features that constitute grammatical complexity (Biber et al., 2011; Ravid & Berman, 2010).

Adverbials

Adverbials only occur in Stage 2 (*2b/2c, 2f*) and Stage 3 (*3a*) in the framework by Biber et al. (2011). Despite the limited number of sub-stages of adverbials in the framework, the results demonstrated a higher frequency of adverbials in L2 learners' writing than complements which occur across 8 sub-stages. This finding can be explained in two ways. Firstly, the highest use of adverbials was observed in the category of finite adverbial clauses (*2b/2c*, 52%, n = 430). Although finite adverbial clauses belong to only one sub-stage in the framework, such clauses can be actualized with a variety of conjunctions: *if, whether or not, provided, unless, even if, in case* for conditional clauses, *because, as, since, now that, in as much as* for

causative clauses, and *although, though, even though* for concessive clauses. Hence, this high number of ways that finite adverbials can be realized might be an explanation for the high frequency of adverbials in learners' writing. Also, finite adverbial clauses are generally emphasized in L2 writing instructions at Turkish universities. Especially in preparatory schools, such clauses are taught both explicitly and implicitly. L2 learners may be encouraged to link their ideas in their writing through these conjunctions, which may be related to instructors' beliefs about complexity. Embedding in the clause is an indication of higher complexity, which has been a traditional measurement of complexity in the writing literature.

The findings regarding finite adverbial clauses are in line with Staples, Egbert, Biber, and Gray's (2016) study. They concluded that lower level texts are marked by high usage of clause-level features, especially finite clauses. They argue that writers can form cause and effect relations, use contrast in their sentences "to refine the argument", and thus pay attention to "describing relationships and comparisons rather than presenting a great deal of abstract information" (p. 175). Since the data for this study were from argumentative essays, prevalent use of finite clauses suggest such clauses help L2 learners express cause and effect, and contrastive connections in their writing.

Staples and Reppen (2016) investigated first-year university students' writings across three different L1s (English, Arabic, and Chinese), and found out that the use of conditional clauses may enable L2 writers to extend valid arguments, and thus complexify their arguments. They also concluded that L2 learners (Arabic and Chinese) favor specifically *because* especially L1 Arabic learners. In this study,

because and *if* clauses were predominantly used, suggesting that such structures are "comfortable choice" for L2 learners to expand their argumentation (Staples & Reppen, p.32). However, considering the characteristics of academic writing, there is a clear need to make L2 learners "explicitly aware of the ways to express other relationships besides causation to support arguments" (Staples & Reppen, p. 32).

The second highest frequency of adverbials was in *3a,* prepositional phrases as adverbials (28%, n = 826). This pattern does not follow the sequence of adverbials in the framework by Biber et al. (2011). Turkish L2 learners seem to have acquired prepositional phrases as adverbials (*3a*) before phrasal embedding in the clause: adverbs as adverbials (*2f*). In other words, Turkish L2 learners do not follow the same developmental pattern as native speakers of English regarding *2f* and *3a*. This pattern might be because L2 learners find it more difficult to realize phrasal embedding (*anyway, anyhow*) than to use prepositional phrases of time, place and manner (*3a*). This finding can be interpreted as the L1 effect. Since Turkish is an agglutinative language, native speakers of Turkish (TNSs) can form complex words by linking morphemes together (i.e. "okul-lar-iniz-da" meaning "school-plural-your-at"). TNSs acquire time and place adverbials (i.e. "ev-de" meaning "home-at"; "sabah erken-den" meaning "morning early-from") earlier than phrasal embedding in the clause: adverbs functioning as adverbials, 2f ("her neyse" meaning "anyway"; "her nasılsa" meaning "anyhow"). Thus it is understandable why Turkish L2 learners' writing demonstrated prepositional phrases as adverbials (*3a*) more than phrasal embedding in the clause: adverbs as adverbials (*2f*).

Furthermore, time and place adverbials (*3a*) in Turkish are taught both explicitly and implicitly at primary schools in Turkey, which explains their earlier acquisition. Hence, it is safe to ponder that such structures (*3a*) are developmentally easier than *2f* for Turkish L2 learners as they can transfer their linguistic resources from L1.

Another explanation might be the effect of prompt. The prompt of Topic 1 demanded students to write about whether "cell phones should/should not be allowed in schools". Learners used the form "*in schools*" excessively in their sentences. Therefore, the structure "in schools" in the prompt as an adverbial of place might be an explanation for students' heavy reliance on adverbials. However, for a clear understanding of this, a deeper analysis should be done on prompt-related complex forms, which was not done in this study due to scope and time limitations.

Complements

Complements are realized in 8 sub-types (*1a/1b, 2a, 2d/2e, 3b/3c, 3d, 4a, 4b/4c, 5b*), and they occur in all stages in the framework by Biber et al. (2011). L2 learners in this study used complements only with a 15% (n = 423). The use of complements in the current study's dataset was comparatively low. L2 learners' argumentative texts reflect finite complement clauses controlled by verbs the most (63.31%), followed by non-finite complement clauses controlled by verbs (27.54%). Finite and non-finite complement clauses controlled by adjectives (7.48%) were rather low. Complement clauses controlled by nouns occurred with only 1.40%. In academic writing, complement clauses that are controlled by nouns (e.g., *the idea/the fact that…*) are favored more prevalently compared to conversation, since they aid writers to convey their stance on a topic in an implicit way (Biber, 2006; Biber et al., 1999, 2011;

Charles, 2007; Taguchi et al., 2013). Since there were only 6 instances of noun complement clauses (1.40%) in students' writing in this study, it can be concluded that L2 learners in this study could not express meaning implicitly. Staples and Reppen (2016) found that L1 writers of English started to change their writing "from more explicit expressions (*I think*) to more implicit expressions (*the fact that . . .; the problem is that. . .*)" (p. 32). However, the findings of their study also indicated that the L2 writers (L1 Chinese in their study) found it difficult to employ the most common nouns that control noun complement clauses (i.e., *fact*). Findings of this study are in line with Staples and Reppen's (2016) results for Chinese L2 learners since Turkish L2 learners' texts did also poorly demonstrate the most common nouns that go with noun complement clauses (2 instances of *the fact that…*; 2 instances of *the idea that…*).

The findings show that L2 learners' use of complements were more verbal than phrasal and reflected features of conversation more than features of academic writing. While the complexity features that occurred in the complement category were more verbal (1a/1b, 2a, 3d, 2d/2e) than nominal, students favored complement clauses controlled by a wider set of verbs (*2a*) than those controlled by extremely common verbs (1a/1b). While complement clauses that are controlled by verbs are more prevalent in conversation, they establish a writer's own stance such as "evaluation, attitude, and degree of certainty" to support the arguments (Staples & Reppen, 2016, p. 18). The results of this study align with Staples and Reppen's findings to some extent. They found that all the participants in their study, regardless of their L1 background, used complement clauses controlled by many verbs that are reflective of conversation (*think, believe, say*) as a means of conveying stance and

stating information from source texts. Although stance was not analyzed in this study, the fact that L2 learners used verbal complement clauses more prevalently might be considered as a way to express their own stance (i.e., *I think/believe that...*) and the opponents' stance to provide counter-arguments (*i.e., Opponents claim/think/argue/state/say that...*). As Staples and Reppen (2016) point out, establishing stance is a necessary skill, and clausal structures should be viewed as significant methods of stance-taking in academic writing specifically in argumentation.However, for a better understanding of ways of stance-taking employed by student writers such as "evaluation, attitude, and degree of certainty" (Staples & Reppen, 2016, p. 18), an in depth stance analysis should be done, which was beyond the scope of this study.

The findings also demonstrated that learners used limited variety of reporting verbs and words (*state/think/argue...*). These findings are also provide support for Parkinson's (2013) study. She investigated *that* complement clauses used in students' writings and research articles, and concluded that students' writings demonstrated conversational norms more. She also interpreted this findings as the start of "sharing academic values about objectivity and evidence" (p. 1). Thus, although students struggled to use a wide range of nouns and verbs to control complement clauses, such structures are significant in helping L2 learners socialize into the conventions of academic environment by starting to develop objective argumentation and showing evidence for their claims. Parkinson (2013) also came to the conclusion that student writers used "non-academic sources of evidence, such as common knowledge and community beliefs" (p. 428). Findings of current study also show a similar pattern in students' writing. L2 learners' texts relied heavily on

common knowledge and beliefs, and demonstrated limited objectivity or evidence. As Parkinson (2013) discussed, this might be related to the fact that student writers, including those in this study, are still at the beginning of their "academic careers who are not yet familiar with the discourse norms of their disciplines or of academic writing" (p. 438). Thus, it can be pondered that student writers can develop objective argumentation skills and familiarize themselves with norms and values of academic community by disciplinary reading and writing more than what they read and write in the "academic writing" courses.

Noun modifiers

The findings regarding the high frequency of noun modifiers (57%) can also be linked with the number of different complex forms in noun modifiers. There were 12 sub-categories of noun modifiers (*2g/2h, 3e, 3f, 3g, 3h, 3i, 4d/4e, 4f/4g, 4h/4i, 5a, 5c, 5d*). Considering the number of these sub-stages, it seems natural that the highest frequency of occurrence was in the category of noun modifiers. While noun-phrase modification is a significant feature of academic writing, the types of high frequency noun modifiers were found to be at simple level, mainly through attributive adjectives as pre-modifiers (i.e., *2g/2f; new crimes, common issue, criminal behavior*), and nouns pre-modifying a head noun (i.e., *3f; crime rate, justice system, education system*). While the frequency of occurrence at simple level noun modification was high, L2 learners underused non-finite relative clauses that modify a head noun (i.e., *4d/4e; friends taking the same course*), and prepositional phrases modifying a head noun, when having abstract meaning (i.e., *4h/4i; an escape route for some cases*). These findings suggest that high frequency of noun modifiers in L2

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learners' texts do not show extensive embedding, or as Ortega (2015) puts it "elaboratedness" is a characteristic of academic writing.

The role of topic on grammatical complexity stages of L2 learners

Findings of this study showed that statistically significant differences existed among three topic groups in terms of learners' grammatical complexities in Stage 2 (M = 23.85), Stage 4 (M = 2.11) and Stage 5 (M = .63). Stage 2 had the overall highest frequency, and the lowest frequencies of complex forms were in Stage 5 and Stage 4 respectively. This suggests that topic had a significant effect on grammatical stages with both the highest and the lowest frequencies. Overall complexity stage for both Topic 1 (cell phones) and Topic 2 (death penalty) was Stage 3. However, overall complexity stage of Topic 3 (online learning) was found to be lower (i.e., Stage 2) than Topic 1 (cell phones) and Topic 2 (death penalty). Thus, Topic 3 elicited less complex features overall compared to Topic 1 and Topic 2. A closer look into the linguistic features used by different topics revealed that while topic affected the complexity stages of L2 learners, most frequently used types of complex forms were the same apart from nouns as pre-modifiers. While the highest frequency was in the use of attributive adjectives for both Topic 1 (cell phones) and Topic 3 (online learning), nouns pre-modifying a head noun had the highest frequency in Topic 3 (death penalty). An explanation for this might be how much L2 learners used the phrases from the prompt in their texts. As Yang et al. (2015) suggested, topic can be defined as what learners are asked to explain specifically from writing prompt; that is, "actual wording of the writing task" (p. 56). The prompt for Topic 2 includes a complex form "death penalty", which includes a noun pre-modifier while the prompt for Topic 1 and Topic 3 included attributive adjectives modifying a head noun

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(cell/cellular phones, online learning, and traditional learning). However, the frequency of attributive adjectives in Topic 3 was substantially higher than the frequency of attributive adjectives in Topic 1 and Topic 3. This trend might be explained again in terms of the prompt. The prompt for Topic 3 included two complex forms, two head nouns modified by an attributive adjective, that is, *online learning* and *traditional learning*. Naturally, it is not surprising that students repeated these complex forms in their texts, mostly both forms in each sentence they formed. Thus, it might be the reason why Topic 3 had approximately 3 times more attributive adjectives than Topic 1 and Topic 2.

Findings also revealed an interesting pattern across all three topic groups, though main stages and total number of complex forms learners used differed. The second highest frequency of adverbials was in *finite adverbial clauses* for all three topic groups. Since such clauses were not present in the wording of the prompts, it must be interpreted in relation to another factor. Such a pattern in our context might be related to the effect of instruction as clausal subordination is still widely viewed as structurally complex among Turkish EFL instructors, thus learners too. Finally, prepositional phrases as adverbials were typical in L2 learners' argumentative texts in Topic 1 and Topic 2. The prompt of Topic 1 included the phrase "in the schools" which was repeatedly used by this group. Topic 3 was also related to learning, so students also used phrases such as "in the school", "in the classroom" excessively. While there were statistically significant differences among topic groups in terms of stages, most frequently used types of grammatical complexities and their rank did not differ. Turkish L2 learners might not get feedback and instruction on phrasal complexity and nominal characteristic of academic writing as reflected in their high

frequency use of features of conversation (*2b/2c, 2g/2h*) and fiction (*3a, 3f*). In this regard, they might have limited repertoire of complex features of academic writing, directing them to rely heavily on the structures of prompt, and preventing them from acquiring further complex forms beyond Stage 3 throughout their preparatory classes.

The role of topic on grammatical functions

The findings indicated statistically significant differences across all three topic groups in terms of noun modifiers, but not complements and adverbials. As discussed previously, all topic groups were similar in terms of high frequent use of adverbials, and quite low manifestation of complements. Overall, noun modifiers were used mostly in Topic 1 (n = 430), Topic 2 (n = 544) and Topic 3 (n = 699). The higher frequency of noun modifiers in Topic 3 does not reflect a higher stage as the main stage of this group was lower than the other two groups. The total occurrence of noun modifiers was 57 % of total complex forms. This finding confirms Biber et al.'s (1999) claim concerning noun phrases having a modifier. They found that about 60% of noun phrases that occur in academic writing have either pre or post modification. Noun modifiers of L2 learners will be discussed in relation to their position and type in the sentence.

Attributive adjectives, nouns as pre-modifiers

Attributive adjectives as pre-modifiers (*2g/2h*) in Topic 3 (n = 459) differed drastically from Topic 1 (n = 169) and Topic 2 (n = 152). It can be concluded that the prompt for Topic 3 (online learning is better than traditional learning) might be the main reason for this difference as learners repeatedly used these two pre-modifying

adjectives. With regard to *nouns as pre-modifiers* (*3f*), the same difference was observed in the topic group whose prompt included a noun pre-modifying a head noun. Topic 2 repeated the phrase death penalty (n = 188), thus used this form two times higher than Topic 1 (n = 86), and Topic 3 (n = 90). As for *adjectives + nouns as premodifier* (*4f/4g*), there was only one case in Topic 3. It might be beyond L2 learners' linguistic resources in this context.

Prepositional phrases as post-modifiers

The highest category of prepositional phrases (PPs) post modifying a head noun were *of* phrases (*3h*) and simple *PPs as post-modifiers with concrete/locative meaning (3i)* across three topic groups. The highest frequency of post-modifying prepositional phrases (*3i*) were in Topic 1 (n = 61). When compared to simple prepositional phrases as post modifiers with abstract meaning (4h/4i), Topic 1 (n = 11) is lower than Topic 2 (n = 37) and Topic 3 (n = 35). On the other hand, L2 learners' texts on death penalty (Topic 2) and online learning (Topic 3), demonstrated more abstract themes and concepts (i.e., right and wrong, justice, law, revenge, punishment, human rights). It thus can be concluded that Topic 2 and Topic 3 directed learners' attention to more abstract ideas.

<div align="center">

Implications for practice

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The findings of the present study have some pedagogical implications for curriculum design, assessment, and instruction, and feedback in L2 writing pedagogy. As one of the aim of this study was to identify L2 learners' complexity stages, it holds some implications for how writing tasks should be implemented and assessed in EAP courses. First of all, written grammatical complexity stages of L2 learners'

argumentative essays were identified as Stage 2 and Stage 3 respectively (89.95% of total complex forms belonged to these two stages together) with most frequent usage in attributive adjectives modifying a head noun and finite adverbial clauses, which are more typical of conversation than academic writing. It suggests that the participants of this study who were Turkish EFL learners in an EAP course have mastered such complex forms, but not the complex forms of higher stages, which are more representative of academic writing. Complexity features from Stage 4 and Stage 5 are typical indicators of academic writing. These features should be included and emphasized in writing courses of both EAP and preparatory school programs in order to foster the syntactic development of L2 learners. As Mazgutova and Kormos (2015) suggest, EAP curriculum does not mainly focus on linguistic development, and explicit instruction on complexity is usually not provided. They posit that repeated errors including grammatical forms, wrong choice of words, spelling mistakes are "highlighted" on learners' essays and feedback is given on "one-to one tutorials" (p. 8). Students receive feedback on content, organization, language errors on their essays, but not on complexity. Since complexity is the most ignored dimension in writing courses, students are not able to benefit from instruction and feedback on written complexity.

Complexity features of written academic writing, such as nominalization and different types of phrasal modification should be added not only to writing instruction but also to writing assessment because writing assessment usually focuses only on the accuracy dimension of CAF. For instance, rubric for TOEFL iBT independent writing task (ETS, 2008) include rating descriptors for accuracy (i.e. "having minor grammatical errors") and "syntactic variety". However, there is no

explicit criteria for written syntactic complexity. Since syntactic variety is not equal to complexity, assessment rubrics should incorporate descriptors related to other dimensions of CAF, specifically grammatical complexity through embedded noun phrases. A similar concern for lack of complexity as a descriptor in writing rubrics was addressed by Yang et al. (2015). If learners know that their writing will be measured for complexity, they will probably pay more attention to using more complex forms than usual. Whether there is a process- or product-based approach to writing, as Vyatkina (2013) also suggests, learners might be provided with model essays, checklists, and self-assessment instruments comprised of typical features of grammatical complexities of academic writing since they can help learners when they edit, and revise their essays.

As several writing researchers (Mazgutova & Kormos, 2015; Storch & Tapper, 2009) also suggest, drawing L2 learners' attention to grammatical complexities of written academic discourse before the writing task possibly with academic reading texts, and during the revision process through explicit instruction, might prove to be helpful for learners. However, instruction on complexity might not yield the same results for all features of complexity and types of complex forms. For example, there were no instances of appositive noun phrases in the present study's dataset, so whether Turkish EFL learners can acquire such forms with instruction or not may be interesting to investigate.

In terms of the effect of topic on grammatical complexities of L2 learners, our findings did not show contradictory results. Topic is a significant variable regarding its effects on complexity features. Since this study uses the term topic as the phrases

in writing prompt, the complexity of the phrases in the actual wording of the prompt needs to be considered while designing tasks for instructional or assessment purposes. Writing prompt that includes phrases at a lower level seem to elicit high frequency of such forms, while prompts including phrases of higher stage of the complexity framework direct learners to overuse such structures. As different topics and specific wording of the prompt might elicit different grammatical complexities (finite clauses, non-finite clauses, noun phrases) and frequency of complex forms, this might affect the reliability of exams that include writing. Hence, it can be suggested that test administrators should make sure that the prompt for different writing tasks should be of equal complexity level if learners are tested on the same task with different options of topics.

Regarding the framework used for this study, another pedagogical suggestion might include the training of instructors on register differences (i.e., spoken register and written register) and relevant, complexity measures that capture L2 complexity best, specifically on how meaning is condensed into phrases not clauses in academic writing. Thus, instructors can mediate their beliefs about complexity and classroom instruction and feedback to help learners progress from clause level complexity to noun-phrase level complexity. In addition, instructors can help learners develop complexity to socialize into norms and values of academic writing such as providing objective evidence, and legitimate argumentation (Parkinson, 2013). Also, test administrators can mediate writing assessment methods to incorporate measuring complexity features. A consideration of complexity dimension can inform instructors' practices to better equip learners with richer linguistic resources.

Limitations of the study

This study has some limitations, and interpretations of findings should be done with caution. Firstly, although the total number of texts (n = 60) that were analyzed is considered to be sufficient compared to similar complexity studies in the literature (Mazgutova & Kormos, 2015, *n* = 39; Parkinson & Musgrave, 2014, *n* = 37; Vyatkina et al., 2015, *n* =12). The number of texts that were used to investigate the effect of topic (n = 20 for each topic group) might be considered as insufficient. Since manual coding of all complex forms was time consuming, this study could not go beyond 20 texts for each topic group. Although the number of total texts that were analyzed was sufficient and similar to previous studies, a larger sample of texts could have benefitted the study more. Therefore, findings related to the role of topic on complexity features might not be possible to generalize.

Another limitation of the study concerns writing prompts. Complex forms that appeared in the wording of prompts were not excluded (i.e. death penalty, *3f*; online learning/traditional learning, *2g/2h*; cell phones, *2g/2h*). Therefore, if complex forms of prompt were excluded from students' texts, it might have yielded different results.

Implications for further research

In the present study, written complexity stages and grammatical functions of L2 learners were identified, and the role of topic on both complexity features and grammatical functions in argumentative essays were investigated. For this study, argumentative (discourse mode) essays (genre) of L2 learners were analyzed. Investigating complexity features across different discourse modes (expository, narrative, and) and genres (grant proposals, research articles, reports,) for both

complexity stages and the topic variable is a valuable area both pedagogically and theoretically. Considering the results and the limitations of this study, further research may explore the effect of topic on grammatical complexities across different genres or discourse modes by adopting Biber et al.'s (2011) framework. Furthermore, this study investigated only second drafts of L2 learners' argumentative essays and learners did not get complexity feedback. Another study can be conducted to see the differences in complexities of first drafts which can be considered raw writing and second drafts. How L2 learners revise and edit their texts after complexity feedback is given is an area that needs to be explored. Thus, future research can address the gap by investigating the effect of complexity feedback on revising and editing process in writing classrooms.

In addition, this study only investigated one specific proficiency level. In the current study, proficiency was not a variable. For the homogeneity of the sample, the data were collected only from 2nd year university students from the same EAP program. Further research may investigate development of noun phrase complexity in various proficiency levels. As complexity is a dimension of proficiency, it might be fruitful to explore how grammatical complexities are demonstrated in written texts of lower proficiency level students and higher proficiency level students. Since there is only one study (Parkinson & Musgrave, 2014) that investigated complexity in different proficiency levels by adopting Biber et al.'s (2011) complexity framework, there is still need for empirical evidence from different instructional settings, contexts, learners of various backgrounds.

Moreover, it is evident in the current literature that complexity has been the most neglected dimension of proficiency in EFL classrooms. As complexity instruction and feedback is usually not provided in academic writing courses, further studies might investigate the effect of instruction and complexity feedback on grammatical complexity features in academic writing.

The design of the writing task was also not a variable in this study. A process writing approach was followed, and students wrote only two drafts. The first drafts were timed and the final drafts were not. Only second drafts were analyzed for this study because of accuracy concerns. Therefore, whether the writing tasks are timed or not might affect complexity features of L2 learners.

Lastly, instructors and institutions' beliefs about what constitutes complexity affects their practice and assessment. Therefore, interviews can be conducted to investigate instructors' and administrators' beliefs about written grammatical complexity and whether their curriculum and practices align with the new findings especially noun phrase complexity.

In written complexity literature, there is no classroom research for complexity. Thus, classroom observations can be conducted to investigate if complexity is addressed in writing courses, to what extent complexity features can be taught and how far learners can benefit from complexity feedback. Such classroom research for complexity can lend evidence for recent findings regarding features of academic writing and pedagogy.

Conclusion

This mixed-methods study investigated (a) written grammatical complexity stages and grammatical functions of L2 learners' argumentative texts based on grammatical complexity developmental framework by Biber et al. (2011), (b) the effect of topic on grammatical complexities and grammatical functions. In the qualitative phase of the study, all instances of complex forms were coded manually and designated to relevant stage in accordance with the framework for complexity. The identified complex forms were also coded for three grammatical functions (adverbials, complements, and noun modifiers) that they serve as proposed in Biber et al. (2011). Through frequency and descriptive analysis, L2 learners' grammatical developmental stage(s) and grammatical functions were examined. Findings revealed that the highest frequency of L2 learners' complex forms were mostly in Stage 2, and Stage 3, suggesting that grammatical complexity stages of L2 learners' texts demonstrate features of conversation more than features of academic writing. The highest frequency was also observed in noun modifiers as a grammatical function. Since the high frequency of noun modifiers consisted of attributive adjectives pre-modifying a head noun (*2g/2h*), and nouns as pre-modifiers (*3f*), noun-phrase modification demonstrated in L2 learners' texts does not point to extensive *embeddedness*, a characteristic of academic writing.

The findings also indicated that topic had statistically significant effect on L2 learners' grammatical complexity features in Stage 2, Stage 4 and Stage 5. Further post-hoc analyses also showed significant differences within topic groups. Kruskal-Wallis test for grammatical functions established statistically significant differences within topic groups in terms of their use of noun modifiers, but not adverbials and

complements. The findings lend empirical evidence for developmental complexity stages of L2 learners, provides pedagogical implications for addressing complexity in writing courses. Finally, this study entails the need for classroom complexity research.

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APPENDIX A: Normality Value for Grammatical Complexity Stages

Descriptive Statistics for Grammatical Complexity Stages

	N	Mean	Std. Deviation	Skewness		Kurtosis	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Stage 1	60	2.167	1.6173	.715	.309	.634	608
Stage 2	60	23.850	10.5859	1.186	.309	1.150	608
Stage 3	60	19.967	7.4035	-.030	.309	-.723	608
Stage 4	60	2.117	2.0260	1.303	.309	2.461	608
Stage 5	60	.633	.9013	1.669	.309	2.938	608
Valid N (listwise)	60						

APPENDIX B: Normality Value for Grammatical Complexity Sub-stages

Descriptive Statistics for Complexity Sub-stages

	N	Mean	Std. Deviation	Skewness		Kurtosis	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
1a/1b	60	2.167	1.6173	.715	.309	.634	608
2a	60	2.350	1.4824	.368	.309	-.621	608
2b/2c	60	7.150	2.8808	.179	.309	-.710	608
2d/2e	60	.733	.9364	1.335	.309	1.632	608
2f	60	.600	1.0118	2.104	.309	5.317	608
2g/2h	60	13.017	9.4645	1.388	.309	2.210	608
3a	60	5.983	3.9078	.942	.309	.645	608
3b/3c	60	.033	.1810	5.334	.309	27.360	608
3d	60	1.233	1.5770	1.665	.309	2.685	608
3e	60	.717	1.1511	1.963	.309	3.750	608
3f	60	6.067	5.4395	1.011	.309	.213	608
3g	60	1.150	1.5604	1.625	.309	2.571	608
3h	60	2.417	2.1256	1.040	.309	1.426	608
3i	60	2.367	1.9042	1.279	.309	2.021	608
4a	60	.483	.8535	2.930	.309	12.418	608
4b/4c	60	.017	.1291	7.746	.309	60.000	608
4d/4e	60	.200	.5764	3.275	.309	11.224	608
4f/4g	60	.017	.1291	7.746	.309	60.000	608
4h/4i	60	1.400	1.6894	1.237	.309	.569	608
5a	60	.467	.7471	1.757	.309	2.990	608
5b	60	.100	.3025	2.736	.309	5.671	608
5c	60	.000	.0000	.	.	.	.
5d	60	.067	.2515	3.564	.309	11.071	608
Valid N (listwise)	60						

APPENDIX C: Normality Values for Grammatical Functions

Descriptive Statistics for Grammatical Functions

	N	Mean	Std. Deviation	Skewness		Kurtosis	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std.Error
adverbial	60	13.733	4.8112	.546	.309	-.080	608
complement	60	7.117	3.3094	1.087	.309	2.174	608
noun modifier	60	27.883	10.4413	.750	.309	1.570	608
Valid N (listwise)	60						