Research Paper

Metadiscourse Markers in Quantitative and Qualitative Applied Linguistics Research Articles' Discussions: A Comparative Study

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Abstract
Metadiscourse markers are aspects of a text's organization denoting a writer's stance toward its propositional content. Given the ideological difference between quantitative and qualitative research in terms of determinacy, metadiscourse markers can be viewed as a venue through which writers' epistemological positions are presented. The present study was designed to compare the use frequency of interactive and interactional metadiscourse markers in the discussion section of 20 quantitative and 20 qualitative applied linguistics research articles, with reference to Hyland's (2005) framework. The analysis involved the comparison of frequency counts of metadiscourse markers across the two corpora using a series of Chi-square tests. To that end, the results were computed and analyzed through SPSS. The results revealed significant differences in terms of the frequency of all interactive and interactional metadiscourse markers except for frame markers, evidentials, attitude markers, engagement markers, and boosters. The findings of study have important implications for academic writing instruction.

Keywords: *Interactional metadiscourse markers Interactive metadiscourse markers, Qualitative research, Quantitative research*

نشانگرهای فراگفتمانی در مباحث مقاله های کمی و کیفی زبانشناسی کاربردی: یک مطالعه مقایسه ای

نشانگرهای فراگفتمانی به ابعادی از متن اطلاق می شود که موضع نویسنده را نسبت به محوای گزاره ای آن نشان می دهد. با توجه به تفاوت ایدئولوژیک پژوهش های کمی و کیفی از منظر قطعیت، نشانگرهای گفتمانی را می توان به منزله ابزار راسی بیان مواضع معرفت شناختی نویسندگان انست. مطالعه حاضر با هدف مقایسه فراوانی بکارگیر نشانگرهای فراگفتمانی تبادلی و تعاملی در بخش مباحثه یافته های 20 مقاله مربوط به پژوهش کمی و 20 مقاله مربوط به پژوهش کیفی در رشته زبانشناسی کاربردی، بر اساس چارچوب هایلند (2005) انجا شد. در تحلیل داده ها که با برنامه آماری SPSS صورت گرفت، آزمون خی به منظور مقایسه تعداد نشانگرها در دو زمینه مورد مطالعه بکر گرفت. شد. نتایج حاکی از تفاوت هایی معنادار در فراوانی بکارگیری کلیه نشانگرها به استثنای نشانگرهای قالبی، ارجاع درون-متنی، نگرش، ارتباطی، و تأکیدی بود. یافته های این مطالعه می تواند در حوزه آموزش نگارش متون علمی و دانشگاهی کاربردی باشد.

فراگفتمانی: نشانگرهای فراگفتمانی تبادلی ; نشانگرهای فراگفتمانی تعاملی ; پژوهش های کمی ; پژوهش های کیفی :

Introduction

Effective production of written academic discourse is contingent upon not only adequate content knowledge but also knowledge of discursive features that the related discourse community deems appropriate and functional. Research articles (RAs), as the epitome of written academic discourse, are no exception. The bulk of research on "English for research publication purposes" (ERPP) (e.g., Li & Flowerdew, 2020) is support for the significance of mastering RAs' discursive features to publish in high-ranking English-medium journals. Among discourse-related features of RAs, generic moves and steps, transitivity processes, information structure and thematic development, cohesion, and metadiscourse markers have been shown to implicate in the effectiveness with which authors encode their intended meanings and induce interpretations of propositional content (e.g., Akmilia et al., 2022; Jalilifar, 2011; Phonhan, 2021; Wei, 2015; Yang, 2021). Studies in this regard have substantiated the differential use of such features not only across the sections of RAs (e.g., Saidi & Talebi, 2021), but also in RAs across various disciplines (e.g., Adel & Ghorbani Moghadam, 2015). However, these have rarely addressed the discoursal features of RAs reporting differentially designed research with an eye to quantitative (Quan) and qualitative (Qual) paradigms.

Investigating the discourse-related features of RAs reporting Quan and Qual research finds justification in their ideological and epistemological differences: Quan research is more objective and quests for generalizability, while Qual research is more visibly focused on individual meaning, and characterized by emergent questions, design, and procedure (Creswell, 2013; Dornyei, 2007). These differences have implications for the way authors organize their propositions, and represent themselves and engage their readers in the text. The generalizability of Quan research is associated with the author's objective presentation and argumentation of their findings. On the other hand, the in-depth analysis of individual meanings in Qual research allows the author's subjective interpretation to be . nguistically encoded.

Among linguistic devices that help writers organize their text and encode their point of view, metadiscourse markers stand out. Such devices act as mediators between the information provided in the text and writers' own perspe. tives, helping them to project themselves into their discourse, and to show their attitude toward both the audience of the text and the content. They also come of aid to readers in decoding the hidden message intended by writers as they reflect culture-specific writing conventions. Hyland (2004) defined metadiscourse as a dynamic aspect of language, applied by the writer/speaker to interact with the reader/hearer, and divided them into interactive and interactional ones. Interactive metadiscourse markers are employed to facilitate comprehension by leading readers through the text. On the other hand, interactional metadiscourse markers are employed to help writers to signal their attitude toward the text, and to engage readers in the construction of the text. Several studies have been carried out in relation to the use frequency and function of metadiscourse markers (e.g., Ghazanfari et al., 2018; Kim & Lim, 2013; Loi & Evans, 2010), but most have treated a single aspect of metadiscourse such as hedges or boosters, and fallen short of considering the use of metadiscourse markers in their totality in articles reporting differentially designed research, including Quan and Qual research.

The venue through which these differences are most conspicuously communicated is RA's discussion section. More specifically, since authors' interpretations of findings surface in research articles' discussions, the investigation of the use of metadiscourse markers in the discussion section of an article is justified. Sheldon (2013; 2019) has this point in his recognition of the ideologically-laden nature of RA discussions. This might be one reason behind the difficulty novice writers experience in writing the discussion section of their RAs or theses (Al-

Shujairi, 2021; Jin, 2021). According to Jalilifar, (2011), this difficulty originates, among others, in RA authors' lack of awareness of the peculiar discoursal features of the discussion.

The discussion section has been assigned different rhetorical functions by researchers. Adopting an objective and therefore Quan-research associated perspective, some primarily see it as the place for the mere presentation of findings and positioning them in the context of existing research (e.g., Moyetta, 2016). Others, however, have accentuated the interpersonal, argumentative, and interpretive function of the discussion section, deeming it appropriate for making claims about the study's contribution to disciplinary knowledge (e.g., Basturkmen, 2012; Dujsik, 2013). This standpoint is more aligned with the inherent subjectivity of Qual research. The variously sketched functions of the discussion section might be owing to research's ignorance of the research paradigms' implications for the discourse aimed at reporting them. Devices employed by authors in the discussion section of a research report could vary across qualitative and quantitative research, owing to the peculiarities of each. This is despite the fact that this section has received "scant attention" in the literature (Kurniawan & Lubis, 2020, p. 137). Against this background, the present study investigated interactive and interactional metadiscourse markers in quantitative and qualitative applied linguistics research articles' discussion sections.

Review of Literature

RAs are now acknowledged as the major genre of written academic discourse for the exchange of up-to-the-mark disciplinary and interdisciplinary knowledge and research findings. Accordingly, authors need to be equipped with knowledge of their discoursal features, on top of content knowledge, to persuade their readership of the merits of their research. This aim is verbalized in the discussion section, which is viewed as one of the essential, yet difficult-to-write, parts of an RA, particularly for novice writers (Al-Shujairi, 2021; Amnuai, 2017; Basturkmen, 2012; Comert & Al-Beyati, 2019; Gounder, 2012; Jalilifar, 2011; Kurniawan & Lubis, 2020). In the face of the various models of the rhetorical moves of the discussion section, Al-Shujairi (2021) found the presentation of findings and their comparison with existing research evidence as the two obligatory moves. Referring to the three metafunctions of language outlined in systemic functional linguistics (see Halliday & Mathieson, 2004), discourse tools that potentially realize these two moves can be said to be more textual in nature. Most of the models have, however, assigned a special position to the authors' interpretation, evaluation, explanation, hypothesis formation, generalization, and argumentation as well, which convey the interpersonal load of the propositions (e.g., Dudley-Evans, 1994; Hupkins & Dudley-Evans, 1988). These textual and interpersonal discourse tools are collectively referred to as metadiscourse.

The term *metadiscourse* was first introduced by Zellig Harris (1959), and it has ever since been widely investigated by language teaching and second language acquisition (SLA) researchers (e.g., Abdelmoneim, 2009; Adel, 2006; Crismore, 1984; Dafouz, 2003; Hyland, 1998, 2004, 2005, 2008). Associated with the rhetorical function of texts, metadiscourse entails the way writers depict themselves and their perspectives. Hyland (2000, 2005) described metadiscourse as the linguistic resources employed to organize a discourse or encode the writer's attitude toward its content or the reader. In view of the Hallidayan distinction among ideational, interpersonal, and textual metafunctions (Halliday & Mattheissen, 2004), metadiscourse markers tend to more visibly carry the interpersonal load of a text (see Abdi, 2002; Alipour, 2018; Atai & Sadr, 2008).

The significance of metadiscourse in assisting writers with effective writing and also readers with comprehension cannot be overstated. Simin and Tavangar (2009) conceptualized metadiscourse as pragma linguistic devices used to account for attitudes as well as the architectural properties of any text: "the second level of discourse which fulfills the textual and also interpersonal functions on language to point and help readers rather than advise them" (p.

230). Without metadiscourse, the writer is likely to distort the message intended to be conveyed (Mulholland, 1999). Metadiscourse has been in evidence in applied linguistics research since the 1990s, and due to its importance, a considerable amount of literature exists on the role of metadiscourse in academic writing, including RAs (e.g., Abdi, 2002; Esti Nugrahani & Bram, 2020; Kim & Lim, 2013; Simin & Tavangar, 2009).

Hyland (2005) offered a demarcation between *interactive* and *interactional* metadiscourse markersp Interactive metadiscourse markers reflect the writer's awareness of a participating audience, and the ways they seek to accommodate its probable knowledge, interests, rhetorical expectations, and processing abilities (Hyland & Tse, 2004). They are employed to shape a text in a way to meet the needs of particular readers, and to set out arguments so as to reflect the writer's interpretations and goals. They fall into the five categories of transitions, frame markers, endophoric markers, evidentials, and code glosses. The function and examples of each of these are presented in table 1.

Table 1
Interactive Metadiscourse Markers (adapted from Hyland, 2005, p. 92)

Category	Function	Example
Transitions	expression of relations between the main clauses	in addition, but, thus, and
Frame Markers	reference to discourse acts, sequences, and stages	finally, to conclude , my purpose is
Endophoric Markers	reference to other parts of the text	noted above, see fig., in section 2
Evidentials	reference to the information from part of the text	according to x, z states
Code glosses	elaboration of propositional meanings	namely, for example, such as, in other words

On the other hand, interactional metadiscourse markers relate to the personal attitude of the writer toward the text and its potential audience, and are more directly bound with disciplinary discourse conventions (Hyland 2004). These interactional resources fall into the five categories of hedges, boosters, attitude markers, self-mentions, and engagement markers, as displayed in table 2.

Table 2
Interactional Metadiscourse Markers (adapted from Hyland, 2005, p. 92)

Category	Function	Example
Hedges	withholding commitment to propositional content	might, perhaps, possible, about
Boosters	emphasizing certainty to close dialog	in fact, definitely, it is clear that
Attitude Markers	expressing writer's attitude toward propositions	unfortunately, I agree surprisingly
Self-mentions	making explicit reference to the authors(s)	I, we, my, me, our
Engagement Markers	explicitly building a relationship with the reader(s)	consider, note you can see

Metadiscourse is highly reflective of the context and co-text in which the text is situated. Hyland (2000) posited a close relationship between the use of metadiscourse and the norms and expectations of those who use it in particular settings. In a similar vein, Hyland (2005) pointed

out that as metadiscourse functions to represent the social aim of writers, it can be considered as a social act, rather than a simple thread of language objects. This means that its use varies vastly depending on the addressee, the purpose of communication, and other aspects of the social context. This sociolinguistic perception of metadiscourse justifies its investigation across different fields of study, and across reports of differentially designed research.

Research on metadiscourse has majorly centered on intra-discipline and language-specific variations of its use (e.g., Abdi, 2002; Blagojevic, 2004; Dafauz, 2003; Hyland, & Tse, 2004; Keshavarz & Kheirieh, 2011; Kim & Lim, 2013; Mardani, 2017; Noorian & Biria, 2010; Simin & Tavangar, 2009; Swales, 2004; Sultan, 2011; Kawase, 2015). Metadiscourse markers seem to boost the organization and acceptability of RAs. Gholami and Ilghami (2016) investigated 40 biology RAs in terms of the use of metadiscourse markers, and found (b) Iranian writers' more frequent use of both interactive and interactional markers compared with native RA writers, and (b) a strong positive relationship between RAs' use frequency of metadiscourse markers and the impact factor of the journals they were published in. Evidence also comes from Soleimani and Mohammadkhah (2020), who found metadiscourse markers, particularly interactional markers, more frequent in book reviews published in ISI journals in comparison with those published in non-ISI journals.

As for inter-disciplinary research, Hyland and Tse (2004) found metadiscourse markers more frequent in soft sciences. Harwood (2005) carried out a qualitative corpus research project of self-promotional *I* and *we* in academic work in four disciplines: physics, economics, computing science, and business and management. The study showed that even supposedly "author-evacuated" (p. 1207) articles in the hard sciences can be seen to have a self-promoting flavor with the help of personal pronouns. Along the same lines, Abdi (2002) compared social sciences (SS) and natural sciences (NS) disciplines' use of hedges, emphatics, and attitude markers in their discussion of findings. The disciplines were found to differ in their use of hedges and attitude markers, but there was very little variance between them in terms of emphatics' use. The in-depth analysis of the corpus showed the predominance of validity markers used to support arguments. In a similar vein, Sarani et al. (2016) investigated the use of hedges, boosters, and attitude markers in the discussion and conclusion sections of RAs by non-humanities and humanities writers, and discovered that hedges and attitude markers were more common in the humanities RAs. The use of metadiscourse markers by academic writers with different first languages has also been investigated, and differences located (e.g., Allami & Mirshamsi, 2013; Jalilifar, 2011; Zarei & Mansoori, 2011).

In the domain of applied linguistics, Esti Nugrahani and Bram (2020) investigated the use of metadiscourse markers in eight language teaching journal articles, and found interactive markers more frequent. More specifically, they reported transitions as the most frequent and boosters as the least frequent markers in their corpus. In a similar vein, Abdollahzadeh (2011) investigated hedges, emphatics, and attitude markers in the conclusion section of 60 applied linguistics' RAs. The results showed the remarkable tendency of authors to hedge their propositions. Ghazanfari et al. (2018), too, investigated the use of these markers in applied linguistics and chemistry RA introductions, and found interactive markers more frequent than their interactional counterparts in both disciplines, with evidentials, transitions, and code glossed as the most common categories; however, none of these studies have distinguished between Quan and Qual RAs in their analyses. This is despite the fact that the writing conventions associated with each can be, for one, defined with respect to the employment of metadiscourse markers.

In line with the social turn of applied linguistics (Ortega, 2013), the discipline witnessed a surge of interest in Qual and mixed-methods research; however, studies into the features of their associated written discourse are far and few between. Quan and Qual RAs are assumed to encode the differential epistemology underlying them, and metadiscourse markers are among the means

for achieving this. While Qual research seeks to uncover individual meanings in emergent designs, Quan RAs are valued for their design-related rigor, objectivity, and generalizability (Creswell, 2013; Dornyei, 2007). The tension between Qual research's subjectivity and Quan research's objectivity is embodied in the discussion section of their related RAs. Accordingly, the investigation of their discoursal features, including metadiscourse markers, gains salience. Existing studies have addressed the discoursal features of either Qual or Quan research, or ignored their paradigmatic differences. For one, Rahimpour et al. (2015) investigated the discourse tools employed to represent authors' identity in Qual applied linguistics RAs. They found that authors used mental processes, and inclusion and activation devices to reflect subjectivity, individual meaning, and researchers' visibility. Metadiscourse markers encode the interactive and interactional dimensions of discourse. Therefore, the comparison of their use in the Quan and Qual RAs' discussions could shed light on how their associated ideologies are linguistically encoded. Against this backdrop, the following three research questions were formulated:

RQ1. What are the most frequent metadiscourse markers in Quan and Qual RAs' discussions?

RQ2. Is there a significant difference between Quan and Qual RAs' discussions in terms of the use frequency of metadiscourse markers?

RQ3. Is there a significant difference between Quan and Qual RAs' discussions in terms of the use frequency of the subtypes of interactive and interactional metadiscourse markers?

Methodology

Corpus Compilation

The corpus applied in this study consisted of a randomly selected sample of 40 RAs (published from 2014 to 2020), consisting of 20 Quan RAs and 20 Qual RAs, of which the discussion sections (22984 words for Quan and 23052 words for Qual articles) were investigated in terms of the use of metadiscourse markers. They constituted one-third of a bank of 142 RAs from three reputable journals in the field of applied linguistics. The journals were all indexed in the Web of Science Core Collection, with an impact score beyond 1 (Q1):

Language Awareness (published by Taylor & Francis Ltd.)

Language Teaching Research (published by Sage Publications)

TESOL Quarterly (published by Wiley-Blackwell)

The 142 RAs (a) were all single-authored, (b) had a distinct discussion section, (c) reported either Quan or Qual research and (d) were exclusively related to second language acquisition.

Instances of use of different subcategories of interactive and interactional metadiscourse markers in 20 quantitative and 20 qualitative discussions were manually coded by two raters, and inter-coder agreement was ensured (see Procedure). The coders were Ph.D. candidates of ELT, who were debriefed on the goals of the study and provided with definitions of the metadiscourse categories prior to coding.

Procedure

The present study applied Hyland's (2005) categorization of metadiscourse markers. The study employed a descriptive (ex post facto) design, and the approach to the analysis of the corpus was "directed qualitative content analysis" (DQCA). DQCA involves detecting and coding instances of the use of elements of a pre-existing analytic framework (Hyland's (2005) model of metadiscourse markers, in this study) (see Mayring, 2014). Firstly, the corpus was compiled based on the mentioned criteria (see Corpus compilation). The second step was to comparability of the lengths (word count) of the Quan and Qual corpora. Following a 60-minute debriefing session with one of the researchers (an assistant professor of applied linguistics

specializing in discourse analysis), the other researchers engaged in locating and determining the type of the metadiscourse markers used in 30% of each corpus (i.e., Quan and Qual discussions) (see Kanoksilapatham, 2005) based on Hyland's (2005) model constituted the next step. Subsequently, the inter-coder agreement was ensured in a Cohen's kappa coefficient of .76. Cohen's kappa, which was run separately for each of two general categories of metadiscourse on the two raters' detected instances, is a measure of inter-rater agreement for categorical scales when there are two raters. Cases of disagreement as to the type of the detected instances of metadiscourse markers were then discussed, and agreements were reached by all the researchers. Disagreements occurred mainly because one metadiscourse token could equally take as an instance of more than one category. The multi-functionality of some metadiscourse markers is also referred to by Hyland (2005). To exemplify, the word "mostly" could be viewed as both an attitude marker and a booster (see Flowerdew, 2013). Clauses containing such cases were double-checked for meaning and writer's possible intention to resolve ambiguities. The final step was counting instances of metadiscourse markers in the two corpora separately. As for data analysis, a series of Chi-square tests were conducted to compare the frequencies of metadiscourse markers, both generally and specifically with an eye to each of their subtypes.

Results

This study was designed to investigate and compare the use frequency of interactive and interactional metadiscourse markers in Quan and Qual RAs' discussions. The first research question addressed the most frequent metadiscourse markers in Quan and Qual discussions. A total of 2425 interactive and interactional metadiscourse markers were located in the corpus of study: 1698 in Quan and 727 in qualitative Qual discussions. Table 3 illustrates the frequency counts and percentages of the subtypes of interactive and interactional metadiscourse markers in each corpus separately. The results indicated that in both Quan and Qual, transitions and self-mentions were the most frequently used markers, constituting 54.18%, and 36.39% of all markers in Quan discussions, and 71.52% and 12.79% of all markers in Qual discussions. Other markers, on the other hand, comprised a negligible percentage of all located cases. In both corpora, hedges ranked third in terms of use frequency, making up 4.47% of all detected instances in Quan discussions and 8.66% of all detected instances in Qual discussions. Overall, 89% of the all located markers in both Quan and Qual RAs were self-mentions and transitions, followed by hedges with a 5.73% share of all markers. Accordingly, in each of the Quan and Qual discussions as well as Quan and Qual discussions put together, transitions were the most frequent interactive metadiscourse markers, and self-mentions were the most frequent interactional metadiscourse markers.

The second research question was formulated to find out whether the two corpora differed significantly in their general use of metadiscourse markers in Quan and Qual discussions. To answer this question, a Chi-square test was run. The obtained significant Chi-square value [$\chi2$ (1) = 5.173, p < .05, Φ = .65] supported the hypothesis as to the significant difference between the number of interactive and interactional metadiscourse markers in Quan and Qual discussions, with an acceptable effect size, as shown in the Phi coefficient (Φ) (see Table 4). Accordingly, the second question was answered in the affirmative. In other words, Quan discussions housed a significantly higher number of metadiscourse markers in comparison with Qual discussions.

Table 3
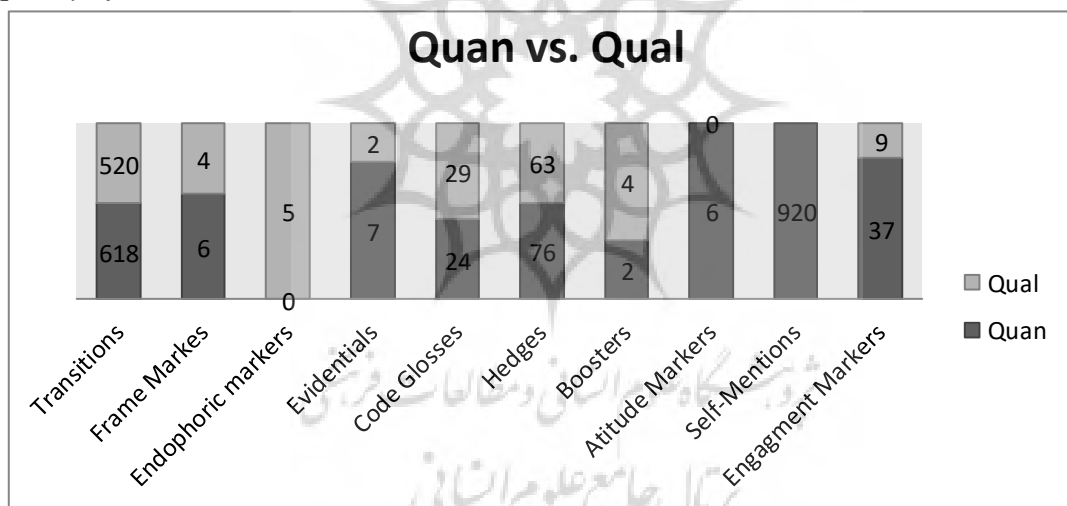*Use Frequency of Metadiscourse Markers in Quan and Qual RAs' discussions*

Metadiscourse Markers	Quan discussions		Qual discussions	
	Frequency	Percentage	Frequency	Percentage

Interactive	Transitions	618	36.39	520	71.52
	Frame markers	6	0.35	4	0.55
	Endophoric markers	0	0	5	0.68
	Evidentials	7	0.41	2	0.27
	Code glosses	24	1.41	29	3.98
Interactional	Hedges	76	4.47	63	8.66
	Boosters	4	0.25	2	0.27
	Attitude markers	6	0.35	0	0
	Self-mentions	920	54.18	93	12.79
	Engagement markers	37	2.17	9	1.23

Figure 1 provides a sketch of the differences with regard to the use of the subcategories of metadiscourse markers.

Figure 1
Frequency of Metadiscourse Markers in Quantitative vs. Qualitative Research

The third research question involved the comparison of the use frequency of each of the subtypes of interactive and interactional metadiscourse markers. To answer this question, a series of Chi-square tests were run (separately for each of the subtypes of interactive and interactional markers). The significance level was also set at the more conservative .01 level to adjust for multiple comparisons. As evident in Table 4, significant differences were observed for transitions [$\chi2$ (1) = 132.44, p <.01, Φ = .54], self-mentions [$\chi2$ (1) = 20.24, p <.01, Φ = .65], endophoric markers [$\chi2$ (1) = 3, p <.01, Φ = .36], code glosses [$\chi2$ (1) = 15.13, p <.01, Φ = .73], and hedges [$\chi2$ (1) = 15.4, p <.01, Φ = .33]. Accordingly, the question was positively answered. Effect sizes were acceptable for code glosses, transitions, self-mentions, and hedges, but it was moderate for endophoric markers. Differences were not significant for frame markers, boosters, evidentials, attitude markers, and engagement markers.

Table 4
Chi-Square Values for Binary Qual-Quan Discussions' Comparisons of the Subtypes of Metadiscourse Markers

Metadiscourse Markers		χ2	df	Sig.
Interactive	Transitions	132.44	1	.00
	Frame markers	6	1	.49
	Endophoric markers	3	1	.00
	Evidentials	0.5	1	.47
	Code glosses	15.13	1	.00
Interactional	Hedges	15.04	1	.00
	Boosters	0	1	1
	Attitude markers	3	1	.08
	Self-mentions	209.24	1	.00
	Engagement markers	2.56	1	.10
Total		5.173	1	.00

The investigation of standard residuals was also revealing. For three of the metadiscourse markers' subtypes for which significant differences were detected across the two corpora (i.e., transitions, self-mentions, and hedges), standard residuals were far beyond expectation, falling outside the range of +/- 1.96. This indicates that:

the deployment of *transitions* in Quan discussions was significantly beyond the expected frequency (46.92%, Std. Residual = 9.68);

the deployment of *self-mentions* was significantly below the expected frequency in Qual discussions (41.77%, Std. Residual = -12.09), but its deployment in Quan discussions was significantly beyond the expected frequency (54.18%, Std. Residual = 7.91); and

the deployment of *hedges* was significantly beyond the expected frequency in Quan discussions (5.73%, Std. Residual =3.30), but its deployment in Qual discussions was significantly below the expected frequency (4.74%, Std. Residual = -2.16).

In sum, the results showed that Quan discussions embedded more metadiscourse resources than their Qual counterparts. The results also indicated that transitions, self-mentions, and hedges were the most frequently used metadiscourse markers in both Quan and Qual discussions. However, other markers were rare. Moreover, transitions, self-mentions, and hedges were used significantly more frequently in Quan discussions. On the other hand, code glosses and endophoric markers were used significantly more frequently in Qual discussions, though they were rare in both.

Discussion

The present study showed significant differences in terms of the use frequency of metadiscourse markers in the discussion sections of Quan and Qual RAs. Transitions, self-mentions, and hedges were the most frequent metadiscourse markers in both Quan and Qual corpora. Authors of Quan discussions deployed self-mentions, transitions, and hedges most frequently, while authors of Qual discussions used transitions, self-mentions, and hedges most frequently, in descending order of magnitude in both cases. Other markers were rarely drawn upon in either corpus. Moreover, Quan discussions housed (a) a generally higher number of metadiscourse markers, irrespective of their type, and (b) a significantly higher number of transitions, self-mentions, and hedges,

compared with Qual discussions. On the other hand, Qual discussions embedded a higher number of endophoric markers and code glosses, though these were rare in both corpora. No significant differences were detected for other metadiscourse markers.

That among interactive metadiscourse markers, transitions were frequent in both Quan and Qual corpora is justified on account of cohesiveness as an essential feature of well-constructed written texts of all types. Transitions are known to boost the comprehensibility and smoothness of a text (Hinkel, 2001; Tanskenan, 2006; Duruk, 2017; Rasooyar et al., 2019; Köroğlu, 2019) located a wide variety of transitions in the introduction, results and discussion, and conclusion sections of English MA theses written by both native and Turkish speakers, irrespective of their research designs. This provides evidence for the essentiality of such metadiscourse makers in academic writing. According to Hyland (2005), transitions, which mark addition, contrast, causation, or consecution, provide comprehension-enhancing links between the steps of an argument. This function makes them particularly useful for meeting the main rhetorical function of the RA discussion, namely argumentation (Al-Shujairi, 2021; Jalilifar, 2011). However, Quan discussions embodied significantly more transitions, as it did more metadiscourse markers in general. This observation can be attributed to Quan research's inherently greater systematicity and rigor as well as its pre-ordained design (Creswell, 2013), which would demand more linguistic discourse-organizing devices in its associated written discourse. It is upon the authors to present their argumentation and interpretation in their discussions in relation to each of the research questions separately, and this would invoke more transitions to render the text comprehensible and easy to follow. The inherent systematicity and objectivity could also have induced the use of more metadiscourse markers, irrespective of their type. To capture systematicity in discourse and to make their discussions more relatable to the readership in the face of all objective measures taken to conduct their research, Quan discussions' authors are compelled to use more metadiscourse markers.

On the other hand, Qual research's more dynamic and emergent nature allows RA authors to discuss their findings in a more integrated manner (McKay, 2006: Benson et al., 2009), which would lead to a general and holistic, rather than research-question specific, understanding and interpretation of the findings. Written academic discourse reporting Qual research seems to reflect these distinguishing features of Qual research, most evidently in the discussion of findings. The representation of the epistemological underpinnings of Quan and Qual research studies in their respective reports is conceded by Dobakhti (2013), whose study showed Quan and ndiscussions' incorporation of differential "commenting on findings" strategies.

The frequent deployment of hedges, one of the two most frequent interactional metadiscourse markers in both Quan and Qual corpora, is also explicable in terms of disciplinary discourse conventions. As a discipline in the humanities, applied linguistics seems to demand the use of hedges as a way of keeping facts and opinions distinct, and accentuating the provisional nature of claims (Nizigama & Mahdavirad, 2021). In this regard, Takimoto (2015) found hedges more frequent than boosters in philosophy RAs, likewise being among the humanities, while both were rare in natural sciences RAs. Authors of both Quan and Qual RAs hedged their statements, indicating the greater implications of discipline (i.e., humanities vs. non-humanities) for the choice of hedges over boosters, compared with RAs' underlying research paradigms (i.e., Quan or Qual).

This is not to totally deny the significance of the research design, as Quan RA authors deployed a significantly higher number of hedges in their discussions than their Quan RA authors. Qualitative research is known for the space it allows authors to push their subjective, yet theory-informed, interpretation of the findings, without aiming for generalizability (Dobakhti, 2013; Creswell, 2013; Dornyei, 2007; Leedy & Ormrod, 2014; McKay, 2006). This inherent

subjectivity can be said to have been registered in Qual discussions' less frequent assimilation of hedges. There was not, however, a parallel increase in the use of boosters, since instances of these interactional metadiscourse markers were infrequent in both Quan and Qual discussions. Those Qual RA authors used fewer hedges, but did not opt for boosters, attitude markers or engagement markers instead, can be rationalized with reference to the promotion of the "impersonal" discourse in the field of applied linguistics over the years (Hyland, 2005). They seem to have preferred neutral argumentation over definitiveness or stance-taking to maintain an alliance with the disciplinary discourse on Quan research. This likely strategic discourse-related measure could be thought of as one reason for the increasing acceptance of Qual applied linguistics research (not to mention the field's epistemological development (see Ortega, 2013)), despite its initial refutation by purist Quan researchers (see Dornyei, 2007).

This so-called "good intention" of Quan and Qual researchers to bring their interests closer to one another can also justify the observed difference in terms of the self-mention token's frequency. In addition to transitions and hedges, self-mentions were used frequently in both Quan and Qual discussions, though they were found to be way more frequent in Quan discussions. Hyland (2001, 2002) initiated the discussion on the projection of researchers' identity in the discourse that reports their research, and self-mentions (which had been long frowned upon in quest for impersonality in written academic discourse (see Wang & Zeng, 2021)) can best serve this purpose. Quan researchers' reflection of their researcher-identity through self-mentions can be partly owing to their likely intention to meet up to the standards of the field's changing epistemology. They seem to have taken a discourse measure which shows their recognition of the value of Qual research and its underlying themes, including individual (rather than group) meaning, and the dynamic nature of the interrelationships of the various aspects of the research as an activity system, including the researcher as a subject (see Michelle & Myles, 2004). With Qual researchers' infrequent use of boosters, and Quan researchers' more frequent use of self-mentions, Quan and Qual discourse can be said to be acting as a catalyst to bring the Quan and Qual camps' closer together. Wang and Zeng (2021), for example, found expert authors to use self-mentions in the absence of boosters in research articles belonging to different fields of study. This line of argumentation, however, stands in need of more research evidence that targets RA authors' intentions behind their choice of certain categories of metadiscourse markers over others.

Qual RAs' discussions were found to embody significantly more endophoric markers and code glosses. As for endophoric markers, Qual discussions' authors generally need to make frequent reference to verbal data (e.g., interview or diary excerpts) presented in the RAs' results section to thrust the interpretation and argumentation of their findings. However, Quan data are rarely, if ever, referred to in the discussion section (see Dobakhti, 2013). This can explain why endophoric markers were more frequent in Qual discussions. In addition, the rhetorical function of argumentation based on verbal data in Qual discussions seems to have demanded more elaboration from authors to convince their potential readership of their subjective interpretations with reference to their own resources (data and analyses), rather than external sources in the form of evidentials. Dobakhti (2013) found Qual RA authors to comment on their findings in their discussions through elaboration, rather than explanation; code glosses can be said to best verbalize this discourse strategy.

Last but not least, the observed insignificant differences between Quan and Qual discussions in relation to frame markers, evidentials, boosters, attitude markers, and engagement markers should be interpreted cautiously, owing to their rarity in both sub-corpora and the small corpora investigated. Based on this observation, however, it is apt to say that both Qual and Quan authors tended to organize their text mostly through transitions, and establish their relationship with their readers mostly through hedges and self-mentions. The predominance of these metadiscourse

markers can be, for one, attributed to instructional emphasis on these at the cost of other markers (e.g., Behbahani et al., 2018).

Conclusion and Implications

A main discoursal feature of written academic discourse is metadiscourse in all its variants. Research has substantiated the disciplinary and language-specific attachments of these markers (see Wang & Zeng, 2021), and the present study provided evidence for the significance of Quan and Qual research paradigms for metadiscourse markers' deployment in terms of both their types and frequency. Based on the results, it can be concluded that Quan discussions make greater use of metadiscourse markers in general to reflect such research's greater rigor and systematicity, as well as its quest for generalizability. Irrespective of the research paradigm, though, transitions, hedges, and self-mentions are the most frequent interactive and interactional metadiscourse markers in RAs' discussions. Moreover, Quan discussions tend to project the researcher(s)' identity through self-mentions, and this visibly brings them in line with applied linguistics' epistemological development toward valuing individual meanings and subjective activity systems-based interpretations (see Creswell, 2013). Qual researchers, too, tend to avoid deploying boosters, attitude markers, and engagement markers in excess, despite the research paradigm's dynamism and flexibility, probably to appeal to purist Quan researchers. These researchers also realize the elaboration discourse strategy in discussing their findings (Dobakhti, 2013) through endophoric markers and code glosses. Overall, written academic discourse brings to the forefront the ideological and epistemological orientation of Quan and Qual research partly through metadiscourse makers. As for the significance of metadiscourse markers' use for the effective writing of RAs' discussions, Hyland's proposition (2005) is worth mentioning: Metadiscourse reflects how authors strive to portray themselves, their texts, and their readers as they frame, scaffold, and present their arguments and research findings in ways that their disciplines recognize and value.

The study has both theoretical and pedagogical implications. Theoretically, the ideology underlying Quan and Qual research paradigms is reproduced in their associated discourse, particularly in the discussion of the findings where discourse organization and writer-reader relations gain salience. Metadiscourse markers' use is both mediated by research-paradigmatic properties, and constructive of them. This is evident in Quan researcher's use of self-mentions, which contradicts the typically impersonal nature of Quan discussions, and Qual researchers' avoidance of boosters, and attitude and engagement markers, which goes against Qual research's provision of space for negotiating individual and subjective interpretations. Paltridge (2012) provides support for the idea that discourse (Quan and Qual RAs' discussions, in the present study) and reality (research-paradigmatic properties) are mutually constitutive of one another. Practically, the predominance of transitions, hedges, and self-mentions probably indicates an excessive instructional focus on these at the expense of others. The findings invoke writing instructors, specially instructors of ERPP, to (a) raise their learners' awareness of the interaction of research paradigms and discourse that reports them, and (b) treat all metadiscourse markers (both interactive and interactional) in their awareness-raising endeavors. ERPP learners should be familiarized with the whole range of metadiscourse markers, and instructed to use them in relation to common rhetorical moves of Quan and Qual RAs' discussions.

The study's limitations should be admitted. The small corpus of the study obviates drawing definitive conclusions, particularly with respect to other markers than transitions, hedges, and self-mentions. A larger corpus could potentially yield more reliable findings regarding metadiscourse markers' use frequency differences across Quan and Qual discussions. Moreover, authors' L1 background and gender were not controlled for, but further research is needed to find

out if these mediate the use of metadiscourse markers across Quan and Qual corpora. Author's L1 background is especially important since research has substantiated language-related associations of the discoursal features of academic writing (Wang & Zeng, 2021). Authors of both Quan and Qual articles in the present study came from a variety of language backgrounds and included both native and non-native speakers. Investigating whether the findings of this study will hold true if L1 background is controlled for can shed more light on the use of metadiscourse markers in applied linguistics' RA discussions.

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