Metadiscourse in academic writing: A systematic review

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Abstract

A means to control how writers mark their presence, negotiate knowledge claims, and engage with their audience, metadiscourse is one of the most prominent approaches to analysing academic writing. The present systematic review attempts to take stock of the existing literature by investigating how metadiscourse has been researched in academic writing by analysing a sample of 370 high-quality empirical studies published between 1990 and 2021. Studies were coded for their conceptual frameworks, research designs, data sources, study contexts, writers, texts, corpora, and reporting practices. It was found that over 80% of research involved cross-sectional descriptive corpus-based analysis, drawing on intercultural rhetoric. Owing to its impact, ease of application, and study comparability, most research adhered to the 'broad' tradition in metadiscourse. Representative of this approach, Hyland's interpersonal framework and models of stance and engagement were prevalent, although difficulties in undertaking a 'thick' analysis of such a wide variety of features coupled with publishing constraints meant that many authors narrowed their focus to a few select features (especially hedges, boosters, and self-mentions). Approximately 37% of corpus-based research followed the 'thin' tradition, with an emphasis on marker frequency counts over contextually-bound interpretations. Corpora of English texts, notably, research articles, were prominently studied, with little research taking place outside of university contexts or recruiting human participants as informants. We discuss avenues to advance research in metadiscourse, through identifying possible future inquiries and improving study quality.
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Keywords: Metadiscourse; Metatext; Systematic review; Interactive resources; Interactional resources; Discourse reflexivity

1. INTRODUCTION

The rapid development of large electronic corpora of academic texts and the software to study them has revolutionised how we think of academic writing (Hunston, 2002). It is now widely accepted that, far from representing external reality impersonally and objectively, academic writers use language to offer credible and compelling representations of their work and themselves, and to acknowledge and negotiate social relations with their readers using genre and disciplinary-specific conventions (Hyland, 2004a, 2005b; Mauranen, 2010; Mei, 2007). Acceptance into a given

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discourse community requires writers to control the level of personality in a text (Hyland, 2004b), encompassing how authors guide the reader in processing and understanding their intended message, evaluate and signal their attitude towards the material, and align with or distance themselves from other perspectives (Akbas and Hatipoğlu, 2018; Crismore et al., 1993; Hyland, 2005b; Hyland and Jiang, 2022; Vande Kopple, 2002). As such, there is growing awareness of the importance for novice and L2 authors to be more critically aware of the textual and interpersonal functions of language in the construction of texts, writer identity, and disciplinary communities (see Halliday, 1973) as well as the need to view writing as a socially and culturally-embedded practice (Jones, 2004).

A notable sub-domain within discourse analysis that addresses such concerns is metadiscourse. The term was originally coined in 1959 by Zellig Harris, denoting a language producer's attempts to guide a receiver's perception of a text (Hyland, 2005a). It was not until the 'interactional turn' in discourse analysis in the late 1970s and the distillation of Halliday's trifunctional model of language that initial operationalisations of metadiscourse arose (D'Angelo and Consonni, 2020), notably by Williams (1981) and Crismore (1983). The concept has since evolved, thanks to the work of Mauranen (1993a, 1993b, 2010), Ädel (2006, 2010), Crismore and colleagues (Crismore and Farnsworth, 1989; Crismore et al., 1993), Hyland and colleagues (Hyland, 2004a, 2004b, 2005a, 2005b; Hyland and Jiang, 2018a, 2018b; Hyland and Tse, 2004, 2005a; Jiang and Hyland, 2017), and Vande Kopple (1985, 2002, 2012). For a conceptual history of metadiscourse, see D'Angelo and Consonni (2020).

Metadiscourse is delineated by some as a heterogenous array of language resources that guide the reader in following, interpreting, and evaluating ideational content within a given text (Vande Kopple, 1985; Crismore et al., 1993; Hyland, 2005a, 2005b), thereby signalling the presence of a discourse-organising, content evaluating author (Hyland, 2017). This work is representative of the 'broad' or 'integrative' tradition that incorporates both textual and interpersonal Hallidayan functions of language. One of its fullest proponents is Hyland (2005a:41), who argues that, "all metadiscourse is interpersonal in that it takes account of the reader's knowledge, textual experiences and processing needs". Not all scholars conceive of metadiscourse in this way. The 'narrow' or 'non-integrative' tradition (Ädel, 2006, 2010; Bunton, 1999; Dahl, 2004; Mauranen, 1993a) bounds metatext or discourse reflexivity – terms preferred over metadiscourse (Ädel, 2006) – to the textual function within the confines of the text, or as Mauranen (2010) puts it, discourse about the on-going discourse. Thus, the writer's epistemic and affective attitude towards the text and interaction with the reader are not considered metadiscourse within this interpretation.

As a result of over three decades worth of rigorous empirical research, several robust taxonomies of metadiscourse have emerged (see Ädel, 2006, 2010; Crismore et al., 1993; Hyland, 2005a, 2005b; Mauranen, 1993a; Vande Kopple, 1985). Authors tend to adopt a 'marker' approach, which operates at the level of lexis (Ädel, 2023), with the exception of Ädel (2006, 2010), whose taxonomy operationalises metadiscourse at the move level. Tables 1 and 2 provide a synthesis of the linguistic resources used to realise various metadiscoursal functions across five popular taxonomies, adapted from Li et al. (2017). Models representing the broad tradition (see Crismore et al., 1993; Hyland, 2005a, 2005b; Vande Kopple, 1985) incorporate an array of interactive and interactional markers that correspond to Halliday's textual and interpersonal metafunctions. Finer distinctions within interactional resources were elaborated by Hyland (2005b) in the form of engagement markers.

In contrast, Mauranen's (1993a) typology is limited to purely textual elements that serve discourse-organising purposes. Also of the narrow tradition is Ädel (2006, 2010), albeit her framework incorporates 'audience interaction', which broadly corresponds to commentaries or engagement. As such, metadiscourse is renowned for being a fuzzy concept (Ädel, 2006; Çandarli et al., 2015; Dahl, 2004), encompassing potentially polysemic and polypragmatic discourse elements that can only assuredly be identified and categorised with reference to the surrounding context (Hyland and Jiang, 2022). It should also be noted that the five taxonomies were developed using corpora of English academic texts. The universality of metadiscourse, situated within wider debates surrounding the responsibility of the writer versus the reader to make sense of the message (see Hinds, 1987), is a contentious issue (Crismore et al., 1993; El-Seidi, 2000; Mauranen, 2010).

As a search of the Web of Science, Scopus, or Google Scholar will attest, there has been an explosion in empirical metadiscourse research in recent years (see also Hyland, 2017; Hyland and Jiang, 2022), such that it constitutes one of the most prevalent ways of analysing discourse (Hyland, 2017; Hyland and Jiang, 2022; Hyland et al., 2021). Much scholarship draws on Kaplan's highly influential theory that an individual's linguistic background and cultural tradition mediate how they write (see Akbas, 2014; Hyland, 2017). As such, there is a wide body of descriptive corpus research in the vein of intercultural rhetoric, whereby certain writer or textual characteristics are understood to mediate metadiscourse use, thus constituting the basis for corpus-based comparison. Concerning writers, of particular note is their first language (e.g., Breivega et al., 2002; Çandarli et al., 2015; El-Seidi, 2000; Lee and Casal, 2014), nativeness with the language (e.g., Akbas, 2014; El-Dakhs, 2020; Ruan, 2020), extent of L2 proficiency (e.g., Bax et al., 2019; Carrió-Pastor, 2021; Yoon, 2021), gender (e.g., El-Seidi, 2000; Tse and Hyland, 2006, 2008), and disciplinary background (e.g., Aull, 2019; Hyland and Jiang, 2018a, 2018b; Vold, 2006).

Table 1
Synthesis of five notable textual metadiscourse taxonomic frameworks.

Vande Kopple (1985)		Crismore et al. (1993)		Mauranen (1993a)	Hyland (2005a, 2005b)	Ädel (2006, 2010)
Category	Sub-category	Category	Sub-category	Category	Category	Category
Textual metadiscourse		Textual metadiscourse		Metatext	Interactive metadiscourse	Metatext
Text connectives	Sequencers	Textual markers	Sequencers		Frame markers	Introducing topic Delimiting topic Concluding topic Contextualising
	Logical connectives		Logical connectives	Connectors	Transitions	Adding to topic
	Reminders		Reminders	Reviews	Endophoric markers	Endophoric marking Reviewing
	Topicalisers		Topicalisers		Code glosses	Enumerating Exemplifying
	Announcements	Interpretive markers	Announcements	Previews	Endophoric markers	Previewing Arguing
Code glosses			Code glosses		Code glosses	Reformulating Clarifying Managing terminology
Illocution markers			Illocution markers	Action markers	Frame markers (see above)	
Narrators					Evidentials	Commenting on linguistic form/meaning

English is considerably better investigated than other languages (Akbas, 2014), reflecting its status as the lingua franca of academia (MacKenzie, 2015). A sizeable body of work investigates expert English users (e.g., Pérez-Llantada, 2010; Pisanski Peterlin, 2016), generating insights into the nature of the L1/L2 writing proficiency trajectory. One implication is that understandings of how expert English writers employ metadiscourse markers can contribute to the design of instructional materials targeted at neophyte EFL/ESL learners (Akbas and Hatipoğlu, 2018; Crismore et al., 1993; Smirnova and Strinyuk, 2020). Nevertheless, concerns have been expressed over the suitability of the professional academic's research article as a pedagogical template for novice academic writing (El-Dakhs, 2018b), while the metalinguistic label of metadiscourse itself has yet to gain widespread use among practitioners and students.

In addition to writer characteristics, a range of textual features mediate authors' uses of metadiscourse. The most well-documented are disciplinary differences unique to particular academic 'tribes' (Becher and Trowler, 2001) (for example, soft versus hard sciences as well as subsidiary disciplines) and academic genres (e.g., research articles, postgraduate theses, and argumentative essays), emphasising that effective academic writing requires writers to conform to complex and varied community-specific rhetorical expectations (Hyland, 2004a). Recent studies that reveal finer differences in use across the research article (RA) genre with regard to the section of the report (e.g., Crosthwaite et al., 2017), research paradigm (e.g., Cao and Hu, 2014), methodology (e.g., Liu and Tseng, 2021), publication venue (e.g., Birhan, 2021), and its impact factor and prestige (e.g., El-Dakhs, 2018a), further attest to the challenges involved in disciplinary socialisation. Increasingly, corpus studies have adopted longitudinal designs (e.g., Gillaerts, 2014; Hyland and Jiang, 2018a, 2018b; Liu and Huang, 2017), exploring how uses of metadiscourse resources evolve diachronically, perhaps from a cross-disciplinary perspective (see the works of Hyland and Jiang, 2018a, 2018b). In a few cases (e.g., Abbuhl, 2012; Cheng and Steffensen, 1996; Jalilifar and Alipour, 2007), such research can be interventionist and (quasi-)experimental, examining the effects of explicit metadiscourse instruction on novice writers' academic reading and writing capabilities.

Metadiscourse has also constituted the topic of two academic journal special issues, in *Educational Sciences: Theory and Practice* (volume 18, issue 4) and *Nordic Journal of English Studies* (volume 9, issue 2). The former features a number of contrastive studies of metadiscourse use across varying sub-genres of academic writing (e.g., dissertation acknowledgements, medical abstracts, and teacher feedback) that applies both broad and narrow analytical approaches. The special issue of the *Nordic Journal of English Studies* also foregrounds this conceptual divide, bringing in contributions from central proponents of both broad and narrow traditions. While acknowledging the divisions across conceptions of metadiscourse, the special issue serves to emphasise heterogeneity of metadiscourse as an area of study (Ädel and Mauranen, 2010). Metadiscourse is also being boosted by the existence of the *Metadiscourse Across*

Table 2
Synthesis of four notable interpersonal metadiscourse taxonomic frameworks.

Vande Kopple (1985)		Crismore et al. (1993)	Hyland (2005a, 2005b)		Ädel (2006, 2010)
Category	Sub-category	Category	Category	Sub-category	Category
Interpersonal metadiscourse		Interpersonal metadiscourse	Interactional metadiscourse		Audience interaction
Validity markers	Hedges Emphatics Attributors	Hedges Certainty markers Attributors	Hedges Boosters		
Attitude markers		Attitude markers	Attitude markers		
Commentaries		Commentaries	Engagement markers	Directives	Anticipating the reader's response Managing the message Imagining scenarios
				Shared knowledge Questions	
				Reader pronouns Personal asides	Audience orientation
			Self-mentions		

Genres special interest group (SIG). The SIG has held annual conferences on metadiscourse in Cyprus, Italy, Hong Kong and Spain since 2017.

In spite of the wide body of research, there have been markedly few attempts to take stock of the current literature on metadiscourse. A number of reviews provide coverage of key empirical texts in the field but are orientated towards summarising and refining conceptual understandings of metadiscourse itself (e.g., Ädel and Mauranen, 2010; Amiryousefi and Rasekh, 2010; Hyland, 2017; Khedri et al., 2013; Li and Deng, 2019), rather than providing a comprehensive account of the literature. Several exceptions include Cuevas-Alonso and Míguez-Álvarez's (2021) pioneering metareview of interactive and interactional makers across various textual genres, Hyland et al.'s (2021) overview of metadiscoursal variation between languages and genres, Khedri et al.'s (2013) more interpretive review of cross-disciplinary and cross-linguistic research, Wei et al.'s (2016) examination of influential 2000–2015 scholarship (although not limited to academic genres), and Crismore and Abdollahzadeh's (2010) review of studies situated in the burgeoning Iranian language education context. It is the belief of the researchers that a comprehensive review of research into metadiscourse use in academic writing, particularly drawing on the systematic tradition that emphasises rigor, transparency, completeness, and accuracy (Ganann et al., 2010; Mallett et al., 2012), is long overdue.

The present study constitutes a systematic review of the state-of-scholarship of metadiscourse research situated in academic writing contexts. It was commissioned as part of a three-year international research project into metadiscourse between a higher education institution in Southwest England and a public university in Qatar. The following research questions guided the design of the review:

1. What conceptual frameworks are adopted in empirical metadiscourse research involving academic writing?
2. What research designs and data sources are employed in metadiscourse research of academic writing?
3. What are the methodological characteristics of empirical studies of metadiscourse use in academic writing with respect to:
   - Study contexts?
   - The writers of texts featured in research?
   - The texts and corpora analysed in research?
   - Statistical tests and coding procedures?

In answering these questions, we will attempt to highlight gaps in the existing literature body and identify areas for improving metadiscourse study quality.

2. METHOD

2.1. Identifying relevant studies

Theoretical disagreements (Ädel, 2006; Ädel and Mauranen, 2010) and conceptual fuzziness (Ädel, 2006; Dahl, 2004) pose challenges in demarcating a clear boundary around metadiscourse research. We navigated these difficulties through the adoption of a comprehensive set of search terms, the development of principled inclusion/exclusion criteria, and ancestral searching. As with other systematic reviews, the present study followed PRISMA guidelines (Page et al., 2021), beginning with the identification of relevant studies using appropriate search terms across multiple indices. The development of search terms began with the retrieval of 686 documents from Scopus with 'metadiscourse' in the title, abstract, or keywords. Analysis of the frequency counts of prevalent author-supplied keywords yielded an initial search string comprising: 'metadiscourse' OR 'interactive' OR' interactional' OR 'interpersonal' OR 'stance' OR 'engagement' AND 'markers' OR 'resources'.

To avoid excluding research that addressed sub-categories of metadiscourse as well as studies that did not position themselves using these terms, the string was broadened to encompass features across a range of metadiscourse models (e.g., Crismore et al., 1993; Hyland, 2005a, 2005b; Mauranen, 1993a; Vande Kopple, 1985). The labels of several metadiscourse categories that also encompass more general meanings ('reviews', 'announcements', 'reflexivity') were excluded as they were found to generate too many irrelevant hits. Further amendments to the search terms were made in response to feedback solicited from four subject-matter experts. To better ensure the retrieved studies were situated in academic settings, contextual keywords (e.g., 'academic writing', 'argumentative essay', 'research article') were employed in conjunction with the search terms. The final set of search terms, provided in Appendix 1, we applied to the title, abstract, and keyword fields of the chosen research indices, with the exception of Google Scholar, where functional limitations meant the search terms were applied to the provided search box.

The point of departure for the search were databases of indexed research, namely the Web of Science (WoS), Scopus, ERIC (Educational Resources Information Centre) and EBSCOhost. Such services enable complex search strings that integrate Boolean operators to generate more refined and informative results and provide comprehensive bibliometric information, including document abstracts, essential for efficient document screening. A search of Google Scholar (using the term, 'metadiscourse', owing to search string length limitations) was also performed, with results limited to the first 200 hits for manageability.

In addition, ancestral searching of reference lists was undertaken to retrieve studies not listed on the above indices. This process was limited to review papers (e.g., Ädel and Mauranen, 2010; Crismore and Abdollahzadeh, 2010; Cuevas-Alonso and Míguez-Álvarez, 2021; Hyland, 2017; Khedri et al., 2013; Vande Kopple, 2012; Wei et al., 2016), recent research (i.e., 2020–2021), and studies that seemed particularly influential (e.g., Ädel, 2010; Aull and Lancaster, 2014; Dahl, 2004; Hyland, 2004a, 2005b; Hyland and Tse, 2004, 2005a; Yoon, 2021; Zhao, 2013), since it was not feasible to examine the reference lists of all studies obtained. Furthermore, the online catalogues of two journals not indexed on the selected indices – *Educational Sciences: Theory and Practice* and *Nordic Journal of English Studies* owing to their contribution of a special issue on metadiscourse (in 2018 and 2010 respectively). The only exclusion criterion used to filter studies at the identification stage was the timeframe in which they were published. An initial cut-off date of 1990 was set for reasons of manageability, while no studies published after 2021 were obtained, as the search process was conducted during February to March 2022.

2.2. Study selection, retrieval, and filtering

Records for 998 unique studies were obtained using the search terms and ancestral citation searching. As per PRISMA procedures, document titles and abstracts were screened by one of the researchers to determine study relevance (see Fig. 1), with 219 records being removed because they were unrelated to metadiscourse. The retrieved literature was limited to empirical studies published in English in academic journals, edited book chapters, and conference proceedings, since these are considered the main repositories for primary empirical research in language and linguistics. Full length books retrieved in our initial sample were excluded since they were either theoretical (e.g., Ädel, 2006) or deemed incomparable with the standard lengths of research reports using our developing analytical scheme. Similarly, we did not retrieve doctoral dissertations since the length and expectations of such reports mean the reporting practices of authors cannot be meaningfully compared with journals. 15 studies were omitted for being the wrong document type. Despite the use of contextual search terms, 85 studies were removed because they addressed metadiscourse in historical written texts (pre-1900), spoken texts (often lectures), and non-academic registers (e.g., newspaper articles, instructional textbooks). A broad interpretation of 'academic writing' was employed, with research featuring blogs, teacher written feedback, and young learner as well as adult essay writing in non-tertiary settings included. Additionally, a judgement was made whether studies were empirical, in other words, uncovering or generating experientially-based knowledge through formal study. Non-empirical studies (mainly comprising reviews and position papers) and discourse analytic studies that lacked a clear description of corpus and/or methods were excluded (*N* = 86).

Additional exclusion criteria were developed to address studies that bestride the fuzzy boundary surrounding metadiscourse (Ädel and Mauranen, 2010; Hyland, 2017; Khedri et al., 2013). Operationalisations of metadiscourse incorporating either markers or moves (see Ädel, 2023) were included. Text-analytic research that examined textual and interpersonal features of academic writing from a non-metadiscoursal perspective (e.g., lexicogrammatical accuracy and range, clausal length and complexity) were removed. Explorations of writer identity that focused entirely or mainly on students' autobiographical or authorial selves (e.g., Ivanič, 1998) were also rejected. Additionally, to ensure the focus remained on metadiscourse, studies that investigated features of author involvement through a discrete (but potentially overlapping) theoretical model to metadiscourse (e.g., appraisal, multi-dimensional analysis of genre variation, thematic organisation) were not included. Concerning voice, exceptions were made for studies where the metadiscoursal properties of voice could be disentangled from ideational features, for example, Zhao (2013).

It was apparent from the title, source name, and abstracts that many studies fulfilled the criteria for article type, study type, and study focus but were of low quality, with a few originating from publications listed on Beall's List of Predatory Journals. Since there seemed little value in appraising the conceptual and methodological features of low-quality research, we decided to apply a minimum quality standard as an additional inclusion criteria. This entailed the requirement for included studies to either be published in journals listed on the SSCI (Social Sciences Citation Index), AHCI (Arts and Humanities Citation Index), ESCI (Emerging Sources Citation Index), or SCIE (Science Citation Index Expanded) or to appear in Q1 or Q2 ranked journals in 2020 on the indexing service Scimago. Full-text reports for the remaining 454 studies were retrieved for closer analysis to determine eligibility for inclusion in the review (with 22 being eliminated owing to a lack of full-text availability). As can be seen from Fig. 1, a further 62 articles were eliminated because they were not deemed empirical (15), did not address the metadiscoursal properties of language
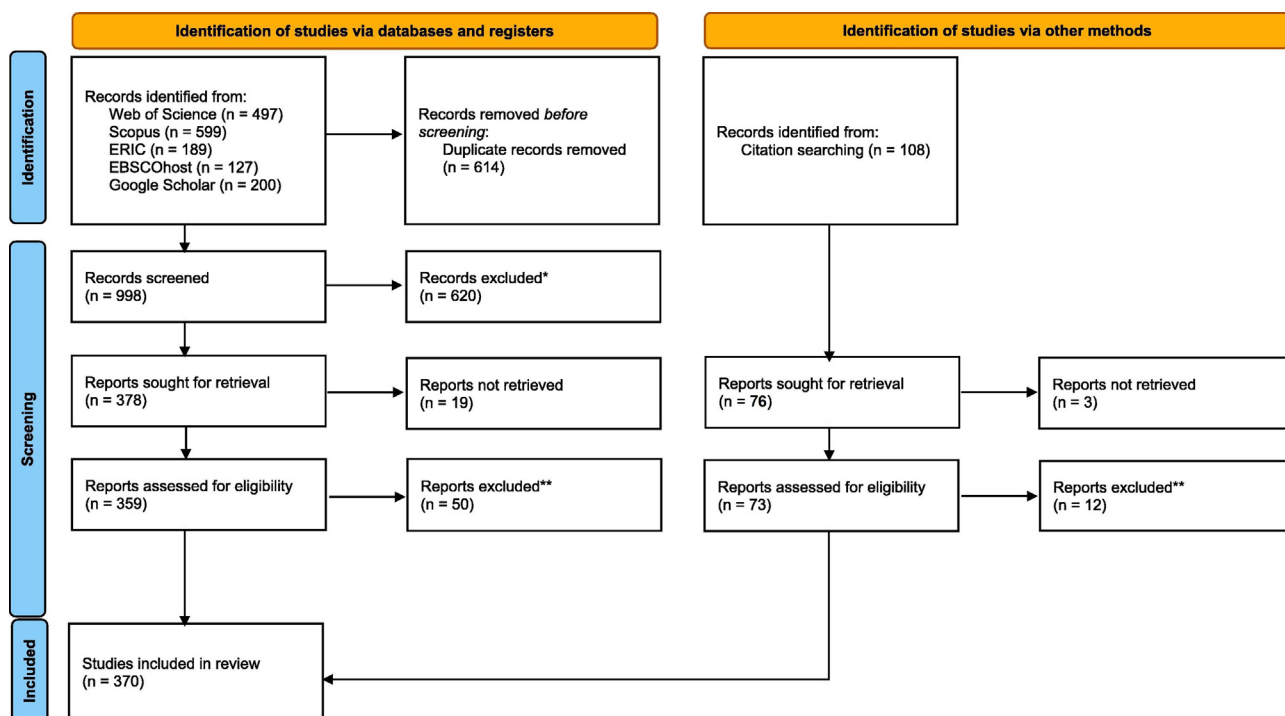
Fig. 1. PRISMA diagram. *Unrelated (219), from a low-quality publication (155), not an empirical study (86), not contemporary academic writing (85), utilises a different theoretical framework (e.g., Appraisal, CARS, Multi-dimensional analysis) (50), metadiscoursal properties of textual features not considered (33), wrong document type (e.g., thesis) (15), not in English (9).**Not an empirical study (15), utilises a different theoretical framework (15), metadiscursive properties not addressed (15), not contemporary academic writing (11), metadiscourse not a central focus (6).

resources (15), adopted a separate theoretical approach to metadiscourse (15), or did not feature contemporary academic writing (11). An additional criterion was employed to remove six studies where metadiscourse was deemed a subsidiary concern, i.e., reports where metadiscourse comprised one of more than three discourse analytic focal areas or if very limited space in the manuscript had been dedicated to metadiscourse. At the end of the PRISMA process, 370 studies were deemed suitable for inclusion in the systematic review.

2.3. Data coding and analysis

As with other methodologically-orientated systematic reviews (e.g., Hiver et al., 2021; Liu and Brown, 2015; Plonsky and Gass, 2011), this study employs quantitative data collection and analysis methods, centred on a deductive analytical scheme to code conceptual and methodological features of empirical metadiscourse research. The scheme was developed iteratively and recursively by identifying values, variables, and categories of interest with reference to influential metadiscourse studies (e.g., El-Dakhs, 2018b; Gillaerts and van de Velde, 2010; Hyland and Tse, 2004, 2005; Intaraprawat and Steffensen, 1995; Lee and Deakin, 2016; Yoon, 2017), defined as featuring in the top 40 most cited studies on Scopus with the term 'metadiscourse' in the title, abstract, or keywords. Additionally, systematic (e.g., Hiver et al., 2021; Plonsky, 2013) and methodological reviews in other areas of applied linguistics/language education (e.g., Liu and Brown, 2015; Plonsky and Gass, 2011) were consulted. The draft coding scheme underwent piloting by one researcher involving 50 metadiscourse studies, whereupon revisions were made in response to consistency issues, particularly with variables that required greater researcher interpretation, variables that had not been foreseen in the initial literature review, and feedback from two members of the project team, one based in England and another in Qatar.

Six pre-eminent categories emerged from piloting: research designs/data sources and conceptual considerations (addressing research question 1), and contexts, writers and readers, texts and corpora, and reporting practises (research question 2). Each category contained a number of variables, which featured either open-ended (e.g., corpus size in words, languages featured in the corpus) or categorical values (e.g., metadiscourse framework featured, analytical

software used). In most instances, values could be objectively identified in the texts, often the Method and Results/Discussion sections. However, there were a number of subjective variables requiring interpretation (e.g., how analytical software was used, how corpora were being compared). Coding was undertaken by one researcher. To reduce the threat of unreliability and misinterpretation, all study variables were iteratively checked by the coding researcher after a three-month interval. Additionally, a small sample of coding was double-checked by the other researcher working independently. Problematic variables were discussed with the other researcher and, in some instances, recoded. The findings are presented in the form of frequency counts/proportions of the uncovered research features, indicating prevalent and unusual practices, gaps in the literature, and for the purposes of addressing research question three, study quality.

3. RESULTS AND DISCUSSION

3.1. Overview of the sample

Table 3 provides an overview of the literature body. A striking finding is that nearly 80% of retrieved studies were published after 2009, with 27.97% being issued between 2019 and 2021. This indicates a dramatic recent uptick in metadiscourse research (measured as raw discrete studies), supporting the findings of bibliometric research (Hyland, 2017; Hyland and Jiang, 2022; Liu and Hu, 2021). As we were not able to normalise the frequency counts of publications for the particular time periods, we cannot say for certain if this constitutes an increasing rate of research.

Two publications stood out in their contributions to metadiscourse, the *Journal of English for Academic Purposes* (7.22%) and *English for Specific Purposes* (6.39%), indicating metadiscourse is often applied in English language teaching and learning settings. With 149 discrete publications recorded, there was much variety in where high quality metadiscourse research has been published. However, all but six of these sources contributed fewer than 2% of studies, suggesting metadiscourse is a diffuse interest that appeals to a wide range of readerships. It was also evident that lower quality publications were well represented among the sample, corroborating (Liu and Hu, 2021:111), who characterise much metadiscourse research as "narrowly circumscribed, frequency-based, descriptive studies of core written academic genres". It may be that the ease of 'push-the-button' analyses coupled with the lack of a requirement for ethical clearance appeals to early career scholars or those under pressure to publish. However, the superficiality of many such analyses prevents them from meeting the quality standards of more impactful language and linguistics journals.

3.2. Conceptual frameworks

As can be seen from Table 4, the metadiscoursal features investigated among the retrieved studies varied noticeably. Interestingly, studies that examined the full array of resources associated with a particular taxonomy of metadiscourse were in the minority. These more comprehensive investigations typically adopted Hyland's (2005a) influential interpersonal model (N = 134, encompassing the framework also as presented in Hyland, 1998b, 2004a; Hyland and Tse, 2004) and, to a lesser extent, Vande Kopple's (1985) earlier taxonomy (N = 14). Perhaps providing validity to criticisms that the broad approach lumps too many phenomena under the label metadiscourse (Ädel, 2006; Mauranen, 2010), it was more common for research to focus on one or a handful of resources. Another reason for this could be the length limitations of academic publishing, which may prohibit a meaningful thick analysis of such a heterogeneous array of features. Particularly prominent (and often paired together) were hedges (22.97%) and boosters (13.51%), underscoring the importance of doubt and certainty to the rhetorical and interactive character of academic writing (Hyland, 1998a). Also common were author self-mentions (12.43%), drawing especially on Hyland (2002b) and Tang and John (1999), reflective of the difficult balancing act academic writers face in safeguarding neutrality and objectivity while establishing visibility in the field (Can and Cangır, 2019), complicated by notable disciplinary and methodological variations (Cheung and Lau, 2020; Hyland, 2002a).

Consistent with what has been reported by Hyland (2017), most authors adhered to the broad metadiscourse research tradition, visible in the high uptake of Hyland's interpersonal model (2005a) and stance and engagement framework (2005b). From a theoretical perspective, adherence to the Hylandian perspective was evident in author alignment with Hyland and Tse's (2004:161) oft-cited claim that 'all metadiscourse is interpersonal' (e.g., Birhan, 2021; Cao and Hu, 2014; Kojima et al., 2019) or belief in the importance of interactional resources in academic communication as a socio-rhetorical activity (e.g., Gong et al., 2021; Hu and Cao, 2015). Authors also referenced more practical concerns, including the interpersonal model's ubiquity (e.g., El-Dakhs, 2018b; Hu and Cao, 2015) – an aid to study comparability (Akbas, 2014; Birhan, 2021), its impact as measured through citations (e.g., Ahmed et al., 2016), reliability as a measure of metadiscourse (e.g., Gu and Xu, 2021), and comprehensiveness (e.g., Akbas, 2014). We also speculate that, as marker-based models, such approaches are easier to apply and reach a consensus on in comparison to metadiscourse

Table 3
Features of the sample.

Variable	Value	N	%
Decade of publication	2020–2021	79	21.35%
	2010–2019	215	58.11%
	2000–2009	59	15.95%
	1990–1999	17	4.59%
Publication type	Journal article	322	87.03%
	Book chapter	25	6.76%
	Conference proceedings	23	6.22%
Top-10 most common publication venues (academic journals)	*Journal of English for Academic Purposes*	28	7.57%
	English for Specific Purposes	24	6.49%
	Journal of Pragmatics	21	5.68%
	English Language Teaching	14	3.78%
	Ibérica	10	2.70%
	Written Communication	10	2.70%
	3L: Language, Linguistics, Literature	7	1.89%
	Discourse and Interaction	7	1.89%
	Indonesian Journal of Applied Linguistics	7	1.89%
	Nordic Journal of English Studies	7	1.89%
Journal article availability	Subscription-based	208	56.22%
	Open access	162	43.78%

Table 4
Metadiscourse features investigated and frameworks adopted.

Variable	Value	N	%
Metadiscourse features investigated	Interactive/textual and interactional/interpersonal metadiscourse	77	20.81%
	Interactive/textual metadiscourse, metatext, discourse reflexivity	25	6.76%
	Transitions, (logical) connectives	21	5.68%
	Frame/illocution/action markers, sequencers	15	4.05%
	Endophoric markers, announcements, reviews, previews	4	1.08%
	Evidentials, narrators	8	2.16%
	Code glosses, topicalisers, reformulation markers	14	3.78%
	Interpretive markers	2	0.54%
	Interactional/interpersonal metadiscourse	26	7.03%
	Stance	49	13.24%
	Hedges	85	22.97%
	Boosters, emphatics, intensity markers	50	13.51%
	Attitude markers	24	6.49%
	Self-mentions	46	12.43%
	Attributors	2	0.54%
	Engagement	25	6.76%
	Reader pronouns, audience orientation	4	1.08%
	Directives	5	1.35%
	Questions	2	0.54%
	Metadiscursive nouns	7	1.89%
	Other	18	4.86%
Taxonomy of metadiscourse markers adopted	Hyland (2005a)	134	36.22%
	Hyland (2005b)	39	10.54%
	Ädel (2006, 2010)	14	1.67%
	Vande Kopple (1985)	14	3.78%
	Hyland (2002b)	7	1.94%
	Tang and John (1999)	7	1.94%
	Crismore et al. (1993)	6	1.67%
	Mauranen (1993a)	5	1.39%

at the move level (Ädel, 2023). It may also have been the case that authors perceived adoption of a Hylandian model, as a mainstream approach, would lend credibility to the analysis, boosting the prospect of a manuscript at peer review.

Adoption of a narrow approach, principally following the frameworks of Ädel (2006, 2010) and Mauranen (1993a) was noticeably less common (accounting for 35 studies in total). Such an approach seemed to be chosen for its manageability (e.g., Noble, 2010) and precision in demarcating metadiscourse from neighbouring concepts (e.g., Pérez-Llantada, 2010). Few studies adopted a move-orientated approach to metadiscourse (e.g., Ädel, 2010), which, owing to its flexible application across genres (Ädel, 2023), may usefully serve as an analytical tool for comparative analyses between academic and non-academic genres.

There are also some interesting trends in the role of theoretical frameworks in metadiscourse research. Most studies applied a singular, pre-existing model of metadiscourse to texts to classify and provide meaning to textual patterns the researcher(s) identified in the discourse. Ten per cent of studies were found to draw upon two or more taxonomies (e.g., MacIntyre, 2017; Wang and Jiang, 2018), although a lack of clarity prevented coding how prior literature had been synthesised into the stated analytical approach. Few studies (12.70%) were found to be theory generating, operationalised as analyses that posited new categories of metadiscourse or refined existing ones. Instead, scholars drew heavily on unmodified versions of models of metadiscourse markers developed by Hyland and colleagues, notably the interpersonal model (e.g., Hyland, 2004a, 2004b, 2005a, Hyland and Tse, 2004), metadiscursive nouns (e.g., Jiang and Hyland, 2017, 2021), and taxonomies of hedges and boosters (e.g., Hyland, 1998a). Adaptations of existing models mainly involved fine-tuning the selection of resource types to better suit the sample of writers or writing (e.g., Dobbs, 2014; Hong and Cao, 2014; Li and Wharton, 2012; Mur-Dueñas, 2011; Wang and Zeng, 2021). Instead, authors tended to view the selection of markers as a more context-dependent and malleable feature of the analytical approach (e.g., Ho and Li, 2018; Hu and Cao, 2011).

3.3. Research designs and data sources

3.3.1. Epistemological tradition

The epistemological tradition underlying research was determined based on authors' approaches to sampling, data collection, and analysis. Quantitative studies featured prominently (41.35%), with many being representative of the 'thin' tradition in metadiscourse research (see Ädel, 2006; Ädel and Mauranen, 2010; Gillaerts, 2014). Typically, corpora were electronically searched using a pre-prepared inventory of items that potentially realise metadiscourse functions, for the purposes of making inferences based on overall frequencies and/or distributions of resources (Ädel and Mauranen, 2010). One implication of this approach is that determining frequencies of expected or acceptable metadiscourse use among competent users helps identify potential overuse or underuse in less skilled writing (e.g., Granger and Tyson, 1996; Kuzborska and Soden, 2018), albeit there have been very few meta-reviews that synthesise frequency patterns from the wider literature (see Cuevas-Alonso and Míguez-Álvarez, 2021), the findings of studies often conflict (e.g., Çandarli et al., 2015; Hyland and Tse, 2005b), while the notion of acceptable frequencies, especially in the judgment of novice L2 writing by expert L1 standards, is controversial (see Connor and Moreno, 2018). Metadiscourse studies of the thin tradition (37.56%) are varyingly criticised across the literature, largely for their superficiality, decontextualised analysis, and reliance on researcher intuition (Ädel and Mauranen, 2010; Gillaerts, 2014; Liu and Hu, 2021). It is concerning that, even though a great deal of low quality research was cut during screening, so many metadiscourse studies followed this tradition.

Since metadiscourse offers a view of language grounded in pragmatics (Crismore et al., 1993; Hyland, 1998b), researchers are reminded that, "reading concordance lines is more important than recording frequency counts" (Hyland, 2017:18). This is reflected in the dataset, where 55.41% of studies triangulated quantitative data with an interpretive account of contextually-bound units of metadiscourse, to both establish metadiscoursal function in context (Hyland, 2005a) and describe and explain differences or similarities in text patterns with reference to illustrative units from the discourse (Ädel, 2010; Connor and Moreno, 2018). This was not always a straightforward delineation, usually because the provision of illustrative metadiscourse markers in context was not accompanied by qualitative interpretation. The mere checking of metadiscoursal function in context was not deemed sufficient to characterise a corpus-based study as mixed methods, since a confirmatory statement featured as a methodological footnote in some studies that were clearly of the thin tradition, inserted perhaps at the behest of peer reviewers or journal editors. Only 3.24% of research reports featured an entirely qualitative approach (e.g., Bondi, 2010; Dahl, 2008), reflective of the indispensability of frequency counts in focusing the reader's attention on similarities and differences in uses of metadiscoursal resources (Gillaerts, 2014; Han and Gardner, 2021). In a handful of instances, a qualitative element had been undertaken but did not feature in the report (Abdi et al., 2010; Ädel, 2010), perhaps owing to publishing constraints.

3.3.2. Study types

Adopting manual analysis, the retrieved studies were read, reviewed, and classified into eight discrete categories of research (with some featuring multiple classifications) based on the outlined aims and methods, illustrated with representative studies in Table 5. By far the most common was the corpus-based, cross-sectional descriptive study of writer metadiscourse use (Type A1; 87.84%), with a rich body of work drawing on the intercultural rhetoric tradition (A1ii; 81.89%). Such studies are grounded in Robert Kaplan's highly influential theory that individuals' cultural and linguistic characteristics considerably mediate their social interactions (Connor and Moreno, 2018), realised in textual artefacts that constitute the key locus of research attention (Hyland, 2004a, 2004b). Consequently, comparison of textual features across corpora that are deemed sufficiently large enough to be considered representative of the particular characteristics under scrutiny yields insights into the nature and extent of their influence. With a few exceptions (e.g., Harwood, 2006; Peng and Zheng, 2021; Zhao and Liu, 2021), this analytical approach involved the removal of written texts from their actual circumstances of composing, and can be contrasted with a more contextually-bound form of analysis encompassing examination of interaction as a situated encounter in an individual text (Hyland, 2005a).

Despite near universal acceptance of the dynamic properties of language and culture, only a small portion of metadiscourse research adopted diachronic perspectives (study type B; 6.76%), mostly for the purposes of identifying changes in particular resources within the RA genre, notably interactional markers (e.g., Gong et al., 2021; MacIntyre, 2017; Šandová, 2021) or identifying cross-disciplinary trends in professional research writing (e.g., Jiang and Hyland, 2017, 2018a, 2018b). Since some analyses have generated unexpected results (see Chen and Hu, 2020; Hyland and Jiang, 2016, 2018a, 2018b), further research that incorporates diachronic with cross-disciplinary (with a greater variety of subject areas) and cross-paradigmatic perspectives is needed. Additionally, no diachronic descriptive study comparing novice written registers across different time periods could be retrieved, a line of inquiry that may helpfully identify trends in student writing, perhaps for the purpose of providing further evidence to validate English language support programmes. Diachronic approaches were utilised with novice texts in six recent studies that tracked metadiscourse development across a series of discrete essays (e.g., MacIntyre, 2017; Martín-Laguna and Alcón-Soler, 2018) or drafts (e.g., Peng and Zheng, 2021; Zhao and Liu, 2021). Further research that longitudinally tracks the developmental trajectories of individual writers is needed to complement evidence based on the textual outcomes of different writers at different developmental stages (see Abdollahzadeh, 2019; Qiu and Ma, 2019; Ruan, 2020).

Table 5
A taxonomy of empirical metadiscourse study types.

Category	Sub-category	Example studies	N	%
(A) Cross-sectional descriptive studies of authors' metadiscourse use in academic writing	(1) Studies that investigate writer use of metadiscourse		325	87.84%
	(i) single corpus inquiries	Alonso-Almeida (2012), Tang and John (1999)	22	5.95%
	(ii) intercultural rhetoric studies	Hu and Cao (2015), Hyland (2004a)	303	81.89%
	(2) Studies that correlate metadiscourse use with measures of writing quality	Dobbs (2014), Uccelli et al. (2013)	9	2.43%
	(3) Studies that investigate writers' appropriacy of metadiscourse use	Harwood (2006), Intaraprawat and Steffensen (1995)	12	3.24%
(B) Diachronic descriptive studies of authors' metadiscourse use in academic writing	(1) Diachronic studies of metadiscourse use	Gillaerts (2014), Jiang and Hyland (2021)	19	5.14%
	(2) Longitudinal studies tracking novice writers' metadiscourse development	MacIntyre (2017), Martín-Laguna and Alcón-Soler (2018)	6	1.62%
(C) Interventionist studies examining the role of metadiscourse and the effects of its teaching	(1) Studies of the effects of metadiscourse teaching on writing quality	Cheng and Steffensen (1996), Firoozjahantigh et al. (2021)	10	2.70%
	(2) Studies of the effects of metadiscourse teaching on reading ability	Jalilifar and Alipour (2007), Tavakoli et al. (2008)	2	0.54%
	(3) Studies of the role of metadiscourse (and/or its absence) on reading ability	Alonso et al. (2012), Parvaresh and Nemati (2008)	6	1.62%

Owing to the prominence of corpus-based research grounded in intercultural rhetoric, the culturally-bound feature(s) that constituted points of comparison across corpora were identified, although we acknowledge the role of our own inter-pretations in synthesising and labelling these categories. Those that featured more than twice are outlined in Table 6. Of less interest to research (*N* = 167) was the backgrounds of writers, notably their nativeness with the language (18.65%), expertise (or development stage as a writer) (9.73%), and L1 (8.38%). Mediating textual factors were boosted by the prevalence of cross-disciplinary analyses (28.65%), and to a lesser extent, the section of texts examined (8.65%). The notion of competent language use/users was complex. A distinction was made between the large group of studies that compared metadiscourse use based on the developmental stage of different writers (e.g., master's versus doctoral students, doctoral students versus academics) and the afore-discussed developmental tracking studies. Additionally, research (e.g., Basturkmen and von Randow, 2014; Ho and Li, 2018; Kuzborska and Soden, 2018) that examined metadiscourse use according to categories of writing quality (determined through a formal or informal assessment, often by the researchers) was differentiated from that where a multi-skill language assessment had been employed in order for comparison across the broader notion of L2 proficiency (e.g., Bax et al., 2019; Carrió-Pastor, 2021).

Separate from studies that contrasted metadiscourse use across categorical variables that related to the quality of written texts, a rare sub-strand of research correlated (usually, novice) writer use of metadiscourse resources with writ-ing quality (type A2 in Table 5). Measures of textual quality varied notably, with researchers utilising holistic scales drawn from language assessment (e.g., Huh and Lee, 2016), institutional (e.g., Kuzborska and Soden, 2018), Zhao's (2013) and holistic voice rubrics (e.g., Yoon, 2017), or an eclectic series of measures, such as, quantity of clauses, syn-tactic complexity, and lexical density (content words per clause) (see, for example, Dobbs, 2014; Munoz-Luna, 2015; Uccelli et al., 2013). Novice writers' competence using metadiscourse resources was also an unusual strand of inquiry (A3; 3.24%) (e.g., Intraprawat and Steffensen, 1995; Kojima et al., 2019). Unfortunately, most of these studies failed to clearly operationalise concepts such as 'errors' or 'misuses' of metadiscourse (for an exception, see Martín-Laguna and Alcón, 2015). On only three occasions was the sole focus the accuracy of writers' metadiscourse use (e.g., El-Dakhs et al., 2020), leaving much work to be done in this area.

Even though much descriptive corpus-based metadiscourse research foregrounds pedagogical implications for insti-tutions and practitioners, as shown in Table 5, interventionist studies into the effects of explicit metadiscourse teaching to novice users remain a marginal research type (C; 5.14%). Such studies generally adopt (quasi-)experimental designs, featuring a pre-test, intervention in the form of a metadiscourse-centred instructional programme, and post-test, although in only one instance a delayed post-test (Sun and Hu, 2020). Unsurprisingly, there is greater interest in the effects of instruction on academic writing (C1; 2.70%) than on reading academic texts (C2; 0.54%), though instruction for the purposes of improving authentic, high-stakes student writing (i.e., dissertations and theses) has yet to be considered. It is also worth noting that much experimental research is no longer recent (e.g., Cheng and Steffensen, 1996) nor is featured in higher quality publications. There is a need for more rigorous experimental studies that provide detailed insights into the content and processes of pedagogical interventions (see Sun and Hu, 2020). Addi-tionally, as explicit metadiscourse instruction enhances the sensitivity of novice writers to their readers, experimental measures could be complemented by the self-reports of writers, obtained through the discourse-based interview (Ivanič and Satchwell, 2007).

3.3.3. Data sources and retrieval

As shown in Table 7, 95.14% of research featured a corpus or corpora of academic texts as the only or primary data source, although how these were investigated varied noticeably. Significant heterogeneity was exhibited in determining metadiscourse resources for corpus analysis. Deductive approaches were common (30.54%), represented most fre-quently by the use of Hyland's (2005a) list of metadiscourse markers (16.22%), the creation of novel lists synthesised from the wider literature (9.73%) or grammars and dictionaries (2.70%), and researcher brainstorming (1.89%). Other studies (11.35%), focused on (usually) a limited range of forms that realise a metadiscoursal function (e.g., author self-mention using *I* and *we*), elaborated on a shorter, closed list of items (e.g., Can and Cangır, 2019; Cheung and Lau, 2020) or POS-tagging to retrieve structural patterns of interest, for example, the evaluative *that* (e.g., Hyland and Tse, 2005a, 2005b) and metadiscoursal nouns (e.g., Jiang and Hyland, 2017, 2021). Less commonly, resources were determined inductively, centred on the close reading of all (29.46%) or a portion of the texts themselves (1.62%). This encompassed the manual identification and annotation of metadiscourse markers in context, supported by software such as *UAM Corpus Tool* (2.70%) or *NVivo* (1.89%), and the inductive development of inventories for later electronic analysis, often using *AntConc* (featured in 19.73% of all studies) or *Wordsmith Tools* (16.22%). The automa-tion of marker identification using *Authorial Voice Analyzer* (AVA) or *METOOL* featured sparingly (e.g., Carrió-Pastor, 2021; Yoon, 2017; 2021), perhaps because the need to verify metadiscoursal function in context undermines the big data affordances underlying such software.

Table 6
Writer and textual points of comparison in contrastive metadiscourse research.

Writer values	N	%	Textual values	N	%
Nativeness (L1 vs L2)	69	18.65%	Discipline (chemistry, linguistics)	106	28.65%
Writer expertise (novice, expert)	36	9.73%	Text section (introduction, discussion)	32	8.65%
			Academic genres (research article, student essay)	19	5.14%
L1 (English, Chinese)	31	8.38%	Writing quality	15	4.05%
Gender (male, female)	14	3.78%	Rhetorical moves across a research article (establishing a territory, occupying a territory)	12	3.33%
L2 proficiency (CEFR B1, B2)	6	1.62%	Original language of an academic text vs a translation	7	1.89%
Writer development (across a learning programme)	5	1.35%	Paradigm adopted in a research article (quantitative, qualitative)	6	1.62%

The identification and retrieval of metadiscourse markers represents a noteworthy area for improving the design/reporting of future research. First, the source of metadiscourse markers could not be confidently determined across a concerning 25.68% of studies. This omission was particularly common among studies adopting Hyland's (2005a) framework, with some authors likely conflating the framework with the list of markers. While authors' rationales underlying the selection of metadiscourse inventories was not coded, reliance solely on this list without adaptation, exhibited by 33 studies, reinforces the unhelpful perspective that this (or any list of markers) is complete as well as removing markers from the context of composition. The provision of a wordlist, usually as an Appendix, was disappointingly rare (14.86%). Although we recognise the incorporation of a wordlist in an academic report is not always feasible given its length, we recommend future authors provide inventories as supplementary material, a feature of academic publishing gaining increasing acceptance.

Research that featured software to aid the identification of metadiscourse markers (N = 209) provided varying descriptions of how tools were used, which were synthesised into six discrete purposes. Most frequently (37.30%), tools were employed to search (usually large) corpora for candidate items featured in a pre-determined list. Such automated analyses were not always complemented by manual checking of the texts to avoid skipping items that were missed prior to the analysis (Abdi et al., 2010). The majority of authors recognised the threat to study validity brought about by the inability of software to account for candidate items' functional and context-dependent metadiscursive properties (Abdi et al., 2010; Ädel, 2006) or to distinguish between internal (within the text) and external (beyond the text) reference markers (Hyland, 2005a). Automated retrieval of markers was often complemented by manual analysis of the metadiscursivity of candidate forms (see Statistical Tests and Coding Procedures). In some instances, software was utilised to generate concordance lines for manual checking of metadiscursivity (12.70%) or to allow markers to be manually annotated according to the chosen taxonomy (7.03%).

Of great interest in future metadiscourse research is the use of software that can intelligently identify metadiscourse markers, such as AVA (Yoon, 2017; Yoon and Römer, 2020). Comparison with manual coding shows high levels of inter-rater reliability (Yoon, 2017; Yoon and Römer, 2020). However, it is also the case that some metadiscourse devices (e.g., questions, personal aides, multifunctional markers) do not lend themselves to automated counting (Yoon, 2017), which may explain why the software has not been more widely taken up. A lack of clarity in software use limits the replicability of 27 studies, especially for 13 reports where the source of markers was also deemed unclear. As in other research areas, replicability through methodological transparency both serves to demonstrate that the knowledge produced is sound, while providing future authors the means to confirm, build upon, or dispute current knowledge by applying existing approaches in novel ways.

A final notable result in Table 7 is the low incidence of qualitative data collection methods to supplement corpus-based approaches. In just 34 studies were interviews used to explore writer perspectives and the sociocultural contexts in which texts were written (e.g., Çandarli et al., 2015; Harwood, 2006; Jiang and Ma, 2019; Munoz-Luna, 2015). Few of these were classified as case studies (N = 5), with a tendency for interview data to contribute an ancillary role, evinced by the limited content dedicated to the description of the purpose and format of interviews, approach to data analysis, and method of triangulation with corpus findings (for an exception, see McCambridge, 2019). Rarely was interview data given parity with or pre-eminence to textual data (e.g., Harwood, 2006; Lancaster, 2016b). We, of course, acknowledge the vital role corpora play in illuminating the metadiscourse use of novice and expert writers. Yet, as notions such as writer identity, writer personality, and reader-writer interaction are not reified phenomenon but dependent on the interpretation and meaning making of both writers and readers, in conjunction with textual artefacts, we urge future research-

ers to incorporate the first-hand reports of the participants involved (e.g., through interviewing, think-aloud protocols, stimulated recall). In this way, it may be helpful for researchers to look to other areas of applied linguistics where the triangulation of textual outcomes with student reports confer more complete understandings, such as response to written feedback.

3.4. Study contexts

Table 8 outlines the contextual characteristics of the included research. It can be seen that most studies were classified as not featuring data generated from within an institutional context, usually because data sources encompassed bespoke-compiled corpora of research articles or non-institutionally-specific novice writing (e.g., BAWE, VESPA). In fact, a mere 19.46% of studies investigated metadiscourse via a sample of individuals recruited from within a given context. With the exception of a handful of studies that explored academics' perspectives towards metadiscourse in their own or others' research writing (e.g., Alonso et al., 2012; Harwood, 2006; Zou and Hyland, 2020), such studies recruited samples of novice writers. 79.17% of such participants were enrolled on a tertiary-level academic programme, with an additional 12.50% undertaking elementary or secondary public education. Teaching and learning contexts outside of public education that feature academic writing, such as the private language teaching organisation, have seldom been considered. Interestingly, novice writer samples were typically recruited to produce samples of writing for metadiscoursal analysis, with only 13.89% being queried on their perspectives towards metadiscourse through interviewing. Future research could also incorporate learners' perspectives, perhaps triangulating their metadiscourse use in written texts with metalinguistic understanding.

An alternative to enlisting novice users to produce essays for corpus analysis was the retrieval of texts from institutions directly (12.70%) (e.g., Basturkmen and von Randow, 2014; Peng and Zheng, 2021) or use of an institutionally-associated corpus (5.14%), such as MICUSP or TARBUC (e.g., Aull and Lancaster, 2014; Hasselgård, 2016), useful for analysing high-stakes assessed writing, such as course assignments or theses (Bunton, 1999; Gardezi and Nesi, 2009; Lee and Casal, 2014). In a small number of studies (e.g., Can and Cangır, 2019; Wu and Paltridge, 2021), data were retrieved from (usually) national repositories of novice writing, offering the advantage of greater variety across learner characteristics and the contexts in which texts were produced. Thirty-two studies were found to draw on data from more than one context, usually for the purposes of contrasting novice writing (obtained via a recruited sample or data repository) with expert writing in the form of research articles (e.g., Çandarli et al., 2015; Takač and Ivezić, 2019).

By far the most common settings in which data had been generated (excluding studies of research articles that were deemed 'not institutionally based') was the academy (38.92%). Within this varied context, most participants were undertaking undergraduate programmes (18.65%), followed by master's degrees (12.97%) and doctorates (7.84%). Undergraduates were more likely to be involved as recruited participants in research (N = 36), compared with master's (N = 11) and doctoral students (N = 4). These findings may reflect the practical realities of participant sampling, such as the availability of larger cohorts of undergraduate writers and writing, the comparative shortness of their texts in comparison to master's and (especially) doctoral theses, and a preference for retrieving samples of postgraduate writing

Table 7
Data sources and corpus tools.

Variable	Value(s)	N	%
Data sources	Corpora	352	95.14%
	Interview transcripts (individuals)	28	7.57%
	Pre-tests/post-tests	12	3.24%
	Questionnaires/surveys	12	3.24%
	Interview transcripts (focus groups)	6	1.62%
Corpus software tools used	*AntConc*	73	19.73%
	Wordsmith Tools	60	16.22%
	WordPilot	14	3.78%
	UAM CorpusTool	10	2.70%
	NVivo	7	1.89%
How corpus software tools were used	Identify forms and frequencies of metadiscourse markers from a predetermined list	138	37.30%
	Generate concordance lines for manual analysis	47	12.70%
	Manually annotate metadiscourse markers	26	7.03%
	Identify metadiscourse markers using a tag query	8	2.16%
	Intelligently identify metadiscourse markers	6	1.62%

from institutions, repositories, and established corpora. Despite an abundance of research within undergraduate and postgraduate degree contexts, few studies actually contrasted students' metadiscourse use across tertiary degree levels (e.g., Aull and Lancaster, 2014; Aull et al., 2017; Becker and Feng, 2020; Jalali, 2017; Wu and Paltridge, 2021). Further comparative research or meta-reviews of current research (see Cuevas-Alonso and Míguez-Álvarez, 2021) could help highlight how writers at varying stages along the academic learning-to-write trajectory navigate their positions from non-discipline-specific evidence-based argumentation to literacy within a specialised discipline using technical knowledge (Aull and Lancaster, 2014; Becker and Feng, 2020; Pujol Dahme and Selfa, 2020).

Data sourced from pre-tertiary learning contexts were rare, highlighting that much research on metadiscourse in L1 and L2 academic writing focuses on adult academic discourse (Martín-Laguna and Alcón, 2015). Further attention on learners outside of university contexts is needed, not least to generate pedagogical insights into how young learners can be better equipped with the metadiscoursal resources required to succeed in essay writing tasks (Cheng and Steffensen, 1996; Quílez, 2021), which become ubiquitous by middle education (Dobbs, 2014) and feature prominently in higher education (HE) gateway examinations (Uccelli et al., 2013). Additional inquiries employing samples of learners within school settings would also contribute longer-term developmental perspectives on metadiscourse (see Dobbs, 2014; Pujol Dahme and Selfa, 2020; Yoon and Römer, 2020), as well as providing insights into the practices of a more diverse sample of writers in terms of academic ability and socioeconomic status (Dobbs, 2014; Kim, 2017). Against expectations, only a handful of metadiscourse studies were situated within private language teaching organisations (e.g., Parvaresh and Nemati, 2008; Tavakoli et al., 2008). This could be due to the neglect of metadiscourse in mainstream textbooks (Crismore et al., 1993; Hyland, 2005a), insufficient training provided to teachers (Abdelrahim and Abdelrahim, 2020), or a lack of time in heavily-loaded curricula (Abbuhl, 2012). Since studies have shown that the skilful use of metadiscourse can enhance how a reader interprets argumentative writing (see McCarthy et al., 2021), it is surprising that research has yet to properly address how metadiscourse, perhaps taught as part of a test management strategy, could impact on outcomes in high-stakes L1 or L2 language assessed reading and writing (e.g., Firoozjahantigh et al., 2021).

3.5. Writers (and Readers)

It has been well-reported that aspects of an individual's identity and the context of writing, such as their gender, L1, and disciplinary focus mediate the quantity and types of metadiscourse they use (Ädel, 2006; Crismore et al., 1993; Hyland, 2004a; Tse and Hyland, 2006, 2008). As such, a range of background characteristics to the individuals involved in metadiscourse research were examined. In the vast majority of instances (N = 362), these individuals encompassed writers whose texts were analysed for metadiscourse. Given that many studies incorporated texts (especially research articles) without the involvement of the original author(s) or did not provide a list of the included studies (unfeasible with larger corpora), writer sample sizes could rarely be retrieved. As only eight studies featured participants in the role of the reader, more emphasis is placed on the uncovered characteristics of writers.

Generally, studies featuring novice L2 writers and those recruiting human participants tended to report writer backgrounds more comprehensively. In contrast, background information on expert L1 research article writers was scant, with the publication's renown, impact factor, or prestige considered more salient. Reflective of this reporting feature is writer gender, the breakdown of which was provided in a mere 48 studies. The phenomenon of greater female involvement in higher education is visible in metadiscourse research, with a total of 2,294 female participants identifiable across the dataset versus, 1,766 males. The age of writers was reported slightly less frequently (N = 43), perhaps because this factor was not deemed important (in the case of RA writers) or because the level of tertiary study was considered a more critical mediator of metadiscourse use. Indeed, no contrastive study directly featured writer age as a dependent variable. Yet, given that some individuals return to higher education later in life, it could be insightful to explore if or how professional experience in fields involving exposure to academic texts (e.g., education, health, law) heightens awareness of metadiscourse.

3.5.1. Expert/novice language users

A distinction was made between studies that incorporated participants or texts by writers considered novice (L1 or L2) users, i.e., those in primary, secondary, or tertiary education, and expert writers, usually professional academics. Such a distinction was not always clearcut, since a few studies of expert users sampled low-quality publications (e.g., Youssef, 2016) or featured the conference abstract/proposal genre where the writer's expertise was unclear (e.g., Simon-Maeda, 2016). As reported elsewhere (Hyland 2005c), studies incorporating expert writing occurred more frequently (N = 231) than novice writing (N = 168), highlighting the importance of understanding the rhetorical practices of competent users prior to cross-linguistic or inter-developmental comparisons (Connor and Moreno, 2018), constituting the basis for novice-writer disciplinary acculturation via textual modelling (e.g., Becker and Feng, 2020; Hyland,

Table 8
Contextual characteristics.

Variable	Value	N	%
Study setting	Not institutionally based	254	68.65%
	Institutionally-based participants	72	19.46%
	Texts obtained from an institution	47	12.70%
	Use of an institutionally-associated corpus	19	5.14%
	Texts retrieved from a data repository	10	2.70%
Institutional settings	University	144	38.92%
	High school	8	2.16%
	Language teaching organisation	4	1.08%
	College	2	0.54%
	Middle school	2	0.54%
	Elementary school	1	0.27%
Learning programmes	Bachelor's degree	69	18.65%
	Master's degree	48	12.97%
	PhD	29	7.84%
	English as a foreign language course	8	2.16%
	Diploma	2	0.54%
	Test preparation course	1	0.27%

2002a, 2004b; Soliday, 2011; Uccelli et al., 2013). As can be seen from Table 9, many researchers have answered calls from Hyland (2005c) and others for attested evidence of the forms novice writers use to guide and interact with the reader, such that novice L2 writers constitute the most heavily researched population (37.57%), aided by several well-established corpora of tertiary-level student writing (e.g., BAWE, LOCNESS, MICUSP). Interestingly, expert L2 writers are well-represented in the dataset, although owing to the need for non-native scholars to engage with their readers in English given its status as the lingua franca of academic publication (MacKenzie, 2015), this is perhaps not surprising.

Thirty-four studies incorporated texts by both novice and expert users for the purpose of contrasting metadiscourse use by student writers at varying stages in their academic journeys with professional academics (e.g., Aull et al., 2017; Crosthwaite et al. 2017; Jiang and Ma, 2019). Unexpectedly, the direct comparison of L1 expert users with L2 novices (e.g., Wang and Jiang, 2018; Wang and Zeng, 2021) was rare (N = 11). This, however, was usually because authors did not report the nativeness of expert writers (N = 114) (e.g., Hyland, 2002a, 2004b), perhaps because it can be assumed that the stringent quality demands of top journals and rigorous peer review mean such writers can be considered acculturated into disciplinary conventions (Hu and Cao, 2011; Mur-Dueñas, 2010, 2011). An alternative explanation is that such information was not easily retrievable. In general, higher quality studies directly addressed potential reader uncertainty over the assumed (non-)nativeness of writers not directly sampled in the study by reporting checking authors' affiliations (N = 31) (e.g., Abdollahzadeh, 2019), names (N = 18) (e.g., Lafuente-Millán, 2014), backgrounds or CVs (N = 13) (e.g., Dontcheva-Navrátilová, 2021), but only rarely through direct contact with authors (N = 4) (e.g., Akbas and Hardman, 2017). Even though 87 studies provided a bibliography of included studies, we did not consider it feasible to undertake a background check of cited authors ourselves. However, in 58 other studies, description of the data source allowed us to determine the nativeness of the included texts' authors.

3.5.2. Users' L1s

Expert and novice English writers constitute by far the most heavily sampled population in metadiscourse research, reflecting the primacy of English as the medium in which academic research is published. There is also a preponderance of studies featuring users of Spanish, a phenomenon noted by Lee and Casal (2014), and of Persian (for a review, see Crismore and Abdollahzadeh, 2010). Speakers of Mandarin and Cantonese (if not specified, labelled as 'Chinese') were also well represented in the dataset, although primarily as novice (and notably, L2) users, reflecting the importance of Chinese overseas students to the education systems of Anglophone countries (Kuzborska and Soden, 2018) or local institutional requirements (not unique to China) to complete coursework in English (Peng and Zheng, 2021). This pattern was also shared by cohorts from Japan, Turkey, and Korea. Further research is required to investigate features of metadiscourse use across languages poorly represented in the sample (relative to the number of speakers worldwide), notably Arabic, French, and Hindi. Additional cross-linguistic research could generate insights into universality versus culturally-bound expectations of writing (El-Seidi, 2000; Hyland, 2005a), addressing the validity of Hinds' (1987) claim of writer- versus reader-responsible languages. Additionally, as there is growing acceptance that English used as a lingua franca need not resemble English as a native language (MacKenzie, 2015; Smirnova and Strinyuk, 2020), a focus

on expert L2 English users from diverse language backgrounds is warranted, along with cross-cultural studies that offer practical pedagogical implications for how metadiscourse features transfer from English into writers' L1 and vice-versa.

3.5.3. Novice L2 users' background characteristics

Given the affordances of metadiscourse instruction to helping novice L2 users improve as academic writers (Abbuhl, 2012; Abdelrahim, and Abdelrahim, 2020; Firoozjahantigh et al., 2021; Petchkij, 2019), additional features unique to this profile were investigated. One hundred and thirteen studies reported the language proficiency levels of novice L2 participants, with an additional 83 omitting this information. This may have been because the texts produced for metadiscourse analysis were subject to an assessment of writing quality, either for the purposes of correlating metadiscourse use with the measures of writing quality (e.g., Huh and Lee, 2016; Uccelli et al., 2013) or for comparing learners across criterion-referenced L2 proficiency levels (e.g., Bax et al., 2019; Carrió-Pastor, 2021). Nevertheless, it was highly unusual for novice L2-writers' metadiscourse use to be compared across proficiency levels where all four skills had been assessed (see Carrió-Pastor, 2021). As the academy constituted the pre-eminent settings in which texts were retrieved, L2 students at and above the common cut threshold of CEFR B1 (Pearson, 2020) were highly represented (B1-C2, $N = 70$). TOEFL ($N = 17$), an in-house placement test ($N = 10$), and IELTS ($N = 6$) were the most commonly reported tests from which students' language levels were ascertained, albeit this information was frequently omitted in reports.

We agree with Qin and Uccelli (2019) that further research is needed to examine metadiscourse use among L2 learners with emergent proficiencies (i.e., CEFR A1 and A2). The perspective that core forms should be mastered before students are introduced to the notion of audience consideration seems flawed, while some studies have shown explicit metadiscourse instruction can improve lower-level L2 learners' writing skills (e.g., Abbuhl, 2012) and boost their comprehension and memory of propositional content (e.g., Parvaresh and Nemati, 2008). Similarly, admissions policies at many Anglophone institutions allow lower proficiency students to gain conditional admission onto a tertiary-level programme via pre-sessional and foundational English language programmes (Pearson, 2020). Further research could helpfully indicate if developing L2 writers are better served being made explicitly aware of metadiscoursal considerations, as is often the case on EAP programmes, versus language development on 'general English' courses outside of the academy.

3.5.4. Disciplines

Disciplinary context was taken to mean the (sub-)field in which authors explicitly positioned the retrieved research, most commonly, RAs or novice writers' degree programmes. EFL/ESL courses supplementary to students' majors were not recorded since such programmes tend to offer non-disciplinary-specific content (Pearson, 2020). As shown in Table 10, metadiscourse has been most commonly studied within applied linguistics (24.72%) and linguistics (9.72%). This was often justified with reference to authors' greater familiarity with discourse practices (e.g., Breivega et al., 2002; Hu and Cao, 2011) or the observation that linguistics is representative of humanities more broadly (e.g., Dahl, 2008; Fløttum et al., 2006). Additionally, applied linguistics is a locus of the trend towards HE internationalisation, given that many institutions require postgraduate students to submit their theses in English (Wu and Paltridge, 2021). Yet, it is also the case that metadiscourse has been researched across an array of academic disciplines ($N = 164$), albeit

Table 9
Nativeness, writer expertise, and notable languages featured.

Variable	Value	Expert N	%	Novice N	%
Nativeness	L1 user	91	24.59%	64	17.30%
	L2 user	61	16.49%	139	37.57%
	L3 user	0	0.00%	1	0.27%
	Not reported	114	30.81%	9	2.43%
	Not considered relevant	10	2.70%	0	0.00%
Top-9 writer/ reader L1s	English	80	47.62%	52	30.95%
	Spanish	25	14.88%	19	11.31%
	Chinese (incl. Mandarin and Cantonese)	23	13.69%	61	36.31%
	Persian	19	11.31%	13	7.74%
	Arabic	8	4.76%	7	4.17%
	French	7	4.17%	6	3.57%
	Czech	6	3.57%	3	1.79%
	Russian	5	2.98%	4	2.38%
	Japanese	4	2.38%	10	5.95%

Table 10
Disciplinary contexts.

Variable	Value	N	%
Discipline, Becher and Trowler (2001) taxonomy	Soft pure	256	69.19%
	Soft applied	228	61.62%
	Hard pure	159	42.97%
	Hard applied	142	38.38%
Top-10 disciplinary contexts	Applied linguistics	89	24.72%
	Linguistics	35	9.72%
	Sociology	35	9.72%
	Biology	34	9.44%
	Economics	34	9.44%
	Medicine	24	6.67%
	Physics	24	6.67%
	Social sciences	24	6.11%
	Computer science	19	5.28%
	Business studies	18	5.00%

there were a number of overlaps (e.g., computer engineering/computer science, humanities/arts and humanities). As can be seen from Table 10, when categorised according to Becher and Trowler's (2001) taxonomy, more studies have considered metadiscourse in the 'soft' disciplines, with 'pure' fields exceeding 'applied' ones owing to the preponderance of linguistics, sociology, economics, social sciences, and philosophy. Clearly, more research is required within the hard disciplines (especially applied hard). Authors should also consider how publication choice (notably applied linguistics versus hard science-orientated publications) may affect the visibility and impact of such research, the latter being an uncommon venue for metadiscourse research.

Great heterogeneity was exhibited in the scope of disciplinary size/specialisation adopted, the quantity of disciplines compared (mean = 4.07, S.D. = 2.26), and the rationale behind their selection, revealing few generalisations. More recently, the role of two factors that intersect disciplinary contexts have been investigated, namely quantitative versus qualitative paradigmatic traditions in six studies (e.g., Cao and Hu, 2014; Chen and Hu, 2020) and Liu and Tseng's (2021) comparative study of metadiscourse use across case studies and narrative inquiries. It was found 36 studies did not report a disciplinary context. While this could be considered concerning given the mediating role of disciplinary conventions on academic persuasion (Dahl, 2008; Dontcheva-Navrátilová, 2021; Tse and Hyland, 2008), it did not always appear feasible to report the full array disciplines (e.g., Aull et al., 2017), the name of the programme was omitted for anonymity (e.g., McCambridge, 2019), or not all learners had a specialisation (perhaps by virtue of being in public education) (e.g., Hong and Cao, 2014).

3.6. Texts and corpora

The importance of corpus linguistics approaches to metadiscourse research (Farahani, 2019; Hyland, 2005a, 2017) was borne out in the present study, with all but 18 of the retrieved studies deemed to feature written texts as the sole or primary data source with a corpus-based analysis in mind. We took authors' depictions of written genres at face value since a lack of description and illustration meant we felt unable to synthesise the stated genres into our own taxonomy. We also acknowledge that the selection of contextual keywords may have influenced the inclusion and exclusion of studies based on how authors described writers' texts in the title, keywords, and abstracts. Table 11 outlines the registers of written texts that appeared more than three times across the retrieved literature.

3.6.1. Research articles

The research article is the most comprehensively represented genre (61.93%), indicative of long-running scholarly efforts to provide wider access to the rhetorical conventions of skilled academic writers (e.g., Becker and Feng, 2020; Hyland, 2002b, 2004b, 2005a; Soliday, 2011). With a few exceptions (e.g., Barton, 1995; Birhan, 2021; Tse and Hyland, 2006), the RA constituted the sole genre of expert writers present across the retrieved literature. Three hundred and eighty-nine discrete academic publications were identified as sources of research articles. The fact that 309 of these titles were present in only one or two studies reflects the practice of sampling a variety of publications for cross-disciplinary analysis (e.g., Cheung and Lau, 2020), a focus on non-English medium journals (e.g., Breivega et al., 2002), and for purposively sampling specific authors (e.g., Gong et al., 2021). Consistent with the preponderance of language and linguistics among disciplinary contexts, the eight most frequent publications were applied linguistics

Table 11
Textual registers.

Value	N	%
Research article	218	61.93%
Abstract	28	7.95%
Introduction	31	8.81%
Literature review	1	0.28%
Methods	6	1.70%
Results	11	3.13%
Discussion	38	10.80%
Conclusion	18	5.11%
Highlights	1	0.28%
Essay	86	24.43%
Argumentative	62	17.61%
Academic	7	1.99%
Descriptive	3	0.85%
Expository	1	0.28%
Thesis	43	12.22%
Abstract	5	1.42%
Introduction	4	1.14%
Literature review	3	0.85%
Methods	0	0.00%
Results	3	0.85%
Discussion	7	1.99%
Conclusion	2	0.57%
Report	18	5.11%
Coursework	6	1.70%
Language assessment	6	1.70%
Unpublished research paper	6	1.75%
Book review	5	1.42%
Critique	5	1.42%
Proposal	5	1.42%

related. Particularly prevalent were *English for Specific Purposes* (N = 29), *Applied Linguistics* (N = 27), and *TESOL Quarterly* (N = 27), selected for their high impact factor or prestige (e.g., Cao and Hu, 2014; Dontcheva-Navrátilová, 2021) or based on the recommendation of external experts (e.g., Hyland, 2001; Khedri et al., 2015). Omission of an outline of the retrieved publications by 85 studies appears concerning.

As indicated by the incidence of cross-text section comparison in Table 6, it was not always the case that authors were interested in entire research articles (e.g., Dontcheva-Navrátilová, 2021; Vassileva, 2001). In addition to the procedural exclusion of footnotes, references, and keywords, 18 studies removed RA abstracts, on the basis that they can be considered a discrete genre within academic writing or largely copy content verbatim from other sections of the text (e.g., Alonso-Almeida, 2015), although reasons were not always stated. Yet, it was also found that abstracts commonly encompassed the focus of metadiscourse research (N = 28), particularly from a cross-disciplinary perspective (N = 10), in large part owing to the urgency in which authors (need to) foreground their claims and evaluations (Hyland and Tse, 2005a; Khedri et al., 2015). Also visible from Table 11, the RA introduction (N = 31) and discussion (N = 38) constituted pre-eminent points of interest, in view of the rhetorically forceful nature of these sections (Li and Xu, 2019; Mauranen, 1993a; Pérez-Llantada, 2010; Vassileva, 2001). Finally, it should be noted that although it might appear from Table 11 that the RA literature review has been poorly studied, it was the case that this section was often merged with the introduction (e.g., Khedri and Kritsis, 2018), following Swales' (1990) IMRD structure, which regularly served as a basis to filter out undesired research (e.g., Gong et al., 2021).

A noticeably wider variety of written registers linked to novice writers were present, reflecting the diverse forms of assessed and non-assessed academic writing in the academy and beyond. The most common novice textual genre was the essay (N = 86), particularly argumentative/persuasive varieties (N = 62), due not only to the importance of student writers learning the rhetorical expectations of constructing a persuasive argument (Lee and Deakin, 2016), but the centrality of metadiscourse to improving the readability and persuasiveness of propositional content (Crismore and Farnsworth, 1989; Hyland, 1998a, 1998b, 2004a, 2005a). The second most prevalent novice genre was the high-stakes academic thesis (bachelor degree level = 3, master's = 27, PhD = 22), selected since it represents what an indi-

vidual can achieve across a lengthy and exacting academic investigation (Hyland 2004a; Lee and Casal, 2014) that infers professional credentials and membership of a discourse community (Koutsantoni, 2006). Nevertheless, few metadiscourse studies analysed whole theses, an issue particularly acute at PhD level (N = 4). This deficit may stem from the practical challenge of checking the metadiscoursal properties of candidate items across such lengthy texts. Yet, as Bunton (1999:42) emphasises:

> it is the very length of the research thesis which makes it all the more important for the writer to continue to orient the reader throughout the thesis as to how the current subject matter relates to the overall thesis.

3.6.2. Languages represented across corpora

Table 12 outlines six features of interest of corpora developed or utilised in metadiscourse research. Mirroring the bibliometric findings of Hyland (2017), English dominates as the language in which metadiscourse is most frequently investigated. Two hundred and eighty-four studies focused solely on English (albeit there may have been multiple corpora), usually for the purposes of comparing features of metadiscourse use beyond L1s, particularly discipline and nativeness. These two focal areas were addressed by the remaining 75 studies which contrasted metadiscourse in English with, usually, a second language. Only in five studies were three languages present, including papers employing data from the KIAP corpus of English, French, and Norwegian (e.g., Breivega et al., 2002; Dahl, 2004), and Martín-Laguna and Alcón's (2015, 2018) contrastive studies of English, Catalan, and Spanish. Spanish occupied the second most popularly researched language for metadiscourse, with a notable proportion of studies (N = 27) contrasting metadiscourse use with English. The same can be said for the third most frequently-represented language, Persian (N = 15), where all but one of the studies contrasted Persian with English. Further contrastive studies, perhaps featuring comparisons between two languages other than English or under-represented languages (relative to global or overseas student users) are required to better understand culturally-bound standards of writer textual involvement that could contribute to instructional materials for L2 users.

3.6.3. Corpora and Sub-Corpora

It is perhaps unsurprising that, given much metadiscourse research examines the mediating effects of textual, learner, or writing context characteristics, the majority of corpora were custom-made for the respective study (77.84%). The many studies undertaken by Hyland (e.g., 2002a, 2002b, 2004a, 2004b, 2005b) were attributed a discrete value since the author (and colleagues) drew upon a corpus not solely developed for each individual study. The construction of bespoke corpora was particularly prevalent with research articles (n = 167), since authors sought to customise corpora based on publications, publication prestige, quantity of texts, date range, number of RA authors, and their background. That is not to say established corpora of RAs were not prevalent, indeed, SERAC (Spanish English Research Article Corpus) featured as the joint third most prevalent corpus, utilised for the purposes of comparison across users of L1 and L2 English and L1 Spanish (e.g., Lafuente-Millán, 2014; Mur-Dueñas, 2011). A limitation evident across research that featured bespoke corpora of research articles was a failure to report the component journals (29.94%) or studies (83.23%). Replication studies involving the application of new or modified models of metadiscourse (e.g., comparing the broad with the narrow tradition) to existing corpora could yield new insights, as well as reducing the workload required in assembling novel corpora.

In terms of student writing, established corpora tended to serve the purposes of representing Anglo-American L1 tertiary-level writing (LOCNESS, BAWE, e.g., Çandarli et al., 2015), high-level L1 or L2 writing (e.g., MICUSP in Aull and Lancaster, 2014), assessed university course work (e.g., BAWE in Bruce, 2016), and L2 writing in controlled (essay length, time, topic) conditions (e.g., ICNALE in El-Dakhs, 2020). Coding the number of (sub-)corpora proved challenging since sub-corpora and reference corpus designations were not always clearly outlined, while features such as diachronicity or multiple features of comparison complexified analysis. Rather than aligning codes with author-provided information on (sub)-corpora quantity, the study recorded the number of contrastive dimensions, if any. For example, a study that compared metadiscourse use across English and Chinese research article introductions and discussions was labelled as 'four'.

As evident from Table 12, a high proportion of studies featured two to four writer/textual variables as the basis for metadiscourse comparison. A popular pattern (N = 28) was L1 English metadiscourse use compared with users of another language and L2 English learners using that language (e.g., Akbas and Hardman, 2017; Pérez-Llantada, 2010) or L2 translations by authors (e.g., Pisanski Peterlin, 2008, 2016). This reflects the contention that nativeness with a language only partially explains a user's proficiency with metadiscoursal textual features, since much depends on their experience with academic writing (MacIntyre, 2017; Yoon, 2021). In contrast, complex inquiries featuring greater than 10 sub-corpora points of comparison were rare (N = 23) (see Becker and Feng, 2020; Dontcheva-Navrátilová, 2021), resulting from the inclusion of variables associated with multiple values (e.g., discipline, text section,

Table 12
Features of corpus design.

Variable	Value	N	%
Top-10 languages represented in the corpora	English	342	97.16%
	Spanish	27	7.67%
	Persian	15	4.26%
	Chinese (incl. Mandarin and Cantonese)	8	2.27%
	Turkish	7	1.99%
	Arabic	5	1.42%
	Slovene	5	1.42%
	Catalan	4	1.14%
	Bahasa Indonesia	3	0.85%
	French	3	0.85%
Top-5 corpora developed or utilised across research	Bespoke	274	77.84%
	Ken Hyland's Corpus	22	6.25%
	MICUSP	12	3.41%
	SERAC	12	3.41%
	LOCNESS	10	2.84%
No. of (sub-)corpora	1	189	53.69%
	2	100	28.41%
	3	41	11.65%
	4	11	3.13%
	5+	4	1.14%
Quantity of texts	1–10	11	3.13%
	11–20	39	11.08%
	21–50	84	23.86%
	51–100	75	21.31%
	101–250	64	18.18%
	251–499	40	11.36%
	500+	23	6.53%
	Not reported	16	4.55%
Average text lengths (words)	1,000<	71	20.17%
	1,001–5,000	78	22.16%
	5,001–10,000	84	23.86%
	10,001–25,000	14	3.98%
	25,001–50,000	4	1.14%
	50,001–100,000	2	0.57%
	Not reported	99	28.13%
Corpus time frame (in years)	1	20	5.41%
	2–5	78	21.08%
	6–10	53	14.32%
	11–20	28	7.57%
	21–30	9	2.43%
	31+	2	0.54%
	Not reported	20	5.41%

rhetorical move). Research investigating possible interactions among the effects of multiple background characteristics were uncommon (e.g., Abbuhl, 2012; Yoon, 2021).

3.6.4. Corpus size

As Table 12 indicates, multiple criteria were used to measure the size of corpora, developed for or utilised in metadiscourse research. Distribution across the quantity of texts resembles a bell curve. Research that featured small quantities of texts tended to focus on longer texts, analyse corpus data more qualitatively, and combine discourse analysis with other research methods, particularly interviewing (e.g., Harwood, 2006; Thompson et al., 2016). In contrast, the inclusion of higher quantities of texts was associated with quantitative approaches, sometimes featuring automated analytical processes (e.g., Yoon, 2021; Yoon and Römer, 2020) or focusing on a narrow range of forms (e.g., Lancaster, 2016a). This distribution also reflects the tension inherent in metadiscourse research in the need for sufficient sample sizes to mitigate the idiosyncratic choices of authors, if the purpose is to generalise claims to a wider population

(Farahani, 2019; Kashiha and Marandi, 2019; Vold, 2006) and the practical challenges posed by the necessary require-ment of checking metadiscoursal function in context (Hyland, 2005a), assigning functions to polypragmatic forms (Abdollahzadeh, 2019), and weeding out noise (Dahl, 2004). Combined with the common focus on a handful of text sec-tions, a notable portion of studies examined texts with an average length of 5,000 words or less. 5,001–10,000 words was the most common discrete category, reflecting the length typically expected of research articles. As indicated earlier with regard to text genres, analysis of full length postgraduate thesis reports was uncommon, although it should be acknowledged that the inclusion of master's with PhD theses in six studies affected the averages displayed in Table 12.

3.7. Statistical tests and coding procedures

Table 13 summarises reporting practices and statistical analyses across the included studies. Reflective of the high number of quantitative/mixed methods studies and descriptive epistemological tradition of corpus linguistics research, 96.59% of studies incorporated descriptive statistics (often, frequencies of metadiscourse tokens, a breakdown of token distributions across selected categories/labels, and counts for specific marker types). Inferential statistics featured noticeably less frequently (51.14%), most commonly chi-square (16.76%) and log-likelihood tests (10.51%) to determine the potential significance of distributions of marker frequencies between two or more (sub-)corpora. Other, non-parametric tests, such as Mann-Whitney U (3.69%) and Kruskal-Wallis (3.13%) were common owing to small or unequal sample sizes (e.g., Gong et al., 2021; Hong and Cao, 2014) and the non-normal distribution of metadiscourse resources (Salas, 2015). Parametric analyses such as paired t-tests (8.24%) and ANOVA (5.68%) were also associated with experimental studies that investigated the effects of metadiscourse instruction on reading/writing (study type C1-C3).

To enable valid cross-corpora analysis, normalised frequency counts were often presented, typically to per 1,000 or 10,000 words, often in conjunction with raw counts. Perhaps a limitation, 12 studies adopted normalisation approaches that could pose a challenge for analysts seeking to compare marker frequencies in a future meta-review (e.g., Cuevas-Alonso and Míguez-Álvarez, 2021), such as per line, per T-unit, or N sentences, while a further 11 outlined distributions of markers without raw or normalised frequencies. Just under a half of studies provided counts for occurrences of indi-vidual marker types, often because a handful of forms constituted a particular category of markers, for example, author self-mention (e.g., Cheung and Lau, 2020; Wang and Zeng, 2021). It is not always feasible to report quantities for all metadiscourse resources included across categories, which may explain why 40 studies reported only the top N most frequent forms (e.g., Ruan, 2020; Wang and Jiang, 2018).

Regardless of how metadiscourse markers are identified, an important element in attending to research quality is ensuring forms that are labelled as metadiscourse actually perform a metadiscoursal function through closely analysing forms in their surrounding co-text (Cheung and Lau, 2020; Hyland, 2005a; Ruan, 2020). As demonstrated in Table 13,

Table 13
Reporting practices and statistical analyses.

Variable	Value	N	%
Analytical tests reported	Descriptive statistics	340	96.59%
	Inferential statistics	180	51.14%
	Chi-square	59	16.76%
	Log likelihood	37	10.51%
	Paired t-test	29	8.24%
	ANOVA	20	5.68%
	Mann-Whitney U	13	3.69%
	Kruskal Wallis	11	3.13%
Reporting metadiscourse marker types	Full quantitative results	121	34.38%
	Most frequent markers	40	11.36%
Metadiscoursal function checked in co-text?	Yes	230	65.34%
	Not reported	126	35.80%
Reliability of coding reported?	Yes	146	41.48%
	Inter-rater analysis of a portion of items	58	16.48%
	Double coding of all items	54	15.34%
	External reviewer	19	5.40%
	Delayed intra-rater analysis	12	3.41%
	Iterative cross-checking	4	1.14%
	Multiple counting of items	3	0.85%
	No	211	59.94%

65.34% of studies provided a confirmatory statement that such checking had taken place, usually parsimoniously. Yet, it was exceedingly rare for authors to provide a quantitative breakdown of the frequencies/proportions of candidate forms that ended up being non-metadiscoursal or to reflexively expand upon coding difficulties, such as multifunctionality (Abdollahzadeh, 2019; Vold, 2006) and how metadiscourse is realised across language forms of varying units in length (Bondi, 2010; Gillaerts, 2014). We believe reporting such information should constitute routine practice in metadiscourse research, since it may help to build a body of knowledge on the tendency of particular candidate items to be metadiscoursal, as well as providing transparency in the analytical procedures applied by the researchers. Owing to the challenges involved in manually coding metadiscourse functionality (see Cheung and Lau, 2020; Gillaerts, 2014), authors commonly signalled that attention had been paid to the reliability of coding (41.48%), although this figure is slightly lower than the 45% reported across language education research more generally (Plonsky, 2013). Most frequently (16.48%), a portion of items were selected for coding by a second rater, while slightly fewer studies (15.34%) featured double coding of the entire dataset.

4. CONCLUSIONS

This study systematically reviewed the conceptual and methodological features of 370 empirical metadiscourse studies within academic writing, with an eyewatering 27.97% of studies that met the screening requirements being published in the last three years alone. In response to research question 1, 'broad' conceptions of metadiscourse were found to predominate (Hyland, 2017), especially studies of interactive and interactional metadiscourse (Hyland, 2005a) and stance and engagement (Hyland, 2005b). However, the challenges of applying a 'thick' analysis (Ädel, 2010) to such a wide array of resources, compounded by academic publishing limitations, meant many authors narrowed their approach, with hedges, boosters, and self-mentions being particularly well covered. To answer research question 2, we synthesised a range of metadiscourse study types across quantitative, qualitative, and mixed methods paradigms, along with identifying various data sources featured in inquiries. It was found that a notable 91.62% of research conformed to the corpus-based, cross-sectional descriptive analysis of metadiscourse, often investigating the mediating role of writer (particularly, nativeness, expertise, L1) and textual characteristics (discipline, text section) in the vein of intercultural rhetoric.

While most corpus studies featured qualitative interpretations of discourse, 37.56% were of the quantitative or 'thin' tradition, conveying a static and somewhat superficial view of metadiscourse (Ädel and Mauranen, 2010). The fixed nature of metadiscourse was further seen in reliance on Hyland's (2005a) list of metadiscourse markers and the paucity of diachronic corpus studies, particularly those that contrasted novice texts across different time periods or tracked writer development across multiple texts. In research question 3, we investigated the methodological features of metadiscourse research, including study contexts, writers, texts, corpora, and statistical tests and coding procedures. Most studies did not feature an institutional context, largely due to the preponderance of analyses of the research article genre, attractive since it provides a template of good practice to novice writers (Hyland, 2002b, 2004b; Soliday, 2011). Nevertheless, actual comparisons between novice and expert writers were uncommon (N = 34), surprisingly so between L1 experts and L2 novices (N = 11).

4.1. Recommendations

Based on the information synthesised in this review, we make the following recommendations for improving study quality in future metadiscourse research:

- Future studies should clearly address whether and how metadiscoursal function was checked in context, explicate the use of supporting software, and (where feasible) append the list of markers.
- In studies that automatically scan texts to retrieve a pre-determined list of candidate items, we urge authors to clarify the nature or contents of this list. If permissible, we recommend appending the list as supplementary material.
- We also believe there is scope for authors to provide greater transparency concerning the determination of the metadiscoursal properties of markers, perhaps through a reflexive account or providing examples that illustrate difficult coding decisions.
- Study replicability could be boosted in investigations featuring bespoke corpora of research articles by authors providing a list of the included articles (see Yang, 2013). Additionally, greater precision could be obtained if authors specify which elements of a research article they did or did not draw on.

- While it is not incumbent on authors to report the background characteristics of writers, the addition of such information could enhance the prospects of future meta-reviews that compare metadiscourse use by gender, L1, nativeness, discipline, L2 proficiency, and other related features.

In terms of fruitful lines of future metadiscourse inquiry, we suggest the following:

- When novice writers were recruited as participant writers in a study, it was nearly always the academy, highlighting the need for further research in L1 and L2 primary and secondary classrooms to gain wider perspectives on metadiscoursal learning trajectories (Crismore and Abdollahzadeh, 2010), particularly how learners bridge the secondary to post-secondary gap (Sancho Guinda and Hyland, 2012).
- We see great potential for the self-reports of novice and expert writers, generated through the discourse-based interview (Ivanič and Satchwell, 2007), to complement insights gained from corpus analysis, through future endeavours that explore expert writers' perceptions of their metadiscoursal choices (e.g., Harwood, 2006), novice writers' metalinguistic understandings of the resources in their own writing or textual models (in light of the requirement of the given written register), and the effects of resources on the reader (Alonso et al., 2012).
- More rigorous experimental research is needed to provide a more compelling case for the explicit teaching of metadiscourse, ideally complemented by qualitative data that may help explain the affordances of such instruction.
- There is a need for replication studies, which were scant across the dataset. Replication of research (e.g., as a focus on replication across corpora or markers) could help triangulate and verify existing results in relation to rhetorical cultures (Poole et al., 2019) and delimit the generalisability of existing research (Cao and Hu, 2014).
- Since English-medium corpora featured heavily, further research into metadiscourse use across popularly spoken languages (e.g., Arabic, Chinese, Hindi) could provide insights into debates surrounding writer/reader responsibility among languages (Hinds, 1987) as well as cross-linguistic metadiscourse transfer.

4.2. Limitations

We caution readers to interpret the findings of the study in light of the following limitations. We acknowledge that the review features a bias towards rigorous research and more highly selective publications. Coupled with 22 studies being inaccessible, it is, thus, possible that the results do not fully reflect the wider metadiscourse literature on academic writing. We suspect removing the criterion on publication quality would increase the variety of writer, textual, and learning characteristics demonstrated as well as boosting the prevalence of Hyland's (2005a) interpersonal model, with a wide uptake among weaker studies (perhaps without a clear rationale provided). On the other hand, we do not feel this would affect the consistency of the proposed taxonomy of metadiscourse study types, since our impression of weaker reports indicated writers took their cues from influential/highly cited studies. Additionally, we acknowledge that limiting the sample to papers published in English means the quantities of corpora featuring texts not written in English might be understated.

Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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APPENDIX 1. LIST OF SEARCH TERMS

metadisc*		
metatext		
discourse reflexivity		
interactive marker*/feature*/device*		
interactional marker*/feature*/device*		
interpersonal marker*/feature*/ device*		
stance marker*/feature*/device*		
engagement marker*/feature*/ device*		
textual marker*/feature*/device*		
writer-reader interaction		
writer identity		
author* voice		
writer* voice		
writer* stance		
voice construction		academic writing
rhetorical device*		research writing
attitude markers		graduate writing
self-mentions		academic context*
endophoric markers		academic text*
frame markers		academic essay*
illocution markers		argumentative essay*
action markers	AND	argumentative text*
transitions		argumentative writing
code glosses		student writing
hedges		persuasive writing
hedging		research article*
boosters		scientific writing
evidentials		research-based essay*
connectives		academic blog*
connectors		teacher feedback
sequencers		
epistemic modality		
dialogic interaction		
emphatics		
topic shifts		
amplifying adverbs		
personal asides		
interjections		
reflexivity markers		
reformulation markers		
validity markers		
certainty markers		
topicalisers		
attribute markers		
reader pronouns		
directives		
appeals to knowledge		

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