



A Comparison of Metadiscourse Markers Used in English Research Article Introduction and Literature Review Sections Across Two Disciplines

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Abstract

The purposes of this study were 1) to investigate the Metadiscourse Markers used in Humanities and Social Sciences English research articles published in Naresuan University (NU) Journals, 2) to investigate the Metadiscourse Markers used in Science and Technology English research articles published in NU Journals, and 3) to compare the Metadiscourse Markers used in English research articles between these two disciplines. In this study, Hyland's (2005a) Metadiscourse Markers (MDMs) model was the main framework employed, consisting of two major categories of MDMs, namely Interactive and Interactional categories. The Interactive category includes Transitions (TR), Frame Markers (FM), Endophoric Markers (ED), Evidential Markers (EV), and Code glosses (CD). The Interactional category includes Hedges (HE), Boosters (BO), Attitude Markers (AM), Engagement Markers (EM), and Self-mentions (SM). The data were a total of 40 datasets of written texts in the introduction and literature review sections published in NU Journals. 20 datasets were from Humanities and Social Sciences English research articles, and the other 20 datasets were from Science and Technology English research articles. They both were purposively selected from NU Journals between 2019 and 2022. The MDMs were collected and analyzed based on Hyland's (2005a) taxonomy of Metadiscourse. The findings revealed that both disciplinary authors tended to employ MDMs almost equally in research articles. However, when comparing the two types of MDMs, authors in the Science and Technology field employed Interactive MDMs more frequently, whereas authors in Humanities and Social Sciences used Interactional MDMs more often. These findings are relevant for the teaching of research writing, highlighting that academic authors should pay attention to the conventions of MDM usage in different disciplines.

Keywords: Metadiscourse Markers, Discourse Analysis, Academic Writing, Research Articles

Introduction

Academic writing is a necessary ability for EFL/ESL graduate students and new academics in various fields. This proficiency in academic writing is an essential skill for graduate students and emerging academics across diverse fields of study. Nonetheless, establishing robust rhetorical strategies in advanced academic community is one of major challenges for non-native English language writers. Based on Sajid and Siddiqui (2015), it is reported that many EFL students lack the necessary English language abilities, such as deficiencies in tenses, ambiguous or loose sentence construction, unparalleled sentence of construction, flaws in the surface and deep structure sentences, poor diction and expression, an inability to transform or rephrase texts, and errors in the use of pronouns and articles.

In research articles, presenting background information and related previous discoveries of the research topic is crucial for academic writers. These introductory parts serve as the key messages that gain readers' interests in the article and encourage them to continue reading until the conclusion. Therefore, it is necessary for the authors to provide a thorough understandings of the key terms used in the research. According to Bailey (2017), the introduction section of a research article provides an overview of the research topic, identifies the research problem or knowledge gap, and presents the theoretical framework or conceptual basis for the study. The literature review section demonstrates the researcher's understanding of the subject area and provides a comprehensive



background. It also aids in focusing the research boundary as well as formulating research hypotheses or approaches to research questions.

Nevertheless, evidence from past research indicates that non-native speakers tend to use discourse markers less frequently in academic writing. This leads to challenges in conveying essential information and necessary communication in both the introduction and literature review sections. Several studies and scholarly articles have highlighted this challenge. For example, Al-Rubaye (2015) stated that both EFL and ESL writers failed to employ various MDMs to express their attitudes clearly and engage their readers. Al-Rubaye investigated the effect of different environments (EFL versus ESL) as well as the effect of time on the development of writers' MDMs. In addition, Çapar and Turan (2020) investigated how Turkish non-native speakers and native speakers of English use MDMs in 50 research articles written by Turkish academic writers and 50 research articles written by American academic writers in the field of teaching a foreign language. The findings showed that American academic writers used significantly more Interactional MDMs in English research articles compared to Turkish academic writers.

According to Hyland (2008), different disciplines or fields of study have their own unique conventions, styles, and expectations. The use of MDMs, which are expressions that help writers guide readers through their text, can vary significantly across these academic disciplines depending on writers' convention of writing. This variation has been underscored by Cao and Hu (2014) who conducted a comparative analysis of MDMs in research articles across different disciplines and research paradigms. The findings revealed variations in the use of MDMs features across disciplines and identified that the use of MDMs is influenced by disciplinary conventions and the specific research paradigm employed. Birhan (2021) also confirms the variation features in an investigation of MDMs in book review articles of different journals in three disciplines. The finding revealed that some Interactive and Interactional markers were used more frequently than the other Interactive and Interactional devices. It was found that MDMs usage differences were observed among disciplines and journals. For soft science writers, MDMs were employed to connect with the readers and express writers' views. This suggests that book reviewers of English and Education may need to utilize more MDMs than their counterparts in computer science to enhance communication with their readers.

However, to our knowledge, there have not been any research studies analyzing the use of MDMs in English research articles in the introduction and literature review sections in the fields of Humanities and Social Sciences and Science and Technology together. Due to the limited number of comparative studies in these fields, this research aimed to analyze and compare the use of MDMs between these two disciplines. The introduction and literature review sections were chosen because they are the sections that provide essential background information as well as the context of the research to help readers understand the significance of the study and its relevance to the broader academic context. According to Swales (2004), the introduction section is one of the most crucial parts of the research articles as it directly communicates with the readers and requires the use of communication tools, namely MDMs. Moreover, the literature review section helps identify gaps, controversies, or inconsistencies in previous research, which can justify the need for the current study. Also, it aids in the formulation of research hypotheses or guiding research questions (Pautasso, 2013). Given the significant role of discourse features in academic writing, the researchers would like to analyze and compare the use of MDMs in English research articles' introduction and literature review sections published in Naresuan University (NU) Journals within these two distinct fields.



In this study, NU Journals was chosen because it publishes research and review articles across a variety of disciplines. The journal covers a wide range of subjects, including Health Sciences, Linguistics, Humanities, Arts, and more. Consequently, academics and researchers from various universities and countries prefer to publish their work in this journal. Importantly, the journal is open-access, allowing many people to access and read it for free.

The findings of this study will lead to more appropriate and effective writing for EFL and ESL writers who lack experience with MDMs as a tool in their academic writing. Importantly, academics and researchers who are interested in submitting research articles to the NU Journals will discover comprehensive insights into the use of MDMs in this study. Furthermore, scholars in the two fields can investigate differences in the use of MDMs to enhance the effectiveness of their academic writing.

Research Objectives

The researchers aimed to achieve the following goals:

1. To investigate the Metadiscourse Markers used in Humanities and Social Sciences English research articles published in Naresuan University Journals.
2. To investigate the Metadiscourse Markers used in Science and Technology English research articles published in Naresuan University Journals.
3. To compare the Metadiscourse Markers used in English research articles published in Naresuan University Journals between the Humanities and Social Sciences and Science and Technology.

Research Questions

1. What are the Metadiscourse Markers used in Humanities and Social Sciences English research articles published in Naresuan University Journals?
2. What are the Metadiscourse Markers used in Science and Technology English research articles published in Naresuan University Journals?
3. To what extent are the Metadiscourse Markers used in Humanities and Social Sciences and Science and Technology English research articles published in Naresuan University Journals different?

Literature Review

Metadiscourse Markers in Academic Writing

According to Hyland and Tse (2004), the concept of MDMs can be described as linguistic elements within a text that reflect the writer's self-awareness and refer to the text itself, as well as the writer and the imagined reader. In Hyland's (2005b), MDMs are linguistic devices used by writers to guide readers through the text, help them understand the writer's stance, and create a sense of interaction between the writer and the reader. MDMs play a crucial role in shaping the writer-reader relationship and facilitating the comprehension of complex academic texts. Hyland's (2005a) Taxonomy of MDMs is shown in Table 1 below, and it is the main analytical framework used in this present study.

**Table 1** Hyland's (2005a) Taxonomy of Metadiscourse Markers

Category	Function	Example
Interactive: Help to guide reader through the text.		
Transitions (TR)	express semantic relation between main clauses.	In addition, thus, but, and
Frame Markers (FM)	refer to discourse acts, sequences, or text stages.	Finally, to conclude, my purpose here is to
Endophoric Markers (ED)	refer to information in other parts of the text.	noted above, see figure, in section
Evidential Markers (EV)	refer to sources of information from other texts.	according to X/ (Y, 1990)/ Z states
Code Glosses (CD)	help readers grasp functions of ideational material.	such as, in other words, e.g.,
Interactional: involve the reader in the argument.		
Hedges (HE)	withhold writer's full commitment to proposition.	might, perhaps, possible, about
Boosters (BO)	emphasize force or writer's certainty in proposition.	in fact, definitely, it is clear that
Attitude Markers (AM)	express writer's attitude to proposition.	unfortunately, I agree, surprisingly
Engagement Markers (EM)	explicitly refer to or build relationship with reader.	consider, note that, you can see that
Self-mentions (SM)	explicitly refer to authors.	I, we, my, your

Source: Adapted from Hyland (2005a)

According to Table 1, Interactive MDMs serve as features that bring out an argument and explicitly identify the writer's preferred interpretations. These resources anticipate the reader's understanding of the text and represent the writer's judgment on what needs to be explicitly provided to facilitate the reader's understanding of the text. Interactional MDMs play a crucial role in engaging readers, conveying the author's perspective and attitude towards the information presented, and controlling the level of personal involvement in the text (Hyland, 2005a).

In addition, Hyland (2018) investigated MDMs function in writing and its impact on coherence and cohesion. There was an extensive review of MDMs and their significance in establishing coherence and cohesion for EFL authors. As a result, MDMs assist EFL writers in establishing coherence and cohesion in their writing. They lead readers through the text by indicating connections between concepts, offering structure, and making the text more structured and understandable. Even though EFL/ESL writers can write correctly, not all of them are able to create clear messages or effectively deliver their ideas to readers. As stated by Hyland (2005a), MDMs hold a significant role in the writing process for EFL/ESL authors. They contribute to the establishment of coherence, reader guidance, conveying perspective, and meeting the demands of academic writing. Hence, the use of MDMs in an effective manner that may overcome the limitations of NNS writers in producing scientific writing.

Linguists and researchers on MDMs present a variety of terms, definitions, and taxonomies. Each defined taxonomy or theory reveals its strengths and weaknesses. Ädel (2006); Crismore et al. (1993); Hyland (2005a); and Kopple (1985) were among the first who developed the taxonomy and boundaries of MDMs. The work of Hyland and Tse (2004) and Hyland (2005a) contributes to EFL/ESL understanding of Metadiscourse and its significance in academic writing. It provides valuable insights into how MDMs are employed by writers in order to shape their texts, engage readers, and convey their stance and attitude. Hyland (2005a) developed the MDMs model, and this model was adopted for this study. Two dimensions of MDMs were employed in this study, including Interactive and Interactional dimensions. Each has five categories. Interactive category includes Transitions (TR), Frame Markers (FM), Endophoric Markers (ED), Evidential Markers (EV), and Code glosses (CD). Interactional category includes Hedges (HE), Boosters (BO), Attitude Markers (AM), Engagement Markers (EM), and Self-mentions (SM).



Previous Studies

Several research studies have explored the use of MDMs in academic articles. Various usage patterns have been identified, based on different factors such as gender, whether writers are native or non-native speakers of English, the types of writing, and the specific academic disciplines. For instance, Khajavy et al. (2012) examined Interactive MDMs within the discussion sections of English and Persian sociological research articles from 2009. Their research involved analyzing 20 articles, with 10 in English from international journals and 10 in Persian from national journals. The findings indicated that English sociological research articles use more overall Interactive markers than Persian sociological research articles. Endophoric markers were the only subcategory in which Persian research articles appeared more frequently. Similarly, Alshahrani (2015), conducted a comparative study of Interactive MDMs in the academic writing of two groups: native speakers of English and native speakers of Arabic doctorate students working in the field of linguistics. The findings indicated that Arab writers' L1 interference influenced their view of the writer's role, and this reflected in their use of a limited number of Interactive MDMs. In contrast, native English writers employed a greater number of Interactive MDMs to assist the reader in navigating through the texts.

In a different context, Estaji and Vafaeimehr (2015) examined the differences in the use, type, and frequency of Interactional MDMs in the introduction and conclusion sections of research papers across the two disciplines of Mechanical and Electrical Engineering. 42 research articles from each of the two disciplines were randomly selected from two major international journals. A Chi-square analysis revealed that while there were minor variations in the frequency and type of MDMs, no statistically significant difference was found between the disciplines. This might be due to the close relationship between the fields. The findings of this study may have implications for ESP courses and writing research papers. More recently, Saraswati and Pasaribu (2019) conducted a study that focused on the analysis of Interactive and Interactional MDMs in journal articles within the humanities and science fields. The study also investigated whether there was a correlation between the gender of authors and the use of these markers. A qualitative corpus-based method was employed to analyze a total of 40 journal articles: 20 articles were written by male authors, and 20 were written by female authors. The findings indicated that in both fields, transition markers were used more frequently, whereas the least frequently used were endophoric markers in Interactive markers. Moreover, the most common Interactional markers were hedges, while the least frequently used were boosters. The researchers elaborated that male and female authors tended to use MDMs in the same way, suggesting that there is no straightforward relation between gender and the use of MDMs in journal articles.

As can be seen, there is a limited number of studies that specifically compare the use of MDMs in research articles across the two focused disciplines in this present study, namely, Humanities and Social Sciences and Sciences and Technology. Hence, the researcher aimed to explore how EFL writers use MDMs in these two different disciplines published in NU Journals, including the Journal of Community Development Research (JCDR) for Humanities and Social Sciences and the Naresuan University Journal of Science and Technology (NUJST).

Research Method

Data Source

The corpora datasets were constructed using purposive sampling. We selected 64 English research articles published in Naresuan University journals between 2019 and 2022. These datasets comprised 32 humanities and



social sciences English research articles and 32 science and technology English research articles. Specifically, we chose 20 articles from Thai authors and 12 from non-native authors. For each article, only the introduction and literature review sections were included, with a word count ranging from 750 to 1,000 words for each section, excluding tables, figures, symbols, and formulas. The authors' identities were kept confidential, and the results of this study were solely used for academic purposes. In the corpus of this study, the average word count for the introduction section in humanities and social sciences English research articles was approximately 26,304 words, while the literature review sections contained approximately 29,120 words, resulting in a total of 55,424 words. For the introduction section in science and technology English research articles, the word count averaged approximately 26,016 words, and the literature review sections contained approximately 29,440 words (55,456 words in total). In this study, the word count in the research writing data was required as the criterion for selecting articles. This was to ensure that the articles chosen had the similar number of words, preventing the way in which some articles employed MDMs more than others due to having the number of words.

Theoretical Framework

The main framework in this study was retrieved from Hyland's (2005a) taxonomy of MDMs as shown in Table 1. This model consists of two major categories of MDMs: Interactive and Interactional categories. The Interactive category includes Transitions (TR), Frame Markers (FM), Endophoric Markers (ED), Evidential Markers (EV), and Code glosses (CD). The main objective of these features is to provide an organized and coherent text that guides the reader through the text in the way that meets the reader's needs based on the writer's expectations. The Interactional category includes Hedges (HE), Boosters (BO), Attitude Markers (AM), Engagement Markers (EM), and Self-mentions (SM). The main objective of these features is to provide an imaginative text in which the reader can easily identify the writer's style. It also aims to develop a personal relationship with the reader by expressing the writer's reactions to the content.

Data Analysis

In this study, the MDMs were counted and classified into their groups based on the proposed categories. To conduct qualitative analysis in each research article, the collected data were carefully examined. The number of MDMs was counted and classified individually, word by word. Once the word count was complete, the total number of words was calculated using Excel to determine the frequency and percentage of each type. The researchers then reread and analyzed the articles again before having two inter-coders who evaluate them. This aimed to ensure that the analysis was accurate. To confirm the reliability of data coding and categorization, 10% of the data were analyzed by two inter-coders. The first coder was an expert in Applied Linguistics expert from the Faculty of Humanities, English Department, Naresuan University, and the second coder is an expert in Linguistics, Society & Culture, also from the Faculty of Humanities, English Department, Naresuan University. To achieve a high correlation between the researcher and the two inter-coders, the inter-coder reliability agreement of more than 80% was conducted, and the result indicated the high reliability of the data coding and categorization system of analysis. This process was conducted in order to ensure the reliability of the findings.

Results and Discussion

The results and discussion of this research are presented according to the three Research Questions (RQs) of this study. Table 2 below shows the results of the use of MDMs between these two disciplines of English research articles.

**Table 2** The Use of Metadiscourse Markers in Humanities and Social Sciences and Science and Technology

Category	Metadiscourse Markers	Humanities and Social Sciences (JCDR)		Science and Technology (NUJST)	
		Frequency	Percentage	Frequency	Percentage
Transitions (T)	Interactive				
	a) Addition				
	additionally	1	0.40	0	3.24
	also	19	7.66	8	2.43
	as well as	4	1.61	6	1.21
	besides	3	1.21	3	1.21
	further	6	2.42	3	2.02
	furthermore	8	3.23	5	3.64
	in addition	9	3.63	9	2.43
	moreover	14	5.65	6	0.81
	b) Comparison				
	although	1	0.40	2	0.40
	conversely	0	0	1	0.40
	even though	2	0.81	1	6.48
	however	15	6.05	16	0.81
	likewise	1	0.40	2	1.62
	on the other hand,	0	0	4	0
	similarly	2	0.81	0	0
	whereas	1	0.40	0	3.24
	c) Consequence				
	as a result	4	1.61	6	2.43
	because	1	0.40	4	1.62
	consequently	7	2.82	2	0.81
	correspondingly	0	0	1	0.40
	hence	4	1.61	2	0.81
	in consequence	1	0.40	0	0
	nevertheless	5	2.02	1	0.40
	nonetheless	0	0	1	0.40
	since	7	2.82	2	0.81
	so	5	2.02	1	0.40
	therefore	14	5.65	17	6.88
	thus	2	0.81	7	2.83
Total		136	54.84	110	44.53



Table 2 (Cont.)

Category	Metadiscourse Markers	Humanities and Social Sciences (JCDR)		Science and Technology (NUJST)		
		Frequency	Percentage	Frequency	Percentage	
		Interactive				
Frame Markers (Fm)	a) Sequencing	first	3	1.21	2	0.81
		firstly	0	0	1	0.40
		finally,	1	0.40	0	0
		last	1	0.40	0	0
		lastly	2	0.81	0	0
		next	1	0.40	0	0
		second	1	0.40	1	0.40
		subsequently	2	0.81	0	0
	b) Label States	so far	1	0.40	2	0.81
		aim	7	2.82	7	2.83
	c) Announce Goals	decided to	1	0.40	0	0
		focus on	8	3.23	5	2.02
		interested in	2	0.81	3	1.21
		objective	0	0	8	3.24
		purpose	0	0	4	1.62
	d) Shift Topic					
	Total		30	12.10	33	13.36
Endophoric Markers (En)	x above	3	1.21	4	1.62	
	for section x	1	0.40	0	0	
Total		4	1.61	4	1.62	
Evidential Markers (Ev)	according to	13	5.24	5	2.02	
	explained	1	0.40	2	0.81	
	defined	2	0.81	3	1.21	
	discussed	0	0	2	0.81	
	found that	5	2.02	5	2.02	
	highlighted	2	0.81	0	0	
	mentioned	2	0.81	0	0	
	presented	1	0.40	5	2.02	
	proposed	1	0.40	5	2.02	
	reported	1	0.40	6	2.43	
	researched	3	1.21	0	0	
	revealed	6	2.42	2	0.81	
	show that	0	0	4	1.62	
	stated that	2	0.81	0	0	
	studied	4	1.61	1	0.40	
	supported	2	0.81	0	0	
	Total		45	18.15	40	16.19



Table 2 (Cont.)

Category	Metadiscourse Markers	Humanities and Social Sciences (JCDR)		Science and Technology (NUJST)		
		Frequency	Percentage	Frequency	Percentage	
		Interactive				
Code Glosses (Co)	called	0	0	6	2.43	
	defined as	1	0.40	1	0.40	
	e.g.,	1	0.40	0	0	
	for example	1	0.40	6	2.43	
	for instance	3	1.21	1	0.40	
	known as	6	2.42	5	2.02	
	namely	2	0.81	0	0	
	refer to	1	0.40	0	0	
	such as	17	6.85	41	16.60	
	via	1	0.40	0	0	
Total		33	13.31	60	24.29	
Total		248	100	247	100	
Interactional						
a) Epistemic Verbs	appear	1	0.54	0	0	
	indicate	4	2.16	2	1.38	
	can	0	0	1	0.69	
	could	2	1.08	3	2.07	
	may	16	8.65	9	6.21	
	might	0	0	1	0.69	
	suggest	2	1.08	2	1.38	
	tend to	0	0	3	2.07	
	about	0	0	6	4.14	
	almost	0	0	1	0.69	
Hedges (H)	approximately	2	1.08	3	2.07	
	around	3	1.62	1	0.69	
	frequency	0	0	2	1.38	
	generally	2	1.08	0	0	
	b) Probability Adverbs	likely	5	2.70	1	0.69
		mainly	2	1.08	2	1.38
		mostly	3	1.62	3	2.07
		often	4	2.16	4	2.76
		nearly	2	1.08	0	0
		never	1	0.54	0	0
relatively		1	0.54	1	0.69	
c) Epistemic Expressions		most	21	11.35	17	11.72
		probable	0	0	1	0.69
		possible	0	0	2	1.38
Total		71	38.38	65	44.83	



Table 2 (Cont.)

Category	Metadiscourse Markers	Humanities and Social Sciences (JCDR)		Science and Technology (NUJST)			
		Frequency	Percentage	Frequency	Percentage		
		Interactional					
Boosters (Bo)	a) Intensifier Verbs	found	13	7.03	14	9.66	
		know	1	0.54	3	2.07	
		show	2	1.08	6	4.14	
	b) Intensifier Adverbs	always	4	2.16	1	0.69	
		clearly	1	0.54	0	0	
		completely	2	1.08	0	0	
		concretely	4	2.16	0	0	
		in fact	0	0	1	0.69	
		never	1	0.54	0	0	
		obviously	1	0.54	0	0	
		partially	1	0.54	0	0	
		scarcely	2	1.08	0	0	
		c) Intensifier Adjectives					
		Total		32	17.30	25	17.24
Attitude Markers (Am)	a) Attitude Verbs	expect	0	0	1	0.69	
		appropriately	0	0	1	0.69	
		especially	10	5.41	10	6.90	
		even x	2	1.08	1	0.69	
		importantly	1	0.54	1	0.69	
	b) Attitudinal Adverbs	interestingly	0	0	1	0.69	
		particularly	0	0	1	0.69	
		significantly	3	1.62	4	2.76	
		unfortunately	0	0	2	1.38	
		usually	1	0.54	3	2.07	
	c) Attitudinal Adjectives	appropriate	0	0	1	0.69	
		better	1	0.54	0	0	
		essential	1	0.54	0	0	
		important	14	7.57	13	8.97	
		creative	1	0.54	0	0	
		good	2	1.08	4	2.76	
		significant	4	2.16	5	3.45	
		Total		40	21.62	48	33.10
Engagement Markers (Em)	a) Reader Pronoun						
	b) Interjection						
	c) Directive Imperatives	key	5	2.70	1	0.69	
		note that	2	1.08	0	0	
	d) Obligation Modals	must	4	2.16	0	0	
		should	12	6.49	2	1.38	
		would	0	0	1	0.69	
Total		23	12.43	4	2.76		



Table 2 (Cont.)

Category	Metadiscourse Markers	Humanities and Social Sciences (JCDR)		Science and Technology (NUJST)	
		Frequency	Percentage	Frequency	Percentage
Interactional					
Self-mentions (Sm)	the author	3	1.62	1	0.69
	the researcher	12	6.49	1	0.69
	our	4	2.16	1	0.69
Total		19	10.27	3	2.07
Total		185	100.00	145	100

Note: F = Frequency; P = Percentage

RQ1: What are the Metadiscourse Markers used in Humanities and Social Sciences English research articles published in Naresuan University Journals?

According to Table 2, the results indicate that in English articles within the field of Humanities and Social Sciences, Interactive markers (248 instances) were employed more frequently and with a greater variety of words compared to Interactional markers (185 instances). This result suggests that writers in the Humanities and Social Sciences may be slightly more adept at using and familiar with Interactive category markers compared to Interactional category markers. The study by Nur et al. (2021) reveals that Indonesian authors in Applied Linguistics prioritize the use of Interactive MDMs over Interactional MDMs in both local and international English medium journals. Unlike some authors writing in a second or foreign language, Indonesian authors consider Interactive MDMs significantly more important than Interactional MDMs in their research article abstracts. This preference may stem from their focus on enhancing text readability rather than actively engaging prospective readers in their texts. As seen in Table 2, the results indicate that, among the five categories of Interactive markers, the most frequently used markers were Transitions (136 instances, or 54.84%), Evidential Markers (45 instances, or 18.15%), Code glosses (33 instances, or 13.31%), Frame Markers (30 instances, or 12.10%), and Endophoric Markers (4 instances, or 1.61%), respectively. Furthermore, among the five categories of Interactional markers, the most frequent ones were Hedges (71 instances, or 38.38%), Attitude Markers (40 instances, or 21.62%), Boosters (32 instances, or 17.30%), Engagement Markers (23 instances, or 12.43%), and Self-mentions (19 instances, or 10.27%), respectively. A similar finding was also found in Saraswati and Pasaribu (2019) who analyzed MDMs in 20 Humanities and 20 Sciences journal articles, and the result showed that the most frequently used in Humanity journal articles were Transitions (45.85%) and Hedges (22.1%).

RQ2: What are the Metadiscourse Markers used in Science and Technology English research articles published in Naresuan University Journals?

In Science and Technology English research articles, as can be seen in Table 2, it was found that, Interactive markers were used more frequently (247 instances) with a greater variety of words than Interactional category markers (145 instances). The findings show that among the five categories of Interactive markers, the most frequent ones were Transitions (110 instances, or 44.53%), Code glosses (60 instances, or 24.29%), Evidential Markers (40 instances, or 16.19%), Frame Markers (33 instances, or 13.36%), and Endophoric Markers (4 instances, or 1.62%), respectively. In addition, among the five categories of Interactional markers, the most frequently used markers were Hedges (65 instances, or 44.83%), Attitude Markers (48 instances, or 33.10%), Boosters (25 instances, or 17.24%), Engagement Markers (4 instances, or 2.76%), and Self-mentions



(3 instances, or 2.07%), respectively. Significantly, in Science and Technology English research articles, authors often did not refer to themselves and the readers in their research articles, as seen in the categories Engagement Markers and Self-mentions. The results indicate that authors in Science and Technology are more likely to use basic words and categories such as Transitions and Hedges. This suggests that Science and Technology authors should consider incorporating other MDMs apart from Transitions and Hedges to introduce greater variety in their usage.

RQ3: To what extent are the Metadiscourse Markers used in Humanities and Social Sciences and Science and Technology English research articles published in Naresuan University Journals different?

Based on the indicated results, Interactive MDMs were more frequently used in Humanities and Social Sciences, specifically Transitions (136 instances, or 54.84%), Evidential Markers (45 instances, or 18.15%), Code glosses (33 instances, or 13.31%), Frame Markers (30 instances, or 12.10%), and Endophoric Markers (4 instances, or 1.61%). In Science and Technology, the most frequent Interactive MDMs were Transitions (110 instances, or 44.53%), Code glosses (60 instances, or 24.29%), Evidential Markers (40 instances, or 16.19%), Frame Markers (33 instances, or 13.36%), and Endophoric Markers (4 instances, or 1.62%), as shown in Table 2.

Furthermore, the most frequent markers of Interactional MDMs in Humanities and Social Sciences were Hedges (71 instances, or 38.38%), Attitude Markers (40 instances, or 21.62%), Boosters (32 instances, or 17.30%), Engagement Markers (23 instances, or 12.43%), and Self-mentions (19 instances, or 10.27%). In Science and Technology, the predominant Interactional MDMs were Hedges (65 instances, or 44.83%), Attitude Markers (48 instances, or 33.10%), Boosters (25 instances, or 17.24%), Engagement Markers (4 instances, or 2.76%), and Self-mentions (3 instances, or 2.07%).

According to Table 2, in both fields, Interactive MDMs are used more frequently, most commonly with a greater variety of words than Interactional MDMs in Humanities and Social Sciences research articles (Interactive 248 instances, Interactional 185 instances), compared to Science and Technology English research articles (Interactive 247 instances, Interactional 145 instances). This might be because Interactive MDMs consist of familiar and commonly used words, making them easier to use in writing. In contrast, Interactional MDMs aim to convey the writer's opinions and viewpoints in the writing. This may be the reason why some writers are not proficient in using Interactional MDMs. These findings align with the study by Pooresfahani et al. (2012), indicating patterns of Interactive and Interactional discursual features in Applied Linguistics and Engineering. In both fields, writers tended to use Interactive MDMs more frequently than Interactional ones.

Moreover, in these two fields, there are clearly different effects on the use of self-mentions. In Humanities and Social Sciences, there are 19 instances, while in Science and Technology, there are only 3 instances, which is a significantly different number. As Grogan (2021) stated, writing is an integral part of science at every stage; it is how we outline a project idea, communicate with collaborators, synthesize our insights into a manuscript, and share science beyond academia. However, when training students to be scientists, there is often an exclusive focus on the scientific method and the process of data collection. From this result, it can be inferred that writers in Science and Technology rarely mention themselves or other researchers in their academic writing.

Interestingly, both Humanities and Social Sciences and Science and Technology writers employed the same number of instances of the category Endophoric Markers in Interactive Categories (4 instances). Furthermore, the use of Interactive MDMs in Humanities and Social Sciences was most commonly related to the word "also" (19 instances, or 7.66%) in the category Transitions. On the other hand, the use of Interactional MDMs in Science

and Technology was most frequently indicated by the word “such as” (41 instances, or 16.60%) in the category Code glosses. Additionally, the use of Interactional MDMs in Humanities and Social Sciences was most commonly related to the word “most” (21 instances, or 11.35%) in the category Hedges. Similarly, the use of Interactional MDMs in Science and Technology was most frequently indicated by the word “most” (17 instances, or 11.72%) in the category Hedges. It indicated that in both fields, they are likely to use the terms “also”, “such as”, and “most” more frequently because they are common words and simple to use.

Based on the findings, this study suggests that research writers in both disciplines should incorporate a greater variety of words and categories when using MDMs in the introduction and literature review sections. Hyland (2018) notes that these two sections are among the most critical parts of a research article since they establish readers’ interest and introduce the fundamental principles of the research. Therefore, research article writers should embrace a broader range of MDMs. This allows writers to successfully express their ideas and engage readers by increasing interaction between writers and readers.

Conclusion, Limitations, and Recommendations

The present study aimed at investigating the differences between Humanities and Social Sciences and Science and Technology articles in the use of Interactive and Interactional MDMs based on Hyland’s (2005a) taxonomy of MDMs in the introduction and literature review sections of 40 English research articles published in Naresuan University (NU) Journals between 2019 and 2022. According to the findings, the research authors of Humanities and Social Sciences used Interactive category markers more frequently and with a greater variety of words than Interactional category markers. For Science and Technology authors, Interactive category markers were employed more frequently and with a greater variety of words than Interactional category markers. Overall, each group of authors applied Interactive Markers more than Interactional Markers.

There were certain limitations apparent in this study that future research could address. The corpus was confined to a small number of research articles, with a focus solely on the introduction and literature review sections (i.e., 20 articles from each discipline). Future research should collect more data in the discussion and/or the entire research section, as well as across other journals so that the results are more diverse. Despite the limited data, this work can demonstrate differences in the utilization of MDMs across the two different disciplines. Nonetheless, it is advisable that more comprehensive investigations into the application of MDMs be undertaken, potentially incorporating qualitative data from authors, which would better serve the research objectives.

The findings from this research can contribute to academic writing as they underscore the significance of discipline-oriented MDMs. The use of MDMs should be explicitly taught to help academics and research writers effectively communicate their ideas and engage with scholarly discourses in their chosen discipline. By using discipline-oriented MDMs, writers can convey their understanding of the subject matter, engage with existing research, and express their own perspective in a way that is relevant and meaningful to readers in that discipline.

For those who are preparing their manuscripts for publication submission, the findings imply that writers in these two disciplines pay more attention to the use of MDMs in the introduction and literature review sections as MDMs serve as the basis for comprehension of the article essence as well as facilitating connection between the authors and the readers. Effective use of MDMs would enhance better understanding of the research articles’ objectives and propositions of the study. In each discipline, the variety of different discourse markers appear to



exist, underscoring the need for research articles authors to acknowledge and adhere to the established conventions in academic articles.

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