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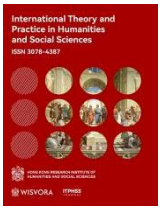

A Comparative Analysis of Metadiscursive Nouns Across Four disciplines in Research Articles

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Abstract

Metadiscursive nouns are essential resources in research articles. This study does the genre analysis by investigating the use of metadiscursive nouns in the academic articles written by different fields or disciplines, which is drawing on Jiang and Hyland's metadiscursive nouns model (2017) and the help of Python. This research compares the distribution, frequency, and functional roles of metadiscursive nouns in the four disciplines' research articles, which are Linguistics, Education, Chemistry, and Materials Engineering.. The results show that there existed difference in the use of metadiscurive nouns among the four disciplines. This research enriches the understanding of metadiscursive nouns in interdisciplinary academic articles and it provides insights into the writing proficiency of different disciplines and offers pedagogical implications for novice academic writers and educators to address the specific challenges faced by corresponding disciplines' scholars in improving their academic writing skills.

1. Introduction

Academic discourse refers to the ways of thinking and using language which exist in the academy (Hyland, 2009). It is the way or site for researchers to present their newest, up-to-date or some originate findings or views and therefore the academic discourse is conductive to help people get to know the frontier or the key to each field. Journal articles, as a common form of academic discourse, offer the majority of academic discourse and at the same time is the space to show their newest findings and academic viewpoints.

Metadiscoursive nouns function in academic discourse is to articulate the discourse and express the author's academic views (Jiang, 2017). It is a means for the author to connect with the reader and form an effective dialogue with the reader. It is also an effective discourse resource for the author to express his position. Research papers are an important platform for scholars to present their academic achievements. Hence, scholars investigated different types of academic writing.

For example, some scholars examined the academic wiring course (Edsoulla & Aaron, 2025), academic article's grammatical complexity (Thirakunkovit et al.,2019). As for the metadiscoursive nouns, there are investigations which focus the one field (Chen and Xu, 2024). However, there are very few studies on interdisciplinary comparative study, especially the comparison of hard and soft disciplines.

Therefore, this paper will make a comparative analysis of the use of metadiscoursive nouns resources in research articles of four disciplines: Linguistics, Education, Chemistry, and Materials Engineering, which is combined with two soft disciplines and two hard disciplines. Specifically, based on Jiang and Hyland's Metadiscursive nouns model (2017) and the help of Python, the present study will examine the distribution, similarities and differences and function of metadiscursive nouns. For the theoretical significance, this paper enriches the research on the metadiscursive nouns in interdisciplinary papers. For the practical values, it can also be more clearly understood whether the thesis writing ability is different among different disciplines. Meanwhile, it may give some enlightenment for the novice academic writer and teachers to revise students' writing ability.

2. Literature Review

The present study is based on genre analysis which focuses on the metadiscursive nouns in research articles' introduction. The review is illustrated by two aspects, which is the review about the metadiscursive nouns and the review about the research articles.

2.1 Previous Studies on Metadiscursvie Nouns

The first part is the review towards the use of metadiscursive nouns. Jiang and Hyland (2017) paid attention to the noun resource of metadiscouse and put forward the concept of metadiscursive nouns, which is theoretical progress and development. Before Jiang and Hyland's classification of metadiscursive nouns, there was no systematic study of such noun resources. There are other items which signify this kind of noun, such as shell nouns, container nouns, carrier nouns. Thus, the earlier research for metediscourse is about the collocation of those nouns. Some researchers have explored the comparative analysis of the use for metadiscursive nouns. For instance, Schmid (2001) analyzed N-be-that-constructions, revealing their roles in creating expectations and distributing focus in discourse and explored their strategic use for bluffs with evidential adjustments and objectivization. Gary and Cortes (2011) investigated the use of this and these as pronouns versus determiners in a corpus of research articles in Applied Linguistics and Materials and Civil Engineering. The study reveals that authors in the two disciplines use both structures in a similar manner, with pronominal uses constituting one-fifth of all occurrences. Similarly, Zhang (2009) focused on the comparative analysis of the use of demonstratives in Chinese learners' English argumentative writing and native speakers. Benitez and Miguel (2021) made a survey of the use of way and problem in third-year undergraduate writing across three different disciplines. Recently, some scholars focused on the ChatGPT. Huang and Deng (2025) evaluated ChatGPT's use of shell nouns when rephrasing dissertation abstracts in the fields of physics and economics and it showed that ChatGPT-rephrased versions are more promotional and repetitive, with reduced authorial visibility. Moreover, other previous research into metadiscursive nouns has focused on function. For example. Gómez (2024) examined the construction of discourse through coherence relations thorough the use of factual shell nouns.

2.2 Previous Studies on Research Articles

The second part is the review about the research articles' introduction. The theoretical base of the research articles is mostly based on Swales' CRAS(1990) model, in which the introduction can be divided into three moves : move 1： establishing a territory; move 2: establishing a niche; move 3: occupying a niche. Some scholars examined the articles' introduction. For instance, Farhang-Ju et al. (2024) investigated the specificity and generality of lexical bundles in the rhetorical moves of applied linguistics research article introductions. It is based on Swales' model. Maher and Milligan (2019) paid attention to the engineering disciplines which had gained little attention before. Introduction sections in 57 master theses were used to analyze and the characteristics of these findings may have pedagogical implications for teachers. In the meantime, the new writers also can get inspiration from this finding. In addition, there are most studies probed into the introduction of different disciplines. Alanazi and Alqarni (2022) took the very first sentence in research article introductions in the field of linguistics and translation. Also, half of those articles were selected from low-impact journals and the rest were selected from high-impact journals in which they can investigate the difference between the two kinds of journals. Lu et al. (2021) explored syntactic complexity and rhetorical move-steps in research article introductions among four social science and engineering disciplines. Their findings contributed to the emerging understanding of disciplinary variation in function-form mappings in RA writing and have useful implications for genre-based academic writing research and pedagogy. Gao and Pramoolsook (2023) inspected the cross-culture factors to the electronic engineering research article introductions. This study took Chinese, Thai and native English scholarly writers into consideration and the find would shed light on the teaching and learning composing or constructing a RA Introduction for international publication, in which non-native scholar can benefit a lot. Deng at al. (2024) explored the ways in which academics from four different disciplinary backgrounds (applied linguistics, education, electrical engineering, biology) engage with their discourse community when writing their research article (RA) introductions. The results have pedagogical implications for EAP practitioners in raising the novice writers' awareness of both discipline and genre when they approach academic writing through evaluative resources. In addition, there are also many studies focusing on the abstract of research articles. For example, Ansarifar et al. (2025) revealed the linguistic variation in thesis abstract according to two criteria: L1 background and academic level. Li et al. (2020) carried out the bundle-driven method to ascertain the rhetorical moves in PhD abstracts and found a new move, which is the *Structure*. And similarly, scholars made an interdisciplinary analysis of grammatical subjects on the two fields: economics and applied linguistics and identified that applied linguistics more focused on the research outcomes than economics (Ebrahimi and Chan,2015).

Furthermore, different variables which belong to external factors or the quality of mind have been found to be related to the writing of research articles. Surveys such as that conducted by Ahn and Oh (2024) examined the difference use of citation between Korean master's theses and research articles which reflected the different subjectivity. Yin et al (2024) demonstrated the description of the English for academic purpose speaking assessment construct by including the concept of critical thinking. Bruce (2016) demonstrated that the expression of criticality through the literature reviews of these texts appears to draw upon the discourse competence and specifically the genre knowledge of expert writers. Xu and Li (2021) investigated the four genres' syntax complexity between translational and non-translational English, which give the implications for translators to notice the different skills used in different genres.

From what have been mentioned before, it can be concluded that the study of academic articles is mainly for teaching and writing for novice scholars and the metadiscousive nouns are critical resources in the article in which it not only realizes the building of the structure but also can have

the interaction between the author and the reader. However, scholars paid little attention to the comparative analysis of hard discipline and soft discipline. Therefore, the present study makes a comparative analysis of metadiscousive nouns across different disciplines international research articles. [Times New Roman 12 font, normal]

3. Theory Framework

The present study is based on mainly metadiscursive nouns, which evolved from metadiscourse. Therefore, the basic information about the metadisocurse is listed firstly, and then the introduction of metadiscursive nouns is given.

3.1 Metadiscourse

The term "metadiscourse" can date back to 1959, when Zellig Harris first used it to describe the way which a writer to guide their reader's perception of their text. And many scholars developed different types of metadiscouse. Among those, the most prevalent and mostly used is Hyland's classification of metadicouse, which he devide it into two parts: interactive metadisourse and interactional metadicourse. While interactional metadiscourse is intended to engage the reader with the text, interactive metadiscourse seeks to assist in guiding the reader through the book.

Table 3.1 Hyland's (2005) Classification of Metadiscourse

Category	Function	Examples
interactional metadiscourse	guide the reader through the text	
Transitions	Express relations between main clauses	in addition; but; thus; and
Frame markers	Refer to discourse acts, sequences or stages	finally;to conclude; my purpose is
Endophoric makers	Refer to information in other parts of text	noted above; see Fig, in Section 4.2
Evidentials	Refer to information from other texts	according to x; z states
Code glosses	Elaborate propositional meanings	namely; such as; in other words
interactional metadiscourse	involve the reader in the text.	
Hedges	Withhold commitment and open dialogue	Might; perhaps
Boosters	Emphasize certainty or close dialogue	In fact; definitely
Attitude markers	Express writer's attitude to proposition	Unfortunately; I agree
Self mentions	Explicit reference to author(s)	I; we; my
Engagement markers	Explicit build relationship with reader	Consider; note

The table above clearly shows Hyland's classification of metadiscourse. And the metadiscursive nouns is explained following.

3.2 Metadiscursive nouns

The term metadiscursive noun was first used by Francis interchangeably with "anaphoric

nouns", referring to the cohesive function of nouns, but giving no explanation of their metadiscursive functions. There are various classifications of this kind of nouns resource. Here the author adopted the view of Jiand and Hyland. Jiand and Hyland (2017) defined metadiscursive noun as those which refer to the organization of the discourse or the writers' attitude towards it.

Table 3.2 Jiang and Hyland's (2015) functional classification of metadiscursive nouns

Entity	Description	Examples
Object	Concretizable metatext	Report, paper, extract
Event	Events, processes, states of affairs	Change, process, evidence
Discourse	Verbal propositions and speech acts	Change, process, evidence
Cognition	Cognitive beliefs and attitudes	Decision, idea, belief
Attribute	Description	Examples
Quality	Traits that are admired or criticized, valued or depreciated	Advantage, difficulty, value
Manner	Circumstances of actions and state of affairs	Time, method, way, extent
Status	Epistemic, deontic and dynamic modality	Possibility, trend, choice, ability
Relation	Description	Examples
Cause–effect, difference, etc.	Cause–effect, difference, relevance	Reason, result, difference

In addition, Jiang (2019) pointed out five grammar patterns which the metadiscursive nouns occur. Meanwhile, those patterns are also the critical part of the realization of the program of Python. That is: (1)N + post-nominal clause;(2) N + be + complement clause;(3) Determiner + N;(4) Determiner + be + N;(5) There be + N. These linguistic patterns give part of the fundamental basis for the compliment of the Python script.

4. Research Design

This research is a combination of qualitative and quantitative methods. The qualitative method is used to investigate the functions and the reasons behind the frequency and distribution of the four disciplines. Similarly, the quantitative method is employed to examine the frequency and distribution of the metadiscoursive nouns.

4.1 Research questions

Metadiscoursive nouns are important resources for academic discourse. Scholars have conducted some research on metadiscoursive nouns, but there are very few studies on the interdisciplinary comparative study, especially the comparison of hard and soft disciplines. In order to bridge the gap, this paper tries to make a comparative analysis of the use of metadiscoursive nouns resources in research articles of four disciplines. Based on this, this paper attempts to address three questions:

(1) What is the distribution of metadiscursive nouns in different disciplines' academic articles?

(2) What are the similarities and differences in the use of metadiscursive nouns?

(3) How do the functional roles of metadiscursive nouns vary between those groups?

4.2 Data collection

The data comes from DEAP (Database of English for Academic Purposes) corpus, which is a corpus constructed by co-construction. Led by Professor Xu Jiajin from Beijing Foreign Studies University, the academic English corpus is jointly built by researchers from more than 20 universities. The corpus is the largest open multidisciplinary academic English corpus in the world. The corpus is and sharing mode. It can be required at https://corpus.bfsu.edu.cn/info/1082/1561.htm. It is available to download the specific files on the website. The present study chooses four disciplines in the corpus: Linguistics (LinDEAP), Education (EduDEAP), Chemistry (ChemDEAP), Materials Engineering (MatDEAP). Hereinafter referred to as Lin, Edu, Che and Mat. The four disciplines are composed of two hard science and two soft disciplines, which can compare and analyze the differences in the use of metadiscoursive nouns in soft and hard disciplines.

The basic information for corpus is as follows.

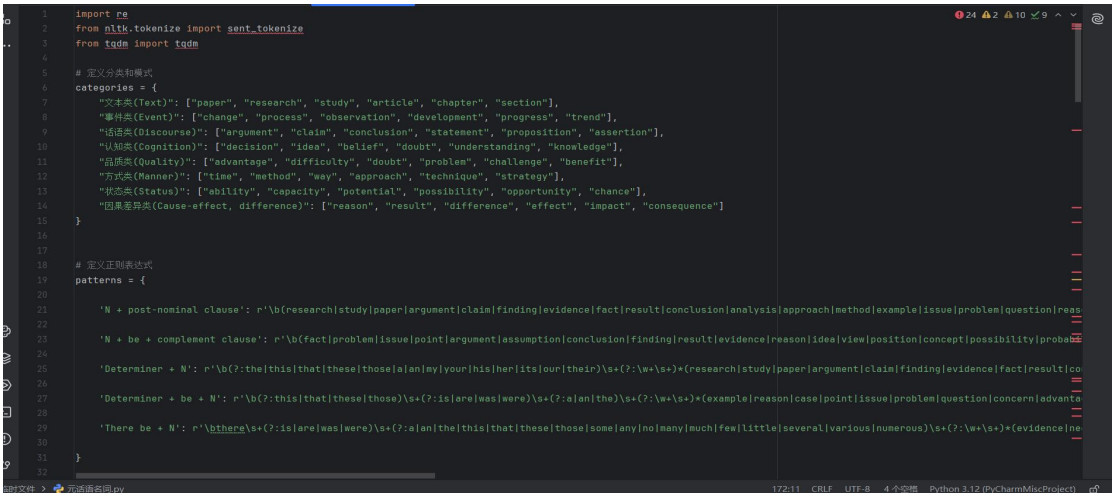
Table 4.1 Four disciplines' statistics

Subcorpora	No. of articles	Words	Avg. words/article
Linguistics (LinDEAP)	1,025	5,059,079	4936
Education (EduDEAP)	1,109	4,914,251	4823
Chemistry (ChemDEAP)	1,020	5,157,134	5056
Materials Engineering (MatDEAP)	901	5,249,032	5826

4.3 Research procedures

The present study mainly relied on one tool, which is Python 3.12. The home-made script provides the functions of identification and calculation. For the identification function, it utilizes the pattern proposed by Jiang and applies the regular expression to find the metadiscoursive nouns among the txt files. Therefore, the characteristics of distribution can be demonstrated. For the calculation function, it calculates the log-likelihood ratio to show whether there is a difference or not.

The first step is to down the corpus from DEAP corpus from the website of BFSU Corpus. The corpus is in the format of txt and the website offers two types of formats: One is a cleaned corpus and the other is a clear and lexically labeled corpus. Here the latter corpus is used for the present study. The second step is to import plain text format files into python script. And through the running of the script, the statistics of distribution and statistical significance of metadiscursive nouns can be shown and calculated. The third step is qualitative analysis of those statistics. According to the different Different characteristics of different disciplines, to analyze the reasons behind the different distribution of meta-discourse nouns and what kind of functional characteristics will be used in various ways. Thus, the differences between the four disciplines, especially the soft and hard disciplines, can be clearly displayed.



```
import re
from nltk.tokenize import sent_tokenize
from tqdm import tqdm

# 定义分类和模式
categories = {
    "文本类(Text)": ["paper", "research", "study", "article", "chapter", "section"],
    "事件类(Event)": ["change", "process", "observation", "development", "progress", "trend"],
    "话语类(Discourse)": ["argument", "claim", "conclusion", "statement", "proposition", "assertion"],
    "认知类(Cognition)": ["decision", "idea", "belief", "doubt", "understanding", "knowledge"],
    "品质类(Quality)": ["advantage", "difficulty", "doubt", "problem", "challenge", "benefit"],
    "方式类(Manner)": ["time", "method", "way", "approach", "technique", "strategy"],
    "状态类(Status)": ["ability", "capacity", "potential", "possibility", "opportunity", "chance"],
    "因果差异类(Cause-effect, difference)": ["reason", "result", "difference", "effect", "impact", "consequence"]
}


# 定义正则表达式
patterns = {

    'N + post-nominal clause': r'\b(research|study|paper|argument|claim|finding|evidence|fact|result|conclusion|analysis|approach|method|example|issue|problem|question|reas

    'N + be + complement clause': r'\b(fact|problem|issue|point|argument|assumption|conclusion|finding|result|evidence|reason|idea|view|position|concept|possibility|probab

    'Determiner + N': r'\b(?:the|this|that|these|those|a|an|my|your|his|her|its|our|their)\s+(?:\w+\s+)*(research|study|paper|argument|claim|finding|evidence|fact|result|co

    'Determiner + be + N': r'\b(?:this|that|these|those)\s+(?:is|are|was|were)\s+(?:a|an|the)\s+(?:\w+\s+)*(example|reason|case|point|issue|problem|question|concern|advanta

    'There be + N': r'\bthere\s+(?:is|are|was|were)\s+(?:a|an|the|this|that|these|those|some|any|no|many|much|few|little|several|various|numerous)\s+(?:\w+\s+)*(evidence|ne

}
```

Figure 4.1 The Screenshot of Python Script

5. Results and Discussion

The following is a tentative analysis of four disciplines and the statistics are as follows.

5.1 The distribution in four disciplines

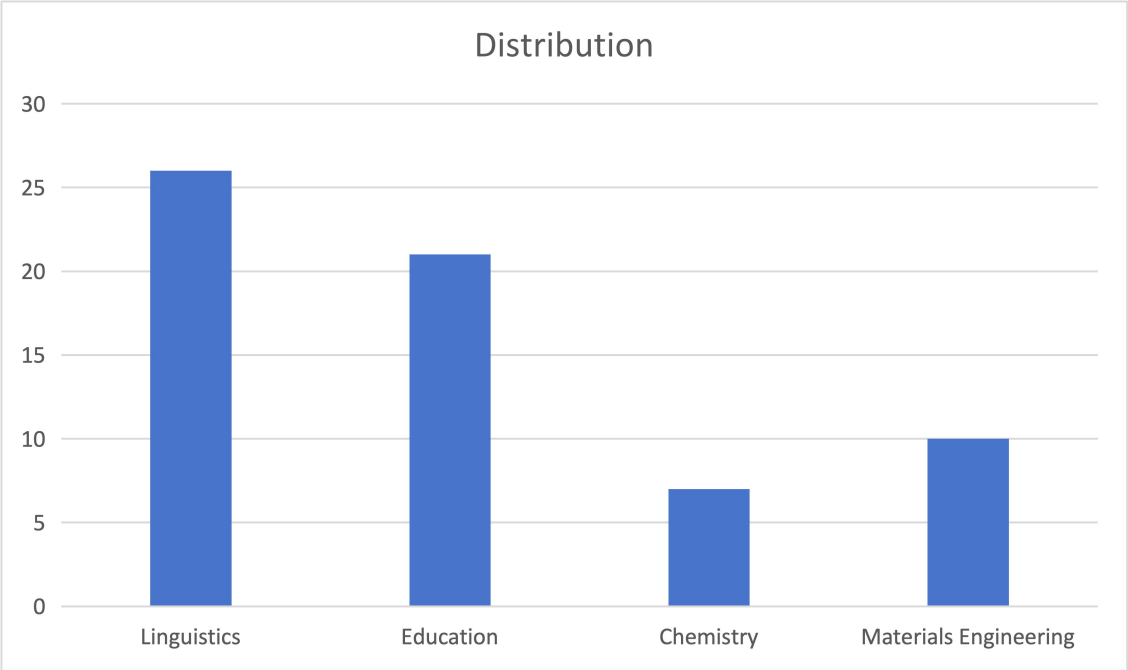


Figure 5.1 The overall distribution of metadiscoursive nouns

Figure 5.1 presents the distribution of metadiscoursive nouns across four academic disciplines: Linguistics, Education, Chemistry, and Materials Engineering. The data indicates significant variation in the frequency of metadiscoursive nouns among these fields.

Linguistics exhibits the highest frequency of metadiscoursive nouns, with a value of approximately 26. Education follows with a slightly lower frequency of around 21. In contrast, Chemistry and Materials Engineering have much lower frequencies, with Chemistry at approximately 7 and Materials Engineering at approximately 10. This variation can be attributed to the differing communicative needs and academic traditions of each discipline. Linguistics and Education, being fields that inherently deal with language and communication, are more likely to

employ metadiscoursive nouns. These nouns help to guide the reader through the text and make explicit the relationship between the author and the reader. In contrast, disciplines like Chemistry and Materials Engineering, which focus more on empirical data and technical results, may not require as much explicit references to the ways of talking about and representing the self and others.

5.2 Similarities and differences

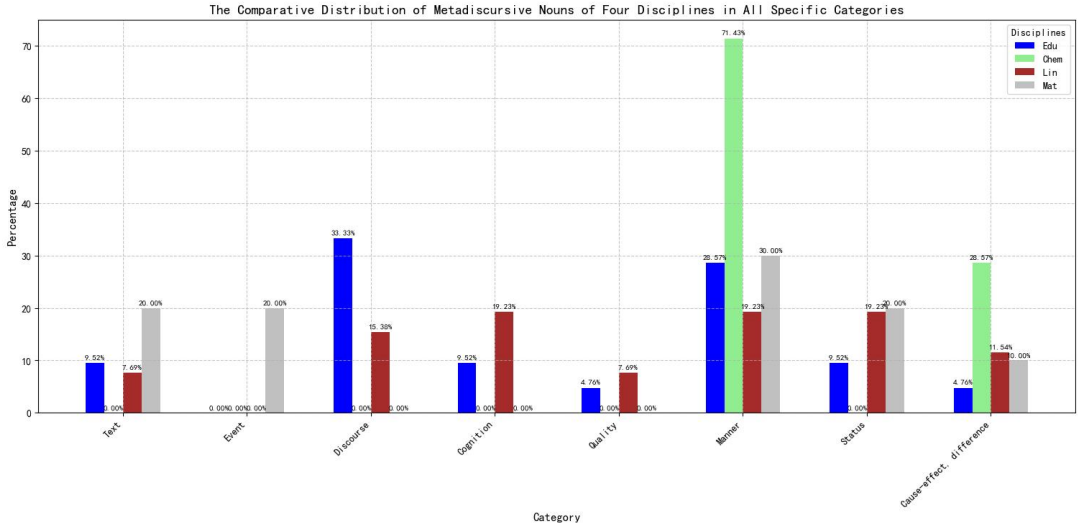


Figure 5.2 The Comparative Distribution of Metadiscursive Nouns of Four Disciplines in All Specific Categories

The chart presents the comparative distribution of metadiscursive nouns across four disciplines—Edu, Chem, Lin, and Mat—in eight specific categories: Text, Event, Discourse, Cognition, Quality, Manner, Status, and Cause-effect difference. In the Text category, Edu has the highest percentage at 9.52%, followed by Lin at 7.69%, with Mat at 20.00%, while Chem has 0.00%. For Event, Mat has 20.00%, while the others have 0.00%. In Discourse, Edu leads at 33.33%, with Lin at 15.38%, and Chem and Mat at 0.00%. Cognition sees Lin at 19.23% and Edu at 9.52%, whereas Chem and Mat have 0.00%. Quality has Edu at 4.76% and Lin at 7.69%, with Chem and Mat again at 0.00%. Manner shows Chem at a significant 71.43%, Edu at 28.57%, Mat at 30.00%, and Lin at 19.23%. Status has Lin at 19.23%, Mat at 20.00%, Edu at 9.52%, and Chem at 0.00%. Finally, Cause-effect difference sees Mat at 11.54%, Edu at 4.76%, Lin at 28.57%, with Chem at 0.00%.

The use of metadiscursive nouns serves to enhance the clarity and persuasiveness of academic writing by guiding readers through the text and signaling the writer's stance. Edu's higher usage in Text and Discourse may reflect its focus on pedagogical communication, where metadiscursive elements are crucial for engaging learners and structuring educational content. Chem's prominence in Manner could be attributed to the precise and methodical nature of chemical research, where metadiscursive nouns help in accurately describing experimental procedures and results. Lin's notable presence in Cognition and Status might stem from its emphasis on linguistic analysis and theoretical frameworks, requiring metadiscursive markers to articulate complex linguistic concepts and establish the argument's validity. Mat's significant usage in Status and Cause-effect difference may be due to its reliance on logical reasoning and formal proofs, where metadiscursive nouns aids in constructing coherent arguments and demonstrating cause-effect relationships. These variations highlight how different disciplines employ metadiscursive nouns to align with their specific communicative goals, methodologies, and epistemological

underpinnings, ultimately shaping the discourse practices that are normative within each field.

Table5.1 The result of t-test for four disciplines

Name	Avg.	SD	t	p
Lin	3.25	1.832	5.017	0.002**
Edu	2.625	2.504	2.966	0.021*
Che	0.875	1.808	1.369	0.213
Mat	1.25	1.165	3.035	0.019*

* $p<0.05$ ** $p<0.01$

The table presents t-test results for four academic disciplines (Lin, Edu, Che, and Mat), comparing their average scores, standard deviations, t-statistics, and p-values to assess statistical significance. Lin demonstrates the highest average score (3.25) with a moderate standard deviation (1.832), yielding a t-statistic of 5.017 and a highly significant p-value of 0.002 ($p<0.01$), indicating a strong deviation from the expected value. Edu follows with an average of 2.625 and the highest variability (SD=2.504), resulting in a t-statistic of 2.966 and a significant p-value of 0.021 ($p<0.05$). Che shows the lowest average (0.875) and a t-statistic of 1.369, with a non-significant p-value of 0.213, suggesting no meaningful difference. Mat has an average of 1.25, the lowest variability (SD=1.165), a t-statistic of 3.035, and a significant p-value of 0.019 ($p<0.05$). Overall, Lin and Mat exhibit the most significant differences, with Edu also showing significance at the 5% level, while Che does not differ statistically. These results highlight distinct performance patterns across disciplines, with practical implications for understanding academic variability.

5.3 Functional roles of metadiscursive nouns

With the figure or statistics shown before, the functional roles of each type of metadiscoursive nouns will be discussed by discipline.

For linguistics, it has the most metadiscoursive nouns among those four disciplines. The overall distribution may account for the reason that linguistics pays more attention to the organization of the article and the attitude which contains the affections to the readers or other scholars. Take the specific classification into consideration, the linguistics articles apply almost all kinds of metadiscoursive nouns, which is just less than education articles. The events metadiscoursive nouns mostly identify for the thing or process, so linguistics may not exist many analyses for process or just for the limitation of the corpus' size.

With regard to education, the number of metadiscoursive nouns is close second to linguistics and it exist in all categories. As a soft discipline, education also pays attention to the organizational relationship of articles and the realization of interpersonal functions of articles. It has the discourse metadiscoursive nouns than other categories, which indicates that education focus more on the speech act or expression. A possible explanation is that education articles rely more on quantitative research, and it draws on previous researchers' findings to support their own articles. At the same time, authors of teaching subjects also want to maintain a good interpersonal relationship with other scholars. The following is a discourse metadiscoursive nouns: claim. For example:

(1) The finding that both democracy and communism have a positive association with our outcome supports our claim that democratic countries do not have a monopoly on rights

discourses. (EduDEAP)

From the example from EduDEAP, it is clear that italic part serves as a crucial element for both cohesion and interpersonal communication: The phrase "claim that" acts as a connective device, linking the researchers' assertion (our claim) to the supporting evidence (the finding). It creates a logical bridge between argument and justification. The use of "claim" also invites the reader to evaluate the strength of the researchers' argument, fostering a dynamic where the reader is engaged in assessing the validity of the assertion. By using "claim that", the authors keep their authority on the topic while also acknowledging that their interpretation is one among many possible perspectives. In a word, this metadiscoursive noun is pivotal in academic writing as it helps structure the argumentation process and establishes a relationship of trust and critical engagement between the authors and their readers.

Take another example of manner metadiscoursive nouns in the field of Education.

(2) This confirms the statement that primary school effects cannot be underestimated in investigating secondary school effectiveness.

The use of "statement that" allows the author to precisely refer to a specific claim or assertion that has been made. Instead of using a vague pronoun like "this" or "it" which might leave ambiguity about what is being confirmed, "statement that" explicitly introduces the exact statement that is being confirmed. This precision is crucial in academic writing to ensure clarity and avoid any misinterpretation of which particular assertion is being supported by the evidence presented. It helps in establishing a clear basis for the argument being made. By framing the idea as a "statement," the author is indicating that this is a proposition that has been put forward and is now being subjected to verification. In addition, it also serves to emphasize the importance of the claim being made. In the context of education research, where the effects of different educational stages are being examined, using this construction highlights that the assertion about primary school effects is not just a casual observation but a significant statement that has implications for understanding secondary school effectiveness.

For the Chemistry academic articles, it has the minimum number of metadiscoursive nouns owing to the reason that as a hard discipline, chemistry is based more on experimental study and the elaboration of experimental results. Their aim is to present the latest findings in research so the organization of gains less attention. At the same time, their findings are the core of the research article's competition, therefore, researchers who major in chemistry reduce the relationship and interaction with other scholars to demonstrate their accomplishments. In addition, chemistry academic articles have the highest account for the manner nouns, which is the way an event occurs or a thing takes shape. As is known to all, chemistry requires a lot of specific experiments to be done in the laboratory to get results or make discoveries. Therefore, it requires the manner nouns to describe the process of their experiment or represent how the reactant or catalysts are conducted or reacted. Moreover, it lacks text, event, discourse, cognition and quality metadiscoursive nouns. It is fairly easy to find the reason that the hard disciplines are less inclined to use metadiscoursive nouns as a resource to achieve textual coherence or cohesion and to define the essential characteristics of events. However, it should be mentioned that this finding is contrary to Jiang's research (2019). This contradictory result might be explained that the specific subject selection is different, and the corpus size may also have some influence.

(3) This LASH-based microarray is a simple, rapid, sensitive, and easy-to-use approach that can be applied to disease diagnosis. (CheDEAP)

The noun "approach" highlights the methodological aspect of the research, which is procedural and contains technical nature of the work. It is crucial in this discipline where precise methods are essential for reproducibility and validation. It may imply the originality and advantage of this

method in the research, while conveying scientific confidence. In other words, it is not only to describe a method, but also to demonstrate the value of research and the researcher's familiarity with the method.

As for the materials engineering academic articles, it does not cover the discourse, cognition and quality metadiscoursive nouns. Something also needs to be noted that materials engineering is the only one discipline which contains the event metadiscoursive nouns. Perhaps the unusual result is owing to that the complex design or mechanism of materials engineering. Thus, it needs event metadiscoursive nouns to define or clarify the complexity of professional knowledge. The following is an example of event metadiscoursive nouns.

(4) The E value of 0-RDF was among the range of 109–732KJmol1 with an irregular trend which was attributed to the complicated reaction schemes which indicated the combustion process was complicated. (Ma et al., 2015, López et al., 2014) (MatDEAP)

There is an event metadiscoursive noun in the sentence: trend, which gives the reaction phenomenon more credibility and construction of academic interaction. The author aims to indicate that the current research is built upon and acknowledges previous work in the field, which is essential for building trust with the academic community. Actually, this situation seems to appear more in soft disciplines, but in the corpus of this paper it only appears in materials engineering. This is likely a problem with the scope of the corpus, or the python scripts need to be optimized.

6. Conclusion and Suggestion

The present study mainly investigated the use of matadiscoursvie nouns among four disciplines in research articles: Linguistics, Education, Chemistry, and Materials Engineering. For the overall distribution, linguistics has the highest distribution while education follows linguistics. Chemistry has the lowest distribution, and materials engineering is slightly higher than it. To sum up, the soft disciplines use more matadiscoursvie nouns than hard disciplines. For the difference and function, the distribution is notably uneven, with linguistics and education having significantly higher values compared to chemistry and materials Engineering. Hence, it demonstrates the trend that soft disciplines are inclined to use metadiscoursive nouns to achieve the cohesion of the article and interpersonal interaction as the essential attribute of humanities and social sciences.

Theoretically, the present study enriches the research range to the comparation of four disciplines. By using metadiscoursvie nouns as a framework, this study tends to identify similarities and differences in metadiscoursive nouns application. This comparison is conducive to broadening the disciplinary of metadiscoursive nouns in academic discourse. One the one hand, it proved that the metadiscoursive nouns have strong applicability and vitality in the analysis of academic discourse. On the other hand, the present study may give some implication or reference for further study which is relevant to the present study. The present study bears practical implications for scholars and students alike. Scholars can leverage the findings from the comparisons to critically examine their own articles. By identifying discrepancies between their work and established norms or exemplary models, they gain targeted insights into specific areas that may warrant revision. Such self - reflection and refinement can elevate the quality of their research articles, enhancing clarity, coherence, and persuasiveness, and ultimately contribute to more impactful scholarship. For novice writers, it helps them to better comprehend the strategic use of metadiscursive nouns as well as other related linguistic devices to achieve their communicative aims in academic writing. By analyzing how these elements function within different contexts and genres, newcomers can grasp the reasoning behind observed differences in writing styles and approaches. This understanding enables them to employ metadiscursive nouns

and other resources more accurately and appropriately, fostering the development of their writing skills and academic voice. Moreover, the study equips novice writers with a deeper awareness of the conventions and expectations within their respective academic communities, which is crucial for successful academic communication and can facilitate their integration into scholarly discourse, helping them to present their ideas more effectively and professionally.

In view of the shortcomings, the current research is limited by several factors. First, the python script employed in this study represents a preliminary and experimental effort to conduct genre analysis within academic articles. As such, the validity and reliability of this script remain to be rigorously established. The computational methods and algorithms utilized in the script require further testing and validation against diverse datasets and analytical benchmarks. Future research could re-verify and optimize the script by refining its underlying algorithms, enhancing its parameter settings. This would enable more precise and robust genre analysis in academic articles, thereby improving the accuracy and reliability of the research findings. Second, the sample size utilized in this investigation is relatively modest, which may restrict the comprehensiveness and precision of the analysis. A limited sample size can introduce sampling bias and reduce the statistical power of the study, potentially leading to errors where existing effects might go undetected. To address this limitation, future studies should incorporate a larger and more diverse dataset encompassing academic articles from various disciplines, publication years, and sources. This expanded sample would provide a more representative and holistic overview of the phenomena under investigation, allowing for more generalizable and accurate conclusions to be drawn.

References

Ahn, C.-Y., & Oh, S.-Y. (2024). Citation practices in applied linguistics: A comparative study of Korean master's theses and research articles. *Journal of English for Academic Purposes*, 69, 101369. https://doi.org/10.1016/j.jeap.2024.101369

Alanazi, M., & Alqarni, M. (2022). The very first sentence in research article introductions: A rhetoric comparative approach. *Heliyon*, 8(8), e10241. https://doi.org/10.1016/j.heliyon.2022.e10241

Ansarifar, A., Shahriari, H., Staples, S., & Ghazanfari, M. (2025). A multi-dimensional analysis of thesis abstracts: Variation across academic levels and L1 backgrounds. *Journal of English for Academic Purposes*, 73, 101465. https://doi.org/10.1016/j.jeap.2024.101465

Benitez-Castro, M.-A. (2021). Shell-noun use in disciplinary student writing: A multifaceted analysis of problem and way in third-year undergraduate writing across three disciplines. *English for Specific Purposes*, 61, 132–149. https://doi.org/10.1016/j.esp.2020.10.004

Bruce, I. (2014). Expressing criticality in the literature review in research article introductions in applied linguistics and psychology. *English for Specific Purposes*, 36, 85–96. https://doi.org/10.1016/j.esp.2014.06.004

Chen, S., Xu, J., & Feng, X. (2024). Sub-disciplinary variation of metadiscursive verb patterns in English research articles: A functional analysis of medical discourse. *Iral-International Review of Applied Linguistics in Language Teaching*, 62(1), 165–195. https://doi.org/10.1515/iral-2022-0232

Deng, L., Cheng, Y., & Gao, X. (2024). Engagement patterns in research article introductions: A cross-disciplinary study. *System*, 120, 103204. https://doi.org/10.1016/j.system.2023.103204

Duque Gómez, Eladio. (2024). Factual Shell Noun Constructions in Discourse. *Revista signos*, 57(114), 311-336. http://dx.doi.org/10.4067/S0718-09342024000100311

Ebrahimi, S. F., & Chan, S. H. (2015). Research Article Abstracts in Applied Linguistics and Economics: Functional Analysis of the Grammatical Subject. *Australian Journal of Linguistics*, 35(4), 381–397. https://doi.org/10.1080/07268602.2015.1070660

Edsoulla, C. & Aaron, W. (2025). Examining the use of academic vocabulary in first-year ESL undergraduates' writing: A corpus-driven study in Hong Kong. *Assessing Writing*, 63, 100913. https://doi.org/10.1016/j.asw.2024.100913

Farhang-Ju, M., Jalilifar, A., & Keshavarz, M. H. (2024). Specificity and generality of lexical bundles in the rhetorical moves of Applied Linguistics research article introductions. *Journal of English for Academic Purposes*, 69, 101387. https://doi.org/10.1016/j.jeap.2024.101387

Gao, S., & Pramoolsook, I. (2023). A cross-cultural move analysis of electronic engineering research article introductions: The case of Chinese, Thai, and native English scholarly writers. *Ampersand*, 10, 100106. https://doi.org/10.1016/j.amper.2022.100106

Gillaerts, P., & Van De Velde, F. (2010). Interactional metadiscourse in research article abstracts. *Journal of English for Academic Purposes*, 9(2), 128–139. https://doi.org/10.1016/j.jeap.2010.02.004

Gray, B., & Cortes, V. (2011). Perception vs. evidence: An analysis of this and these in academic prose. *English for Specific Purposes*, 30(1), 31–43. https://doi.org/10.1016/j.esp.2010.06.004

Huang, L., & DEng, JL. (2025). "This dissertation intricately explores...": ChatGPT's shell noun use in rephrasing dissertation abstracts. *System* ,129. https://doi.org/10.1016/j.system.2024.103578

Hyland, K. (2017). Metadiscourse: What is it and where is it going? *Journal of Pragmatics*, 113, 16–29. https://doi.org/10.1016/j.pragma.2017.03.007

Hyland, K. 2005. *Metadiscourse: Exploring Interaction in Writing*. New York: Continuum

Jiang, F. (Kevin), & Hyland, K. (2017). Metadiscursive nouns: Interaction and cohesion in abstract moves. *English for Specific Purposes*, 46, 1–14. https://doi.org/10.1016/j.esp.2016.11.001

Jiang, F., & Hyland, K. (2015). "The fact that": Stance nouns in disciplinary writing. *Discourse Studies*, 17(5), 529–550. https://doi.org/10.1177/1461445615590719

Kashiha, H. (2022). Academic lectures versus political speeches: Metadiscourse functions affected by the role of the audience. *Journal of Pragmatics*, 190, 60–72.

Li, L., Franken, M., & Wu, S. (2020). Bundle-driven move analysis: Sentence initial lexical bundles in PhD abstracts. *English for Specific Purposes*, 60, 85–97. https://doi.org/10.1016/j.esp.2020.04.006

Lu, X., Casal, J. E., Liu, Y., Kisselev, O., & Yoon, J. (2021). The relationship between syntactic complexity and rhetorical move-steps in research article introductions: Variation among four social science and engineering disciplines. *Journal of English for Academic Purposes*, 52, 101006. https://doi.org/10.1016/j.jeap.2021.101006

Maher, P., & Milligan, S. (2019). Teaching master thesis writing to engineers: Insights from corpus and genre analysis of introductions. *English for Specific Purposes*, 55, 40–55. https://doi.o rg/10.1016/j.esp.2019.05.001

Schmid, H. 2001. 'Presupposition can be a bluff': How abstract nouns can be used as presupposition triggers. *Journal of Pragmatics*,33(10): 1529-1552. https://doi.org/10.1016/S0378-2166(01)00027-3

Sun A Kim, & Zhaoqi Li. (2025). The Effect of Professional Identity on Customer Orientation among Chinese Estheticians: A Moderated Mediation Model. *Research on Economics and TEST*. https://doi.org/10.70693/rems.v1i1.384

Swales, J.M. (1990). *Genre Analysis: English in Academic and Research Settings*. Cambridge:

Cambridge University Press
Thirakunkovit, S., Rodriguez-Fuentes, R. A., Park, K., & Staples, S. (2019). A corpus-based analysis of grammatical complexity as a measure of international teaching assistants' oral English proficiency. *English for Specific Purposes*, 53, 74–89. https://doi.org/10.1016/j.esp.2018.09.002
Xu, J., & Li, J. (2021). A syntactic complexity analysis of translational English across genres. *Across Languages and Cultures*, 22(2), 214–232. https://doi.org/10.1556/084.2021.00015
Yin, S., Fan, J., Jin, Y., & Stapleton, P. (2024). Towards a framework of critical thinking for assessing EAP speaking. *Journal of English for Academic Purposes*, 71, 101426. https://doi.org/10.1016/j.jeap.2024.101426