

Transitions and Hedges: the Preferred Metadiscourse Markers in Research Articles across English Varieties and Disciplines

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Received: November 8, 2024

Revised: December 13, 2024

Accepted: December 20, 2024

Abstract

This study examines the use of metadiscourse markers (MDMs) in the Results, Discussion, and Conclusion sections of Research Articles (RAs) across social sciences, linguistics, and business disciplines in Philippine English, American English, and Chinese English. Analyzing 90 electronic RAs using Yang and Allison's (2003) model for moves and steps and Hyland's (2005) model for MDMs with AntConc software, the study found that transitional markers were the most common interactive markers, while hedges were the most frequent interactional markers. Significant differences in MDM usage were observed across disciplines and English varieties, with social science authors and Philippine English RAs showing higher MDM usage. Interactional MDMs varied: Chinese English authors preferred boosters (e.g., always, definitely) and hedges (e.g., could, perhaps) in social sciences, Philippine English authors in linguistics, and American English authors in business. Our study on metadiscourse markers provides cross-cultural insights, reveals disciplinary variations, compares MDM usage across English varieties, and informs targeted academic writing instruction to enhance communication in diverse settings.

Keywords: metadiscourse markers, interactive markers, cross-disciplinary MDMs, interactional markers, linguistic variations

Introduction

Functions of Metadiscourse

Because metadiscourse functions as a key pragmatic tool that enables writers to engage effectively with their audience, it has been accorded a pivotal role in discourse (Hyland, 2004). This perspective views discourse as a social interaction and illustrates the dynamic relationship between writers and readers within a text. Metadiscourse demonstrates how writers or speakers utilize language thoughtfully to

aid their audience in processing and understanding the content (Hyland, 2017). In addition, it functions as a filter designed for recipients, which allows writers to convey their messages in a manner intended for optimal comprehension.

According to Hyland (2017), metadiscourse facilitates the understanding of propositional content, which can be denied, regretted, affirmed, doubted, or qualified. Rather than focusing on the subject matter, it comprises elements that organize and assess the text (Crismore et al., 1993). In other words, metadiscourse helps in interpreting, organizing, and assessing the propositions presented in the text (Crismore et al., 1993; Vande Kopple, 1985). In addition, it provides a pathway for authors to engage with the discourse, either implicitly or explicitly, guiding readers in comprehending the text. Moreover, metadiscourse reflects metacognition, which guides thought processes through language, helping readers understand the link between language choices and social contexts. Other than offering cultural theorizing for the differences in metadiscourse use that are specific to different cultures and languages, metadiscourse should be viewed as a reflection of metacognitive processes of writers (Gai & Wang, 2022).

Empirical Underpinnings of Metadiscourse

Due to the high value placed on metadiscourse in academic writing, it has garnered significant attention in research (Ashofteh et al., 2020; Wei, 2024a). Consequently, investigations into metadiscourse have spanned various fields and languages, demonstrating that its application differs based on disciplinary norms and linguistic settings (Khedri et al., 2013; Sun, 2024). Researchers have employed diverse methods including discourse analysis, corpus linguistics (Birhan, 2021; Ren & Wang, 2023), and genre analysis (Bellés-Fortuño et al., 2023) to explore these dimensions. Comprehensive reviews have evaluated numerous empirical studies, indicating that the majority of research employs cross-sectional descriptive corpus-based methods, frequently utilizing Hyland's interpersonal model (Pearson & Abdollahzadeh, 2023). Research has predominantly concentrated on different types of texts with a strong focus on English-language corpora (Pearson & Abdollahzadeh, 2023). Metadiscourse analysis has also been useful in second language writing. It has aided ESL authors in enhancing coherence and effectiveness (Zali et al., 2023). The skillful use of metadiscourse is viewed as a hallmark of proficient writing, as it enables authors to manage their presence in texts and present trustworthy depictions of themselves and their concepts (Wei et al., 2016).

Researchers have concentrated on examining the functions of MDMs in research article writing from a cross-disciplinary viewpoint (Hyland & Jiang, 2018; Jin & Shang, 2016). One of the most significant of these is Hyland and Jiang's (2018) work that investigated the evolution of metadiscourse in the last 50 years in various disciplinary contexts. By building on their diachronic research, which analyzed 2.2 million-word corpora, extracted from research papers in various fields, they noted a notable rise in interactive resources and a decrease in interactional features. They found that there was a pronounced decline in interactional metadiscourse in soft knowledge areas and a considerable rise in scientific subjects.

The examination of MDMs in textbooks and RAs in biology, marketing, and applied linguistics has yielded intriguing insights. Hyland (1999) highlighted that Applied linguistics RAs prominently utilized relational markers and evidentials. In biology papers, writers prioritized hedges, while marketing material used endophorics and evidentials less frequently. Interestingly, biology showed more diversity in the use of MDM across different genres and fields, whereas applied linguistics and marketing maintained consistent MDM use (Hyland, 1999). Also, Jin and Shang (2016), utilizing Hyland's (2005) metadiscourse model, explored metadiscourse in English abstracts of Bachelor of Arts theses in the fields of material science, applied linguistics, and electronic engineering. Their results indicated a preference for interactive metadiscourse items over interactional ones among abstract writers. Scholars assert that MDM usage varies across different sections of academic articles.

Other investigations focused on MDM's distribution in the different RA sections in various academic disciplines. Cao and Hu (2014)'s investigation focused on 120 RAs in various fields, examining the differences in MDM use within methods sections. Likewise, Liu and Buckingham's (2018) study noted meaningful variations in MDM distribution within discussion sections. Gustilo et al. (2021) examined 300 abstracts from business, applied linguistics, medicine, and engineering. Transition markers emerged as the prevalent interactive markers, while engagement markers and hedges were favored as interactional markers. These findings underscore the role of MDMs in aligning with discourse community expectations as tools for impression management.

One of the most recent studies that is related to our study and one that proves cross-disciplinary variations in the use of metadiscourse is the study of Wongsu et al., (2024). This study analyzed and compared metadiscourse markers in English research articles from the humanities and social sciences with those in science and technology articles published in Naresuan University Journals using Hyland's 2005 model. Data included 40 datasets from introductions and literature reviews, with 20 from each discipline. The analysis showed both disciplines used MDMs similarly, but Science and Technology authors favored Interactive MDMs, while Humanities and Social Sciences authors preferred Interactional MDMs. These findings emphasize the importance of understanding MDM conventions across academic fields.

While previous discussions focused on cross-disciplinary metadiscourse investigations, some studies have explored MDM patterns across disciplines and English varieties. Blagojevic (2004) studied the use of metadiscourse by Norwegian bilingual writers in sociology, psychology, and philosophy RAs. The study suggested that disciplinary practices influence MDM variations more than language. Regardless of linguistic background, psychology writers showed reluctance in straightforward proposition statements and used attitude markers sparingly. Psychology authors displayed the greatest level of uniformity, whereas philosophy writers exhibited a variety of writing styles. Writers from the field of sociology occupied a middle ground between these extremes.

Research Objectives

Research on metadiscourse across disciplines has been extensively conducted, particularly within linguistics, physical sciences, natural sciences, and social sciences (Zarei & Mansoori, 2011). However, studies in the business domain remain limited (Hyland & Tse, 2004). Hence, to contribute to the dearth of research in this field, this paper seeks to address this gap by including business in our inquiry. Additionally, this present investigation focuses on the RDC structures of RAs, as the specific function of MDMs within micro-moves and steps of these sections remains underexplored. To achieve this, we answered the following research questions:

1. How are the interactional MDMs utilized in each move and step across RDC sections in various disciplines (business, medicine, and applied linguistics) and English varieties (American, Philippine, and Chinese Englishes)?
2. How are the interactive MDMs utilized in each move and step across RDC sections in various disciplines (business, medicine, and applied linguistics) and English varieties (American, Philippine, and Chinese Englishes)?

Analytical Frameworks

Our analysis was aided by Hyland's (2005) metadiscourse model alongside the move-step analytic model for RAs by Yang and Allison (2003). Yang and Allison's model guided us in identifying the moves and steps, while Hyland's model guided us in locating the MDMs present in the moves and steps in the RDC sections, as well as any other sections following the Results in RAs. Hyland's model includes interactional and interactive categories, both essential for guiding readers and engaging them with the text. Interactive metadiscourse organizes discourse through elements like transitions (for example, however and therefore), evidentials (such as according to), frame markers (such as first, in conclusion), endophoric markers (for example, as mentioned above) and code glosses (like namely, such as), helping readers follow arguments and understand text structure. Interactional metadiscourse, on the other hand, engages the writer and reader through self-mentions (such as I or we), hedges (such as might or perhaps), boosters (like clearly and indeed), attitude markers (for example, unfortunately and surprisingly), and engagement markers (such as consider or note that). These markers allow a connection with readers and express the writer's stance. Together, these metadiscourse types improve text clarity, coherence, and persuasiveness by managing information flow and enhancing reader involvement.

The study utilized the framework of Yang and Allison's (2003) to effectively analyze the distinct components of the RDC sections in RAs. This framework, developed through an extensive examination of RAs in applied linguistics, includes seven specific moves and ten detailed steps. For more information on these moves, steps, and the coding methodology, please refer to the methods section.

Research Methodology

Dataset

Our research utilizes a methodology grounded in corpus analysis to examine the utilization of metadiscourse in RDC's moves and steps across three chosen disciplines and varieties of English. Our dataset comprises ninety electronic RAs published between 2014 and 2018 in American, Chinese, and Philippine Englishes, across social sciences, linguistics, and business disciplines. These articles were sourced from reputable, peer-reviewed journals.

We carefully analyzed the authors' bio-profiles in the RAs, checked the information on their webpages, and sent emails to confirm their nationalities for accuracy. Each discipline includes 10 RAs per English variety, resulting in 30 RAs for each English variety. For consistency, each RA was limited to a maximum of 15,000 words. Out total dataset is composed of 672,379 words.

Data Analysis

In the initial stage of analysis, the process involved separating the moves and steps in the RDC sections, following the framework established by Yang and Allison (2003). Two independent coders conducted this analysis to ensure reliability in the coding process. Next, the process involved identifying the metadiscourse resources used by research article (RA) writers within specific moves and steps, guided by Hyland's (2005) framework. We utilized Hyland's categorization of interactive and interactional MDMs, conducting searches with the concordance software AntConc, developed by Anthony in 2011. The electronic research articles (RAs) were imported into AntConc, creating a searchable corpus for each discipline and English variety. Using Hyland's categorization of interactive and interactional MDMs, specific search queries were constructed. These queries included keywords and phrases representing different types of MDMs. AntConc generated concordance lines for each search query, displaying instances of the MDMs within their textual context. This allowed for the examination of how MDMs were used in different sections of the RAs. In order to ensure the comparability of results, the raw frequencies of metadiscourse markers (MDMs) were normalized to 1,000 words. Normalization adjusts the raw frequency counts of metadiscourse markers (MDMs) to a common scale, allowing for fair comparisons across texts of different lengths. We calculated the occurrences of each MDM per 1,000 words by dividing the raw frequency by the total word count of the corpus section and multiplying the result by 1,000. To determine significant differences, we utilized the Log-likelihood test.

Below are the microstructures of RDCs and the codes used in coding them using the model of Yang and Allison (2003).

M1	Move 1 - Background Information
M2	Move 2 - Reporting results
M3	Move 3 - Summarizing results
M4	Move 4 - Commenting on results
M4S1	Step 1- Interpreting results
M4S2	Step 2- Comparing results with literature
M4S3	Step 3. Accounting for results
M4S4	Step 4. Evaluating results
M5	Move 5 - Summarizing the Study

M6	Move 6 - Evaluating the Study
M6S1	Step 1. Indicating limitation
M6S2	Step 2. Indicating significance/advantage
M6S3	Step 3. Evaluating methodology
M7	Move 7 - Deductions from research
M7S1	Step 1. Making suggestions
M7S2	Step 2. Recommending further research
M7S3	Step 3. Drawing pedagogic implication

Research Results and Discussion

Interactive Metadiscourse for RDC Across Disciplines and Englishes

Playing a crucial role in conveying ideas, interactive MDMs ensure that information is both convincing and coherent. In the context of RDC sections of RAs, these markers are strategically used across various disciplines and English varieties to enhance comprehension. Below is a summary of our top findings:

- In the initial move, which provides background information, data from Tables 1, 2, and 3 indicate that writers frequently employ transition markers. These markers are essential as they help readers interpret connections between ideas, particularly when presenting study backgrounds before discussing results. Notably, American writers utilized all MDM categories more than five times (exceeding a normalized value of 0.7) across all disciplines, with the exception of endophoric markers in business.

- During the second move, where results are reported, nearly all interactive MDM categories are employed across different Englishes. Transition markers (e.g., *in addition*, *moreover*), frame markers (e.g., *finally*, *to conclude*), code glosses (e.g., *namely*, *such as*), and endophoric markers (e.g., *here*, *these*) are predominantly used across disciplines, except in Chinese linguistic research.

- The third move, which involves summarizing results, prominently features frame markers in linguistics across Englishes and transition markers in both business and linguistics. These markers are vital for sequencing materials and signaling text boundaries during summaries.

- Move 4 has four steps:

Step 1: Interpretation of Results

In both American and Chinese academic writing, code glosses are widely employed across various disciplines, while Philippine English frequently uses them in business and social sciences in this rhetorical section. Transition markers are common among writers across all varieties of English and fields of study. These include adverbial phrases and coordinating conjunctions, which help readers grasp the author's subjective interpretations of the results. These elements facilitate the addition of information, rephrasing, and elaboration.

Step 2: Comparison of Results

Authors frequently utilize transition markers, code glosses, and evidentials to compare results with previous findings. Transition markers connect ideas, code glosses elaborate content, and evidentials support findings with literature.

Steps 3 and 4: Accounting and Evaluating Results

Steps 3 and 4 involve accounting and evaluating results. Chinese RAs utilize transition markers for business purposes in both steps and for social sciences only in

Step 3. Philippine and American RAs also commonly use transition markers, except when evaluating results in social sciences. Philippine RAs also prefer frame markers, but they seldom use evidentials (e.g., *according to*) and endophoric markers (e.g., *here, these*) in social science texts.

- Transition markers (e.g., *in addition, also*) are a key feature in Move 5 for writers summarizing their results and the entire study across various disciplines. However, Chinese and Philippine RAs in linguistics tend to avoid these markers. This usage highlights the importance of ensuring that readers can follow the logical progression of ideas. In Philippine and American English RAs, code glosses are frequently used to elaborate summaries in business and social sciences. In contrast, Chinese English predominantly employs them within social sciences.

- RA writers acknowledge the limitations, emphasize the advantages of their study, and evaluate their methods in move 6. In this move, they predominantly use transition markers as their preferred interactive markers across various disciplines. This choice underscores their dedication to guiding readers in comprehending these elements. Notably, American and Philippine English writers frequently employed code glosses (e.g., *such as*) to clarify study limitations, although other interactive resources were less commonly used.

- In Move 7, authors present their deductions from the research. Here, there is a noticeable reliance on both code glosses and transition markers compared to other metadiscourse markers (MDMs). Transition markers are consistently used across all English varieties. Code glosses play a crucial role in helping authors elucidate their deductions by offering examples and alternatives.

A closer examination of MDM usage patterns in the RDC sections, as illustrated in Table 4, reveals that transition markers are the highly frequent interactive markers across different moves, particularly within the social sciences. Philippine English stands out for employing the most interactive markers, with adverbial clauses and conjunctions being the predominant transitional markers. This observation aligns with Abdi's (2010) findings regarding social sciences articles.

RA writers restate and emphasize their claims using transition markers and code glosses to assist their readers' comprehension of the text. In addition, frame markers are instrumental in guiding the logical flow of information. Social Science RAs demonstrate the highest usage of interactive metadiscourse, especially transition devices, corroborating Taboada's (2006) and Hyland's (2005) results about the necessity of transitional signposts and frame markers.

Across English varieties, Philippine English was found to have been the most frequent user of interactive markers, especially the transition markers. This finding contrasts with Zhu and Gocheco's (2014) observations on Chinese writers, who adhere to a reader-responsible writing tradition. In such cultures, readers are expected to independently extract meaning (Hinds, 1987; Noor, 2001). However, Philippine English writers assume this responsibility themselves, ensuring reader comprehension through the strategic use of MDMs.

Table 1
Distribution of Interactive Resources in Philippine English RAs

Philippines																					
M1		M2		M3		M4				M5		M6			M7						
	O		O	M3	O	S1	S2	S3	S4	O		O	S1	S2	S3	O	S1	S2	S3	O	
Markers																					
Code Glosses																					
Bus	1.51	0	9.334	0	0.41	0	5.49	2.75	0.55	0.55	0	2.059	0	0	0.412	0	0	0.137	0.686	1.922	0
Lin	3.533	0	16.25	0	0.42	0	0	5.65	1.27	0.28	0	0	1.696	0.141	1.413	0.707	0	0	0.848	2.685	0
Soc	0.637	0.764	23.19	0	0.13	0	11.1	3.06	0.38	0.13	0	1.147	0	0.637	1.019	0.637	0	0	0	0	0
Endophoric Markers																					
Bus	0.275	0	6.451	0	0.14	0	0.69	0	0	0	0	0	0	0	0	0	0	0	0	0.137	0
Lin	0.989	0	9.751	0	0.14	0	0.42	0.42	0	0	0	0	0	0.141	0	0	0	0	0	0.424	0
Soc	0.255	0	4.459	0	0	0	1.91	0.38	0	0	0	0	0	0	0	0	0	0	0	0	0
Evidentials																					
Bus	0.961	0	0.824	0	0	0	0	11.4	0	0	0	0.137	0	0	0	0	0	0.137	0	0.137	0
Lin	0.707	0	1.413	0	0.28	0	0.14	20.8	0.14	0	0	0	0.141	0	0.141	0	0	0	0.424	0	0
Soc	0.127	0	0.382	0	0	0	0	2.68	0	0	0	0	0	0	0	0	0	0	0	0	0
Frame Markers																					
Bus	0.686	0	3.569	0	0.14	0	0.55	0.96	0.27	0	0	0.275	0	0	0.275	0	0	0.275	0.412	0.549	0
Lin	1.696	0	3.533	0	2.4	0	1.27	0.71	0	0.14	0.141	0	1.554	0	0.424	0.424	0	0.141	0.141	0.141	0
Soc	1.147	0	3.822	0	0	0	2.8	0.38	0.76	0	0	0	0	0	0.127	0.127	0	0	0	0	0
Transition																					
Bus	66.3	0	3.706	0	3.71	0	29	25.8	6.73	1.51	0	11.12	0	0	5.216	0.275	0	4.53	2.882	9.608	
Lin	7.631	0	96.52	0	2.83	0	30.8	38	6.36	2.54	0.707	0	9.892	0.283	5.087	2.12	0	0.989	3.109	6.5	0
Soc	3.057	1.911	95.54	0.38	0.76	0	42.7	14.5	4.2	0.25	0.255	6.497	0	1.656	6.752	1.019	0	0	0	0	0

Table 2
Distribution of Interactive Resources in American English across Disciplines

US

		M1		M2		M3		M4				M5		M6			M7					
Markers		O		O		M3	O	S1	S2	S3	S4	O		O	S1	S2	S3	O	S1	S2	S3	O
Code Glosses																						
	Bus	2.5	0	11.66	0	0.416	0	4.685	5	0.625	0.729	0.104	1.249	0	1.562	3.748	0.104	0	0.833	0.833		0.521
	Lin	3.58	0	10.9	0	0.143	0	1.434	3.73	1.29	0	0	0.574	0	0.574	2.581	0	0	0.287	1.864	0.43	
	Soc	2.87	0	19.59	0	0	0	6.051	3.5	0.796	0	0.318	0.796	0	0.955	2.07	1.752	0	1.274	3.981	0.16	0.318
Endophoric																						
	Bus	0.31	0	4.164	0	0	0	0.416	0.31	0	0.208	0	0	0	0	0.208	0	0	0	0	0	0.104
	Lin	0.86	0	3.871	0	0	0	0	0	0	0.143	0	0	0	0	0	0	0	0	0	0	0
	Soc	1.91	0	7.803	0	0	0	0.159	0	0.159	0	0	0	0	0	0	0.159	0	0	0.159		0
Evidentials																						
	Bus	1.46	0	0.937	0	0.104	0	0.312	5.83	0	0.104	0	0	0	0	0.104	0	0			0	0
	Lin	1	0	0.143	0	0	0	0	4.87	0	0.143	0	0.143	0	0	0.143	0	0	0.143	0.287	0	0
	Soc	1.59	0	1.911	0	0	0	0.318	5.41	0.159	0	0	0	0	0	0.159	0.159	0		0.159	0	0
Frame Markers																						
	Bus	1.15	0.104	3.956	0	0.104	0	0.833	0.62	0	0	0	0.104	0	0.416	0.729	0.208	0		0.833	0	0
	Lin	1.29	0	1.864	0.14	0.717	0	0.287	0.29	0.287	0.287	0	0.287	0	0.143	0.143	0	0	0.143	0.287	0	0
	Soc	2.23	0	4.618	0	0	0	0.955	1.27	0	0	0	0.955	0	0.318	0.478	0.159	0		0.637	0.16	0.478
Transition																						
	Bus	2.81	11.56	66.32	0	1.77	0	22.8	31.9	1.353	2.186	0.312	5.622	0	5.205	15.2	1.145	0	4.893	5.414	0.52	0
	Lin	3.58	0	50.04	0	0.86	0	5.162	13.3	6.165	1.004	0	5.305	0	0.717	7.456	0	0	0.86	5.735	1.58	0
	Soc	15.3	0	66.72	0	0	0	19.43	22.5	3.344	0.318	1.752	6.37	0	5.255	11.62	3.822	0	6.847	14.81	0.48	1.115

Table 3
Distribution of Interactive Resources in Chinese English across Disciplines

China																						
		M1		M2		M3		M4				M5		M6				M7				
Markers		O		O		O	S1	S2	S3	S4	O		O	S1	S2	S3	O	S1	S2	S3	O	
Code Glosses																						
Bus		2.772	0	7.656	0	0.4	0	3.3	1.452	0	0.264	0	0.66	0	0.264	0.66	0	0	0.792	0.92	0	0
Lin		0	0	0	0	0.59	0	5.724	4.256	0	0.147	0	0	0	0.147	0.44	0.294	0	0	0.59	3.082	0
Soc		4.115	0	17.36	0	0	0	7.715	3.215	1.414	0.257	0	1.543	0	0.643	0.51	0	0	0.257	0.26	0	0
Endophoric																						
Bus		1.848	0	8.712	0	0	0	0.66	0.264	0.132	0	0	0.528	0	0.132	0	0	0	0.132	0	0	0
Lin		0.587	0	0	0	0.44	0	1.908	0.294	0	0	0	0	0	0	0	0	0	0	0.734	0	0
Soc		2.829	0	9.772	0	0	0	0.257	0.129	0	0	0	0.7715	0	0	0	0	0	0	0	0	0
Evidentials																						
Bus		1.452	0	0.66	0	0	0	0.264	1.98	0	0	0	0.528	0	0	0	0	0	0	0	0	0
Lin		0.147	0	0	0	0	0	0.881	6.605	0	0	0	0	0	0	0	0	0	0	0.15	0.734	0
Soc		0.129	0	0.643	0	0	0	0.257	3.343	0	0	0	0.1286	0	0	0	0	0	0.257	0	0	0
Frame Markers																						
Bus		1.188	0	1.584	0	0.13	0	0.396	0	0	0.132	0	1.32	0	0.264	0.79	0.132	0	0	0.13	0	0
Lin		0.44	0	0	0	1.61	0	2.055	0.147	0	0.147	0	0	0	0.294	0.15	0.734	0	0	0.44	2.495	0
Soc		2.186	0	6.043	0	0.13	0	2.443	1.543	0.257	0	0	1.1572	0	0.257	0.26	0	0	0	0.26	0	0
Transition																						
Bus		19.54	0	60.72	0	1.58	0	17.42	8.58	2.64	3.696	0	15.444	0	2.376	8.84	1.056	0	1.32	0.79	0	0
Lin		4.403	0	0	0	4.99	0	36.69	16.14	0	0	0	0	0	1.468	4.55	1.761	0	0	4.99	18.64	0
Soc		13.89	0	73.42	0	0.39	0	29.19	19.42	3.729	0.643	0	1.6716	0	1.672	2.96	0	0	3.215	2.44	0.771	0

Table 4

Most Utilized Interactive MDMs in Business, Linguistics, and Social Science across English Varieties and RDC Sections

	Business		Linguistics		Social Science		Overall frequency per country
Philippine English	Markers	F	Markers	F	Markers	F	764
	Transition Markers	170.3	Transition Markers	213.5	Transition Markers	179.5	
	Code Glosses	25.8	Code Glosses	34.9	Code Glosses	42.8	
	Evidentials	13.6	Evidentials	24.2	Frame Markers	9.2	
	Frame Markers	8.0	Frame Markers	12.7	Endophoric Markers	7.0	
	Endophoric Markers	7.7	Endophoric Markers	12.3	Evidentials	3.2	
American English	Transition Markers	179.0	Transition Markers	101.8	Transition Markers	179.6	641
	Code Glosses	34.6	Code Glosses	27.4	Code Glosses	44.4	
	Frame Markers	9.1	Evidentials	6.9	Frame Markers	12.3	
	Evidentials	8.8	Frame Markers	6.2	Endophoric Markers	10.4	
	Endophoric Markers	5.7	Endophoric Markers	4.9	Evidentials	9.9	
Chinese English	Transition Markers	144.0	Transition Markers	93.6	Transition Markers	153.4	540
	Code Glosses	19.1	Code Glosses	15.3	Code Glosses	37.3	
	Endophoric Markers	12.4	Evidentials	8.5	Frame Markers	14.5	
	Frame Markers	6.1	Frame Markers	8.5	Endophoric Markers	13.8	
	Evidentials	4.9	Endophoric Markers	4.0	Evidentials	4.8	

Interactional Metadiscourse for RDC Across Disciplines and Englishes

Tables 5, 6, and 7 illustrate the distribution and functions of interactional MDMs in the RDC sections. Below is a summary of our top findings per move:

- In the initial move, writers effectively used self-references (e.g., *I, we, our*) and hedges (*may, might*) to introduce their research background. Self-references were generally found except in Chinese linguistic studies, whereas hedges were commonly employed in American and Chinese English RAs across various disciplines, particularly in Philippine English linguistics RAs. Boosters were utilized more than five times in American English business and linguistics RAs, as well as in Chinese English business RAs, while other markers were less common. Self-references and boosters contribute to the writer's credibility, whereas hedges reflect an openness to alternative viewpoints from readers.

- Move 2 emphasizes the presentation of investigation outcomes. This move utilized all metadiscourse categories across different disciplines for both Philippine and American Englishes, often appearing more than five times. Notable exceptions included self-references in specific areas. In Chinese English, all markers were frequently used but predominantly within the social sciences. Metadiscourse in this section assist readers in understanding the results. Engagement markers (e.g., *you, note that*), for example, involve readers into a shared understanding, while boosters express confidence in the results, as illustrated by phrases like *in fact, definitely, and it is clear that*.

- During the third move, which involves summarizing study findings, only a few MDMs were employed, particularly in American English RAs. Chinese RAs extensively used hedging markers and boosters in linguistics, while Philippine RAs incorporated hedges in the same field. In move 3, boosters convey assurance, whereas hedging devices soften the impact of less favorable results.

- In move 4 Step 1, writers discuss the results and their implications. MDMs were used across all varieties of English, with the exception of engagement markers in American English. All disciplines effectively used boosters to reinforce interpretations and hedges to strategically mitigate claims. Attitude markers were common among Philippine English writers, enhancing persuasiveness by providing broader implications for findings.

- Move 4 Step 2 compares findings with existing research to document corroborating or non-corroborating results. Hedges and boosters were most frequent, indicating respect for alternative views. American writers extensively used attitude markers to create linkages with prior studies, which convey respect and openness to readers while demonstrating confidence.

- In Move 4 Step 3, authors explain the findings they have presented. A prominent feature is the widespread use of hedges across various disciplines and English varieties, the frequent use of boosters in Chinese English linguistics RAs, and the common occurrence of self-mentions in American English business RAs. Hedges indicate a readiness to discuss claims, while boosters serve to reinforce explanations. Self-references, such as "our," assert authority but might seem subjective to some readers.

- Move 4 Step 4 focuses on assessing the outcomes, with minimal instances of metadiscourse resources noted, particularly in Philippine and Chinese English RAs. Writers of American English used self-references over five times in business RAs and incorporated hedges in both business and linguistics RAs. In social science RAs, Chinese RAs also employed hedges more than five times.

- In Move 5, Philippine RAs in linguistics, American RAs in business, and Chinese RAs in social sciences frequently used attitude markers. Boosters were prevalent in Philippine and American RAs within business and linguistics, as well as in Chinese RAs across various fields. Self-mentions were notably abundant in American English RAs within social sciences and Chinese English RAs in both business and social sciences. Hedges were more commonly used by Chinese and Philippine English RAs across different disciplines.

- In Move 6 Step 1, authors point out the limitations of the study. RA writers in American English employed all interactional MDM categories, with a high frequency of self-references and hedges. Chinese writers in business often used self-references and hedges. Here, self-references demonstrate control over the material and decisions, while hedges show a willingness to discuss decisions and consider alternative viewpoints.

- Move 6 Step 2 emphasizes significant research contributions. All English varieties in the three disciplines under study employed all categories of interactional MDMs, and hedging devices are the most prevailing. Hedges convey openness to readers' ideas regarding potential significance and advantages. Chinese English RA writers mainly used boosters in business RAs, Philippine writers primarily used self-references in social sciences, and American RA writers heavily relied on boosters and self-references across disciplines.

- In Move 6 Step 3, where RA writers evaluate their methodology, RA writers tend to favor using hedges, especially in linguistics. The use of hedges is essential because readers may have different evaluation points throughout the study. Notably, American English writers used boosters, self-references, and hedges more than five times in social science RAs.

- Move 7 is where RA writers deduce conclusions from their research. All MDM categories were applied across various English varieties, though not uniformly across all fields in Step 1, where they make suggestions. Hedges appeared as the dominant MDM in Chinese English RAs in business, Philippine RAs in linguistics, and in all disciplines for American RAs. In move 7 Step 2, proposing further research, the RA writers in all disciplines and English varieties, except for Chinese social science writers, relied on hedging devices to realize this move. In addition, American English business and social science RAs heavily used self-references, and American English social science texts relied on attitude markers.

- Lastly, RA writers articulate broader pedagogical implications in Move 7 Step 3. To realize this move, RA writers utilized hedges more than five times (with an averaged normalized frequency of 0.7) in Philippine English business and linguistics articles. Chinese RAs made use of boosters, attitude markers, and hedges, boosters, in linguistics texts. Other markers exhibited low frequencies, falling below a raw frequency of 5 or an averaged normalized frequency of 0.7. Hedging devices were useful in this move, allowing RA writers to be open to other perspectives.

Summarily, our results indicate that interactional MDMs enhance clarity and engagement. Self-references and hedges introduce research backgrounds, with hedges showing openness to alternatives. Boosters and engagement markers present outcomes confidently and involve readers. Hedges and boosters summarize findings, conveying assurance or softening impacts. Attitude markers in discussions enhance persuasiveness, while hedges and boosters manage claims. In Conclusions, hedges and boosters discuss limitations and contributions, ensuring a balanced presentation and openness to further research.

Table 5
Distribution of Interactional Resources for Philippine English across Disciplines

		M1		M2		M3		M4				M5		M6			M7					
		O		O		O		S1	S2	S3	S4	O	O		S1	S2	S3	O	S1	S2	S3	O
Markers																						
Attitude																						
Bus	0.52	0	2.81	0	0.21	0	1.87	0.94	0.1	0.1	0	0.833	0	0.62	2.39	0	0	0.42	0.312	0.1	0	
Lin	0.29	0	2.29	0	0	0	0.43	1.15	0.43	0	0	0.43	0	0.14	0.72	0.29	0	0.14	0.43	0.14	0	
Soc	1.27	0	2.71	0	0	0	0.48	0.96	0.16	0	0	0.159	0	0.48	1.27	0.16	0	0.32	0.796	0	0.16	
Boosters																						
Bus	0.83	0	4.48	0	0.21	0	2.92	3.02	0.21	0.31	0.1	0.729	0	0.94	2.6	0	0	0.21	0.104	0.21	0.1	
Lin	0.86	0	6.6	0	0	0	0.86	3.15	0.57	0.14	0	0.717	0	0	2.29	0	0	0	0.143	0.29	0	
Soc		0	7.96	0	0	0	3.18	0.64	0.48	0	0	0.637	0	0.48	1.11	1.43	0	0.48	0.478	0.16	0.32	
Self Mention																						
Bus	3.12	0	2.5	0	0	0	1.35	0.52	0.1	1.67	0	0.416	0	0.73	2.5	0.21	0	0	0.833	0	0	
Lin	4.44	0	2.58	0	0	0	0.14	1.15	0.43	0.57	0	0.86	0	0.72	2.01	0.14	0	0.43	0	0.14	0	
Soc	2.23	0	7.64	0	0	0	1.59	0.16	1.59	0	0.32	1.752	0	1.11	2.23	1.11	0	0.64	1.433	0	0.64	
Engagement Markers																						
Bus	0.21	0	0.62	0	0	0	0	0.1	0	0.31	0	0	0	0	0.1	0	0	0	0.312	0	0	
Lin	0.57	0	1.29	0	0	0	0	0.57	0.57	0	0	0	0	0.14	0	0	0	0	0	0	0	
Soc	0.48	0	2.55	0	0	0	0.32	0.32	0	0	0	0.159	0	0	0.8	0.16	0	0.16	0.637	0	0	
Hedges																						
Bus	1.46	0	5.41	0	0.1	0	6.56	2.5	0.42	1.04	0.1	0.625	0	2.81	4.37	0.31	0	2.71	3.331	0	0.73	
Lin	4.16	0	7.89	0	0	0	4.44	4.16	4.73	1.29	0	0	0	0.57	3.44	1.86	0	0.86	1.721	0.29	0	
Soc	1.75	0	5.89	0	0	0	5.25	5.57	2.55	0.16	0.96	0.159	0	1.91	3.18	1.91	0	3.66	6.051	0	0	

Table 6
Distribution of Interactional Resources for American English across Disciplines

		M1		M2		M3		M4				M5		M6			M7					
		O		O		O		S1	S2	S3	S4	O		O	S1	S2	S3	O	S1	S2	S3	O
Attitude																						
Bus	0.41	0	4.12	0	0.27	0	1.92	0.14	0.14	0	0	0	0.41	0	0	0.41	0	0	0.27	0.14	0.27	0
Lin	0.28	0	2.12	0	0.28	0	2.26	0.57	0.28	0	0	0	0.99	0	0	0.28	0.28	0	0	0	0.57	0
Soc	0	0	1.66	0	0	0	3.18	0.13	0.13	0	0	0	0.64	0	0.25	0.13	0	0	0	0.64	0	0
Boosters																						
Bus	0.27	0	6.73	0	0.41	0	3.57	0.96	0	0	0	0	1.65	0	0	0.27	0	0	0.14	0	0.55	0
Lin	0.14	0	2.12	0	0.28	0	2.26	0.57	0.28	0	0	0	0.99	0	0	0.28	0.28	0	0	0	0.57	0
Soc	0.25	0	2.8	0	0	0	3.18	1.15	0.51	0	0	0	0.38	0	0	0.51	0.25	0	0	0.13	0	0
Self Mention																						
Bus	1.37	0	2.61	0	0.14	0	0.82	0	0.14	0	0	0	0.41	0	0	0.55	0	0	0	0.27	0	0
Lin	0.89	0	0.64	0	0	0	0.42	0	0	0	0.28	0	0	0	0	0	0	0	0	0	0.57	0
Soc	0.89	0	0.64	0	0	0	1.91	0.25	0	0	0.13	0.51	0	0	0	0.89	0.38	0	0.13	0	0	0
Engagement M.																						
Bus	0.55	0	1.51	0	0	0	0.82	0	0	0	0	0	0.55	0		0.55	0	0	0.14	0.69	0.69	0
Lin	0.42	0	5.37	0	0	0	1.41	0.14	0.28	0	0.28	0.14	0	0.14		0	0.42	0	0.42	0.14	0.42	0
Soc	0	0	3.06	0	0	0	0.76	0.51	0.25	0	0	0.25	0	0	0	0.38	0	0	0.13	0.13	0	0
Hedges																						
Bus	0.27	0	14.3	0	0.55	0	13.5	3.57	1.1	0.41	0	1.78	0	0	1.37	0.27	0	0.55	1.51	3.98	0	0
Lin	0.71	0	5.09	0	0.99	0	8.48	1.27	3.53	0.57	0	2.83	0	0.28	1.84	1.27	0	0.71	1.41	2.12	0	0
Soc	0.38	0.38	0.64	0	0.13	0	13.9	0.76	1.78	0.13	0	0.51	0	0.89	2.8	0.13	0	0.51	2.55	0	0	0

Table 7
Distribution of Interactional Resources for Chinese English across Disciplines

		M1		M2		M3		M4				M5		M6			M7					
		O		O		O		S1	S2	S3	S4	O		O	S1	S2	S3	O	S1	S2	S3	O
Markers																						
Attitude																						
Bus		0.26	0	0.4	0	0	0	0.26	0	0	0	0	0.13	0	0	0.13	0	0	0	0.26	0	0
Lin		0	0	0	0	0.15	0	0.59	0.15	0.15	0	0	0.15	0	0	0.15	0	0	0	0.15	0.88	0
Soc		0.51	0	4.76	0	0	0	3.86	0.77	0.26	0	0	1.41	0	0	0.51	0	0	0.26	0.13	0	0
Boosters																						
Bus		0.79	0	11.4	0	0.13	0	2.64	1.72	0.13	0.13	0	1.72	0	0.26	0.79	0	0	0	0.26	0	0
Lin		0	0	0	0	1.03	0	4.7	1.91	0.73	0	0	0.88	0	0.15	0.29	0.147	0	0.15	0.29	1.32	0
Soc		0.64	0	9	0	0.13	0	4.11	1.29	0.64	0	0	3.86	0	0.51	0.39	0	0	0	0.13	0.13	0
Self Mention																						
Bus		5.94	0	0.66	0	0.13	0	1.06	0.26	0.13	0.66	0	2.77	0	1.06	0.66	0	0	0.13	0.26	0	0
Lin		0.15	0	0	0	0	0	0.29	0.15	0	0	0	0.15	0	0	0.15	0	0	0	0	0.29	0
Soc		3.73	0	3.86	0	0	0	1.8	0.51	0	0	0	1.41	0	0.64	0.51	0.257	0	0.13	0.51	0	0
Engagement																						
Bus		0	0	0.66	0	0	0	0.13	0	0.13	0	0	0.13	0	0	0.26	0	0	0	0.26	0	0
Lin		0.15	0	0	0	0.15	0	0.59	0.44	0	0	0	0.15	0	0.15	0.15	0	0	0	0.15	0.15	0
Soc		0.39	0	1.67	0	0	0	0.51	0.51	0	0	0	0.64	0	0	0	0	0	0.13	0	0	0
Hedges																						
Bus		2.64	0	7.39	0	0.26	0	4.49	1.19	0.4	0.66	0	2.24	0	1.45	2.38	0	0	0.79	0.79	0	0
Lin		0.73	0	0	0	2.05	0	9.39	3.82	2.5	0	0	1.03	0	0.15	0.73	1.321	0	0.44	2.5	5.28	0
Soc		1.93	0	12.1	0	0	0	9.9	4.76	2.19	0.77	0	2.57	0	0.64	0.64	0.129	0	0.26	0.39	0	0

Table 8

Most Utilized Interactional MDMs in Business, Linguistics, and Social Science across English Varieties and RDC Sections

	Business		Linguistics		Social Science		Overall frequency per country
	Markers	F	Markers	F	Markers	F	244
American English	Hedges	32.5	Hedges	35.4	Hedges	39.0	
	Boosters	17.0	Boosters	15.6	Self Mention	22.5	
	Self Mention	14.0	Self Mention	13.6	Boosters	17.4	
	Attitude	11.2	Attitude	6.9	Attitude	8.9	
	Engagement Markers	1.7	Engagement Markers	3.2	Engagement Markers	5.6	
Chinese English	Hedges	24.7	Hedges	29.9	Hedges	36.3	195
	Boosters	19.9	Boosters	11.6	Boosters	20.8	
	Self Mention	13.7	Attitude	2.3	Self Mention	13.4	
	Engagement Markers	1.6	Engagement Markers	2.1	Attitude	12.5	
	Attitude	1.5	Self Mention	1.2	Engagement Markers	3.9	
Philippine English	Hedges	43.1	Hedges	31.1	Hedges	25.5	189
	Boosters	14.5	Engagement Markers	9.6	Boosters	9.2	
	Attitude	8.5	Attitude	7.9	Attitude	6.8	
	Self Mention	6.3	Boosters	7.8	Self Mention	5.7	
	Engagement Markers	5.5	Self Mention	2.8	Engagement Markers	5.5	

Table 8 summarizes the most commonly used interactional markers across various sections of RAs in all disciplines and English varieties. Hedges, particularly within the social sciences, are the most frequently used. American English RAs has the highest usage of these markers. Boosters, self-mentions, attitude markers, and engagement markers come next to hedges.

In contrast to Khendri et al.'s (2013) study of 16 RAs across disciplines such as civil engineering, economics, English language teaching, and biology, boosters were found to be the most prevalent interactional marker. Hedges and attitude markers come next. Also, Abdi's (2010) research highlights a preference for self-mentions, hedges, engagement markers, and attitude markers, among social science RAs. This suggests

that RA writers from social science disciplines prefer interactional devices to realize the different structures in the RDC sections effectively.

The RDC sections of RAs tend to hedge and, at the same time, boost because writers aim to persuade and provide comprehensive discussions of their study results (Livingstone, 2019). This aligns with Hyland's (1996) observation that authors should extend beyond data presentation to offer general and insightful interpretations. Consequently, writers are encouraged to use diverse writing strategies, including MDMs, to enhance the paper's quality and manage readers' perceptions.

The current study indicates that among the three English varieties examined, American English RAs contain the most interactional MDMs. This suggests that American RA writers prioritize engaging their readers in the discussion all throughout the RDC. Linguistic scholars have noted that ESL learners often struggle with using hedges and boosters effectively (Hyland & Tse, 2004). As Hyland (1996) pointed out, EFL writers face significant challenges in correctly applying these lexical devices. This difficulty may explain why RA writers in Philippine and Chinese English have fewer interactional resources in their RDC sections.

Table 9

Results of Log-Likelihood Test on MDMs in RDC Sections in Linguistics, Business, and Social Science

Discipline	Observed	Expected	df	Critical value	G value	p-value (two-tailed)
Linguistics	763.11	865.22	2	5.991	22.937	0.000*
Business	871.01	865.22				
Social Science	961.53	865.22				

*p<0.05

The examination of MDMs reveals significant differences across various disciplines, as evidenced by the data in Table 9. The *G* value of 22.937 with a *p*-value of 0.000 surpasses the critical threshold of 5.991, highlighting distinctive practices in employing MDMs within RDC sections. This suggests a potential solidification of MDM usage specific to each field. Notably, MDM deployment appears more prevalent in social science articles compared to those in business and linguistics.

Table 10

Results of Log-Likelihood Test on MDMs in RDC Sections in Three English Varieties

English	Observed	Expected	df	Critical value	G value	p-value (two-tailed)
American	886.48	865.22	2	5.991	34.115	0.000*
Philippine	973.74	865.22				
Chinese	735.43	865.22				

*p<0.05

The examination of MDMs reveals significant differences across various disciplines, as evidenced by the data in Table 9. The *G* value of 22.937 with a *p*-value of 0.000 surpasses the critical threshold of 5.991, highlighting distinctive practices in

employing MDMs within RDC sections. This suggests a potential solidification of MDM usage specific to each field. Notably, MDM deployment appears more prevalent in social science articles compared to those in business and linguistics.

Table 10 captures variations in MDM usage across different English varieties, indicated by a *G* value of 34.115, which is significantly higher than 5.991, the critical value. This substantial figure, supported by a *p*-value of 0.000, underscores the notable variation in MDM application across three English varieties. These findings suggest that both linguistic and disciplinary factors shape how MDMs are utilized in research writing.

Our findings indicate that the most prevalent interactive markers are transitional markers, while the most preferred interactional resources in RDC sections are the hedges. Results of the *Log-Likelihood Test* confirm that MDM usage varies significantly across disciplines and English varieties, with a pronounced presence in social science texts; they are more ubiquitous in Philippine English. In terms of interactional resources, Chinese English authors use hedges and boosters more frequently in social sciences, whereas Philippine English favor these markers in linguistics, and American English articles in business.

In summary, the study highlights two key points: first, while there are similarities in MDM usage across some moves, certain markers are employed exclusively for specific moves, with statistically significant differences. Second, disciplinary expectations shape MDM usage, with soft disciplines like humanities and social sciences demanding greater writer accountability. The frequent use of metadiscourse in these fields may be intentional, given their focus on human behavior and interaction.

Recommendations

In closing, our study on MDMs confirms previous findings (e.g., Sun, 2024; Wei, 2024b; Wongsu et al., 2024), offers cross-cultural insights, reveals disciplinary variations, and compares usage across English varieties, which enrich the literature and inform targeted academic writing instruction. It enhances understanding of functions in diverse linguistic contexts and enriches knowledge of language variations and sociolinguistic dynamics. For business professionals, it improves cross-cultural communication skills for global interactions. For linguistics, it advances theories on language variation and sociolinguistic phenomena. For social sciences, it aids in understanding power relations and social interactions in multicultural settings.

To continue the scholarly work on this area of research, we suggest the following future actions to take:

- The implications for teaching involve creating educational materials that cater to learners' needs for global communication, enhancing linguistic awareness, and developing effective academic writing strategies in various disciplinary and cultural contexts. By integrating comprehensive discussions on metadiscourse into curricula, writers can become familiar with the genre-specific MDMs favored in their fields. Consequently, this research provides greater understanding and practical applications for the attainment of educational and professional goals that foster effective communication in a world that is increasingly interconnected.

- The dataset, confined to 2014-2018 articles, may not capture recent metadiscourse trends. By focusing on American, Philippine, and Chinese Englishes, other varieties are excluded, limiting generalizability. Future research should extend the timeframe and include diverse English varieties for a broader perspective. In addition, conduct longitudinal studies to track changes in MDM usage over time, which could offer insights into evolving academic writing conventions. Also, examine MDM usage in disciplines beyond social sciences, linguistics, and business to uncover unique patterns across academia. Finally, investigate how digital media and online publishing impact MDM use in academic writing.

Disclosure:

This article is based on a previously published version in the *Modern Journal of Studies in English Language Teaching and Literature* (MJSELT), which is no longer available online due to the journal's discontinuation. The current version has been revised, given a new title, and republished with permission from the original publisher and the editor of this journal. The original published work is referenced as follows:

Gustilo, L., Gamad, J., Dimaculangan, N., & Dumanig, F. (2023). Metadiscourse Markers in the Results, Discussion, and Conclusion Sections of Research Articles Across Englishes and Disciplines. *Modern Journal of Studies in English Language Teaching and Literature*, 5(2), 136-162.

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