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Comparison of Authorial Stance Between Professional and Amateur Writers in Scientific Correspondence Writing

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***Abstract*—Writing argumentative correspondences is an art requiring linguistic and rhetorical skills to bring forth the ultimate effect of persuading the audience. However, instruction of this critical language art has been underrepresented in Thai tertiary educational contexts. This study is based on an interventional experiment of teaching an ESP-Science course to 40 students majoring in science, with a strong emphasis on linguistic devices for academic interaction, consisting of stance and engagement marking, as elaborated in Hyland (2005a, 2005b). The interventional experiment made use of the 240 correspondences taken from the scientific journal *Nature* with the duration of 30 hours over a 10-week period. This study reports the findings from a comparison of the students' writing before and after the intervention and a comparison of the students' post-experiment writing and the experts' writing. The analysis is based on content analysis, inter-rater assessment, and descriptive statistics, and shows that a meaningful level of progress has been obtained as a result of the intervention. The progress is evident in not only that students' post-experiment writing exceeds in quality their pre-experiment writing, but also that students' post-experiment writing has become similar to the expert writing to a great extent, with respect, in particular, to the strategic patterns of stance and engagement marking. The success of a relatively short intervention, i.e., 10 weeks, calls for implementation of courses using authentic correspondences in ESP-Science classes, or more broadly, in ESP courses in diverse disciplines (237/250).**

***Index Terms*—stance, engagement, scientific correspondences, expert and student writers**

I. Introduction

Argumentative writing can be viewed as a communication channel between writers and readers (Liu, 2013). It allows people to record, examine, and evaluate representations of reasoning as objects of reflection (Ferretti & Graham, 2019). It not only presents and confirms any particular claims by using a justification from evidence and warrant that represent the writer's verification and validity of their perceptions, theories, or assumptions, but also attempts to persuade and convince readers directly and straightforwardly in order to agree and accept the writer's viewpoints (Azizi & Ghonsooly, 2015). For its strategic nature, writing an argumentative text is a challenging task, especially for English as a second/foreign language (ESL/EFL) students, despite the fact that their writing and critical thinking skills are essential for academic achievement at the university level (Hasani, 2016; Zhu, 2001). Acquiring the crucial skills needed in composing an argument with claims, justifications, and evidence logically and critically can determine students' academic achievement (Hillocks, 2010).

The critical importance of argumentative writing notwithstanding, there are elements that impede the students' argumentative writing success, such as the inadequacy of genre familiarity and knowledge, low language proficiency levels, and lack of cultural background (Zhang, 2018). Ferretti and Graham (2019) assert that written argumentation is a process that develops gradually, and thus advanced writing skills are required to achieve high quality writing outcomes through appropriate curriculum, instruction, and assessment. In a study on evaluative language use in Chinese university EFL students' argumentative writing, Liu (2013) points out the paucity of linguistic studies that focus on interpersonal meanings in their academic writing. Writing correspondences can be a foundational practice to master the skills in longer genres because one of the practices used for teaching this genre is to use shorter texts first (Derewianka, 2003). Furthermore, successful argumentation critically depends on effective deployment of linguistic devices for stance and engagement, which are more complicated than a general scheme (Hyland, 2005a, 2005b). Therefore, for novice writers, writing an argumentation about controversial issues can be a perplexing task. It involves the writer's comprehension of the topics and requires reasonable arguments and counterarguments from different sources to support their final position for a formal, well-structured piece of argumentative writing (Luna et al., 2020). Therefore, it is

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imperative that an adequate program and instruction be implemented for successful correspondence writing, incorporating instruction of writing skills and rhetorical features for stance and engagement marking.

Despite the significance of argumentative writing, its instruction has been largely ignored in higher education in Thailand. Studies on instruction of argumentative writing are also underrepresented in the fields of EFL/ESP in Thailand. Furthermore, publishing correspondences is not a common practice for Thai academic journals. Therefore, Thai educational contexts present a deeply adverse situation for teaching and learning about argumentative writing. This study intends to fill this unfortunate gap by conducting an interventional experiment of an argumentative writing course and examining its effect on the participating students.

Given the background, the objectives of this study are threefold. First, it examines if the students participating in the intervention show progress in developing argumentative writing skills as a result of intervention. Second, it investigates the interactional features in argumentative correspondences in scientific contexts by exploring stance and engagement markers in scientific correspondences written by experts. Third, it compares the usage patterns of stance and engagement markers between those of experts and students. Thus, this study aims to answer these three research questions:

1. To what extent have the students attained improvement after attending the interventional ESP course?
2. How do expert writers express their stance and engagement with their readers in scientific correspondences?
3. How are scientific correspondences written by expert writers (dis)similar to those written by student writers in terms of strategic uses of interactional features?

Scientific argumentative correspondences involve three obligatory moves: claim, premises, and conclusion. The claim is the main constituent part of a contentious assertion needing additional supports. The premise establishes the efficacy and strength of the claim. The conclusion restates the main idea, makes predictions, and offers suggestions or opinions. This study involves ESP-Science students, but it bears implications that are immediately relevant to academic writing pedagogy for other disciplines in higher education in Thailand and beyond.

II. Theoretical Background and Previous Studies

A. Stance and Engagement

The theoretical framework of this study is the model of interaction proposed by Hyland (2005a, 2005b), in which the two pivotal notions ‘stance’ and ‘engagement’ play the key role. These two notions are derived from his earlier theory of Matadiscourse (Hyland, 1998), addressing the interactional and interactive means that writers and speakers employ to achieve their goals. Since powerful argument illustrates attentive consideration of one’s associates as writers, positioning themselves and their work to reflect and frame a crucial specialty ideology, authors must explicate their evaluations and endeavor to establish understanding with readers in academic writing (Hyland, 2005b). Stance markers comprise hedges, attitude markers, boosters, and self-mentions, while engagement markers are reader pronouns, directives, shared knowledge references, questions, and personal asides (Hyland, 2005b).

Stance is the way in which writers designate themselves into their authorial argument or hide their engagement with the text. It also indicates the textual voice, including the features that convey the writers’ presentation and their opinions, judgements, and commitment (Hyland, 2005b), and can be exhibited to varying degrees in grammatical devices, personal opinion word choice, and paralinguistic features (Biber, 2006). Engagement is the alignment dimension between writers and readers regarding the positions where writers accept and associate with others, being aware of their readers’ existence, persuading them, attending their focus, comprehending their skepticism, adding them as discourse members, and leading them to evaluation (Hyland, 2001, 2005b).

There is a body of studies addressing stance and engagement and the notions closely related to them. Research on stance and engagement in various dimensions has become popular in various genres, both written and spoken, such as research articles in different areas of study, research abstracts, article summaries, etc. For instance, Gillaerts and Van de Velde (2010) performed a quantitative investigation on interpersonality features in research article abstracts, e.g., hedges, boosters and attitude markers. In cross-disciplinary research, McGrath and Kuteeva (2012) found that hedges and attitude markers were used less frequently in pure mathematics research articles than in other hard and soft disciplines, whereas shared knowledge and reader references were more frequently used in them. Biber (2006) asserts that, while stance expression is essential in all university registers, the expressed stance meanings, grammatical features, and circumstances vary according to register.

In second language writing contexts, it has been observed that rhetorical identity is influenced by the writer’s background. For instance, Hyland (2004) notes that, while Anglo-American scholarly traditions support a deliberate exploitation of authorship identity to attract readers’ attention to the writer’s portrayal and perspective, second language authors from different cultures, e.g., Asians, may be less confident in revealing their authorial identity.

The notion of ‘voice’ is often used in the context of stance marking, as well. One of the notable manifestations of authorial voice that has attracted scholarly interests is employing first-person pronouns (Nunn, 2014; White, 2018). Self-mention is a key pragmatic attribute of academic discourse by virtue of its contribution to the creation of the author’s rhetorical self. Furthermore, the authorial pronoun is an important device for illuminating an intellectually qualified character and achieving approval for a person’s particular idea (Hyland, 2004). However, while some EFL undergraduate students were aware of its rhetorical effects, they were reluctant to make use of them for its association

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with the connotation of authority. Consequently, they considerably underapplied authorial pronouns, minimized their position, and avoided using overt stance markers, unlike professional writers (Hyland, 2002). For these reasons, it is important for theorists and practitioners alike to study authorial voice in the model texts and raise the students' voice awareness in EFL writing.

B. Argumentative Correspondences in Scientific Fields

Argumentative correspondences have the same rhetorical structure as the agreed rhetorical structure of argumentative essays, i.e., thesis, argument, and conclusion (Oshima & Hogue, 2014). In scientific journals, a correspondence generally takes one of the following forms: a substantial re-analysis of a previously published article in the same or another journal, an article that may not cover standard research but may be of general interest to the broad readership of a journal, or a brief report of research findings adequate for the journal's scope and of particular interest to the community. In some journals, correspondences are represented as letters to the editor, which are comments on previously-published articles (Peh & Ng, 2010). In general, correspondences are typically a short communicative form, addressing any subject matter within the scope of readers' interest (Süer & Yaman, 2013).

A correspondence is one kind of response texts. It provides a chance to communicate in writing a personal viewpoint and personal learning as it relates specifically to the book, essay, paper, article, etc. in question and the ideas and values contained therein. Promoting or criticizing the rationale, investigation, or results of a study is the major function of a correspondence composed in response to a formerly published report. Clear evaluation and straightforward commentaries are needed if the writer's intention is to criticize. However, this assumes that a prejudiced point of view should be avoided, and recommendations should be based on well-documented empirical evidence (Peh & Ng, 2010; Süer & Yaman, 2013).

In terms of internal structure, argumentative correspondences consist of three moves: claim, premise, and conclusion, each with further steps, as shown in Table 1.

TABLE 1
MOVE AND STEPS OF CORRESPONDENCES

Move 1: Claim (obligatory)		
	Step:	express agreement or disagreement toward the previously published text
Or		express attitudes concerning a topic
Move 2: Premise (obligatory)		
	Step:	support by raising evidence / warrants / opinions
Move 3: Conclusion (obligatory)		
	Step:	restate the main idea
Or		make predictions
Or		give suggestions
Or		give opinions

Claim is the main constituent of an argumentative correspondence. It is a contentious assertion which requires additional support. Premise establishes the efficacy and strength of the claim. Finally, conclusion restates the main idea, makes predictions, gives suggestions, or gives opinions. Claim, premise, and conclusion are exemplified in (1), taken from the scientific journal *Nature*:

Example (1)

Claim — Nils Hansson and colleagues suggest that Nobel committees in 1901–66 were persuaded to award the Nobel Prize in Physiology or Medicine based on the potential research impact of a single discovery or innovation, rather than on a distinguished research record. As secretary general of the Royal Swedish Academy of Sciences, I can confirm that this is still the case.

Premise — The Nobel Prize is not a lifetime achievement award. In his last will of 1895, Alfred Nobel stipulated that the Physiology or Medicine prize should go to "the person who shall have made the most important discovery within the domain"; in physics should be for "the most important discovery or invention within the field"; and in chemistry should be awarded for "the most important chemical discovery or improvement".

Conclusion — It is reassuring that the assessment of hundreds of nominations by Nils Hansson (no relation of mine) and colleagues confirms that past committees have rigorously upheld Nobel's will.

(#11 *Nature* **556**, 31 [2018], emphasis added)

In example (1), claim, the first move, acts as a topic paragraph where the author presents their strong stance (cf. *I can confirm that...*). Premise, the second move, supports the author's claims by providing one or more pieces of evidence, references, as well as their opinions. Conclusion, the last move, restates the main idea with a booster for its emphatic effect (cf. *It is reassuring that …*).

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III. Methodology

A. Data and Functional Classification

A crucial preparatory process for data collection was the identification and functional classification of linguistic and rhetorical devices used in argumentative writing. The instruments for data collection comprised coder manual and data record sheet, and the instruments for data analysis consisted of an analysis manual, two raters, one inter-rater, and AntCont program (version 3.4.4). The analysis manual contains stance and engagement markers from Hyland's (2005b) interactional model, as shown in Table 2 (note that certain forms are polyfunctional and are cross-classified).

Table 2
Functions and Forms of Stance and Engagement in Academic Interaction

Category	Function	Examples
Stance		
Hedges	Conceal author's full commitment to statements	*could, would, might, may, likely, assume*
Boosters	Affirm force or author's confidence in message	*will, can, most, also, only*
Attitude markers	Reveal author's attitude to propositional matter	*should, need, must, agree, disagree*
Self-mentions	Obvious mention of writer(s)	*I, we, our, my*
Engagement		
Reader pronouns	Explicit readers/ direct route for importing readers into an interlocution	*we, you, our, your*
Directives	Direction for readers to respond to and recognize issues as the author imposed	*should, need, must,* imperative form of verbs
Questions	Strategize dialogic relationship, invite participation, and bring the audience into a sphere where they can be induced to the author's perspective	utterances typically functioning as a request for information and indicated by a question mark
Shared knowledge references	Attempt to locate readers within evidently familiarized borderlines of disciplinary apprehensions	*known as…, as emphasized previously by…, we now know that…*
Personal asides	Direct audiences by concisely interfering in the argument to propose an assertion on a previously mentioned statement	statements indicated by em dash, parentheses, and comma

B. Data Collection

Two corpora were created for use as the model for students' writing and the target text for expert writing analysis. The main corpus was the dataset consisting of 240 correspondences, selected via stratified random sampling, representing the total population of 612 correspondences, published in *Nature* from 2016 to 2019. The main corpus was used for macro-analysis of linguistic features used in expert writing. The satellite corpus was the dataset consisting of 342 sentences (of 40 correspondences), selected via random sampling, representing 4,896 sentences of the total population of 612 correspondences. The satellite corpus was used for micro-analysis of rhetorical features.

Two pairs of datasets were used for comparative analysis: one set consisting of pre- and post-intervention writing (40 pieces each; see D below), and the other set consisting of the students' and experts' writing. In the latter, the students' writing was the post-intervention correspondence writing (40 pieces) and the correspondences compiled in the satellite corpus (40 pieces by the original, expert authors).

C. Data Analysis

The four sets of the collected correspondences (two sets of corpus data and two sets of student writing) were separated into sentence units and entered on spreadsheets to facilitate identification and classification of language use. In this process, an examination by two raters was performed to ensure the accuracy of the analysis of language use in the sample correspondences. The data were put to an inter-rater reliability test to ascertain agreement. When the language features were all identified, the researchers coded them into a spreadsheet. The researchers identified each feature, hand-counted the frequency of stance and engagement markers, and separated them into groups according to the coding schemes. Frequency and percentage were used in the statistical analysis of the data from the corpus, as well as in the content analysis for qualitative descriptions of the data.

D. Students' Pre- and Post-Intervention Writing

The students' pre-intervention writing was obtained from the 40 participants to assess their entry level proficiency in ESP-Science writing, and the students' post-intervention writing was obtained from the same students after an intervention to examine the extent of progress the students attained. Each time, the student participants were asked to read one of five correspondences from *Nature* and write a correspondence to present facts and provide their opinions about the situation.

The intervention was an ESP-Science writing course for a duration of 10 weeks (3 hours per week, for a total of 30 hours). Due to logistical limitations from the COVID-19 measures, the implementation of the course was carried out online and the subject scheme was based on the single-group, pretest and posttest model, known as 'a quasi-experimental research design' (Johnson & Christensen, 2019), thus without a control group.

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IV. Results and Discussion

A. Students' Pre- and Post-Intervention Writing

The first research question pertains to the extent of improvement the students attained after attending the interventional ESP course. A comparative analysis reveals a number of issues bearing significance. Among the most noteworthy changes are enriched content, more accurate command of linguistic features, and more appropriate deployment of rhetorical devices.

In terms of enrichment of content, the average length of pre-intervention writing was 50.58 words, whereas that of the post-intervention was 159.4 words, a three-fold increase. This is particularly noteworthy in the light that the average length of expert writing in the correspondences in *Nature* is 170 words (see C below). Similarly, the average number of sentences in the pre-intervention writing was 3.65, whereas that in the posttest was 8.85, indicating improved confidence in writing.

In terms of linguistic features, students' pre-intervention writing revealed numerous infelicities, e.g., informal language use, fragments, typographical and punctuational errors, improper diction, and other types of grammatical errors. As the present study places primary focus on rhetorical features, however, they are not addressed here. An analysis of these errors and inadequacies warrants further research.

Most importantly for our purposes, attitude markers occurred 111 times in the pre-intervention writing, whereas they occurred 290 times in the post-intervention writing, indicating a 161 per cent increase. Similar increases are witnessed with boosters, from 71 to 158 (a 123% increase); self-mentions, from 23 to 95 (a 313% increase); and hedges, from 21 to 59 (a 181% increase). A remarkable increase occurred not only with stance markers but also with engagement markers. For instance, the use of directives increased from 46 times in the pretest writing to 98 times in the posttest writing (a 113% increase); and reader pronouns, from 10 to 33 (a 230% increase), whereas the extent of increase with knowledge references, questions and personal asides is negligible or incalculable since they did not occur in the pre-intervention writing.

B. Experts' Writing

The second research question relates to the ways the expert writers express their stance and engagement. An analysis of the experts' writing reveals a number of noteworthy aspects of argumentative correspondences with respect to the use of stance and engagement markers, as shown in Table 3, with figures in per thousand words (PTW) and percentage.

Table 3
Stance and Engagement Features in Experts' Correspondences

Stance	Token	PTW	Percentage	Engagement	Token	PTW	Percentage
Attitude markers	222	30.31	35.98	Directives	62	8.46	44.93
Boosters	172	23.48	27.88	Personal asides	38	5.19	27.53
Hedges	114	15.56	18.48	Reader pronouns	30	4.10	21.74
Self-mentions	109	14.88	17.66	Shared knowledge refs.	8	1.09	5.80
				Questions	0	0	0
Total	**617**	**84.23**	**100**	**Total**	**138**	**18.84**	**100**

As Table 3 shows, stance markers were used four times more often than engagement markers (617 vs. 138). Attitude markers, occurring 222 times, were the most frequent among the stance markers (35.98%) and among all the stance and engagement features. On the other hand, directives showed the highest frequency among the engagement markers (44.93%). The attitude marker *should* is exemplified below.

Example (2)

Health-care providers <u>should</u> educate and advise their local residents about vaccines and make the acceptance rate increase. (#S035-03; emphasis added)

In the following we will describe the manifestations of rhetorical features of stance and engagement in more detail.

(a). Attitude Markers

Attitudes are manifested in the form of a few markers, as indicated in Table 4.

Table 4
10 Most Frequently Used Attitude Markers in Experts' Correspondences

Rank	Form	Word class	Token	PTW	Percentage
1	*should*	modal	21	2.87	24.42
2	*need*	verb/noun	15	0.25	17.44
3	*must*	modal	13	1.77	15.12
4	*concerned*	adjective	8	1.09	9.30
5	*agree*	verb	7	0.96	8.14
6	*disagree*	verb	6	0.82	6.98
7	*crucial*	adjective	5	0.68	5.81
8	*important*	adjective	4	0.55	4.65
8	*better*	comparative adjective	4	0.55	4.65
10	*welcome*	verb	3	0.41	3.49
	Total		**86**	**12.5**	**100**

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As shown in Table 4, the three most frequently used attitude markers were *should* (24.42%), followed by *need* (17.44%), and *must* (15.12%), respectively. It is noteworthy that the most frequently used markers of the author's attitude belonged to the grammatical category of (quasi-)modal auxiliaries. The modals *should, need,* and *must* were common resources signaling the author's strong attitude of 'necessity'. However, unlike the epistemic or conditional uses of *should* and *must* (e.g. *Should you see him, let him call me; You must be very tired;* etc.), the uses in the corpus were invariably for marking necessity and obligation, i.e., marking the speaker's attitude. Interestingly, the grammatical functions of the word *need* were versatile i.e., auxiliary, main verb, and noun, but their discourse functions as a stance marker are the same, as exemplified in the following:

Example (3)

We therefore also need to consider how such risks might be mitigated and managed. (#016-03; emphasis added)

The next group of attitude markers, i.e. *concerned, agree, disagree, crucial, important,* and *better,* was also lexical items. They might indicate a negative attitude (*disagree, concerned*), a positive attitude (*agree*) or an evaluative attitude towards a newly presented option (*crucial, important, better*). Since these lexical items (as well as their synonyms, e.g., *dissent, object, oppose, deny, concede, acknowledge, acquiesce, decisive, critical,* etc.) were popularly recruited as attitude markers, this inventory needed to be taught to students who are expected to write argumentative texts in the future.

(b). Boosters

Boosters constitute the second most frequent stance markers in the experts' correspondences. The kinds and frequency of the markers in the booster category are shown in Table 5.

TABLE 5
10 MOST FREQUENTLY USED BOOSTERS IN EXPERTS' CORRESPONDENCES

Rank	Form	Word class	Token	PTW	Percentage
1	*will*	modal	22	3.00	24.44
2	*can/cannot*	modal	21	2.87	23.33
3	*most*	adverb	12	1.64	13.33
4	*also*	adverb	10	1.36	11.11
5	*only*	adverb	6	0.82	6.67
6	*too*	adverb	4	0.55	4.45
6	*particularly*	adverb	4	0.55	4.45
6	*simply*	adverb	4	0.55	4.45
6	*still*	adverb	4	0.55	4.45
10	*alone*	adverb	3	0.41	3.33
	Total		**90**	**12.29**	**100**

As shown in Table 5, the use of modal auxiliaries for a boosting effect is prominent, i.e. *will* and *can(not)* account for 44 per cent (43/90). This contrasts with their counterparts functioning as hedges (see (c) below). The subjunctive forms of modal auxiliaries (*would, could,* etc.) are linked to irrealis marking, detaching the proposition from the reality, and thus from the established fact. The indicative forms (*will, can,* etc.) are in direct functional opposition in terms of their illocutionary force on the proposition. The modal auxiliaries *will* and *can* may be used for possibility and mere representation of non-conative future (e.g. *I will come of age next year; Accidents can happen;* etc.), but their use in argumentative texts is invariably for marking the author's conviction, enablement, or certainty of a future event. The booster function of *can* is exemplified in the following:

Example (4)

We argue that viewing climate change instead as a risk multiplier, influencer or co-factor can help to inform rather than inflame this important discussion. (#029-02; emphasis added)

The adverbs, *most, also* and *only,* constitute the second most important source categories of boosters. Needless to say, *most,* as a superlative determiner, designates the maximum degree of the quantity or quality at issue, and fits the functional profile well. The additive adverb *also* is typically used to present an additional item which warrants an attention. The focusing particle *only* also carries a strong boosting effect for its inherent semantics of exclusion of potential alternatives.

(c). Hedges

Hedges, the devices signaling non-accuracy or non-certainty, carry the function of signaling caution or probability. The hedge function is manifested by a number of forms, as listed in Table 6.

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TABLE 6
10 MOST FREQUENTLY USED INDICATORS OF HEDGE IN SCIENTIFIC CORRESPONDENCES

Rank	Form	Word class	Token	PTW	Percentage
1	*could*	modal	27	3.69	29.35
2	*would*	modal	18	2.46	19.57
3	*might*	modal	12	1.64	13.04
4	*In my view/In our view*	phrase	11	1.50	11.96
5	*may*	modal	5	0.68	5.43
5	*suggest*	verb	5	0.68	5.43
7	*likely/unlikely*	adverb	4	0.55	4.35
7	*argue*	verb	4	0.55	4.35
9	*assume*	verb	3	0.41	3.26
9	*little*	adjective/adverb	3	0.41	3.26
	Total		**92**	**12.56**	**100**

As shown in Table 6, the three most frequently used were the modals: *could* (29.35%), *would* (18.57%), and *might* (13.04%). Collectively, their usage was 61.96%, accounting for well over half of the preferred hedge indicators. Other hedge indicators are *believe, perceive, seem*, and *to me*.

Hedges are often employed for politeness. Traditionally, hedges are often discussed with respect to vague language or considered a kind of discourse marker (e.g. *sort of, kind of,* etc.) (Fraser, 2010; Lakoff, 1972). However, discourse markers are often stigmatized as disfluency markers (Crible, 2018) and thus not favored in formal language. In the light of stylistic appropriateness, it is expected that in academic writing such as argumentative correspondences, writers are naturally inclined to use modal markers (*could, would, might*, etc.). Since argumentative texts are about scientific knowledge, the best forms of hedges employed in such genres are epistemic modality markers (cf. Kranich, 2011; Lewin, 2005). It is also noteworthy that the most frequently used epistemic modal markers for the hedging effect were invariably the subjunctive forms of the modal auxiliary, i.e., *could, would,* and *might*, largely due to their connection with the irrealis marking function. This state of affairs was in sharp contrast with their non-subjunctive (i.e. indicative) counterparts that were used for boosting effects (see (b) above). The use of the verb *suggest* for the hedging function is exemplified in the following:

Example (5)

I <u>suggest</u> that climate policy could more effectively direct financial investments. (#032-01; emphasis added)

In the example above, the verb *suggest* reveals the writer's 'subjectivisation strategy', by employing a verb denoting the writer's subjective opinion (*suggest*), which implies that the opinion may be taken in not absolute but relative terms.

(d). Self-Mentions

Self-mentions refer to the reference to the writers themselves, thus inseparably associated with 'authorial voice' (see II-(A) above). It is exemplified in the following:

Example (6)

But <u>we</u> should not discard 25 years of data and clinical experience simply because <u>I</u> misguidedly coined that term for perivascular cells in 1991. (#001-02; emphasis added)

The excerpt contains two self-mention markers (*we* and *I*). The pronoun *we* is an inclusive first-person plural pronoun, making reference to the readership and/or scientists in general, including the writer, whereas the pronoun *I* is singular, specifically referring to the writer (note that this correspondence is a single-authored article), thus attributing the blame (cf. *misguidedly*) to the writer himself. In the corpus, self-mentions were indicated predominantly by *we* (6.69 PTW, 44.54%) and less frequently by *I* (3.96 PTW, 26.36%). The occurrences of other first-person pronouns were marginal in number.

(e). Directives

Directives in simple terms are a device to signal a command. However, the function has a number of different manifestations, as shown in Table 7.

TABLE 7
DIRECTIVE MARKERS IN EXPERTS' CORRESPONDENCES

Rank	Form	Word class	Token	PTW	Percentage	Remarks
1	*should*	modal	21	33.88	33.88	
2	*need*	verb/noun	15	24.19	24.19	
3	*must*	modal	13	20.97	20.97	
4	imperative form of verbs	verb	5	8.07	8.07	*See (2); Consider.., Do not assume..*, etc.
5	*it is therefore crucial to/ for*	phrase	2	3.23	3.23	
6	*require*	verb	1	1.61	1.61	
6	*suggest*	verb	1	1.61	1.61	
6	*recommend*	verb	1	1.61	1.61	
6	*demand*	verb	1	1.61	1.61	
6	*have to*	verb	1	1.61	1.61	
6	*(it is) essential*	adjective	1	1.61	1.61	
	Total		**62**	**99.95**	**100**	

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As shown in Table 7, modals played a crucial role as preferred directive features. The modals *should* and *must* the quasi-modal *need* surfaced as the preferred directive features, collectively accounting for 79.14 per cent. The modals *should* and *must* straightforwardly provide an optimal means of encoding strong deontic obligation. The directive function, in its prototypical form, materializes as imperative sentences, but, as shown in Table 7, the attested patterns of directives in the corpus were special in that such imperative verb forms were infrequent, accounting for 8.06 per cent of all directive tokens. Thus, the use of modals signaling directive is exemplified in the following:

Example (7)

Our intention is that the commission's work will be an important step forward in reaching international consensus on standards that should apply to decisions about germline editing. (#021-08; emphasis added)

Considering the multiplicity of the synonyms of *need* in English, e.g. *necessity, requirement, want, lack,* etc. in the sense of privation, the use of *need* in this context bears pedagogical significance.

(f). Personal Asides

Personal asides are useful devices for addressing readers directly to offer a comment by briefly interrupting the argument (Hyland, 1998, 2005b). It is exemplified in the following:

Example (8)

We agree with Michael Mehling and colleagues that applying carbon charges — rather than trade tariffs — to imports could help to address countries' non-compliance with climate policy. (#018-01; emphasis added)

In the excerpt, the personal aside is separated by em dashes, without which following phrase (*to imports*) would be syntactically and conceptually distanced from its host phrase (*carbon charges*). Since most ESL/EFL students are not familiar with the em dash punctuation and, more generally, the use of personal asides in academic writing, instruction of these features needs to be considered in ESP classes.

(g). Reader Pronouns

Reader pronouns are used to refer to the readers in the form of inclusive first-person pronouns (*we, us, our,* etc.) or second-person pronouns (*you, your,* etc.), whereby the readers are encouraged, or cognitively forced, to be engaged. In the corpus of the experts' correspondences, *we* surfaced most frequently, accounting for 50 per cent of all reader pronoun occurrences, followed by *your*, accounting for 23.33 per cent. The reader can be the general readership or the author whose earlier work is being referred to. The reader pronoun is exemplified in the following:

Example (9)

As you point out, the PACE trial authors (including two co-authors of Sharpe et al. in Nature*) and others promote a form of cognitive behavioural therapy that assumes ME/CFS symptoms can be reversed by teaching people to think differently, and a prescribed form of graded exercise that might be harmful.* (# 013-03; emphasis added)

From the example, the writer used *you* as referring to the previously published text's author; thus, the writer of this piece of correspondence specifically identified the author of the previously published text as the source of the following information and further expresses agreement (cf. *as*) by summarily presenting the gist of the previous text. One interesting aspect of this kind of reader pronoun usage is that even though the present author wrote as if the messages were solely directed to the previous author in form (cf. *as you point out*), the text was in fact directed to the entire journal readership, including the previous author. This type of multiple aspects of readership is of particular significance in that the stance-marking did not involve a single party as the audience of the discourse.

(h). Shared Knowledge References

Shared knowledge references or appeals to shared knowledge constitute a good rhetorical strategy to strengthen the argument by showing that a feature at issue is a part of general knowledge, though the extent may vary from the knowledge of a small community to that of the public at large. It is exemplified in the following:

Example (10)

Of course, diversity alone is no panacea. (#015-10; emphasis added)

The excerpt above contains the expression *of course* as a shared knowledge reference marker. The writer deployed an explicit signal asking readers to regard something as familiar or accepted. This strategy may involve a simple first-order reference such as nomenclature of an entity (marked by *(also/widely) known as..*, etc.) or a higher-order reference such as a propositional content (marked by *of course*, etc.).

Reference to shared knowledge in the source data, however, was minimal, i.e., only eight tokens in the entire corpus, and that without showing any clear patterns. Furthermore, certain instances are not even clear as to their status as signals of shared knowledge unless their context is carefully examined. Therefore, it can be concluded, at least at the current level of understanding, that shared knowledge references are not a prominent feature of argumentative correspondences.

(i). Questions

There are no occurrences of questions in the experts' writing (see Table 3 above). It is not immediately clear if the underrepresentation of questions as an engagement marker is a genre-specific feature for scientific argumentative correspondences, but this should constitute a good topic for a cross-genre comparative investigation.

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C. Comparison of Students' and Experts' Writing

The third research question pertains to the degree of similarity between the experts' correspondences (original in *Nature*) and the students' correspondences after intervention. We will discuss a few notable aspects in the following.

(a). Similarities

At the global level, the two sets of correspondences show a high level of similarity, as a result of the students having attained noteworthy improvement through intervention, as noted in (A) above. With dramatic increase in richness in content (a three-fold increase of average lengths from 50.58 to 159.4 words), the students' post-intervention writing becomes similar to the experts' writing in *Nature*, i.e., 170 words. The average number of words in a sentence also increased (from 3.65 to 8.85 words), again close to that of experts' writing, i.e., 8.85 words.

A statistical analysis of the two sets of writings for distribution of stance and engagement markers is presented in Table 8, with the figures of raw token frequency and the per-thousand-word frequency (note that since the average text lengths of the two groups are different, the denominators for PTW for the two groups are also different).

TABLE 8
STANCE AND ENGAGEMENT MARKERS IN STUDENTS' AND EXPERTS' WRITING

Interactional features	Students		Experts	
	Token	PTW	Token	PTW
Stance				
Attitude markers	290	44.50	222	30.31
Boosters	158	24.24	172	23.48
Hedges	95	14.58	114	15.56
Self-mentions	59	9.05	109	14.88
Stance total	**602**	**92.37**	**617**	**84.23**
Engagement				
Directives	98	15.04	62	8.46
Reader pronouns	33	5.06	30	4.10
Shared knowledge references	2	0.31	8	1.09
Questions	1	0.15	0	0.00
Personal asides	0	0.00	38	5.19
Engagement total	**134**	**20.56**	**138**	**18.84**
Total	**736**	**112.93**	**755**	**103.07**

There are a few notable commonalities between the two groups shown in Table 8. Both the students and experts employ stance markers at a far greater proportion than engagement markers. In students' writing, stance markers are used more than four times as often as engagement markers (602 vs. 134), and this proportion is similar to the experts' writing (617 vs. 138). Again, in both groups, attitude markers, occurring 290 times in the students' writing and 222 times in the experts' writing, are the most frequently used one among stance markers. Among engagement markers, directives are most frequently used in the students' writing (98 tokens, 15.04 PTW) and the experts' writing (62 tokens, 8.46 PTW). A cursory look at Table 8 shows that, despite minor differences, e.g., personal asides (see (b) below), the overall patterns of the two sets of writing are remarkably similar.

(b). Differences

Behind apparent similarities are some noteworthy differences. Even though we have seen that attitude markers are the most frequently used rhetorical feature among all interactional devices in both groups of writing, a closer look reveals some differences in detail. Individual forms of attitude marking in the two sets of writing are shown in Table 9.

TABLE 9
ATTITUDE MARKERS USED IN STUDENTS' AND EXPERTS' WRITING

Rank	Students			Experts		
	Form	Token	PTW	Form	Token	PTW
1	*should*	50	7.67	*should*	21	2.87
2	*agree*	32	4.91	*need*	15	2.05
3	*must*	25	3.83	*must*	13	1.77
4	*important*	10	1.53	*concerned*	8	1.09
5	*would like/want*	8	1.22	*agree*	60	8.14
	Total	**125**	**19.16**		**117**	**15.92**

As shown in Table 9, the modal *should* occurs at a relatively high frequency in both groups, but their frequencies show a notable disparity, e.g., 7.67 vs. 2.87 PTW. In other words, the student writers tend to use *should* (and *must* as well) at a far greater frequency than the expert writers. On the other hand, the expert writers tend to use *agree* at the highest frequency, while they use other attitude markers at a considerably lower frequency. Since *should* and *must* are modals of deonticity (obligation), whereas *agree* is a verb with an affiliative and affirmative meaning, a semantically driven analysis within the same interactional functional categories warrants a future study.

Another area of notable differences is the use of hedges. The frequency of individual hedges in both sets of writing is given in Table 10.

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TABLE 10
HEDGES USED IN STUDENTS' AND EXPERTS' WRITING

Rank	Students			Experts		
	Form	Token	PTW	Form	Token	PTW
1	*In my view/opinion*	14	2.18	*could*	27	3.69
2	*some*	12	1.77	*would*	18	2.46
3	*I think*	6	0.92	*might*	12	1.63
4	*could*	5	0.76	*In my/our view*	11	1.50
5	*may*	3	0.46	*may*	5	0.68
	Total	**40**	**6.09**		**73**	**9.96**

Table 10 shows that student writers in general do not use hedges as productively as the expert writers do (6.09 vs. 9.96 PTW, about 63.5% gap). Furthermore, the expert writers favor subjunctive modals *could, would* and *might*, whereas the student writers favor more lexically determined markers, *in my view/opinion* and *some*. Since the hedging function associated with subjunctive modals is much subtler than the lexical markers, this aspect warrants a more fine-grained investigation in the future for pedagogical reasons.

Personal asides as an engagement marking device present a strong contrast between the student writers and expert writers. Personal asides are orthographically indicated by specialized punctuations such as em dashes, parentheses, and commas. Their occurrence patterns in the two groups are shown in Table 11.

TABLE 11
PERSONAL ASIDES USED IN STUDENTS' AND EXPERTS' WRITING

Rank		Students		Experts	
	Form	Token	PTW	Token	PTW
1	em dash	0	0	21	55.26
2	parentheses	0	0	16	42.11
3	comma	0	0	1	2.63
	Total	**0**	**0**	**38**	**100**

Unlike the expert writers, the student writers did not use personal asides as a rhetorical feature for engagement. As indicated in (B) above, personal asides are the devices Thai EFL students are not familiar, and its inclusion in instruction needs to be considered in the EFL program.

The final category of contrast is the markers of directives. Since directives belong to a pragmatically loaded speech acts, i.e., they are impositional on the addressee, their use needs to be carefully determined. The use of individual forms of directives in the two sets is shown in Table 12.

TABLE 12
DIRECTIVES USED IN STUDENTS' AND EXPERTS' WRITING

Rank	Students			Experts		
	Form	Token	PTW	Form	Token	PTW
1	*should*	50	7.67	*should*	21	2.86
2	*must*	25	3.83	*need*	15	2.05
3	Imperative	5	0.76	*must*	13	1.77
4	*have to*	4	0.61	Imperative	5	0.68
5	*require*	4	0.61	*It is therefore crucial to/for*	2	0.27
	Total	**88**	**13.48**		**56**	**7.63**

As shown in Table 12, *should* is the most frequently used directive marker in both groups. *Need* was the second most frequently used directive marker in experts' writing but did not surface in the top five of the students' directive markers. Overall, students used directives at a far greater frequency than the experts (13.48 vs. 7.63 PTW). This may be due to the fact that the use of directives in general needs discretion for their face-threatening potential. Therefore, students in ESP classes need to be properly instructed to exercise caution in using diverse devices of directives in writing.

V. CONCLUSION

Traditional approaches adopted in Thai ESP-Science classes do not provide sufficient training for students to be conversant with argumentative writing (Songsil et al., 2019). The pedagogical inefficiency, coupled with students' lack of knowledge of grammatical and rhetorical features, poses serious obstacles in learning various strategies necessitated in ESP argumentative writing (cf. Ka-kan-dee & Kaur, 2015). Given the background, this study explored the possibility and efficacy of an interventional writing course developed by means of authentic correspondence texts from the journal *Nature*.

On the whole, the student participants have attained a significant level of progress from a 10-week, 30-hour intervention, as evidenced by the comparison of the pre-intervention and post-intervention writing and further by the comparison of the post-intervention writing and the original authors' writing. The instruction in the intervention, based on the rhetorical features of academic writing as proposed in Hyland's (2005a, 2005b) model of interaction, has proven effective in an ESP course of relatively short duration. Since the present investigation was performed at a macro-level, our analysis of the interactional features, i.e., stance and engagement, does not cover the full range of what can be

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involved under interpersonality in academic texts at a micro-level. Such a fine-grained investigation merits future research.

Such limitations notwithstanding, the present study clearly lends support to implementing ESP-Science writing courses based on authentic texts, focusing on interactional features in academic writing. This study calls for further studies on interactional features in other genres and their application to relevant disciplines in ESP writing courses.

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