Investigation of Content Features that Determine Korean EFL Learners' Argumentative Writing Qualities

Jin Kyung Paek[*]
(Korea University)
Yusun Kang
(Korea University)

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Despite extensive research attention that has been paid to second language (SL) or foreign language (FL) learners' argumentative writing, most research has focused on the structural features characteristic of such writers. There have not been many systematic attempts to identify the quality of argument features SL or FL writers rely on, and how they contribute to the overall writing qualities. This study was designed to examine the relationship between the Toulmin elements, widely used measures of content qualities in arguments which include claims, data, warrants, rebuttals, qualifiers, and backings, and the overall qualities of advanced Korean high school EFL learners' argumentative writing. Each of the thirty three participants' argumentative writing was analyzed, applying the Toulmin model, and the results demonstrate that their overall argument qualities were closely related to the uses of the fundamental Toulmin elements, especially data and predicted best by the degree to which each claim was supported with relevant and sufficient data. These findings shed light on the need for instruction on the use of Toulmin elements in enhancing the overall quality of Korean EFL learners' argumentative writing.

Key words: EFL argumentative writing, the Toulmin analysis, argumentative features, Korean EFL high school students

1. INTRODUCTION

In recent years, there have been growing accounts on the problem of focusing on textual

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[*] Jin Kyung Paek: First author; Yusun Kang: Corresponding author

or linguistic features in judging the quality of argumentative writing (Freeman, 1993; Hillocks, 2005). They argue that it is difficult to tell whether a student has argument skills such as reasoning, counter-arguing, and rebutting just by looking at syntactic complexity or formulas. In addition, plentiful research shows that lexical and syntactic complexity does not improve the writing quality in general (Crowhurst, 1980; Grabe & Kaplan, 1989; Harris & Witte, 1980; Intaraprawat & Steffensen, 1995; Kaplan, 1966; Stratman, 1982; You, 1999). As a result, other more quality-oriented evaluation focus, such as content or logical development of ideas, has emerged as the most important criteria in the evaluation of argumentative writing (Crammond, 1998; Ferretti, MacArthur, & Dowdy, 2000; Macoubrie, 2003; Nussbaum & Kardash, 2005; Page-Voth & Graham, 1999). However, research on content is still in the early stages. Few have attempted to incorporate systematic evaluation of the content quality in English argumentative writing (Harklau, 2002; Qin & Karabacak, 2010). If any, they mostly focused on the presence/absence or the frequency count of the components of arguments, not the qualities of components themselves. Moreover, studies on English as a second language (ESL) and English as a foreign language (EFL) students' argumentative writing in terms of content have remained as an unexplained area. Instead, despite the importance of content in argumentative writing, teachers, especially those teaching ESL/EFL, tend to focus on the accuracy of grammar and vocabulary with no attention paid to the social aspect of writing such as purpose, audience, or context in ESL/EFL writing instructional settings (Mohan & Lo, 1985).

To this point, Connor and Lauer (1988) developed eight linguistic/rhetorical measures to describe and evaluate argumentative student writing, agreeing with several researchers' claim that holistic scores such as the Test of Written English (TWE) are not specific enough to locate strengths and weaknesses of the writing (Charney, 1984; Odell, 1977; Quellmalz, 1981; Witte, Trachsel, & Walters, 1986). Applications of these measures, focusing on coherence and persuasiveness containing superstructure, reasoning, persuasive appeals, and persuasive adaptiveness as well as syntactic features, have shown to be quite explicit and successful at identifying writers' strengths and weaknesses (Connor, 1991; Connor & Lauer, 1988). Yet little such research effort has been conducted for ESL/EFL writers. The present study, thus, aims to investigate the content qualities of EFL student writers' argumentative essays in a systematic way, in relation to their contribution to the overall qualities of their arguments.

2. LITERATURE REVIEW

The content of argumentative writing shows the extent to which the writer's thinking is controlled and the ideas are developed logically in accordance with the genre knowledge,

which is the key to accomplishing the purpose of arguments, namely, convincing readers. Unsurprisingly, content in writing evaluation tends to be weighted more than other categories such as syntax, vocabulary, and mechanics (Brown, 2015), because readers may remain unsure on argumentation with weak and irrelevant contents despite appropriate surface structure (Sampson & Clark, 2008; Stapleton & Wu, 2015). Means and Voss (1996) asserted that "the content of an informal argument is central to its evaluation" (p. 141). Several assessment tools have been developed to measure such content qualities of argumentative writing (Connor & Lauer, 1988; Lautamatti, 1987; Nussbaum & Kardash, 2005). For example, Nussbaum and Kardash's (2005) rubric evaluates the effectiveness of arguments by focusing on the argument categories adapted from Inch and Warnick (2002): final claim, primary claim, counterclaim, rebuttal, and supporting reason or examples. Topical structure analysis developed by Lautamatti (1987) measures coherence by considering sequences of sentences and analyzing how the sentence topics clarify the text in building meaning. The Toulmin analysis which is based on the Toulmin model (Toulmin, 1958), however, is the most widely used measure in judging the quality of content (Connor, 1990; Connor, 1991; Connor & Lauer, 1988), because it has been proven to be effective for argument analysis (Ball, 1994). In addition, it provides such an explicit and systematic paradigm in analyzing the content of arguments (Baron, 1988; Cheng & Chen, 2009; Connor, 1991; Connor & Lauer, 1988; Cooper et al., 1984; Ferris, 1994; Hillocks, 1987; Kneupper, 1978; Knudson, 1992a, 1992b; Macoubrie, 2003; McCann, 1989; Nussbaum & Kardash, 2005; O'Keefe, 1999; Perkins, Farady, & Bushey, 1991; Qin & Karabacak, 2010; Rex, Thomas, & Engel, 2010; Wolfe & Britt, 2008; Wolfe, Britt, & Butler, 2009).

According to Toulmin (1958), the validity of argument is closely related to how argument is laid out. In order to verify the validity, it is necessary to examine how sentences operate in an argument by analyzing individual sentences. The Toulmin model is composed of three fundamental elements and three secondary elements. The three fundamental elements which every well-developed argument exhibits consist of claims, data, and warrants (Kneupper, 1978). Claims are the conclusion of argument, which are proposed for being accepted all in all. Data are the support that justifies the claim in the form of logical, statistical, and anecdotal evidence or facts. Warrants are the reasoning that provides a vital link between data and claim. Warrants may remain implicit when the link is expected to be understood. However, if the same assumption about the validity of the data is not shared nor recognized by readers, the warrants should be explicit. Otherwise, the evidence or claim may not be accepted. Toulmin emphasized the importance of warrants by asserting that "[warrants] may confer different degrees of force on the conclusions they justify" (p. 93). Rex, Thomas, and Engel (2010) further contended that "arguments are won and lost on well-reasoned warrants" (p. 57). The secondary elements are made up of rebuttals, qualifiers, and backing. Rebuttals specify the possible conditions

the warrants do not apply. Many researchers have regarded rebuttals as an important element in increasing persuasiveness (Baron, 1988; Nussbaum & Kardash, 2005; O'Keefe, 1999; Wolfe et al., 2009). O'Keefe (1999), for example, asserted that arguments that included counterarguments and rebuttals were more persuasive than those that did not. Qualifiers indicate the degree of force the argument is true. Without qualifiers limiting the scope or generalizability of the argument, it may seem overstated or overgeneralized. Backing is called for when warrants are not strong enough and are in need of further logic.

Since the Toulmin model is agreed to be effective in analyzing simple arguments rather than complicated or advanced ones, it has been used extensively in evaluating students' argumentative writing, including those of ESL and EFL learners (Ball, 1994; Macoubrie, 2003). For example, in a comparative Exxon-funded project on native English speakers' (NES) writing abilities, Connor and Lauer (1988) analyzed 150 persuasive essays written by 16 year-old students from three different English speaking countries: England, New Zealand, and the United States, using nine different tools measuring syntactic features, coherence, and persuasiveness. Surprisingly, the Toulmin model-based measure alone explained 48 percent of the variation in the students' argumentative writing qualities. Under the belief that the Toulmin model-based measure was such a powerful predictor of writing quality, Connor (1991) expanded the research to examine 22 ESL students from 7 different language backgrounds using the Toulmin measures. The result showed the highest correlation of the overall writing qualities with claim ($r = .72$) and moderately high correlations with data ($r = .68$) and warrant ($r = .68$). Interestingly, the interrater reliability measured by Cronbach alpha for claim, data, and warrant was .77, .56, and .66, respectively, in the 1988 study, while they were .91, .82, and .81, respectively, in the 1991 study. These differences confirm the general notions that the Toulmin model is more applicable for simple arguments rather than complicated or advanced ones.

Although there are some criticisms on the Toulmin model, most of which are mainly about the difficulties of discerning each element (Freeman, 1991; Rex et al., 2010), studies showing the close relationship between the Toulmin elements and argumentative writing qualities have been numerous (Connor, 1987, 1990; Connor & Lauer, 1988; Cooper et al., 1984; Crammond, 1998; Ferris, 1994; Knudson, 1992a, 1992b; McCann, 1989). Crammond (1998), for example, examined the differences in the uses of the Toulmin elements between professional writers and student writers who were in sixth-, eighth-, and tenth-grade. The results showed that the expert writers used the argument structures consisting of a claim and data complex more extensively than the student writers and also tended to use more rebuttals and warrants compared to the student writers. Cooper et al. (1984) revealed similar results showing that less effective argumentative writing made less use of data and warrants than advanced argumentative papers which tended to include data with more elaboration, warrants and backing. Furthermore, several studies have

demonstrated enhanced persuasiveness with the uses of rebuttals (Kuhn, 1991; O'Keefe, 1999; Wolfe et al., 2009). Wolfe et al. (2009), for instance, found that advanced arguments tended to implement counterarguments and rebuttals. In brief, the uses of the Toulmin elements seem to be closely related to the argumentative writing qualities, and advanced writers tend to implement more data, warrants, and rebuttals than less advanced ones.

The Toulmin elements have also been widely used in discerning the relationship between age and the quality of written arguments of NES, since there has been a long history of the application of the Toulmin model to writing pedagogy in English speaking countries (Connor, 1996). Based on the examination of sixth, ninth, and twelfth grade NES students' writing, McCann (1989) reported that the sixth graders made significantly less effective use of claims and warrants than ninth and twelfth grade students did, while there were no significant effects of grade levels on the uses of data. Plus, the uses of secondary elements were reported to be associated with the students' grade levels in the study. Knudson's (1992b) study expanded McCann's study to four grade levels: fourth, sixth, tenth, and twelfth grade NES students. The results were similar to those of McCann's (1989) study: Fourth and sixth grade students used significantly fewer fundamental elements than tenth and twelfth grade students. In addition, there was a huge grade level difference between fourth grade and higher grade children in using claims and rebuttals. Interestingly, relatively few children at any grade level included rebuttals in their written arguments. Crammond (1998) also reported that the frequencies of warrants, rebuttals, and qualifiers increased with grade. Thus, in general, past research findings have shown that NES students tended to use increasingly more amount and kinds of the Toulmin fundamental elements as they got older, and it seems that schooling effects alone may not be a significant predictor to explain the increased uses of secondary elements in their arguments. Although other relevant factors, such as instruction effects, prior experience with the content, or their knowledge about the topic might play equally important roles, little research has been conducted to support this speculation.

In addition to the effects of age, cross-cultural influences on the uses of the Toulmin elements have been explored as well (Cooper et al., 1984; Ferris, 1994; Oi, 1999). Connor and Lauer (1988) conducted cross-national research where they analyzed 150 essays written by high school students from three different English speaking countries (England, the United States, and New Zealand) and found that the U.S. students used less data and warrants, compared to the British and New Zealand students. Oi (1999) reported different uses of the Toulmin elements between Japanese and US college students' argumentative writing, illustrating the absence of data and warrants in Japanese students' essays. Taiwanese were also found to use fewer claims and data than the Americans (Cheng & Chen, 2009). Qin and Karabacak (2010) indicated that Chinese EFL college students' argumentative writing mainly relied on claims and data, with fewer uses of

counterarguments and rebuttals. In brief, the Toulmin analyses have demonstrated that arguments of ESL and EFL students tended to be more dependent on claims and data, and English native speaking students tended to include more data and warrants. Despite loads of cross-cultural studies on the uses of the Toulmin elements, little research has been conducted on Korean EFL learners; thus it seems that research on Korean EFL learners' uses of the Toulmin elements in their argumentative writing is greatly needed, in order to understand the quality of reasoning and the flow of arguments they employ in their argumentative performance in English.

Most studies within the Toulmin model framework, however, have focused on the presence/absence or the frequency counts of the Toulmin elements (Baron, 1995; Nussbaum & Kardash, 2005; Perkins et al., 1991; Wolfe, 2012; Wolfe & Britte, 2008). There has been some research on the quality of reasoning, but even for those studies, the Toulmin analyses were part of the assessment tools used to understand the quality of reasoning (Gil, Ilya, Neuman, & Schwarz, 2003; Means & Voss, 1996; Sampson & Clark, 2008). Very few studies have actually looked into the quality of those included elements or reasoning itself. Recently, Stapleton and Wu (2015) have investigated the quality of reasoning in 125 Hong Kong high school students' argumentative essays, focusing on three main elements of the Toulmin model – claims, counterclaims, and rebuttals – and their accompanied data, and showed that many of their claims and data were judged as weak in the quality of reasoning, while adequate at the surface structure. Many student writers failed to refute the counterarguments or provide acceptable supporting data. Their study is meaningful in that it took a step further to consider the qualities of the Toulmin elements, rather than just counting frequencies or assessing presence/absence. According to previous research findings, however, even though the uses of rebuttals have shown close relationship with the writing qualities (Kuhn, 1991; O'Keefe, 1999; Wolfe et al., 2009), they are usually not the means readily available for less advanced students, especially ESL and EFL students, in increasing their persuasiveness. Since it has been already demonstrated that such writers tend to rely more heavily on the fundamental elements such as claim and data in their arguments, studies on less advanced or SL/FL writers may not provide a full picture of the role of argumentative elements in relation to the overall writing qualities by focusing solely on secondary elements. Furthermore, in the recent Toulmin model, only claims and data are considered to be necessary or required elements out of the three fundamental elements. It classifies warrants as optional along with other secondary elements (Stein & Miller, 1990, 1993), acknowledging that warrants which are one of the two necessary elements for justification are often implicit in everyday arguments (Toulmin, 1958). Thus, as for less advanced learners including ESL/EFL learners, it may seem more suitable to investigate the uses of data in more detail to explore the role of the argumentation elements in relation to the overall qualities of argumentative writing.

Considering that relatively less research attention has been paid to EFL learners', especially Korean EFL learners' argumentative writing in relation to the Toulmin model and that qualitative evaluation of the Toulmin elements for such investigation are called for, studies on the role of the Toulmin elements in Korean EFL learners' argumentative writing seem to be in need. In doing so, additional attention to the qualities of the uses of data, which ESL/EFL learners rely the most on (Qin & Karabacak, 2010) and is closely related to their overall writing qualities (Stein & Miller, 1990, 1993), should be considered. Thus, this study aims to explore the potential relationship between the Toulmin elements and the overall qualities of Korean EFL learners' argumentative writing by examining the uses of both fundamental and secondary Toulmin elements. In addition, since most past studies have only focused on the presence/absence or frequencies of the Toulmin elements included in writing without considerations for the quality of reasoning in the uses of data, this study also aims to undergo qualitative evaluation of each included data in determining its relevance (Connor & Lauer, 1985).

The specific questions this study poses are:

1) Does the Toulmin model explain Korean EFL high school students' argumentative writing qualities?
2) Which specific elements, among both fundamental and secondary Toulmin elements, contribute to the overall quality of Korean EFL high school students' argumentative writing?

3. METHOD

3.1. Participants

Participants in the present study were 33 Korean EFL eleventh grade advanced students from a public high school in an affluent area in Seoul, Korea. The reasons for selecting eleventh grade and advanced students were that seventeen-year-old students are assumed to be mature enough to argue successfully (Golder & Coirier, 1994) and that genre awareness is apt to appear in the advanced writing (Horiba, 1990). All of the participants were very advanced English learners who were within the top 89 percentile nationally on the National Pre-College Scholastic Ability Test (CSAT) and were also placed in the two specially designed advanced level English classes in the school based on the results from their midterm and final English exam.

According to a questionnaire which was administered a week after data collection with 5 missing data, one (3%) student had studied in an English speaking countries for four years;

seven (21%) students for 1 to 2 years; twelve (36%) students less than a year; and eight (24%) none. The average length of stay in English-speaking countries was about 8 months. Seven (21%) students had attended TOEFL speaking or writing class for one to one and a half years; ten (30%) students less than a year; and eleven (33%) students none. Interestingly, eleven (33%) students had taken Korean argumentative writing classes for more than a year, six (18%) of whom had taken them for more than 3 years; ten (30%) students less than a year; and seven (21%) students none. The means and the standard deviation of the three variables along with the scores of English language section of National Pre-College Scholastic Ability Test (English CSAT) are listed below in Table 1. Among these background variables, the participants' English CSAT scores were used as the control variable in further analyses, in controlling for the variation in their English proficiency.

TABLE 1
Means and Standard Deviations for Background Variables

Variables	M	SD
Length of stay in English speaking countries (# of Months)	8.07	11.07
Period of taking TOEFL writing classes	4.79	5.38
Period of taking Korean argumentative writing classes	14.86	19.35
English scores on the National Pre-College Scholastic Ability Test (CSAT)	141.82	7.26

3.2. Measures

3.2.1. Writing task

The students were asked to write a timed argumentative essay in the classroom. The prompt was taken from the TOEFL writing topic list: *Do you agree or disagree with the following statement? Parents are the best teacher.* They were given 30 minutes to complete the essays.

3.2.2. Holistic evaluation of writing quality

In order to assess the overall writing qualities of the argumentative essays produced by the participants and generate holistic scores, an e-rater system called *Criterion* developed by ETS was employed, because human holistic scores have been criticized for questionable validity and reliability (Charney, 1984). In its holistic evaluation, *Criterion* integrates its assessment of discourse as well as linguistic aspect of the writing, thus is deemed an adequate measure of the participants' overall writing qualities. Scores range from 1 to 6,

with 1 being the lowest and 6 the highest. According to ETS, the holistic scores that they provide are "in close agreement with human scores". Burstein, Chodorow, and Leacock (2004) demonstrated that the computed baseline percent agreement between e-rater and the human score was approximately 97% with 75% - 80% baseline agreement between two human readers in general.

3.2.3. Toulmin scores

Basically, the Toulmin scores were total frequency count of the Toulmin elements. However, in gaining the frequency scores, two different approaches were made initially: the total raw frequencies, which counted each occurrence of each Toulmin element, and the qualitatively evaluated relevance-considered frequency of each Toulmin element. The latter was an attempt to complement shortcomings of previous studies that only considered presence/absence or total frequency counts of argumentative elements by qualitatively evaluating each included element in determining its inclusion in the analysis. For such qualitative evaluation, two main criteria – relevance and acceptability – were employed. Thus, for the relevance-considered frequency counts, only those incidences where each use of an element was deemed relevant to and acceptable for the main claim or subclaims were counted, as suggested by Bickenbach and Davies (1997) and Hughes and Lavery (2008). The specific Toulmin elements coded and evaluated for this study are the following:

1) Claims

Claims were evaluated in terms of two distinct criteria in the evaluation of relevance and acceptability: clarity and presence of the topic/problem and the sub-claims included and the consistency across topic/problem and the sub-claims included. When a sub-claim was present in a writing and explicitly connected to the topic, it was classified as qualitatively relevant to be counted for frequency. For example, when an essay started with "*I agree with this statement that parents are the best teacher*," it was coded as a claim and was counted toward relevance-considered frequency because it contained explicit statement of the topic and was relevant to the task at hand.

2) Data

In order to look into the quality of reasoning, data was further evaluated for two criteria in determining its relevance and acceptability: the degree of specificity or elaboration of data and the degree of relevance to the main claim. In order for data to be eligible for the relevance-considered frequency count, they needed to be specific and well-developed. Relevant data can be of different types, such as paraphrase or compare and contrast, and can be represented in a variety of forms of evidence such as quotations, examples, facts,

statistics, and personal experiences. Regardless, they need to be relevant to the main idea and be specific at the same time. Furthermore, acknowledging the significant facilitative role data has been identified to play in explaining the overall quality of argumentative writing (Stein & Miller, 1990, 1993), additional sub-measures of data were adopted: the number of data per each sub-claim, the number of different types of reasoning (i.e., paraphrase, compare and contrast, etc.) and the number of different kinds of evidence used (i.e., personal experience, quotations, statistics, etc.). These further measures were adopted in order to enable more thorough analyses of the role of data in relation to the overall writing quality.

3) Warrants

Warrants are the most challenging to measure since they are reflections of students' subconscious prior thinking or reasoning that they put into language (Rex et al., 2010). In order to identify acceptable warrants, two questions were used as criteria out of four questions that Rex et al. (2010) provided to encourage students to write effective warrants:

(1) What were your reasons for selecting this data for this claim?
(2) Why did you think this particular piece of data was well suited to your claim?

Once warrants were singled out from the participants' writing, they were further evaluated for two criteria: the degree to which the warrants were stated explicitly and the degree of relevance to the case. The warrants that met the two criteria were counted toward the relevance-considered frequency. For example, an essay that stated, "*Parents can understand and love their children most. No other people can do that as their parents. Real education is based on love and understanding* (Warrant). *In that point of view, parents are the best teacher to their children,*" was considered to contain a relevant warrant.

4) Secondary elements

Secondary elements consist of rebuttals, qualifiers, and backings, and the same criteria were applied to evaluate their relevance: clarity (acceptability) and relevance to the main claim. For example, in the following example, "*Even if parents support us with love* (counterargument), *I don't think parents are the best teacher because parents don't know about profession at all* (rebuttal)," there is a relevant counterargument and a relevant rebuttal, but there is no qualifier used. That is, to claim that "*Parents do not know about professions at all*" is an overstatement, because there could be some parents who have ample knowledge about specific specialized areas. Thus, this writer received credit for 1 relevant secondary element, rather than 2. For this writer to have received credit for the qualifiers, s/he should have used expressions such as "*probably*" or argue, "*Not all parents*

know about profession well." Since the participants' use of each secondary element was so low, a composite score (further referred to as "Secondary Elements" hereafter) for the inclusion of qualifiers, rebuttals, and backings was used for further analyses.

Each of the students' writing was coded and scored according to the scoring rubric described above, for both fundamental and secondary Toulmin elements, by two EFL professionals. The *Cronbach alpha* coefficient was .79. It is important to note that the scoring system adopted in this study assesses not just the presence and absence of the particular elements, but considers their relevance and acceptability, as well as their consistency and thoroughness, in relation to the writing as a whole and other elements.

4. RESULTS

In order to first decide whether to use raw frequency scores, which are the mere frequency counts of each included Toulmin element without considerations of its relevance to the topic or main claim, or the relevance-considered scores for which only the uses of each element relevant to the topic and to one another are counted, descriptive statistics for both were generated and compared.

As seen in Table 1, when the raw frequencies and the relevance-considered frequencies of the Toulmin elements were compared, there were statistically significant differences in the inclusion of claim ($t = 3.29$, $p < .01$) and data ($t = 4.67$, $p < .001$). These differences led to the significant differences in comparing the total scores and relevance-considered scores of the total Toulmin score and fundamental elements ($t = 4.61$, $p < .001$ for both). Not much difference was found for relatively less used elements such as warrants and secondary elements. The significant differences between the two scorings suggest that using the mere total frequencies without qualitative evaluation may not yield accurate information regarding writers' production of coherent argumentative writing. In addition, preliminary correlation analyses demonstrated stronger correlations between the writing scores and relevance-considered Toulmin scores, compared to the raw frequencies ($r = .45$, $p < .01$ vs. $r = .32$, $p < .10$). Thus, further analyses in this study will be based on the relevance-considered scores that incorporate qualitative evaluations.

The Korean high school EFL students in this study scored 3.09 on average on their holistic writing evaluation, identifying them as intermediate writers. The words per t-unit measure, adopted as a control variable for their sentence complexity, showed an average of 12.58, which further reflects their relatively well-developed syntactic maturity in English, albeit with a wide range. As expected, students actively used fundamental elements, data in particular, with an average frequency of 1.64, while they relied considerably less on the uses of warrants, backing, and secondary elements. In fact, the average frequencies for the

TABLE 2

Descriptive Statistics of Examined Variables

	Raw Frequency				Relevance-Considered Frequency				
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*	*t*
CSAT Score	129	153	141.72	7.26					
Words/T-unit	8.68	21.42	12.58	2.69					
Writing Score (Holistic)	2.00	5.00	3.09	0.72					
Toulmin Score (Total)	2.00	9.00	5.15	1.72	0	9.00	4.09	2.18	4.61***
Fundamental	2.00	8.00	4.97	1.65	0	8.00	3.91	2.05	4.61***
Secondary	0	1.00	.21	0.42	0	1.00	0.18	0.39	.30
Claim	0	3.00	2.00	0.83	0	3.00	1.70	0.88	3.29**
Data	1.00	4.00	2.27	0.76	0	4.00	1.64	1.08	4.67***
Warrant	0	2.00	.58	0.75	0	2.00	0.52	0.76	1.44
Backing	0	1.00	.12	0.33	0	1.00	0.06	0.24	1.44
Rebuttals	0	1.00	.21	0.41	0.	1.00	0.18	0.39	.29

***$p < .001$

TABLE 3

Correlations among the Examined Variables

	Words/ T-unit	Writing Score	Toulmin Score	Fund. Elem.	Second. Elem.	Claim	Data	Warrant	Backing
CSAT Score	.41*	.42*	.41*	.35*	.44*	.28	.29~	.17	.13
Words/T-Unit		.49**	.04	.04	.01	.04	.16	.02	.14
Writing Score			.45**	.43*	.27	.09	.60***	.14	.15
Toulmin Score				.99***	.42*	.68***	.75***	.64***	.52**
Fundamental Elements					.26	.71***	.74***	.66***	.51**
Secondary Elements						.07	.31	.10	.21
Claim							.27	.29	.23
Data								.20	.21
Warrant									.51**

*$p < .05$, **$p < .01$, ***$p < .001$

uses of secondary elements and backings were only 0.18 and 0.52, respectively, with their standard deviations larger than the means, thus suggesting that there were probably more students who did not include them at all. The mean score for their uses of claim was 1.70.

Next, correlation analyses were conducted to discern potential relationship among the variables (See Table 2). Among the examined individual Toulmin elements, only the uses of data displayed significant correlations with the writing score ($r = .60, p < .01$). Although no other individual Toulmin elements examined showed significant relations with the overall writing performance, significant correlations of fundamental elements and the total Toulmin score to the holistic writing scores ($r = 43, p < .05$; $r = .45, p < .05$, respectively) were found. Among the Toulmin elements, the uses of warrants and backings had significant correlations ($r = .51, p < .01$). The sentence complexity measured by the number of words per t-unit did not display any significant correlations with the Toulmin

elements, while it was significantly correlated to the holistic English score ($r = .49$, $p < .01$). Their English proficiency measured by their CSAT showed significant relations with the holistic writing score ($r = .42$, $p < .05$), total Toulmin score ($r = .41$, $p < .05$), fundamental elements ($r = .35$, $p < .05$), secondary elements ($r = .44$, $p < .01$), and words per t-unit ($r = .41$, $p < .05$), which suggests that this should be controlled for in assessing the predictability of each of the Toulmin elements in the further regression analyses.

Then, a sequence of hierarchical regression analyses was conducted in order to identify the Toulmin element that contributes to the Korean EFL high school students' overall argumentative writing qualities.

TABLE 4
Hierarchical Regression Analyses Predicting Reading Comprehension

Steps	Variables	R^2	ΔR^2	ΔF	Sig
1	CSAT	.18	.18	6.64**	.02
2	Words/T-Unit	.29	.12	5.02**	.03
3	Secondary Elements	.32	.03	1.26	.27
4	Fundamental Elements	.43	.11	5.21*	.03

*$p < .05$, **$p < .01$

The first hierarchical regression analysis aimed at getting a general picture of the relative predictive role fundamental and secondary elements play in explaining writing qualities (see Table 3). The participants' CSAT score was entered first as a control variable, and it alone explained about 18% of the variance in their writing scores, making a significant contribution ($\Delta F = 6.64$, $p < .01$). The number of words per t-unit was entered next to control for their sentence complexity, and it explained an additional 12% of the variance, making a unique significant contribution ($\Delta F = 5.02$, $p < .01$). Then, the total score for the secondary elements and fundamental elements were entered in Step 3 and Step 4, respectively. Although secondary elements did not make any unique significant contribution, a unique contribution of fundamental elements was found ($\Delta F = 5.21$, $p < .05$), when the participants' CSAT scores, sentence complexity, and the uses of secondary elements were controlled for. This model explained about 43% of the variance in their writing performance. Thus, fundamental elements seem to have a relatively greater and significant predictive power than secondary elements in explaining Korean high school students' writing.

Then, as it was already shown that data, among the fundamental elements, was significantly correlated to the overall writing qualities, subsequent series of hierarchical regression analyses were run in order to identify which specific features of data contribute to the variance in the holistic writing scores (see Table 5). The order of control variables entered in the analyses was the same as the previous regression analysis. When controlling

for the participants' overall English proficiency, sentence complexity, and the amount of secondary elements, their inclusion of claim, warrants, and backings, three of the four fundamental elements entered in Step 4, did not make any significant contribution in explaining the variance in their writing scores. The uses of relevant and appropriate data, however, made unique significant contribution to the variance in their overall writing performance, contributing as much as an additional 20% of the explanatory power ($\Delta F =$ 10.97, $p < .001$) over and beyond the effects of the other Toulmin elements such as claim, warrant, backing, and secondary elements, their English proficiency, and sentence complexity. In short, among the various Toulmin elements considered, data seems to be the crucial element that determines the overall writing qualities of argumentative essays. This model explains about 55% of the total variance in their writing scores. Then, one more step was added to the hierarchical regression analysis at Step 6, to account for the degree to which each subclaim the writer included was supported by relevant data, thus considering the number of relevant data per subclaim ($M = 1.28$, $SD = .58$). This variable contributed as much as an additional 12% of the unique variance to the overall writing qualities ($\Delta F =$ 8.31, $p < .01$). Thus, the extent to which subclaims were supported by data has turned out to have significant explanatory power over the uses of other fundamental and secondary elements, including data themselves, in accounting for the overall writing qualities. This model explained about 66% of the variance in the holistic writing scores.

TABLE 5

Hierarchical Regression Analyses Predicting Reading Comprehension with *Data*

Steps	Variables	R^2	ΔR^2	ΔF	*Sig*
1	CSAT	.18	.18	6.64**	.02
2	Words/T-Unit	.29	.12	5.02**	.03
3	Secondary Elements	.32	.03	1.25	.27
4	Claim & Warrant	.35	.02	.30	.82
5	Data	.55	.20	10.97**	.00
6	# of Data per Claim	.66	.12	8.31*	.01
5	# of Different Data Types	.45	.10	4.54*	.04
6	# of Data per Claim	.65	.20	13.48***	.00
5	Contrast (Data type)	.46	.11	5.12*	.03
6	# of Data per Claim	.65	.19	13.02**	.00

*$p < .05$, **$p < .01$, ***$p < .001$

Another set of very similar hierarchical regression analyses were carried out, with the same variables and the same order, except that at Step 5, the number of different types of relevant data ($M = 1.48$, $SD = .57$), rather than the total score for data that reflected the mere relevance and appropriateness, was entered (see middle panel, Table 4) in order to investigate whether the diversity of data types plays a significant role. It turned out that inclusion of a variety of data types did explain significant variance in the overall quality of

argumentative writing (ΔF = 4.54, p < .05), when controlling for the writers' English proficiency, sentence complexity, and the inclusion of the Toulmin elements minus data. The number of data per subclaim, entered at Step 6, still made significant contribution, adding as much as 20% of the variance in total writing qualities (ΔF = 13.48, p < .001).

Finally, since it was demonstrated that the number of different types of data make a difference in the quality of argumentative writing, each of the different types of data was entered in similar series of hierarchical analyses, entering each at Step 5, to further identify which, among many different types of data, made the most significant contribution. These different types of data were: contrast (e.g., *"Teachers don't have duty to teach him anymore. Maybe some teachers might help him for few more months, but not forever. Comparing with the fact, parents devote themselves almost anytime to their sons and daughters."*), quotation (e.g., *"There is a fun saying in Korea, if children are good, their parents are good, and if children are wrong, their parents are wrong. That saying is quite true."*), paraphrase (e.g., *"The relationship between teachers and students starts from money. Students pay certain amount of money to be taught. Even though the relationship improves into some kind of mental form, the basic statement that they are connected with money doesn't change."*), and personal experience (e.g., *"We are too familiar with our parents so we may lose concentration. For example, during last winter vacation, I planned to study Chinese character with my mother. However, every time to study, we said, 'Let's do it next time.'"*). The means for the inclusion of contrast, quotations, paraphrase, and personal experiences were .27 (*SD* = 52), .00 (*SD* = .00), .82 (*SD* = .39), and .42 (*SD* = .50), respectively. The results indicated that contrasts made significant unique contribution to the writing qualities (ΔF = 5.12, p < .05; see bottom panel, Table 4), while none of the others did. The number of data per subclaim entered at Step 6 still added unique significant variance (ΔF = 13.02, p < .001), over and beyond the effects of language proficiency, sentence complexity, and the inclusion of fundamental and secondary elements.

In short, when controlling for language proficiency, sentence complexity, and the inclusion of secondary elements, the only Toulmin element that predicted the quality of argumentative writing was data. Moreover, not just the mere inclusion of relevant and appropriate data, but the diversity of data types, specifically, contrasts, played a significant role in determining the writing quality. Further, the degree to which each subclaim was supported with relevant data made unique significant contribution on top of the total amount of data and the number of data types included. That is, among the variables examined, how much each subclaim was supported with data has turned out to be the strongest and most significant predictor of Korean high school EFL learners' argumentative writing qualities. These models explained about 65~66% of the total variance in their writing quality scores.

5. DISCUSSION AND CONCLUSION

This study was conducted to explore whether the Toulmin model is applicable to the evaluation of Korean high school EFL learners' argumentative writing. The findings indicate that: 1) the Toulmin elements, especially the fundamental elements, do contribute to their overall writing qualities, 2) among the Toulmin elements, it was data that made significant contribution to their argumentative writing, and 3) the extent to which each subclaim was supported by appropriate data, measured by the number of data per subclaim, was the most significant predictor above and beyond the effects of other Toulmin elements, the uses of data, and the number of different kinds of data used, of the overall qualities of Korean high school EFL writers' argumentative writing. The findings that the Toulmin model was an adequate assessment tool for Korean EFL writers' argumentative writing and that the uses of data were the most significant indicator of their argumentation quality coincided with findings from many previous studies (Cheng & Chen, 2009; Connor, 1987, 1990; Connor & Lauer, 1988; Cooper et al., 1984; Crammond, 1998; Ferretti et al., 2000; Ferris, 1994; Knudson, 1992a, 1992b; McCann, 1989; Nussbaum & Kardash, 2005; Oi, 1999; Page-Voth & Graham, 1999; Qin & Karabacak, 2010). For example, Nussbaum and Kardash (2005) similarly showed close relations between the inclusion of Toulmin elements and the overall evaluation of argumentative writings, and Qin and Karabacak (2010) showed that data was the Toulmin element SL/FL learners seem to rely most on along with claim. Thus, in accordance with other previous studies, the Korean high school EFL learners also showed heavy reliance on the uses of data in making their arguments come through.

What was of most interesting to note from this study was the importance of the need to support each subclaim sufficiently with relevant data. Compared to the diversity of data types used and the specific data types included, the amount of relevant data employed for each (sub)claim demonstrated the most predictive power in explaining their argumentative writing qualities. This suggests that for Korean high school English learners who rarely employed secondary elements or relatively less explicit fundamental elements such as warrants and backings, it is the amount of adequate data provided that determined the evaluation of their argumentative writing qualities. This finding is somewhat related to the findings by other studies on arguments in science education (Means & Voss, 1996; Sampson & Clark, 2008; Gil et al., 2003). In those studies, it was demonstrated that the qualities of data, measured by acceptability, relevance, and sufficiency of data, were essential, since any science arguments without accurate and relevant data will be evaluated as poor in quality. Since there has not been much similar research effort made in the field of SL/FL education to make comparisons, this particular finding from this study also calls for further studies with diverse SL/FL populations from different backgrounds.

In addition, this study has shown that, in general, Korean EFL students relied heavily on claim and data, compared to the other fundamental elements (warrants) and secondary elements such as counterarguments, rebuttals, and qualifiers. Without explicit warrants articulating logical and thorough development of their ideas, the Korean EFL learners' argumentative essays were evaluated as mostly "underdeveloped". Considering the Korean culture-specific discourse where warrants are not underscored and thus usually deleted in writing, the Korean students might not have felt the need to turn their subconscious thinking into explicit statements in their writing, presuming that readers would naturally assume the link. This is typical of writers in reader-responsible writing cultures (Hudson, 2007). Even if they had been aware of its importance, however, it is very likely that they would not have used them effectively since the uses of warrants are not usually included in the school curriculum and is difficult to learn on one's own. Likewise, without counterarguments and rebuttals, arguments may be assessed as partial or biased, failing to look over all sides to an issue, which may make the arguments less persuasive and lower the quality of writing. Considering that the secondary elements are relatively easy to learn and use compared to warrants, it did not seem that the absence of those features reflects their lack of knowledge about those argument features. Rather, the reason was likely to be that they may not have been aware of the potential contribution of secondary elements to the overall quality of arguments (Cooper et al., 1984).

The findings from this study point to the need for sound instructions on different argumentation elements that constitute logical and coherent arguments in English for Korean high school EFL learners. English argumentation has such a great power that it enables the various communicative purposes to be fulfilled. In other words, good English argumentative genre awareness can accelerate some to obtain good scores in high-stakes tests and others to attain a good position or career. Thus, it is imperative for teachers to provide instructions on the uses of each genre element in conveying meaning efficiently and effectively in the target language and culture. This study, however, is not without limitations in that the sample size may be relatively small to allow more complex statistical analysis and that only advanced high school students served as participants. Since past research points to the differential effects of language proficiency and age in the relationship between the uses of the Toulmin elements and the argumentation qualities, studies with participants of diverse language proficiency and ages might yield a more accurate picture. Additionally, since this study is limited to the analysis of argumentative essays, analyzing different types of English argumentative genre such as editorials of newspapers and arguments in textbooks, will provide more extensive information. Despite the limitations, this study has made significant contribution in that it has identified the direct and explicit relationship between the uses of the Toulmin elements and the quality of Korean EFL learners' argumentation, an area that has received little previous research attention.

Moreover, it has highlighted the specific argumentation element that can directly enhance the overall writing quality, namely the amount of relevant data per claim included, which has further pedagogical implications. On the whole, this study has yielded great insights regarding the importance of content quality of English argumentative writing for Korean EFL teachers and students.

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Applicable levels: Secondary

Jin Kyung Paek
Department of English Language Education
Korea University
145 Anam-ro, Seongbuk-gu
Seoul, Korea 02841
Phone: 02-3290-2350
Email: jean100@korea.ac.kr

Yusun Kang
Department of English Language Education
Korea University
145 Anam-ro, Seongbuk-gu
Seoul, Korea 02841
Phone: 02-3290-2354
Email: jenkang@korea.ac.kr