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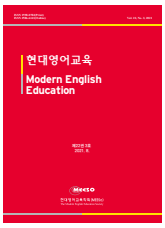

Interlanguage Issues in Noun Phrases and Information Flow

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ABSTRACT

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Various studies have examined factors affecting the textual cohesion, coherence, and flow of Koreans' second language writing in English, particularly focusing on articles, connectors, or discourse markers, as well as the overuse and repetitive use of nouns and pronouns. However, noun use in adjuncts and its effects on information flow and cohesion remain relatively unexplored. This study examines such patterns in an L1 and L2 writing corpus to examine the effects of noun repetition and noun phrase complexity on cohesion. Words counts and multiple variables from Coh-Metrix analysis indicate overuse or repetition of nouns, overuse of certain pronouns, and underuse of syntactic adjuncts, namely, prepositional phrases. Qualitative examination of some essays confirms these patterns of noun usage. The L2 writers relied on simple sentences with few adjuncts that highlight noun or pronoun objects, and some make ineffective or excessive use of lexical and referential cohesion instead of more sophisticated (i.e., grammatically and lexically complex) sentences. This can lead to a more unnatural topic flow and development in paragraphs, with fairly one-dimensional sentence cohesion patterns. Thus, learners need more instruction in noun phrase variety, sentence variety, natural patterns of information flow, and appropriate grammatical sophistication in their paragraphs.

I. INTRODUCTION

Second-language (L2) writers understandably struggle with expressing their ideas, in part due to a lack of lexical and grammatical sophistication. This challenge lies not only in knowledge of words and structures, but the associated meanings. Lexical challenges not only involve knowing suitable vocabulary, but also a command of the conceptual nuances, registers, and suitable collocations. Grammatical knowledge is also relevant in crafting effective writing, not for the sake of grammatical accuracy as an end in itself, but because grammatical forms themselves inherently convey meaning (Goldberg, 1995), and contribute to the effective flow of ideas.

The specific grammatical and lexical challenges of L2 learners of various L1 backgrounds are well attested in the research literature. In recent decades, pragmatic issues have also received attention, such as discourse markers, textual coherence and cohesion in L2 writing, and grammatical issues affecting pragmatics and cohesion, such as definite and indefinite articles (e.g., H. Y. Cho & J. A. Shin, 2014; M. Kim, 2012). Some of this research has been driven by purely empirical research questions (e.g., H. Ahn, 2021; S. Ahn, 2020), while some has also been motivated

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by well-developed theoretical frameworks such as theories of politeness and implicature (e.g., Slabakova, 2010), and functional and cognitive linguistics (e.g., Lee, 2020).

A relatively under-researched area, especially in L2 research, has been information structure (IS). This is a somewhat nebulous language component that involves the packaging and incremental presentation of old and new information at the phrasal, sentential, and discourse levels; thus, it transcends and includes aspects of pragmatics, syntax, and discourse structure. While it can be generally understood as the flow of new and old information within and among sentences, it includes other aspects such as contrast, sentence form and word order (e.g., non-canonical sentences), usage of content words, and referential coherence. Its precise definition and relation to other language components (i.e., syntax, semantics, pragmatics) is amorphous, and varies depending among IS theorists (Arregi, 2016; Erteschik-Shir, 2007; Lüdeling et al., 2016; Zubizarreta, 1998). This has led to research, for example, on word order and pragmatic felicity in first language acquisition (Höhle et al., 2016); on comparative studies of IS across languages (Féry & Ishihara, 2016); and on how Koreans process noun phrases in reading (Y. Lee, H. Lee & Gordon, 2007).

The sequential presentation of information can affect the pragmatic felicity of discourse (Ward et al., 2017), and thus, IS includes various components that are relevant to the research topic here of how Korean L2 writers attempt to structure written paragraphs and essays. Other studies have examined how Korean L2 learners may use pragmatic markers such as connectors for structuring information (Lee, 2013), noun articles (S. Baek, 2014; Lee, 2020), contextual and informational cues in processing noun phrases (H. Ahn, 2021), and degree of sophistication and development of written paragraphs (J. Lee, 2020). As such, IS offers a framework for examining writers' use of cohesive and referential devices such as noun phrases, including pronouns, repeated noun phrases, definite or indefinite nouns, and the role of noun phrases in grammatical complexity. By investigating IS in L2 research, we can also explore the interfaces of IS and pragmatics, and identify areas where IS theory can be better developed. Thus, the following research question is proposed here:

How do Korean L2 writers use noun phrases differently from L1 writers in information flow, specifically, in syntactic adjuncts, noun repetition, noun variety, and pronouns?

II. LITERATURE REVIEW

Cohesion is generally researched in terms of lexical and referential cohesion, such that the referent of a noun or other content word is clear in the context, and such that it can be connected with other coreferential content words in the text. This in part gives rise to coherence, that is, the logical flow within a text, whereby readers can perceive a text as a logical whole (Birner, 2012), and can infer conceptual relationships throughout the text in order to understand it and develop a clear mental representation or discourse schema of its contents (Kintsch, 1998; McNamara et al., 2014). Cohesion and coherence are established in part by means of coreferential lexemes, logical connectors and discourse markers, and clear sequencing of ideas and events. Nouns are of particular importance here as the more meaningful bearers of sentence contents; content words, and especially nouns, convey the primary semantic contents of sentences, and nouns are thus the most prominent discourse entities of sentences (Chafe, 1994).

A number of corpus studies in the past two decades have compared Korean L2 and native L1 writing styles, leading to a number of specific findings. Studies of discourse markers or discourse connectors have consistently found interlanguage challenges for Korean writers, often due to differences in pragmatic usage of such markers between English and Korean. This includes general overuse of common connectors (e.g., *but, so, and, therefore*); underuse of more specific markers (e.g., *nevertheless, furthermore, hence*) (H. Y. Cho & J. A. Shin, 2014; E. J. Lee, 2004; Lee, 2013; Y. H. Na, 2011; Y. Y. Park, 2013); and overuse of sentence-initial connectors, presentational *there is/are* expressions, and enumerative markers (e.g., *first, second, third*) (E. J. Lee, 2004; Lee, 2013). Similarly, studies of Korean writers have reported repetition of the same nouns in texts, leading to excessive lexical cohesion (Y. H. Na, 2011); overuse of definite noun phrases with demonstrative pronouns or definite articles (H. Y. Cho & J. A. Shin, 2014; Hinkel, 2001); overuse of pronouns in subject position (Y. J. Kim, 2012); and repetition of sentence subjects in informal writing tasks (H. Hahn & Y. H. Jiang, 2006). A topical structure analysis study reported that Korean writers tended to continue using the same sentence subject more often in ensuing sentences (sequential progression), often by repeating the noun, and less often used synonyms or paraphrase expressions than L1 English writers (M. Kim, 2012).

Korean L2 writers, especially from lower proficiency levels, also use syntactically simpler sentences (e.g., with fewer adverbial phrases or preverbal elements), with less lexical diversity and more repetition of words, while more advanced students use more sophisticated sentence forms, greater lexical diversity, and less frequent words, as shown by corpus studies using the Coh-Metrix analytical software (S. Ahn, 2020; J. Kim & K. Lim, 2019). Korean learners show less skill in appropriately ordering informationally old or new subordinate clauses before or after main clauses, or old or new noun phrases in indirect plus direct object and dative constructions (Y. S. Lee et al., 2008), though they are sensitive to the preferred sequence of old definite nouns before new and indefinite nouns in dative constructions (S. Baek, 2014).

These studies generally focused on full-length essays of learners at higher proficiency levels, and found a number of linguistic forms that differ from L1 patterns. These are patterns that affect not only cohesion, but overall coherence and information flow. In particular, repetition of noun phrases and personal pronouns are not so surprising, given

the pragmatic and grammatical differences between Korean and English. However, more details would be helpful for language teachers. The simple parametric statistics used (ANOVAs or *t*-tests) indicate overuse and underuse of forms, but less information on the relative degrees of overuse or underuse. Some specific forms or constructions have not been examined in such comparative studies, such as the use of nouns in prepositional phrases (rather than in subject and object positions); focalizing particles used for emphasis or implicit contrasts (e.g., *even, still, also, too*) (König, 2003); indefinite pronouns (e.g., *someone, anyone, everyone*); and the effects of simple sentence structure on overall flow. While a main verb requires certain noun phrases (NPs) as obligatory elements (subjects, direct objects, indirect objects) for the basic required argument structure configuration of a sentence, additional phrasal elements can be added, such as prepositional phrases (PPs). Such optional syntactic adjuncts supplement the basic argument configuration of sentences, which may enhance the sense of flow, depth, and apparent sophistication in writing. Adjuncts and complex noun phrases are also of interest, since various IS models have little to say about them, yet they do affect the flow and readability of writing. Studying their effects on flow and cohesion can inform the development of more precise formulations of IS and pragmatic theories of newness and givenness.

Also, less is known about the writing style of Koreans at lower proficiency levels, who typically deal with shorter writing tasks such as single paragraph compositions, before they are ready for longer essays. Before learning to write full essays, they must first master paragraph writing, and they will likely encounter shorter paragraph writing tasks on standardized tests, language exams, and in college courses, such as short essay or paragraph questions on exams and assignments in English-medium instruction (EMI) courses at Korean universities. Thus, a better understanding of the challenges they face with paragraph-level cohesion, coherence, and information flow would be helpful for writing teachers, so that students can better master paragraph writing before attempting full essay length tasks. This study attempts to examine these issues and replicate past findings with shorter writing samples at lower proficiency levels.

Our understanding of nouns in informational flow can be enhanced by drawing from other linguistic theories that deal with noun status, which thus far have not been used in L2 studies or in theoretical studies of IS. Construction grammar (Goldberg, 1995, 2006), for example, posits that argument configurations themselves (the obligatory noun phrases required by verbs) are inherently meaningful; for example, prepositional datives (e.g., *gave the ring to Frodo*) denote transfer of possession, while regular datives (*gave Frodo the ring*) focus on the benefactive nature of actions. The functional role of nouns in sentences naturally comports with information structure, and hence, in the study reported below, the role of nouns in general sentence argument configurations will be considered, particularly in adjuncts. Another relevant theory known as centering theory (Walker et al., 1998) describes topic and focus patterns among sentences. The topic of one sentence may continue as the topic of the following sentence (topic-topic chain, e.g., *He took the ring. He ran off with it.*); or the focus of one predicate can be taken up as the topic of a following sentence (focus-topic chain, e.g., *He took the ring. The ring captivated him.*). The topic of a subsequent sentence can also shift to a new topic that is closely related to a previous topic (smooth shift, e.g., *The ring captivated him. Its luster was unique.*); or at times a wholly new topic can be introduced (abrupt shift) if contextually appropriate and appropriately signaled, e.g., with a discourse marker (e.g., *Now, let's move on.*). However, IS theory and related theories have little to say about the informational or processing role of sentence complexity, adjuncts, or more complex noun phrases. For this, L2 data can be helpful by showing how differing L2 usage affects information flow, style, pragmatic felicity, and cohesion. Since these theories pertain to noun usage and informational status, such data can lead to a better understanding of L2 writers' use of nouns in short writing tasks, and can also point out aspects where the standard information structure paradigm needs to be elaborated. The following study thus reports on a comparison of elements of information flow between L1 and Korean L2 writers. For this study, L1 and L2 corpus data were analyzed with the Coh-Metrix program, but unlike past Coh-Metrix studies of Koreans' L2 English writing (S. Ahn, 2020; J. Kim & K. Lim, 2019), this study goes deeper by looking at noun phrase complexity and the use of adjuncts, and their effects on cohesion.

III. THE STUDY

In this study, short essays were drawn from a freely available corpus of L1 and L2 college-level writers. The data set includes word counts and measures of cohesion and grammatical complexity derived from the corpus essays, for quantitative comparison of both groups. A brief qualitative examination of two L2 essays follows for further examination of information flow.

1. Data

Essays were drawn from the freely available ICNALE Corpus (International Corpus Network of Asian Learners of English), which consists of short one-paragraph essays of 200-300 words by first-year and second-year college students (Ishikawa, 2014, 2018). The subsets of written argumentative essays by Korean students in Korea, and by native English writers (from the US, UK, and other nations) were used, totalling 542 essays (half of which deal with banning smoking in public, and the others on working part-time jobs in college). The L1 subset contains 200 essays (average word count: 226 per essay, range: 197-301; total words: 44,666); the Korean L2 subset contains 342 essays (average word count: 223 per essay, range: 181-332; total word count: 77,444). The essays reflect the types

of short essay answers and single paragraph tasks on standardized tests or in-class college exams for courses taught in English.

2. Analytical Procedures

Nouns and pronouns in context were extracted from the essays with the AntConc concordancing program (version 3.5.9 for Linux) (Anthony, 2020). Nouns were identified from the AntConc output, and cross-referenced with a lexical frequency database (Brysbaert et al., 2014) and a lemma list from the AntConc website, for statistical analysis. Noun phrases were classified by NP type, i.e., as nouns or pronouns (personal, demonstrative, indefinite, relative pronouns); by quantifier and determiner type (definite, indefinite, bare singular, bare plural, demonstrative determiner, other quantifier); and by the presence of prepositional phrases (if the noun or pronoun was in a prepositional phrase (PP) or in a regular NP ungoverned by a PP).

The essays were also entered into the freely available online Coh-Metrix program (McNamara et al., 2014), which subjects text samples to textual analysis and outputs a number of indices of cohesion and grammatical complexity, as well as other textual variables. The main Coh-Metrix factors of interest here were those for various types of cohesion, givenness (how often nouns and pronouns are repeated), lexical diversity, and syntactic complexity. The word counts and Coh-Metrix measures were then analyzed in SAS (version 9.4), using various statistical models. Since lexical data follow non-normal logarithmic distributions (Baayen & Lieber, 1996), loglinear and logistic regression tests were used. Loglinear tests were used for numerical dependent variables, e.g., when testing Coh-Metrix indices as dependent variables, and logistic tests were used for categorical variables, namely, when language group was entered as the dependent variable. The following variables were tested; variables 2-4 were coded by the researcher, and variables 7-22 are Coh-Metrix measures.

TABLE 1
Relevant Variables

Variable	Explanation
Group	L1 English vs. Korean L2 writers (reference category: L1)
NP type	Nouns, pronouns (personal, demonstrative, indefinite / definite nouns; relative pronouns)
DP status	Determiner / quantifier status (definite, indefinite singular, indefinite plural, demonstrative determiner, quantifier)
PP status	Noun / pronoun in prepositional phrase, versus regular NP
Frequency	Log frequency for each noun in English, based on large corpora (Brysbaert et al., 2014)
Concreteness	Ratings of each noun for semantic concreteness (e.g., from concrete objects or materials, to more abstract meanings) (Brysbaert et al., 2014)
WORDFRQmc	Overall mean log frequencies for all content words in essay
LDTTRc	Lexical diversity of content words, type-token ratio
PCREFz	Referential cohesion index—cohesion among words and ideas overlapping across sentences
PCDCz	Deep cohesion index—cohesion achieved via logical connectives
CRFAO1, CRFAOa	Argument overlap among all sentences (via repetition of nouns and pronouns), and between adjacent sentences, respectively
CRFNO1, CRFNOa	Noun overlap among all sentences (via repetition of nouns and related words), and between adjacent sentences, respectively
CRFCWO1	Content word overlap throughout an entire essay
LSASS1	Semantic overlap between identical or semantically related content words in adjacent sentences, as measured via Latent Semantic Analysis
LSAGN	Givenness index, i.e., use of repeated nouns and pronouns or semantically related nouns as subjects and objects, via LSA
PCSYNz	Overall syntactic simplicity of sentences, i.e., simpler and fewer syntactic structures
SYNLE	Syntactic left-embedding, or grammatical complexity as measured by number of pre-verbal elements
SYNSTRUTt	Sentence syntax similarity
SYNNP	Modifiers per noun phrase
DRNP, DRAP, DRPP	Noun phrase density, adverbial phrase density (XP level phrases headed by adverbs), prepositional phrase density, respectively; counts of these XP phrases per essay
CNCAll, CNCCaus, CNCLogic, CNCADC	Incidence of connectives, for all connectives, causal, logical, adversative/contrastive connectives, respectively
WRDPRP1s, WRDPRP1p, WRDPRP2, WRDPRP3s, WRDPRP3p	Incidence of 1st singular, 1st plural, second person, 3rd singular, and 3rd plural pronouns, respectively

IV. RESULTS

1. Quantitative Results

The L2 group altogether used 5,168 unique nouns in their essays (mean 15.1 per essay), and the L1 group used 10,371 unique nouns (mean 51.9 per essay). Coh-Metrix ratings for various measures of cohesion, grammatical complexity, and lexical diversity were first compared by language group. Each Coh-Metrix variable was entered as a dependent variable in a separate loglinear regression model, with language group as the independent variable, for overall group comparisons (SAS proc genmod, log link; Group reference category: L2). The results of loglinear and logistic regression models yield odds ratios (θ) for the likelihood of each significant effect; for θ = 1.0, odds are equally likely for either outcome, and thus, not different; for $\theta < 1.0$, an effect is less likely for the group; for $\theta >$ 1.0, an effect is more likely (the θ is the natural antilog of the estimate).

These are shown for the L2 writers as compared to the L1 writers in Table 2. The L2 writers showed very slight tendencies to use more frequent nouns, but otherwise less frequent content words, and more concrete (less abstract) content words, though these tendencies are very small. More significantly, the L2 writers showed less lexical diversity (LDTTRc, θ = 0.87 times as likely to use diverse vocabulary as L1 writers), which may relate to the lower overall lexical cohesion (PCREFz, θ = 0.85). Less overlap among nouns and pronouns among sentences was detected (CRFNO1, CRFNOa, CRFAO1, CRFAOa), but a greater likelihood of using of old nouns (LSA givenness) and cohesion with related words and ideas (LSASS1). More cohesion was more likely achieved with connectives (PCDCz, θ = 1.24), mainly via causal and logical connectives rather than adversative or other connectives. The L2 writers were far more likely to use syntactically simpler sentences (PCSYNz) and grammatically similar adjacent sentences (SYNSTRUTt). Syntactic simplicity is manifested in the lower likelihood of left embedding (SYNLE) in the L2 essays, such as fronted adverbials, i.e., adverbial or prepositional elements before the subject and main verb; it is also manifested in a greater density of noun phrases in simpler sentences (DRNP), which is related to the less frequent use of adverbial phrases (DRAP) and prepositional phrases (DRPP). Noun phrases were simpler, with fewer modifiers (SYNNP, θ = 0.86) such as adjectives. Finally, the L2 writers were more likely to use first singular, second person, and especially third plural pronouns.

TABLE 2
Cohesion and Complexity Patterns of L2 Writers

Variable	Explanation	df	Estimate	θ	χ^2	*p*
Frequency	Log lexical frequency (noun)	1	0.0213	1.02	23.90	< .0001
Concreteness	Semantic concreteness ratings (noun)	1	0.0386	1.04	53.84	< .0001
WRDFRQmc	Content word frequency	1	-0.0333	0.97	1183.82	< .0001
LDTTRc	Lexical diversity	1	-0.1434	0.87	3227.93	< .0001
PCREFz	Referential cohesion	1	-0.1617	0.85	17.60	< .0001
CRFAO1	Argument overlap, overall	1	-0.1815	0.83	847.49	< .0001
CRFAOa	Argument overlap, adjacent	1	-0.2965	0.74	1768.72	< .0001
CRFNO1	Noun overlap, overall	1	-0.1690	0.84	332.19	< .0001
CRFNOa	Noun overlap, adjacent	1	-0.3109	0.73	925.36	< .0001
CRFCWO1	Content word overlap	1	0.0320	1.03	12.69	0.0004
LSASS1	LSA overlap	1	0.0691	1.07	66.19	< .0001
LSAGN	Givenness	1	0.1363	1.15	1468.04	< .0001
PCDCz	Deep cohesion	1	0.2145	1.24	134.61	< .0001
CNCAll	All connective incidence	1	0.0022	—	0.20	0.6535
CNCCaus	Causal connective incidence	1	0.1856	1.20	449.23	< .0001
CNCLogic	Logical connectives	1	0.1785	1.20	743.87	< .0001
CNCADC	Adversative connectors	1	-0.0429	0.96	9.06	0.0026
PCSYNz	Syntactic simplicity	1	25.9776	>1000	951.14	< .0001
SYNLE	Left-embedding	1	-0.1674	0.85	213.84	< .0001
SYNSTRUTt	Syntactic similarity	1	0.6532	1.92	10594.40	< .0001
SYNNP	Modifiers per noun phrase	1	-0.1570	0.86	621.78	< .0001
DRNP	Noun phrase density	1	0.0792	1.08	1485.51	< .0001
DRAP	Adverbial phrases	1	-0.0425	0.96	21.57	< .0001
DRPP	Prep. phrase density	1	-0.0365	0.96	38.70	< .0001
WRDPRP1s	1st singular pronouns	1	0.0499	1.05	27.78	< .0001
WRDPRP1p	1st plural pronouns	1	-0.0403	0.96	3.28	0.0702
WRDPRP2	2nd person pronouns	1	0.3009	1.35	65.57	< .0001
WRDPRP3s	3rd singular pronouns	1	0.1133	1.12	7.96	0.0048
WRDPRP3p	3rd plural pronouns	1	0.7458	2.11	157.94	< .0001

Comparison of the Coh-Metrix index for noun coreferential cohesion, PCREFz, between both groups would seem to show less use of coreferential cohesion in the L2 group. However, the L2 group showed much greater variability on this index. As Table 3 shows, though the mean L2 PCREFz score is slightly lower than for the L1, and the L1 group index shows much more consistency; the L2 group shows more variability and extreme values, with some skew toward excessive coreferentiality.

TABLE 3
Descriptive Data for Coreferential Cohesion

Group	Mean	Median	Minimum	Maximum	Skewness
L1	0.8637	0.9185	-3.3100	3.2250	-0.6424
L2	0.8033	0.6840	-1.6350	8.4460	1.9437

For further analysis of NPs, counts of each noun or pronoun lemma per essay were entered as a dependent variable into a loglinear model, with Group, NP type, essay word count, and a Group × NP interaction term as independent variables (SAS proc genmod, Poisson distribution, log link; Group reference category: L1; NP reference category: relative pronouns). The L2 writers were 1.2 times more likely to use personal pronouns (cf. the WRDPRP indices in Table 1), and 1.3 times more likely than L1 writers to use nouns than other words, e.g., content words. This relates to the noun density of sentences mentioned above. No differences were found for demonstrative, indefinite, or relative pronouns. These results are shown in Table 4 and Figure 1 (Group reference category: L1; NP type reference category: relative pronouns), which show significantly higher usage or likelihood of usage for nouns and personal pronouns among the L2 writers.

TABLE 4
Noun Phrase Types (L2 cf. L1)

NP type	df	Estimate	θ	χ^2	p
Demonstrative pronoun	1	-0.1045	—	-0.830	0.4069
Indefinite pronoun	1	-0.0608	—	-0.660	0.5117
Personal pronoun	1	0.2142	1.24	2.080	0.0380
Noun	1	0.2800	1.32	3.570	0.0004

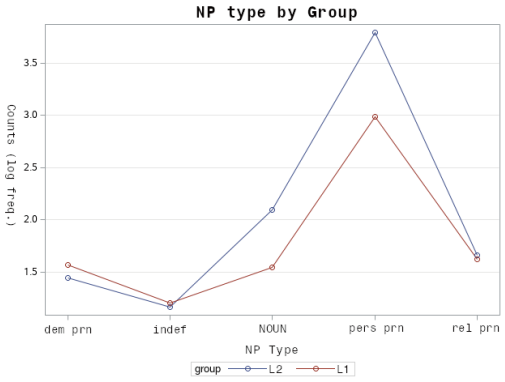

FIGURE 1 NP Type Usage by L1 and L2 Groups
Note. NP types: dem = demonstrative pronoun, indef = indefinite pronoun, NOUN = simple or compound noun phrase, pers = personal pronoun, rel = relative pronoun); y-axis counts represent log frequencies.

For NPs with full nouns (not pronouns), the type of determiner or quantifier was compared by groups, for the incidence of definite (*the*), demonstrative modifier (*this, that, these, those*), indefinite singular (*a, an*), indefinite plural (*some*), other quantifiers (*each, all*, etc.), and bare nouns (nouns with no articles, i.e., zero or null articles) (SAS proc logistic; dependent variable: NP type; Group reference category: L1). As seen in Table 5, the only differences were that the L2 writers tended to use more indefinite singular nouns (θ = 0.9), and were more likely to use bare nouns (θ = 1.2).

TABLE 5
NP Types

NP modifier	df	Estimate	θ	χ^2	p
Definite	1	-0.0580	—	1.764	0.1842
Demonstrative modifier	1	-0.0793	—	1.806	0.1790
Indefinite sg.	1	-0.0906	0.91	3.969	0.0463
Indefinite pl.	1	-0.0160	—	0.026	0.8725
Bare NP	1	0.2060	1.23	30.292	< .0001

Nouns and pronouns governed by prepositional phrases were compared with NPs used as main sentence arguments (subjects or direct objects) (SAS proc genmod, cumulative logit model). The results (Table 6) showed that the L2 group was only 0.8 times as likely to use prepositional phrases as L1 writers; this affect was mediated by frequency and concreteness effects, such that the L2 writers were less likely to use more frequent nouns, but more likely to use more concrete nouns (e.g., nouns for objects or materials) than abstract nouns, in prepositional phrases.

TABLE 6
Prepositional Phrases

Factor	df	Estimate	θ	χ^2	p
Frequency	1	-0.0495	0.95	20.00	< .0001
Concreteness	1	0.2803	1.32	193.28	< .0001
Group (L2, PP)	1	-0.2305	0.79	29.77	< .0001

Finally, counts of focalizing particles (e.g., *even, still, too, also*) were compared, but no significant effect for language group was found ($\chi^2 = 0.856$, $p = 0.36$), so the L2 writers did not seem to use these more or less than the L1 writers.

2. Qualitative Results

A brief qualitative examination of the essays shows a more complex picture. Though overall an L2 tendency for excessive noun repetition was not detected, some of the essays did show this tendency, especially those with high Coh-Metrix scores for coreferentiality (PCREFz). An example from Essay #026 shows heavy repetition of the noun *job*, as well as *students*. This shows heavy topic-topic chaining, or repeated use of the same topic throughout the essay (the main topics are underlined below). Even shifts to examples (*first, ... second, ...*) continue use of the same topical noun. This essay lacks focus-topic chains (new focus in predicate taken up as a topic in following sentences), use of synonyms or paraphrase expressions for topics, or smooth shifts to related foci and topics, e.g., new subtopics or related nouns. The second example (Essay 169) shows less excessive topic repetition, and more shifts, albeit to non-specific sentence subjects as examples (e.g., *your life, people, you*), rather than more specific and rhetorically effective subtopics. The sentences in both examples show relatively simple, basic SVO sentences (ignoring the comma splices) lacking in syntactic adjuncts such as prepositional phrases, adverbial phrases, fronted adverbials, conjunctive adverbials, or other structures. The simple sentences in these examples thus tend to put more emphasis on the noun phrases in the sentence flow.

TABLE 7
Samples

L2 and L1 examples
· L2 (#026) I think part time job is very important. Because we are going to learn experience in part time job and we earn much money. But many students think part time job more important than study. Nevertheless, I think that many people are going to have a part time job. Part time job experience is to be. Because meets many people and learn experience. Here is a lot of reason that students have part time job. First, the part time job experience is going to learn sociability that meets many people. Because many part time job meet people in these days. So sociability is very important. Many customers like to have high social skill worker. Therefore many employers choose to have social skill employee. Second, the part time job is going to earn much money. Many students received pocket money by parent. So there haven't part time job experience and earn money of them. When receive earn money, they are going to be pleased. Finally, they get experience of many part time jobs. These days Korea has many kind of job. So students are going to get experience. When find a job, part time job experience is very important. In conclusion, many students will have part time job. And student study more. So they survive in a competitive society.
· L2 (#169) Students can find a part time job if they can when they are in university or college because it can give you a lot exercise and you can get a lot of success from that, not just money but friends. you can do something better when you do part time job, friends is the best way when you do something. Many people think it is unusual to do a part time job, they play games or shopping in the stores, waste of time and waste of money, ran money is hard but waste of money is easy, many people is poor because they do not work hard and they have no sign in their life ways. in your life you have many chance and you have many choice, if you lost it, perhaps, it is forever. If you are a student what will you do when you have time in school. Students can find a part time job if they can when they are in university or college because it can give you a lot exercise and you can get a lot of success from that, not just money but friends, you can do something better when you do part time job, friends is the best way when you do something.
· (L1 #101) All college students should have a part-time job. There are many excellent reasons to join the work force while still attending school. For some students, the extra money will assist them in obtaining needed books and materials for study. Others will benefit from the discipline and time-management skills gained in balancing a study schedule with a semi-regular work regimen. Students who spend time away from the oppressive, thought-controlling atmosphere of most large universities will meet people accustomed to living and thinking in freedom. It can come as a welcome shock to the cloistered student to learn such a fascinating world exists, where the recommended norms of contemporary university thought patterns not only do not apply, they are mocked as absurd. As well, occupying oneself with an outside activity such as work restricts the amount of time available to fall in with bad company or develop social habits deleterious to academic achievement. Said activities include extended periods of video game playing during school hours, lounging on one's sofa watching daytime television, indulging in repeated bouts of binge drinking with equally dissolute friends, and an obsessive devotion to online fleshpots promising sexual release in exchange for money. The individual whose day is split between class and workplace has no opportunity to sample temptation. It therefore behooves all students to arrange for part-time employment as soon as possible. The alternative does not bear mentioning.
· L1 (#113) Let's ask ourselves, what is the ultimate purpose: To make money? or to improve our academic skills? I believe that the college student must concentrate on their studies. For this reason I am against anybody working during their college days. This is a very short 4 years in which the student can make great advances in their specialized field of research. There will be plenty of time after graduation to work but there will never be such an opportunity to make such an in depth study free from mundane worries. The problem with working while going to school is that they will become distracted, tired and eventually lose their concentration, finally their studies will falter. It is too much to worry about in addition to their schoolwork. They will have long hours, late nights, standing all day with the burden of responsibilities which can wait until after college. I understand that young students are in a hurry to grow up, I feel it's our social responsibility to make sure they take the time to enjoy life too. They may even be pressured into after hour meetings where drinking is involved. For these reasons I am completely against the college student taking on too much during these precious years and running the risk of becoming overwhelmed. This is where they should be concentrating on their studies.

Note. Main topics are underlined.

In the L2 examples above, the topical nouns (*job, part-time job*) are often repeated throughout each paragraph (without modifiers, and sometimes with noun article omissions), and in the second sample, the personal pronoun *you* is used fairly often. The L2 samples use fairly short, simple, subject-verb or subject-verb-object sentences without unmodified nouns and few adjuncts. Typically each sentence focuses on the same noun phrases, with these same noun phrases occurring in subject or predicate positions. The L1 examples avoid repetition of topical nouns (namely, *job*). Occasionally synonyms and related words are used (*work, work regimen*), including other word classes (verbs and gerunds, e.g., *working, to work*). The first L1 sample is strictly in third-person, with few nouns, while the second sample has some first-person and third-person pronouns. Both samples begin with the topic of jobs and quickly shift to other related topics or subtopics (e.g., time management, activities, responsibilities, habits). More complex sentence forms and noun phrases are used, including complex noun phrases, noun modification, and adjunct phrases.

Interestingly, some unnatural and awkward compound nouns were found while classifying the noun phrases in the L2 essays. These include expressions like *cancer people* (i.e., cancer patients), *cigarette people, citizen socialization, coffee fee, college people, college parents, college time, money option, money independence, smoker students, smoker room, smoker people*, and the phrase *give damage*. Quantitative analysis of simple and compound nouns was not attempted, since this is difficult without tagged corpora, but these examples show that further research of simple and compound noun phrases with tagged corpora is warranted.

V. DISCUSSION

This study examined paragraphs written by Korean learners at a lower-intermediate level, who face several challenges writing coherent and sophisticated essays at the paragraph level. In contrast to past studies of essay samples (e.g., S. Ahn, 2020; J. Kim & K. Lim, 2019), the Coh-Metrix results here did not reveal a strong overall trend toward excessive noun repetition throughout the data set for coreferential cohesion, but the L2 writers tended to use given nouns more. However, a subset of writings did exhibit excessive noun repetition, and the whole set of L2 writings exhibited more inconsistency, variability, and extremes, with a skew toward excessive cohesiveness. Some L2 writers used more effective coreferential cohesion, a few used low levels of cohesion, and a number of essays had high Coh-Metrix cohesion scores, with excessive and unnatural sounding use of noun cohesion (e.g., the repetition of *job* in the samples above). The L2 also used bare nouns more often, likely reflecting difficulties in using the English article system for noun cohesion. The L2 writers in this study also used more personal pronouns, which can make essays sound more informal or less sophisticated. Fortunately, the L2 writers in this study did not seem to have difficulties with underusing or overusing emphatic and contrastive particles within sentences (*even, only, also, too*).

The grammatical simplicity of sentences among the L2 writers in this study affected the cohesiveness or over-cohesiveness of the paragraphs. The noun phrases tended to consist of simpler noun phrases, with few modifiers and less lexical diversity (e.g., the very repetitive use of phrases like *job* and *part-time job* above). The higher noun density in sentences relates to the lower indices for adverbial and prepositional density, and lower numbers of prepositional adjuncts. Simple sentences consisting of obligatory arguments (subjects and objects, as required by the main verbs) and few or no syntactic adjuncts lead to simple sounding sentences that highlight the noun phrases. The basic argument structure configuration of a sentence (subject, verb, object) conveys a more basic meaning, which can be elaborated on with prepositional and adverbial adjuncts. This would not only provide more detailed exposition, but would elicit slightly deeper processing of sentences among readers, making for more engaging texts. However, the L2 writers used adjuncts considerably less often, leading to a flow of thought that can sound less developed, sophisticated, or detailed. The packing of information thus seems one-dimensional, overly repetitive, lacking in depth, and prosodically weak, and the succession of simple main clauses with little variety in sentence structure leads to uninteresting prose that can fail to engage readers. The grammatical and lexical redundancy can contribute to a weak topic-focus flow, such as repetitive topic continuations (topic chaining across sentences), with few focus-topic shifts or soft shifts to related topics for expositional development. Frequent topic-topic chains make for texts that are easy to read, but not so sophisticated or engaging.

These results are consistent with those of previous studies. As previous Coh-Metrix studies of L1 and L2 writers have found (Crossley & McNamara, 2011, 2012; Crossley et al., 2011; McNamara et al, 2010; McNamara et al., 2014), excessive use of noun phrases, pronouns, and repeated phrases can lead to over-cohesiveness, or an overuse of cohesion that can make for writing that sounds less sophisticated, repetitive, and less engaging for readers. Of the few comparable Coh-Metrix studies in Korean L2 writers of English, a study of editorial writing (J. Lee, 2020) found that Korean writers tended to use structurally simpler sentences and relied on connectives for cohesion. Another study (S. Ahn, 2020) found that lower-level Korean EFL learners used simpler connectives, less lexical diversity, and more coreferential cohesion. This study shows that the degree of cohesiveness used by such learners can be excessive and redundant, in a way that can adversely affect the style and flow of sentences and paragraphs. These study results also show that a lack of grammatical complexity and lexical diversity correlated with a high level of cohesion, namely, in the form of more simple, unmodified noun phrases, more bare nouns, fewer adjuncts, and more personal pronouns in the L2 essays.

These L2 stylistic patterns can also lead to a seemingly

wordy exposition rather than a concise, formal sounding style, e.g., taking several sentences to develop an idea that can be expressed more succinctly. Learners may need revision exercises in combining sentences with greater complexity for better grammatical sophistication and sentence flow (e.g., *Mr. Smith was an incompetent president. He was a bad character. He made speeches and insulted people like minorities and immigrants. → The incompetent President Smith was a man of poor character, who insulted minorities and immigrants in his speeches.*). Topic continuations can be improved with more use of paraphrase expressions, synonyms, and complex noun phrases, followed by the inclusion of soft shifts to develop more complex thoughts and to avoid excessive topic chaining (e.g., *The incompetent President Smith was a man of poor character, who insulted minorities and immigrants in his speeches. The buffoon even made fun of handicapped persons. His fulsome speeches were roundly condemned, and his legacy is one of ill repute.*). Such development and complexity can engage readers in deeper mental processing, and make essays more interesting.

These results show that students at the paragraph writing stage face difficulties that differ somewhat from those reported in previous studies of those writing full-length essays. The challenges that students face with creating fluid sentences and paragraphs indicate that more intervention is needed when students are learning paragraph writing, before they are ready for essay writing. The shorter writing samples examined here may be comparable to some English writing tasks that students would face, such as short essay questions on exams in college courses taught in English, or on standardized tests. To perform better on shorter writing tasks, and to prepare learners for essay writing, the following specific issues need to be addressed. Within, e.g., a process approach to writing, these issues can be addressed by means of revision exercises with first drafts, and by examining and discussing effective model paragraphs.

Some learners need more instruction on creating cohesion with connectors and noun coreferentiality. However, lexical and referential cohesion can be excessive if it involves overuse of noun phrases, especially simple noun phrases, repeated sentence subjects, pronouns, and common connectors. Excessive use of cohesive devices does not necessarily improve the quality of texts (McNamara et al., 2014), and can lead to essays rated worse in quality and sophistication, especially if the essays use high frequency vocabulary and lack in lexical diversity and grammatical complexity, for L1 and L2 writers (Crossley & McNamara, 2009, 2011, 2012; Crossley et al., 2011). Aside from grappling with the very different nature of English syntax and pragmatics, excessive cohesion or poor cohesion might also arise because some EFL textbooks emphasize the use of discourse connectives, but not other cohesive devices (H. Y. Cho & J. A. Shin, 2014), and textbooks may simply not cover the more natural patterns of topic development. Model paragraphs from authentic materials can be used, for example, if students are taught to perform topical structure analysis (TSA) with sample paragraphs to understand the types of topic development patterns (e.g., focus-topic shifts, smooth shifts) used in more polished writing. Then after performing a similar analysis on their own paragraph drafts, they can revise their own drafts with more sophisticated topic flow.

Model paragraphs can be used to point out other aspects for students to then practice in revising their writings: complex noun phrases with one or more modifier, for more multidimensional NPs, and similarly, complex noun phrases with a post-modifier (i.e., a noun followed by a relative clause, prepositional phrase, or other modifier); various types of adverbs, including sentence adverbs (e.g., *fortunately, incidentally*); adjuncts such as prepositional and adverbial phrases for more varied sentence structures; fronted adverbials, i.e., preverbal prepositional phrases, adverbial phrases, sentence adverbs, and conjunctive adverbs, which often make for smoother transitions to new sentences); occasional referential cohesion with other content words; synonyms and paraphrase expressions to avoid noun repetition; and combining main clauses into compound and complex sentences. Similar lessons are also needed on the effective use of definite and indefinite articles for managing the information status and cohesion of nouns. Model paragraphs with guiding questions can be provided to students in discussion groups to lead them to noticing specific structures. Engaging in inductive or discovery learning with model paragraphs, or in peer editing with their own essays, can help students learn more deeply. Also, in light of the learners' difficulties with lexical diversity and a few infelicitous compound nouns, more vocabulary building is needed with writing instruction if it is not already included somehow, for example, from reading sample essays, paragraphs, and reading assignments.

Teaching sentence patterns and grammatical forms should also focus on functions and usage in context, in contrast to rule-based instruction, especially since grammatical forms themselves convey meaning (as cognitive grammar theories claim). Complex sentences can foreground and background the relative salience of information with main and subordinate clauses (Hinkel, 2002). More complex noun phrases and adjuncts may be more effective and engaging, in that they likely present more information to readers at once about a noun referent that invite deeper mental processing and retrieval of background information that is necessary to interpret words and make inferences. Writers also need to be aware of how to develop paragraphs, as sentences build on another by shifting to synonyms, paraphrase expressions, related topics, or subtopics to add examples, illustrations, evidence, and more detailed explanations of ideas.

Finally, the results of this show that sentential and noun phrase complexity plays a role in cohesion and information flow. However, existing models of IS, and pragmatic theories of newness and givenness (e.g., Centering Theory) have little to say about grammatical complexity and its effects on information flow and cohesion. Thus, current linguistic theories need be developed further to explain the

role of such elements in information flow. Since Construction Grammar and similar cognitive grammar theories treat grammatical structures as inherently mean-bearing units, such cognitively oriented frameworks might yield insights that can enhance IS and pragmatics theories, and subsequently, insights to improve explanations and teaching methods for language teachers and L2 learners.

VI. CONCLUSION

Lower-level learners and those at the paragraph writing level, such as secondary students and beginning college students, face some unique challenges that can differ from those of more advanced learners at the essay writing level. These learners need more instruction on effective writing strategies at the paragraph level, such as those involving more effective use of noun phrases in information flow. Grammar and discourse structure need to be addressed at this level, though not in a traditional rule-based manner. Grammar forms need to be presented and practiced with a focus on their discourse functions in writing and in context, as these forms are actually meaningful in themselves.

This study expands on the concept of information structure by incorporating insights from construction grammar, centering theory, and topical structure analysis, such that IS can better accommodate cohesion as a construct that is related to information structure and flow. This study also explores novel methods for studying IS in L2 writing, such as the use of loglinear/logistic regression on word counts and Coh-Metrix indices. Possible limitations of this study may arise from the focus on single-paragraph writings and the fairly limited sample size. For better generalizability and for discerning trends across levels, these methods need to be applied to a broader set of essays of different lengths from writers at different proficiency levels. Another limitation is that compound versus simple noun phrases were not compared in this study, though some indications of difficulty with compounds were found; this also needs to be examined, with a tagged corpus. This study did not examine contrastive or emphatic forms (other than a few markers like *even, also, too*), and more study of other contrastive forms is needed. More research is also needed on the connection between syntax (including sentence roles), cohesion, and information flow (and a follow-up paper from this study will attempt to explore some of these connections at a theoretical level in the near future). Ultimately, for more in-depth study, a tagged corpus will be needed. Although tagged corpora do not generally include direct tagging of IS categories, the standard syntactic and positional tags can nonetheless be analyzed for many aspects of information structure (Lüdeling et al., 2016).

Thus, effective cohesion is not merely a product of discourse markers and referent repetition. Rather, cohesion is better viewed as a multi-dimensional construct, which involves noun coreferentiality, old-new status, definite-indefinite status, overlap and coferentiality of content words, and connectives for conceptual coherence. This also entails a close connection between IS, grammar, and cohesion in writing. More research on information structure, grammar, and cohesion in L1 and L2 writing is needed, and in particular, more research on specific, suitable teaching methods and strategies is needed.

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