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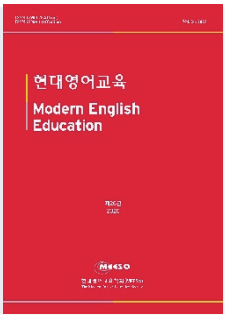

The Effect of Learning Motivation on Korean Learners' Textual Features in English Essay Writing: A Coh-Metrix Study

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Abstract
This study investigates how integrative and instrumental motivation affect the textual features of essays written by Korean EFL learners, addressing the limited research that connects motivational constructs to actual language use in learner-generated writing. We analyzed 600 essays from the ICNALE corpus using Coh-Metrix, a computational text analysis tool. To explore how motivation influences text, we selected 27 indices that encompass surface, lexical, syntactic, and discourse/text levels. We conducted a series of linear regression analyses with motivation scores as predictor variables and Coh-Metrix indices as criterion variables. The results indicated significant differences in linguistic features based on motivational orientation, particularly at the surface, lexical, and discourse levels. Higher integrative motivation correlated with a richer focus on conveying meaning, while higher instrumental motivation was tied to a greater emphasis on message clarity. These findings suggest that learner motivation impacts various aspects of text construction and underscore the importance of student-centered instructional approaches that consider learners' motivational profiles in second language writing instruction.

INTRODUCTION

English has established itself as the dominant language in international business, academia, and culture. Consequently, the number of English learners has increased exponentially, encompassing individuals from diverse backgrounds and learning histories. In response, there is a growing need to develop various instructional methods to support learners in achieving successful language acquisition. To design effective English language instruction, it is essential not only to convey linguistic knowledge but also to carefully consider the learners' individual differences. Of the many individual factors that may affect L2 learning, psychological variables are particularly significant and should not be overlooked. Learners' psychological factors greatly influence their engagement, persistence, use of learning strategies and even L2 learning outcomes (Dewaele, 2007; Sparks, 2019; Wang et al., 2021). Therefore, individualized instructional design that takes psychological factors into account can provide tailored feedback and guide learners toward effective strategies based on their internal states.

In the field of second language acquisition, motivation has long been recognized as a key psychological factor influencing learning outcomes. Motivation is understood not merely as interest but as a complex psychological construct that encompasses goal setting, the capacity to sustain effort, and learners' emotional attitudes toward learning (Gardner, 1985; Samad et al., 2012). Furthermore, it is well established that motivation manifests in diverse forms, ranging from intrinsic motivation, which is driven by personal interest, to extrinsic motivation, which is influenced by external rewards (Deci & Ryan, 2000).

Among theories related to learning motivation such as the Socio-Educational Model (Gardner & Lambert, 1972), the Self-Determination Theory (Deci & Ryan, 1985, 2000), and the Expectancy-Value Theory (Wigfield & Eccles, 2000), the Socio-Educational Model, which categorizes leaners' motivation into integrative and instrumental types by focusing on psychological distance from the language community and sociocultural factors, has long been regarded as a foundational theoretical framework in the field of language learning. Gardner and Lambert (1972) proposed a broad classification of learners' motivation into integrative motivation and instrumental motivation. Integrative motivation refers to the desire to assimilate with the second language community or an interest in its culture (Csizér & Dörnyei, 2005), whereas instrumental motivation pertains to practical goals such as employment, examinations, or promotion.

Importantly, the type of motivation has been found to influence not only learners' language persistence but also the specific learning strategies they employ (Ely, 1989; Nikoopour et al., 2012; Zarei & Elekaie, 2013). Learners with integrative motivation often engage in social and communicative strategies, seeking authentic interaction with the target language community (Bonney et al., 2008). In contrast, learners with high instrumental motivation tend to adopt cognitive and memory strategies that directly support their practical goals, such as passing exams or enhancing job-related skills (Nikoopour et al., 2012). This suggests that learners' motivation plays a crucial role in the selection of learning strategies, and that the type of motivation influences how these strategies are used. In fact, Martínez et al. (2016), in a study of Spanish learners, found that motivation level had the strongest impact on the use of learning strategies, and that the frequency of specific strategies varied depending on the strength of types of motivation (Oxford & Nyikos, 1989; Xu, 2011). These findings indicate that the learning strategies selected by learners may differ according to their learning motivation, which in turn implies that their actual patterns of second language use may also vary depending on the strategies they employ.

Given that motivation influences learners' specific learning strategies, it is also reasonable to predict that these strategic preferences may also be reflected in their essay writing practices. Learners with integrative motivation, who prioritize communication, cultural relevance, and interaction, are likely to produce texts in a way that facilitate reader comprehension. In contrast, learners with high instrumental motivation may prefer writing patterns that emphasize accuracy, organization, and task completion in alignment with their practical goals. Nevertheless, while prior research has examined the influence of learning motivation on learning outcomes and strategy use, little empirical attention has been paid to how such motivation is reflected in learners' actual writing patterns.

Addressing this gap is essential, as writing plays a pivotal role in second language education and serves as a key indicator of both communicative competence and academic achievement (Hinkel, 2009). Essay writing in English language education requires linguistic abilities such as vocabulary, grammar, and sentence construction and higher-level skills including discourse organization and logical reasoning. As a result, major English proficiency tests, such as the TOEFL, include essay writing as a key assessment component, and essay-based instruction and evaluation are widely practiced at universities in English-speaking countries (Hinkel, 2009).

However, writing tasks are often particularly challenging for many second language learners. They demand basic linguistic abilities as well as higher-order cognitive skills, including discourse organization, logical reasoning, and consideration of the audience (Güvendir & Uzun, 2023). In L2 contexts, learners frequently experience a high level of psychological burden due to limited fluency and anxiety about linguistic accuracy (Zhang, 2019). For these reasons, writing

instruction requires pedagogical responses that address such challenges, and it is essential to implement instructional strategies that support learners' strategic engagement in writing within actual educational settings.

Based on this need, what must first be examined is how learners' motivation levels are reflected in their actual writing. Simply knowing whether learners are more or less motivated is insufficient for developing concrete instructional strategies. Rather, identifying how different types of motivation manifest across various levels of the written text can provide the foundation for more targeted educational interventions. Accordingly, the present study aims to empirically investigate whether, and at which levels, integrative and instrumental motivation are reflected in Korean English learners' argumentative essays.

LITERATURE REVIEW

The Effect of Learners' Motivation on Their L2 Achievement

In second language learning, motivation has been regarded as a key psychological factor that determines learners' sustained engagement and successful achievement. Motivation functions as an internal driving force that directs learners' behavior and propels them toward their learning goals. It has been reported that both the level and type of motivation influence learning outcomes (Oxford & Nyikos, 1989).

Numerous studies have demonstrated significant correlations between second learning motivation and learners' performance (e.g. Cahya, 2017; Gardner & Lambert, 1972; Nasihah & Cahyono, 2017; Peng & Fu, 2021; Yu, 2019; Zhang et al., 2020) For example, Cahya (2017) investigated the relationship between learning motivation and EFL proficiency (measured by TOEFL scores) among 195 EFL learners enrolled in Indonesian universities. The results revealed a significant positive correlation between students' motivation and their EFL proficiency, indicating that higher levels of motivation were associated with better L2 performance. The author emphasized that while first language acquisition is often facilitated by abundant input, second language learning typically occurs in more input-limited environments, making learner motivation a critical factor. Accordingly, motivation was described as a key predictor of learning outcomes in second language acquisition.

Furthermore, in the field of second language acquisition, research has increasingly focused on the relationship between the types of motivation learners possess and their language learning outcomes. Samad et al. (2012) investigated whether integrative and instrumental motivation correlated with English language proficiency (IELTS scores) among 100 Iranian EFL learners. The results showed that integrative motivation was significantly correlated with IELTS scores, whereas instrumental motivation did not show a significant correlation. Additionally, the researchers conducted multiple regression analysis to examine whether learners' motivation could serve as a predictor of English proficiency. The analysis confirmed that integrative motivation was the most suitable variable in explaining the variance in IELTS scores. Moreover, learners were categorized into high and low achievers based on their proficiency, and the distribution of their motivational types was analyzed. The findings revealed that high achievers tended to exhibit higher levels of integrative motivation, while instrumental motivation was more prevalent among low achievers. These results suggest that motivation has a substantial impact on English proficiency, with integrative motivation functioning as a key predictive factor. With these results, authors emphasized the importance of providing opportunities for learners to engage in communication within the target language community to foster integrative motivation.

Hernandez (2008) also reported that integrative motivation has a positive impact on second language proficiency, especially on L2 speaking. The study examined 130 Spanish learners to investigate how five variables – integrative motivation, instrumental motivation, the need to fulfil a foreign language requirement, grade point average (GPA), and previous years studying Spanish – affect five Spanish learning-related outcomes; scores on a simulated oral proficiency interview (SOPI), final exam grades, final course grades, the desire to enroll in additional Spanish courses after fulfilling the language requirement, and the intention to major in Spanish. The results revealed that integrative motivation was a significant predictor of both SOPI scores and final exam performance. In contrast, instrumental motivation did not significantly predict any of the five dependent variables. Ultimately this study highlights the important role of integrative motivation in predicting speaking achievement in foreign language learning environments.

While these two studies demonstrate that integrative motivation positively influences second language learning outcomes, there are also studies indicating that instrumental motivation can affect L2 learning. For instance, Aspuri et al. (2019) investigated the impact of instrumental motivation on English learning among students in Yemen. They conducted a qualitative study using interviews with 10 EFL learners. They reported that the participants exhibited strong instrumental

motivation in their English learning process. According to their interview responses, many were learning English to obtain scholarships or to teach English abroad. Moreover, the participants perceived English learning as essential for their future and reported making continuous efforts to improve their proficiency, such as practicing English daily. Based on these findings, the authors concluded that various stakeholders in English education should support learners by fostering instrumental motivation in order to enhance engagement in both language learning and teaching processes.

An empirical study that reported a positive impact of instrumental motivation on L2 learning outcomes is Cocca and Cocca (2019). They analyzed the relationship between psychosocial factors – such as affective variables and motivation – and English proficiency among EFL learners. Drawing on a sample of 354 university students, their study found that students' academic achievement was significantly correlated with motivational intensity, attitudes toward learning English, and their willingness to learn. Notably, instrumental motivation emerged as a significant predictor of English outcomes, whereas integrative motivation was neither correlated with nor predictive of proficiency outcomes. Based on these findings, the authors emphasized the importance of creating student-centered learning environments, arguing that such approaches may have a greater impact on learners' language achievement than teachers' instructional competence alone.

Ultimately, these studies suggest that both types of motivation – integrative and instrumental – have the potential to significantly influence second language learning outcomes. For instance, Suliman et al. (2024) examined 101 ESL students in the United Arab Emirates and found that both integrative and instrumental motivation contributed significantly to learners' English learning performance. In line with this, Gardner and Maclntyre (1991), in their study of French language learners, confirmed that both types of motivation can positively affect second language learning. These findings imply that integrative and instrumental motivations are not mutually exclusive but rather function complementarily (Brown, 2000). In other words, the two types of motivation may work together to enhance learner engagement and persistence. Therefore, future research should move beyond dichotomous groupings based solely on dominant motivation types and instead adopt a more comprehensive approach that considers the distinct influence of both integrative and instrumental motivations on learners' L2 usage.

The Effect of Learners' Motivation on Their L2 Writing Ability

Studies in the field of education have investigated the relationship between learners' motivation and their writing ability or proficiency. Among them, some studies have examined the extent to which the strength of learners' motivation influences their writing abilities. For example, Nasihah and Cahyono (2017) investigated the correlations between language learning strategies, motivation, and writing achievement among 100 Indonesian senior high school students learning English as foreign language. Their findings revealed statistically significant correlations between language learning strategies and writing achievement, between motivation and writing achievement, and between the combination of both factors and writing achievement. Specifically, the more frequently students used learning strategies, the higher their writing scores were; likewise, stronger motivation was associated with higher writing performance. Based on these findings, the authors concluded that both language learning strategies and motivation, either independently or in combination, can predict writing achievement. They further recommend that writing instruction should emphasize the use of language learning strategies and foster learners' motivation for writing tasks.

In addition to such studies, the field of education has also explored how different types of motivation affect writing performance. Fazel and Ahmadi (2011) compared the language proficiency and writing performance of IELTS (International English Language Testing system) candidates in Iran who possessed either integrative or instrumental motivation. The results indicated that both groups demonstrated a positive correlation between their level of motivation and their writing performance as well as language proficiency. These findings suggest that motivation positively influences L2 learners' writing abilities, and the authors emphasized that motivation is a significant factor contributing to language learning.

In line with Fazel and Ahmadi (2011), Widiastuty and Azman (2024) investigated the relationship between instrumental and integrative motivation and the writing performance of Indonesian EFL learners. Seventy-five learners were instructed to select one of three topics and write an argumentative essay. The essays were subsequently evaluated based on writing accuracy. The analysis revealed that both instrumental and integrative motivation showed significant positive correlations with students' writing performance. However, the degree of influence differed between the two motivational types, with instrumental motivation (70.15%) exerting a substantially greater effect on writing performance than integrative motivation (17.03%). Based on these findings, the authors recommended the development of instructional approaches that strengthen instrumental motivation while simultaneously fostering integrative motivation, given that instrumental motivation had a greater impact on the writing performance of EFL learners.

Meanwhile, Hashemian and Heidari (2013) emphasized the importance of integrative motivation in enhancing L2 writing

performance. They assessed the motivation and attitudes of 30 Iranian TEFL (Teaching English as a Foreign Language) graduate students and evaluated their writing proficiency through a writing performance test. The results indicated that instrumental motivation demonstrated a negative correlation with writing achievement, although this relationship was not statistically significant. In contrast, integrative motivation showed a statistically significant positive correlation with writing achievement. Additionally, the researchers found that learners with more positive attitudes toward learning achieved higher writing performance. These findings suggest that integrative motivation and positive attitudes have a beneficial impact on L2 writing achievement. The authors concluded that strategies promoting integrative motivation and positive attitudes are essential for improving writing performance.

These studies collectively indicate that learners' second language learning motivation has a significant impact on their writing performance. However, most of the existing research relies on holistic assessment scores or general measures of writing proficiency, typically based on rater judgments or standardized test results. While such scores offer an overall indication of writing achievement, they fall short in revealing the specific linguistic and structural characteristics of learner texts. That is, they do not provide insights into how motivational orientations are reflected at different levels of written composition, such as lexical choice, syntactic complexity, or discourse organization. This limitation highlights the need for a more fine-grained, text-based approach to examining L2 writing, one that goes beyond outcome scores and focuses instead on the linguistic features embedded in learners' written products.

The Present Study

This study aims to empirically examine the differences in text characteristics that appear in Korean EFL learners' essays according to their levels of integrative and instrumental motivation. While several previous studies have limited their analysis of learner's essays to a single dimension, such as writing proficiency or performance, the present study seeks to conduct an in-depth analysis of how writing manifests across various dimensions of text composition depending on the learners' motivation. Although previous studies have explored the role of motivation in L2 learning outcomes and strategy use, little is known about how specific motivational orientations are reflected in the linguistic features of learners' written texts. To address this gap, the present study adopts an exploratory approach and aims to provide initial evidence on this relationship through computational text analysis.

Furthermore, to conceptually ground the connection between motivation and written production, Gardner's Socio-Educational Model is extended to the domain of writing, thereby offering a theoretical rationale for linking motivational constructs with textual outcomes in L2 contexts. The model posits that learners' motivation interacts with attitudes toward the learning situation, language anxiety, and self-confidence, ultimately influencing learning outcomes. While previous applications of this model have primarily examined how motivational orientations influence writing performance or outcomes, the present study aims to go further by empirically analyzing how these orientations are reflected in specific textual features across different levels of written composition. By applying this model to L2 written production, this study provides a theoretical rationale for linking learners' internal motivational states to observable textual features in their writing. This conceptual extension allows for a more comprehensive understanding of how psychological factors influence not only language acquisition but also the form and quality of language use in written contexts.

Another distinctive feature of the present study is the use of Coh-Metrix, which enables multi-level analysis of learners' essays based on surface, lexical, syntactic, and discourse dimensions (Crossley & McNamara, 2011). Coh-Metrix, developed by the University of Memphis, is an automated text analysis program that quantifies multiple dimensions of text and provides detailed analytical data (Graesser et al., 2004). By offering quantified data across various textual dimensions, the program facilitates the comparison and statistical analysis of features present in the essays of different learner groups (McNamara et al., 2014). In contrast to previous studies that have primarily relied on holistic scores or general proficiency ratings, this study focuses on the linguistic and structural features embedded in the texts themselves. Such an approach allows for a more nuanced understanding of how motivational orientations are reflected in actual written output. Accordingly, this study investigates the relationship between multiple indices provided by Coh-Metrix and learners' motivational orientations, aiming to identify which textual dimensions are most strongly influenced by their learning motivation. In line with this objective, the research questions of this study are as follows:

Research Question 1. Does learner's motivation relate to differences in the text characteristics of English essay?

Research Question 2. If L2 learning motivation affects text characteristics of learners' essays, in which dimensions of the text is this influence reflected?

METHOD

Corpus and Learning Motivation Data

In this study, essays from the International Corpus Network of Asian Learners of English (ICNALE), a corpus containing spoken and written data produced by Asian learners of English, were selected as the primary data for analysis (Ishikawa, 2023). The ICNALE corpus contains essay data from 300 Korean learners of English (105 males, 195 females; mean age = 22.18). However, the Korean learners of English included in the corpus exhibited a wide range of proficiency levels. Their scores on the vocabulary size test ranged from a minimum of 10 to a maximum of 48, with a mean score of 35.74. In addition, they reported having studied English writing for an average of 3.33 years. Each learner wrote two essays on different assigned topics: (1) "It is important for college students to have a part-time job" and (2) "Smoking should be completely banned at all the restaurants in the country." As a result, a total of 600 argumentative essays were collected for analysis.

Additionally, learner motivation data provided by ICNALE were utilized. Learners' motivation levels were assessed using a questionnaire based on Gardner's Attitude/Motivation Test Battery (AMTB), which comprised six items each measuring integrative / instrumental motivation. Given that AMTB is a well-established instrument for distinguishing between these two motivational orientations (Gardner, 1985, 2004; Song & Pornsima, 2016), it was deemed appropriate for the present study, which aims to examine how such motivations are reflected in L2 writing. Each item was rated on a 6-point Likert scale, and the scores for each motivation were calculated by averaging the responses to the relevant items. The items provided by the ICNALE project (Ishikawa, 2023) were categorized as follows:

Integrative Motivation Items
Q1. I find pleasure when I understand the content sufficiently.
Q3. Learning content is more important than being awarded high grades.
Q8. I am interested in the content, even if it is difficult.
Q9. Learning something new is fun, even if it is difficult.
Q10. I find pleasure in discovering something new.
Q12. Increasing English knowledge is fun.

Instrumental Motivation Items
Q2. I want to get a better job in the future.
Q4. I want to be socially acknowledged.
Q5. Being awarded high grades is important for me.
Q6. Learning English is what we have to do anyway.
Q7. I want to achieve a good mark in the tests.
Q11. I want to get a better grade than others.

Before conducting the statistical analysis, the distributions of the integrative and instrumental motivation scores of the Korean learners were examined to determine whether there was a significant difference between the two motivation levels. A paired-sample t-test was then conducted to assess whether the two motivation scores differed significantly. The results showed that the mean integrative motivation score was 4.54 (SD = 0.78), while the mean instrumental motivation score was 4.83 (SD = 0.82). A paired-sample t-test revealed a significant difference between two scores ($t(299) = -5.41$, $p < .001$), showing that instrumental motivation scores were significantly higher than integrative motivation scores. In addition, the correlation between integrative and instrumental motivation scores was examined to assess the degree of association between the two variables. Pearson's correlation coefficient revealed a moderate positive correlation ($r = .37$), which was not strong enough to raise concerns about multicollinearity.

Data Analysis

A total of 27 indices provided by Coh-Metrix were selected for the analysis. The 27 Coh-Metrix indices included in the analysis are presented in Table 1. First, at the surface level, the indices included measures of the number and length of words and sentences in each essay. These indices provide a general overview of the text's structural features. Surface-level indices represent the most basic physical characteristics of a text, but they can also provide indirect insights into the writer's

linguistic or cognitive tendencies. For example, a high number of words coupled with a low number of sentences may indicate a preference for longer sentences, suggesting that the writer tends to integrate complex ideas within a single sentence. Conversely, the use of shorter words and sentences may reflect a strategy that prioritizes simplicity and clarity in communication.

Next, at the lexical level, the indices comprised the frequency of content words and pronouns per 1,000 words. Content words, such as nouns and verbs, play a central role in conveying information. The frequency of these words can indirectly reflect the writer's meaning-oriented narrative style, and the density of information presented in the text (Graesser et al., 2004). In the case of pronouns, those provide insight into how the writer refers to themselves or others and may implicitly indicate whether the text was written from a more reader-friendly, interpersonal perspective or from a more objective stance. Additional lexical measures included the log-transformed frequency, imageability, concreteness, and age of acquisition of the content words. These indices reflect how accessible or difficult the vocabulary used in the text may be. Low word frequency typically indicates the use of more specialized or less commonly used vocabulary. In this study, word frequency was measured using the CELEX log frequency, a logarithmic transformation of frequency counts derived from the CELEX lexical database (McNamara et al., 2014). This transformation is commonly employed to normalize distributional skew (Zipf, 1935) and minimize the influence of extreme values. In contrast, higher imageability and concreteness scores suggest that the text contains more intuitive and easily processed words. Similarly, the age of acquisition refers to the average age at which a word is typically learned; a higher score indicates the use of more complex vocabulary. The lexical dimension also included the type-token ratio of content words in each essay. The type-token ratio represents the proportion of unique words (types) relative to the total number of words used (token) in a text (Graesser et al., 2004). A higher type-token ratio indicates that each word is used less frequently within the text, reflecting greater lexical diversity. This measure primarily reflects the writer's compositional ability and the breadth of topic development.

At the syntactic level, two indices were included to reflect the syntactic complexity of each sentence in the text. The number of modifiers per noun phrase indicates how elaborately a noun phrase is constructed; modifiers may include adjectives, prepositional phrases, and relative clauses. A higher value suggests not only more detailed and sophisticated descriptive ability but also the capacity to produce more complex sentences by expanding noun phrases. Similarly, the number of words before the main verb reflects how many constituents are placed before the main predicate in a sentence. A higher value implies the presence of more modifiers, adverbial clauses, or subject elaborations. Therefore, having more words before the main verb can be interpreted as a sign of better sentence planning ability. Ultimately, both indices reflect the extent to which sentence structure can be deepened and indirectly indicate how information is organized within the sentence.

Finally, at the discourse/text level, the indices included measures of cohesion between sentences, the frequency of connectives (per 1,000 words) that explicitly mark logical relationships between sentences, and text readability indices. Cohesion indices refer to the connectedness established through referential expressions and lexical repetition. A high level of cohesion suggests that the writer did not merely list sentences but rather employed various cohesive devices to clearly express the relationship between ideas, reflecting discourse-level organizational skills (Graesser et al., 2004). Among these indices, referential cohesion is typically measured by argument overlapping, which captures the extent to which key words or referents (e.g., nouns, pronouns) are repeated across adjacent or distant sentences (McNamara et al., 2014). Semantic cohesion, in contrast, refers to the degree of conceptual similarity among words or ideas within a text. In Coh-Metrix, this is measured using Latent Semantic Analysis (LSA), a computational technique that assesses semantic similarity based on patterns of word co-occurrence in large corpora. Specifically, LSA calculates the cosine of the angle between vector representations of textual units, with higher cosine values indicating greater semantic similarity, suggesting that the ideas are more conceptually related across the text. Similarly, connectives explicitly mark logical relationships between sentences and indicate the extent to which the text is logically structured. Overall text readability indices quantify how easily a text can be read by considering factors such as sentence length and word complexity (McNamara et al., 2014). A lower readability score implies the use of more complex sentence structures and difficult vocabulary, suggesting that the text may possess a more specialized or academic nature.

For the statistical analysis, separate linear regression models were constructed with 27 Coh-Metrix indices as dependent variables and the two motivation scores (Integrative and Instrumental) as independent variables. Statistical analyses were conducted using R 4.4.3 (R Core team, 2025), employing the *stats* package, which is included in the base installation of R. Based on these models, the results presented the relationships between motivation scores and the Coh-Metrix indices for each text level.

TABLE 1
The Coh-Metrix Indices for the Present Study

Level	Category	Indices
Surface	Descriptive information	Total number of words
		Total number of sentences
		Average words per sentence
		Average syllables per word
Lexical	Content word	Noun incidence score
		Verb incidence score
		Adjective incidence score
		Adverb incidence score
	Pronoun	First-person pronoun incidence score
		Second-person pronoun incidence score
		Third-person pronoun incidence score
	Word frequency	CELEX Log frequency of content words
	Word characteristics	Imageability of content words
		Concreteness of content words
		Age of acquisition of content words
	Lexical diversity	Type-token ratio of all content words
Syntactic	Syntactic complexity	Modifiers per noun phrase
		Words before main verb
Discourse / Text	Referential cohesion	Argument overlaps (adjacent sentences)
		Argument overlaps (all sentences)
	Semantic cohesion	LSA cosine (adjacent sentences)
		LSA cosine (all sentences)
	Connectives	Incidence score of causal connectives
		Incidence score of additive connectives
		Incidence score of temporal connectives
	Readability	Flesch Reading Ease score
		Flesch-Kincaid Grade level

RESULTS AND DISCUSSION

Surface Level

The analysis revealed that two motivation scores showed significant regression relationship with the total number of sentences, average sentence length, and average word length, but did not show significant regression relationship with the total number of words. The results for the surface-level text indices are presented in Table 2.

TABLE 2
Results of Surface Level Indices

Index	Predictor	Estimate	S.E.	t-value	p-value
Total number of words	(Intercept)	217.752	9.054	24.052	.000
	Integrative	3.155	1.747	1.805	.072
	Instrumental	-1.776	1.662	-1.068	.286
Total number of sentences	(Intercept)	14.067	1.551	9.069	.000
	Integrative	-0.961	0.299	-3.209	.001
	Instrumental	1.361	0.285	4.779	.000
Average words per sentence	(Intercept)	31.566	4.922	6.413	.000
	Integrative	2.284	0.950	2.404	.017
	Instrumental	-5.117	0.904	-5.662	.000
Average syllables per word	(Intercept)	1.389	0.028	48.734	.000
	Integrative	0.004	0.006	0.643	.521
	Instrumental	0.013	0.005	2.393	.017

Specifically, the total number of sentences decreased as integrative motivation increased but increased as instrumental motivation increased (Integrative: β = -0.961, t = -3.209, p = .001 / Instrumental: β = 1.361, t = 4.779, p = .000). Next, both types of motivation were found to have statistically significant effects on the average words per sentence index. The intercept derived from the regression model represents the predicted value when all covariates are held constant and thus may differ from the overall average sentence length calculated by simply dividing the total number of words by the total number of sentences. Specifically, the results showed that average words per sentence demonstrated a positive regression relationship with integrative motivation (β = 2.284, t = 2.404, p = .017) and a negative relationship with instrumental motivation (β = -5.117, t = -5.662, p = .000). As for average word length, no significant relationship was found with integrative motivation (β = 0.004, t = 0.643, p = .521), whereas higher instrumental motivation was associated with longer average word length (β = 0.013, t = 2.393, p = .017).

These results indicate that when integrative motivation is high, the average number of sentences tends to decrease while sentence length increases. Conversely, written by learners with high instrumental motivation exhibit the opposite pattern, with a greater number of sentences but shorter sentence lengths. This suggests that learners with high integrative motivation tend to express complex ideas or rich information using longer sentences, as they are more oriented toward interacting with and assimilating into the L2 native speaker community. Noels (2001) noted that learners with higher integrative motivation are more likely to engage in and value interaction with the L2 community. Furthermore, it was demonstrated that strategy instruction aimed at promoting peer interaction in L2 learning led to an increase in the production of meaningful utterances or idea units (Dao, 2020). Together, these findings imply that learners with integrative motivation may be predisposed to producing more complex and information-rich sentences through their preference for interaction-based learning behaviors.

However, learners with high instrumental motivation focus on achieving specific goals, such as passing the exams or securing employment, and therefore prefer more accurate and clear expressions. Learners with high instrumental motivation tend to focus on achieving specific goals, such as passing exams or securing employment, and may therefore favor more accurate and clear expressions. The use of a larger number of shorter sentences to reduce the likelihood of errors, thereby enhancing precision and clarity in writing, can be seen as indicative of a cautious approach to language use. This tendency may reflect a practical orientation toward language use, where efficiency and task completion are prioritized overelaborate expression, potentially reflecting their goal-directed learning behavior.

Lexical Level

The statistical analysis revealed that the frequency of pronoun use, word frequency and imageability among the lexical characteristics showed significant regression relationships with either integrative or instrumental motivation. However, neither the frequency of content word usage nor lexical diversity exhibited significant regression relationships with the learners' motivation levels. Based on these statistical results presented in Table 3, the relationship between the levels of motivation and the lexical indices are interpreted as follows.

TABLE 3
Results of Lexical Level Indices

Category	Index	Predictor	Estimate	S.E.	t-value	p-value
Content word	Noun	(Intercept)	257.004	12.463	20.621	0.000
		Integrative	-4.170	2.405	-1.734	0.084
		Instrumental	4.100	2.288	1.792	0.074
	Verb	(Intercept)	15.900	8.263	14.027	0.000
		Integrative	1.411	1.595	0.885	0.377
		Instrumental	-0.340	1.517	-0.224	0.823
	Adjective	(Intercept)	79.024	7.452	10.604	.000
		Integrative	-1.209	1.438	-0.841	.401
		Instrumental	2.060	1.368	1.506	.133
	Adverb	(Intercept)	59.195	5.981	9.898	.000
		Integrative	1.124	1.154	0.974	.330
		Instrumental	1.023	1.098	0.932	.352
Pronoun	First-person pronoun	(Intercept)	13.213	4.331	3.051	.002
		Integrative	-1.445	0.836	-1.729	.084
		Instrumental	1.776	0.795	2.233	.026
	Second-person pronoun	(Intercept)	17.700	3.379	5.239	.000
		Integrative	0.375	0.652	0.575	.565
		Instrumental	-2.781	0.620	-4.484	.000
	Third-person pronoun	(Intercept)	2.813	3.248	0.866	.387
		Integrative	0.800	0.627	1.277	.202
		Instrumental	0.853	0.596	1.431	.153
Word frequency	CELEX Log frequency of content words	(Intercept)	2.646	0.057	46.182	.000
		Integrative	0.005	0.011	0.417	.677
		Instrumental	-0.035	0.011	-3.315	.001
Word Characteristics	Imageability	(Intercept)	412.998	6.570	62.862	.000
		Integrative	-2.749	1.268	-2.167	.031
		Instrumental	1.119	1.206	0.928	.354
	Concreteness	(Intercept)	377.337	6.949	54.305	.000
		Integrative	-2.288	1.341	-1.706	.089
		Instrumental	0.595	1.276	0.466	.641
	Age of acquisition	(Intercept)	318.174	11.705	27.182	.000
		Integrative	2.455	2.259	1.087	.278
		Instrumental	4.194	2.149	1.952	.051
Lexical diversity	Type-token ratio	(Intercept)	0.576	0.024	23.550	.000
		Integrative	0.008	0.005	1.697	.090
		Instrumental	0.004	0.004	0.993	.321

First, integrative motivation showed a statistically significant regression relationship with the imageability index (β = -2.749, *t* = -2.167, *p* = .031), one of the lexical characteristics, indicating that learners with higher integrative motivation tended to use words with lower imageability. Imageability refers to the extent to which a word easily evokes a concrete mental image. This result suggests that learners with higher integrative motivation are more likely to use abstract words. This tendency reflects the inclination of learners with strong integrative motivation, who are often interested in socio-cultural things, to address complex and abstract subjects. Rather than describing simple, tangible objects or actions, these learners tend to express more complex meanings, such as their thoughts, attitudes, and beliefs. This writing strategy aligns with previous research indicating that learners with integrative motivation prefer meaning-oriented, interaction-based learning (Noels, 2001) and demonstrates their preference for expressing more complex ideas.

In contrast, instrumental motivation exhibited a positive regression relationship with the frequency of first-person pronoun use (β = 1.776, *t* = 2.233, *p* = .026) and a negative relationship with second-person pronoun use (β = -2.781, *t* = -4.484, *p* = .000). This finding reflects the tendency of instrumentally motivated learners, who pursue practical goals, to approach exams or writing tasks from a personal or opinion-based perspective. These learners often aim to achieve high grades and, therefore, may prefer to produce essays that allow evaluators to easily understand their thoughts and arguments. As a result, their essays are likely to exhibit textual characteristics that emphasize clarity in the expression of their opinions and ideas. Furthermore, learners with high instrumental motivation tend to perceive essay writing as an objective task, which explains their avoidance of second-person pronouns. Second-person pronouns are primarily used as reader-friendly expressions to engage the audience in conversation or create a conversational tone. Therefore, their use is generally discouraged in formal academic writing, as noted in several writing guidelines (e.g. Purdue Global Writing Center, Scribbr). In summary, learners with high instrumental motivation prioritize achieving outcomes and conveying their opinions with clarity, leading them to produce essays that emphasize clear self-expression while minimizing direct interaction with the reader.

Also, instrumental motivation was found to have a negative regression relationship with log-transformed word frequency. This result indicates that learners with higher instrumental motivation tend to use lower frequency, that is, more advanced, words in their essays. This tendency can be interpreted as reflecting the fact that instrumentally motivated learners pursue practical goals that require a higher level of lexical proficiency and recognize the importance of demonstrating advanced vocabulary skills to evaluators. Therefore, it is likely that they deliberately selected more specialized and lower-frequency words rather than relying on everyday vocabulary. In fact, in academic writing, the use of sophisticated vocabulary often serves as a key indicator of essay quality. While repetitive use of high-frequency, simple words tends to be associated with lower-quality writing, the appropriate use of lower-frequency, advanced vocabulary is positively evaluated as a marker of academic maturity and expressive ability (Chung & Wan, 2025; Dabbagh & Janebi Enayat, 2019; Johnson et al., 2016). Consequently, it can be inferred that learners with high instrumental motivation chose lower-frequency, advanced words to achieve better grades on their assignments.

In summary, the lexical-level findings suggest that learners' motivations may be associated with their linguistic choices in L2 essay writing. Learners with higher integrative motivation tend to favor abstract vocabulary reflecting their focus on conveying nuanced thoughts and socio-cultural concepts. In comparison, learners with higher instrumental motivation exhibit textual features that could be related to preference for clarity, self-expression, and lexical sophistication, likely to fulfill practical goals such as achieving high academic performance. These distinct patterns suggest that motivation could play a role in learners' engagement and may relate to the linguistic complexity and stylistic choices evident in their writing.

Syntactic Level

The results of the statistical analysis for the syntactic level are presented in Table 4.

TABLE 4
Results of Syntactic Level Indices

Index	Predictor	Estimate	S.E.	t-value	p-value
Modifiers per noun phrase	(Intercept)	0.673	0.048	13.950	.000
	Integrative	0.005	0.009	0.501	.617
	Instrumental	-0.003	0.009	-0.337	.736
Words before main verb	(Intercept)	4.068	0.732	5.555	.000
	Integrative	0.170	0.141	1.200	.230
	Instrumental	-0.145	0.134	-1.079	.281

The analysis indicated that neither of the two indices reflecting the syntactic complexity of the essays exhibited a significant regression relationship with the learners' motivation levels. This suggests that learners' motivation does not have a meaningful influence on text characteristics at the syntactic level. One possible explanation is that syntactic complexity is often constrained by learners' overall language proficiency, grammatical knowledge, and instructional background, rather than by motivational factors. For example, Ortega (2015) argued that syntactic complexity in a second language is determined by overall L2 proficiency, first language background, instructional experience, and factors such as text genre, all of which relate to linguistic knowledge and educational experience. While motivation can influence the textual features learners display in their writing, the ability to produce syntactically complex sentences may rely more heavily on structural competence and formal language training.

Discourse / Text Level

The analysis revealed that instrumental motivation exhibited statistically significant regression relationships with both the argument overlap measure, which reflects referential cohesion across all sentences, and the LSA Cosine measure, which reflects semantic cohesion across all sentences. Both measures showed negative regression coefficients with instrumental motivation (Argument overlaps: β = -0.026, t = -2.351, p = .019 / LSA cosine: β = -0.015, t = -2.268, p = .024).

TABLE 5
Results of Discourse / Text Level Indices

Category	Index	Predictor	Estimate	S.E.	t-value	p-value
Referential cohesion	Argument overlaps (adjacent sentences)	(Intercept)	0.640	0.060	10.720	.000
		Integrative	0.008	0.012	0.721	.471
		Instrumental	-0.018	0.011	-1.670	.095
	Argument overlaps (all sentences)	(Intercept)	0.539	0.060	9.014	.000
		Integrative	0.021	0.012	1.839	.066
		Instrumental	-0.026	0.011	-2.351	.019
Semantic cohesion	LSA cosine (adjacent sentences)	(Intercept)	0.351	0.037	9.516	.000
		Integrative	-0.005	0.007	-0.658	.511
		Instrumental	-0.010	0.007	-1.479	.140
	LSA cosine (all sentences)	(Intercept)	0.315	0.035	8.851	.000
		Integrative	0.000	0.007	-0.018	.986
		Instrumental	-0.015	0.007	-2.268	.024
Connectives	Causal connectives	(Intercept)	33.395	4.791	6.971	.000
		Integrative	-0.140	0.925	-0.151	.880
		Instrumental	1.653	0.880	1.880	.061
	Addictive connectives	(Intercept)	16.231	2.598	6.248	.000
		Integrative	-0.047	0.501	-0.093	.926
		Instrumental	-0.657	0.477	-1.377	.169
	Temporal connectives	(Intercept)	13.663	3.393	4.027	.000
		Integrative	-0.175	0.655	-0.268	.789
		Instrumental	0.991	0.623	1.592	.112
Readability	Flesch Reading Ease score	(Intercept)	59.091	3.806	15.526	.000
		Integrative	-1.971	0.735	-2.684	.007
		Instrumental	3.283	0.699	4.699	.000
	Flesch-Kincaid Grade level	(Intercept)	8.151	0.660	12.355	.000
		Integrative	0.444	0.127	3.486	.001
		Instrumental	-0.543	0.121	-4.481	.000

In addition, both integrative and instrumental motivation demonstrated statistically significant regression relationships with the readability indices. Specifically, as integrative motivation increased, the Flesch Reading Ease score decreased while the Flesch-Kincaid Grade Level increased (Flesch Reading Ease score: $\beta = -1.971$, $t = -2.684$, $p = .007$ / Flesch-Kincaid Grade Level: $\beta = 0.444$, $t = 3.486$, $p = .001$). In contrast, as instrumental motivation increased, the Flesch Reading Ease score increased while the Flesch-Kincaid Grade Level decreased (Flesch Reading Ease score: $\beta = 3.283$, $t = 4.699$, $p = .000$ / Flesch-Kincaid Grade Level: $\beta = -0.543$, $t = -4.481$, $p = .000$).

Regarding text cohesion, both referential cohesion and semantic cohesion showed negative regression relationship with instrumental motivation. Referential cohesion, as indicated by argument overlap, reflects the extent to which key arguments conveying major meanings are repeatedly used throughout the text. The analysis revealed that learners with higher instrumental motivation tended to repeat arguments less frequently across their texts. In addition, semantic cohesion, measured by the LSA cosine index – which quantifies semantic relationships between sentences – showed that higher LSA cosine value corresponds to greater semantic consistency between sentences or paragraphs. The results indicated that higher instrumental motivation was associated with lower semantic cohesion between sentences. In other words, as instrumental motivation increased, key arguments were repeated less frequently, resulting in lower semantic similarity between sentences.

These findings can be interpreted as suggesting that learners with higher instrumental motivation consciously employ diverse structures or textual features to avoid repetition to enhance their expressive abilities. When key terms conveying in the main meanings are explicitly repeated in a text, readers can more easily perceive the connections between sentences, which can be considered a reader-friendly writing strategy. However, in many tests, repeated use of words is often perceived as a lack of lexical richness, preventing higher evaluations from being achieved. According to Reynolds (2001), less proficient writers tend to repeat information rather than add new content because repetition is cognitively easier. In contrast, more proficient writers tend to include more new information and reduce unnecessary repetition. Similarly, Alotaibi (2015) found that texts receiving lower writing scores exhibited a higher degree of lexical repetition.

Considering these prior studies, the tendency of learners with higher instrumental motivation to repeat key arguments less frequently and to produce texts with lower semantic similarity between sentences can be interpreted as a deliberate strategy aimed at using more varied vocabulary and avoiding repetition to achieve higher evaluations in writing tasks.

Next, both integrative motivation and instrumental motivation demonstrated statistically significant regression relationship with readability indices, namely the Flesch Reading Ease score and the Flesch-Kincaid Grade Level. The Flesch Reading Ease score ranges from 0 to 100, with higher scores indicating easier comprehension of the text. In contrast, the Flesch-Kincaid Grade Level ranges from 1 to 12, with each value corresponding to the grade level of native English speakers; thus, higher scores reflect greater textual complexity (McNamara et al., 2014). Therefore, a higher Flesch Reading Ease score combined with a lower Flesch-Kincaid Grade Level suggests that a text is easier to read.

The analysis revealed that higher integrative motivation was associated with lower Flesch Reading Ease score and higher Flesch-Kincaid Grade Level, while instrumental motivation exhibited the opposite pattern. Contrary to the intuitive expectation that learners with higher instrumental motivation would produce more complex texts to achieve better writing evaluations, the findings indicate that greater integrative motivation corresponds to reduced readability, whereas greater instrumental motivation corresponds to increased readability. This result can be interpreted in conjunction with the previous analysis of surface-level features. Learners with higher instrumental motivation may have prioritized clear and efficient communication in their writing, which likely led them to prefer shorter and more concise sentences, thereby improving readability. It is also plausible that these learners aimed to produce texts that were easier for readers to comprehend. While writing proficiency may also have influenced these outcomes, the observed patterns are nonetheless consistent with the practical and goal-oriented nature of instrumental motivation.

In particular, learners with higher instrumental motivation were likely familiar with the scoring criteria of standardized writing assessments. Examinations such as IELTS do not encourage excessive syntactic complexity but rather reward clear and well-structured writing. For example, in the IELTS Writing Band Descriptors (IELTS Partners, 2019), the Coherence and Cohesion criterion explicitly includes "presents a clear central topic within each paragraph" as an assessment standard, emphasizing the importance of a clear structure. Therefore, these learners may have internalized the evaluation standards and produced texts accordingly. In contrast, learners with higher integrative motivation may have been more concerned with linguistic expression and stylistic variety, which could have resulted in longer sentences and the use of more abstract vocabulary, thereby reducing readability. In other words, attempts to show their linguistic proficiency may have led to low readability.

CONCLUSION

This study empirically examined the relationship between Korean learners' second language learning motivation—a psychological factor—and the text characteristics of their English (L2) writing by analyzing various Coh-Metrix indices derived from English essays written by the learners. The results revealed that linguistic features in the essays varied depending on learners' motivational orientations. Specifically, integrative motivation, which aims for authentic communication with members of the L2 community or native speakers, was associated with a tendency to convey messages more richly. In contrast, instrumental motivation, which focuses on achieving practical goals such as higher scores, appeared to lead learners to prioritize the clarity of message delivery. These findings not only indicate, as supported by previous research (Fazel & Ahmadi, 2011; Hashemian & Heidari, 2013; Widiastuty & Azman, 2024), that learners' motivational orientations influence their approach to writing, but also provide empirical insight into the specific textual features through which such influence is manifested. By identifying how different types of motivation correspond to variations in lexical richness, cohesion, and readability, this study offers a more detailed understanding of how motivation influences various aspects of L2 writing performance.

Notably, differences in writing patterns associated with individual learners' motivational orientations were more clearly observed at the lexical and discourse levels. These findings suggest that, in L2 writing, internal motivational factors have a greater impact on meaning construction and discourse organization than on grammatical correctness or syntactic complexity. In other words, the influence of motivation appears more prominently in meaning-oriented aspects of writing —such as lexical choices and sentence connections—than in surface-level structural aspects of writing. Lexical selection and discourse cohesion involve intentional and strategic decisions about what to say and how to say it. Learners who are more focused on conveying meaning tend to carefully select words and organize sentences to express their intended message more effectively (Green, 2012; Liao, 2020). In contrast, syntactic structures are generally based on automated linguistic knowledge and tend to develop gradually through accumulated exposure and repeated practice. Therefore, syntactic development is more likely to be influenced by factors such as language input and overall proficiency rather than by immediate psychological variables like motivation (Crossley & McNamara, 2014). That is, even when learners possess strong motivation, their influence on syntactic complexity may be limited if they have not yet acquired sufficient syntactic knowledge. In sum, the influence of learner motivation on L2 writing appears more salient in meaning-making processes than in the formal linguistic aspects of writing.

The findings of this study ultimately suggest that learners' psychological motivation should be actively considered in effective second language education. Motivation serves not only as a catalyst that initiates learning but also as a factor that influences learners' strategic choices and meaning-making processes during actual language performance. By conducting a quantitative analysis of learners' written texts, this study extends the application of the learning motivation construct—traditionally examined in relation to attitudes or performance—to the domain of writing style and textual features, thereby demonstrating its significant influence on how learners construct and express meaning in L2 writing. Therefore, in L2 educational settings, it is crucial to go beyond the transmission of linguistic knowledge such as vocabulary and grammar by incorporating an understanding of learners' motivational orientations into the design of instructional strategies. For example, writing tasks that reflect real-life communicative purposes or learning environments that emphasize intercultural understanding can foster integrative motivation and thereby enhance learners' expressive capabilities. Furthermore, assessment frameworks should go beyond formal criteria such as precision of expression and syntactic complexity to also include communicative elements such as meaning-construction features and discourse organization skills. Instructional design that takes learner motivation into account can contribute not only to short-term improvements in task performance but also to increased learner autonomy, sustained engagement, and long-term retention and use of the target language.

Taken together, for second language writing instruction to become more effective and learner-centered, it is essential to recognize psychological motivation as a key variable in L2 learning and to systematically incorporate it into the curriculum and pedagogical practice. It is particularly important to note that the central focus of this study is not to examine the correlation between integrative and instrumental motivation and writing performance, but rather to explore how linguistic features and discourse organization in writing vary according to different levels of each type of motivation. Given that no specific pattern of writing associated with either motivational orientation can be deemed inherently superior or more effective, it is essential to consider instructional strategies that are tailored to learners' motivational profiles and aligned with their learning goals.

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