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Negation in Research Articles Conclusions: Rhetorical Functions and Move Analysis

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Abstract: Extensive studies have been conducted in various sections of research articles, including the abstract, introduction, discussion, and other segments. Remarkably, the conclusion, a component of this academic genre, has received relatively scant attention in genre analysis. Conclusions, serving as the concluding segment, play a crucial role in recalling the previously addressed issues, highlighting key research findings, acknowledging limitations, and suggesting implications for further research. In light of this, authors employ an array of interactive resources to engage with their readership effectively. As an essential part of interactive resources, negation is used to be neglected in discourse analysis. Hence, this study aims to explore the relation between negation and moves in research conclusions. Furthermore, this study seeks to examine how negation contributes to rhetorical persuasion with a focus on its functions and distribution across disciplines. This study shows the rhetorical functions of negation and describes the distribution of negation across disciplines and moves. The findings not only indicate that authors from distinct disciplines exhibit varying preferences in the utilization of negation in their research article conclusions, but also provide some pedagogical implications.

Keywords: Negation; Research Articles; Conclusions; Move Analysis; Rhetorical Functions

1. Introduction

The purpose of a research article (RA) is to show the latest findings and results of research. There are differences in the rhetorical methods used in each part of a research article and in the language, and rhetorical methods are used to realize the interpersonal purpose.[1-2] The conclusion part is exactly where all the findings and results are displayed in research articles, and in this part of different disciplines, authors communicate with readers through a variety of interactive sources. Each discipline has a unique culture, which means that its authors have the same way of thinking and behavior within the field. For this reason, conclusions have been an indispensable section of the genre analysis. While the previous studies on the conclusion part mainly focus on two levels: meta-discourse at the micro level, and the genre analysis at the macro construction, few studies connected the two levels in a research, let alone interactive sources from two perspectives. As one essential way of interactive sources, negation is seen in a very positive light for research article writing, but it is commonly regarded as the missing part in the previous studies. The main objective of this study is to investigate negation in research conclusions and its contribution to rhetorical persuasion. To achieve this goal, on the basis of a self-built corpus with 320 conclusions of research articles, according to the theories of move pattern and interpersonal pattern of negation, this study focuses on the forms, functions and distribution of negation across disciplines and moves of research conclusions.

1.1 Previous Studies on Rhetorical Moves and Steps

Rhetorical moves are a kind of taxonomy for reading a text.[3] A move in genre analysis is a discoursal or rhetorical unit that performs a coherent communicative function in a written or spoken discourse. Moves are defined as rhetorical structures or functional units that play an important role in realizing a specific communicative purpose. Also, steps are key elements of moves in move analysis. Steps refer to the second level of the first level, move, for the realization of establishing a niche.[4]

When it comes to the study on rhetorical structures, in recent years, RA conclusions have raised a variety of research. RA conclusions, are crucial and essential part, in which authors present their findings and seek to establish their importance. At first, Hopkin and Dudley-Evans (1988) proposed a move pattern of the conclusion part which made up of eleven moves, which is so complicated that cannot turn out to be a wide range of applications.[5] After a deep investigation of conclusions in applied linguistics, Yang and Allison developed a move schema for RA conclusions, which consists of three moves: *Summarizing the study* (*Move 1*), *Evaluating the study* (*Move 2*), and *Deductions from the research* (*Move 3*), with a number of steps in each move.[6] This model has inspired plenty of related research. For example, some researchers modified and proposed other models to adapt to their research. Bitchener confirmed the structure of a thesis conclusion, which concludes four moves: *Restatement of aims and methodological approach of study* (*Move 1*), *Summary of findings* (*Move 2*), *Evaluation of study's contribution* (*Move 3*), and *Recommendations for further study* (*Move 4*).[7]

Some researchers compared the rhetorical organization of RA conclusions in two languages or two linguistic levels of authors and demonstrated differences in the extent to which moves and steps were performed. Amnuai and Wannaruk compared the move differences between international and Thai journals' conclusions.[8] Kashiha compared the use of lexical chunks in each move of the journal articles' conclusions by English native scholars and Iranian scholars.[9] Zheng and Jing, from the perspective of genre analysis and meta-discourse, studied echoes of introductions and conclusions of English journal papers, and explored the language usage and the features of moves in the introduction and conclusion of English journal papers.[10] There are also a few studies that have discovered a link between language features and rhetorical functions of RA conclusions. Wang and Hu investigated how lexical bundles are used in the moves of RA conclusions by studying 120 English RAs of humanities & social sciences and natural sciences, and found some differences in lexical bundles usage in moves of the two disciplines.[11] As the aforementioned studies, the level of move in RA conclusion has been investigated widely. In addition, for the link to linguistic features, the top topic is lexical bundles, while other features, such as negation, are neglected.[12-14]

1.2 Previous Studies on Negation

Negation is used to deny or reject a proposition. Clauses are negated by the insertion of the negator *not* or by some other negative word (*no, nothing, etc.*). The English language encompasses a variety of negation types, each serving a function, and they aroused a series of researches in different disciplines. Standard negation uses words like "*no*" or "*not*" to explicitly deny something.[15]

Apart from these researches on types of negation, there are a variety of studies on other aspects. Tottie set up a fragment of an explicit pragmatic theory of negation and then explored the use of *no* and *not*.[16-17] Martínez not only focused on the use and meaning of negation in contemporary written English, in modern English, or in a speech of British English, but also was concerned with the negative polarity system based on data from the Bergen Corpus of London Teenage Language (COLT).[18-21] Romasanta (2022) focused on the effect of not- and no-negation on the complementation profile of the verb regret.[22] In addition, for negative concord in English grammar, *any*, has been proved that it is an invariable component of all dialects of English and an approach to implying the negation.[23] The use of *any*, a necessary part of the meaning of negation, was compared between Chinese-speaking learners and Arabic-speaking learners in second classroom.[24] Given the co-articulation of negation with various interpersonal and evaluative resources, using the appraisal framework, Sun and Crosthwaite investigated negation in the "limitation" section of 120 Ph.D. theses across disciplines.[25] For its interactive and interactional functions, Li, Jiang and Ma analyzed the differences in the frequency, distribution, and function of negation between L1 and L2 PhD students.[26] When it comes to moves and steps, Jiang and Hyland explored the way of negation contributing to an interpersonal model of academic writing on the basis of the analysis of a diachronic corpus of research abstracts with the move analysis.[27] According to the previous study, most of them focused on the English language itself, some scholars also probed into the generality of

dialects of English or the continuity of English in history. However, only a few scholars merged the move analysis with negation in English. In line with the previous studies, this study focuses on the negation in English with move analysis in RA conclusions across disciplines, to explore the relation between negation and moves and steps in RA conclusions, and to investigate similarities and differences between those disciplines.

2. Methodology

2.1 Corpus Description

To accomplish the research objective, this study constructed two corpora comprising 320 conclusions extracted from research articles published in 16 journals across four disciplines from 2016 to 2021. Following Becher's disciplinary classification, this study created two distinct corpora.[28-29] The first corpus, Soft Disciplines Conclusion Corpus (SDCC) consisted of linguistics as a pure soft subject, and education and teaching research (ETR) as an applied soft subject. In terms of Hard Disciplines Conclusion Corpus (HDCC), this study specifically included physics as a pure hard subject and mechanical engineering (ME) as an applied hard subject. In addition, this study selected journals in their own fields with high Impact Factors in 2021 by the Journal Citation Report supported by Clarivate Analytic. In selecting the RA conclusions, the final parts of selected research articles are under the title of "Conclusion" or "Conclusions", while the last section titled "Discussion and Conclusion" were removed. On the basis of selection criteria, this study selected 4 journals of each subject, and 20 texts in each journal at random from 2016 to 2021. We named the files according to the order of subjects, journals, and articles. For example, *1-4-13*, *1* refers to the first subject, Linguistics, *4* means the fourth journal of this subject, and *13* represents the order of articles in this journal. In a word, this meant that this study collected 320 conclusions from 16 journals in 4 subjects of two disciplines. Ultimately, two corpora were compiled respectively, named Soft Disciplines Conclusion Corpus (SDCC) and Hard Disciplines Conclusion Corpus (HDCC). The tokens of SDCC and HDCC are 85,275 and 64,627 respectively. Detailed information about two corpora can be seen in Table 1.

Table 1. Corpus Description of SDCC and HDCC

Corpus	Discipline	Texts	Words
SDCC	Linguistics	80	43,424
	Education and teaching research	80	41,851
	Sub-total	160	85,275
HDCC	Physics	80	30,528
	Mechanical engineering	80	34,099
	Sub-total	160	64,627
Total		320	149,902

2.2 Procedures

This study aims to investigate the negation in RA conclusions across disciplines. As the aforementioned studies, according to the main negative markers proposed by Biber et al., no-negation and not-negation are two main types. In a broad meaning, negatives include *rarely* and *little*, as noted by Sinclair et al.[30] Jiang and Hyland listed 17 typical negative markers: *barely, little, few, not, no, nowhere, nobody, never, no, one, neither, none, nor, nothing, seldom, rarely, hardly, scarcely*. For the present study, this study used the negative markers summarized by Jiang and Hyland, while only selected five typical negative markers to analyze and discuss. In the corpus, the five typical negative markers "*not, no, nor, few, little*", are in high-frequency, but others occurred just 1-2 times total, even zero, thus this study only focused on the five, neglected the others which are not representative in the corpus.

Firstly, we annotated the corpus with moves and steps by BFSU Qualitative Coder 1.2., in line with the moves and steps structure proposed by us (see move-step schema in Table 2) on the basis of the previous studies. Then using AntConc 3.5.7., we searched the five negative markers in each corpus. For concordances, we checked them one by one to ensure that they played a role of negation. After the above works, we annotated these concordances according to the interpersonal model of negation proposed by Jiang and Hyland, and in the process, excluding the cases like *(little, 1973)*, *"fist do no harm"* as a research object in study, and other cases cannot be seen as a negation.

We worked independently to clarify every instances by its function in the model, with

inter-rater agreement achieving 96% in SDCC, and 98% in HDCC, and finally we identified the functions of the different annotations. In short, we started from the five negative markers to analyze the function of negation paled in a discourse, and the statistics produced from the two corpora and each discipline were imported into the Log-likelihood spreadsheet and SPSS to induct further analysis.

Table 2. Move-Step Schema

Move	Step	Tagging for short
Move 1 Summarizing the study	Step 1 Background information	M1S1
	Step 2 Briefly introducing the study	M1S2
	Step 3 Summarizing the results	M1S3
	Step 4 Indicating the gap	M1S4
Move 2 Evaluating the study	Step 1 Indicating significance/ advantage	M2S1
	Step 2 Indicating the application	M2S2
	Step 3 Indicating limitation	M2S3
Move 3 Deductions from the research	Recommending further study	M3

Therefore, we mainly attempt to answer the following questions:

(1) What are the similarities and differences in the use of negation across disciplines and moves?

(2) What are the implications of the disciplinary differences for writers in academic English writing?

3. Results

3.1 Overall Distribution of Negation

In this section, this study presents statistics for the functional use of the five negative markers *"not, no, nor, few, little"* in different moves, and for the use of the five in the SDCC and HDCC. For each aspect, explanations and examples are included. In the corpus we totally identified 675 cases of the five negative markers in the corpus. Our data, 4.50 cases per 1000 words, is more than the data in the study of Jiang and Hyland, which presented 4.22 cases per 1000 words in abstracts. Thus it is obvious that the frequency in this study is sufficient to analyze and support the related research in conclusions. The five most frequently used negatives were *not, no, nor, few, little.* Table 3 presents those negative markers that owned the top-five frequency in the corpus.

Table 3. The Frequency of Negative Markers

	SDCC		HDCC		LL	*p*
	Linguistics	ETR	Physics	ME		
not	215	187	73	64	74.01	0.000***
no	24	18	10	8	4.37	0.037*
nor	8	1	3	1	0.84	0.360
few	8	13	8	7	0.03	0.861
little	13	7	1	5	5.82	0.016*
Total	269	227	95	84	79.94	0.000*

(Note: LL= Log-likelihood value; *=p<0.05; **=p<0.01; ***=p<0.001.)

Table 3 shows the overall distribution of the five most frequent negative markers. According to the data, there are significant differences between the authors of SDCC and HDCC in the use of *not, no,* and *little*, but the difference in the use of *nor* and *few* is not obvious. This means that *not-negation*, *no-negation,* and *little* showed a significant difference between SDCC and HDCC, while *nor, few* were difficult to observe the difference just from the frequency. It is obvious that the *no* and *not* negation are the most frequent negative negation among those negative markers, which corresponds well with the previous studies of Biber et al., which mentioned that *no-negation* and *not-negation* were the two main types of negation in a discourse. Apart from that, we cannot deduce more information, thus we will analyze their usage from the functional use.

Moves are discourse-level units in a text, where each move serves as a specific communicative function, contributing to constructing a cohesive and coherent discourse structure. Halliday's theory noted that context is a systemic manner,[31] thus it is pivotal to analyze the use of negation in different moves, aiming to explore the purpose of authors behind the use of negation across moves. Table 4 provides the distributions of the five negative markers in different moves of two corpora.

Table 4 describes the overall distribution of the five negative markers in the three moves. On the whole, in the two corpora, there were significant differences in the use of *not* in the

three moves, and in Move1, the use of *no* and *little* have differences. In Move1, there are four steps: *Background information (M1S1), Briefly introducing the study (M1S2), Summarizing the results (M1S3), and Indicating the gap (M1S4)*.

Table 4. The Overall Distribution of Negation in Different Moves

		SDCC	HDCC	χ^2
not	M1	164	66	18.91***
	M2	168	51	34.34***
	M3	70	19	16.32***
no	M1	21	6	3.99*
	M2	18	10	-
	M3	3	2	-
little	M1	15	3	4.11*
	M2	5	2	-
	M3	2	1	-
few	M1	8	9	-
	M2	12	6	-
	M3	1	0	-
nor	M1	2	1	-
	M2	5	2	-
	M3	2	1	-

The main content of Move1 is to summarize the study. In line with Holmes,[32] by presenting the main points, the author aims to simplify the reader's understanding and enable them to grasp the core content of the entire article. In soft disciplines authors tend to summarize their studies by criticizing or denying some other findings to strengthen their own persuasive power in example (1), while authors in hard disciplines adopt a more descriptive way to summarize their results in example (2), indicating that the latter prefers to highlight the experimental foundation, and process to captivate their intended readers (Hyland, 2008).[33]

(1)*...and researchers have admitted that existing on foreign soil does* ***not*** *necessarily guarantee active engagement with speakers of the language and members of the local community...* (1-2-6)

(2)*In some developing countries, including Iran, many meteorological stations do* ***not*** *record evaporation thus, using novel hybrid algorithms to predict evaporation can be a useful alternative.* (4-2-2)

3.2 Functional Analysis of Negation Across Disciplines

As noted above, negation was used by authors to announce statements, to criticize or question an existing idea, theory, or research result, to introduce new ideas, theories, or research findings that contrast or contradict existing ideas, to highlight problems or limitations, and to increase the complexity and depth of the argument. In practical applications, authors use appropriate negative makers to play specific functions in their research articles, thus realizing their purposes in promoting research progress and communicating with readers. According to Jiang & Hyland's interpersonal model of negation, which adopted the theory of communication that can be divided into interactive and interactional dimensions and the conception of metadiscourse proposed by Hyland (2005), functions of negation consist of two dimensions, and six subcategories of the two dimensions, named *consequence*, *addition*, *comparison* in interactive dimension and *hedging*, *boosting*, *affect* in interactional dimension.[34]

Table 5. Percentage of the functional use of negation

Functions	SDCC	HDCC	Total frequency	Percentage
Consequence	184	73	257	38.07%
Addition	95	24	119	17.63%
Comparison	19	5	24	3.56%
Interactive dimension	298	102	400	59.26%
Hedging	126	34	160	23.70%
Boosting	30	13	43	6.37%
Affect	41	31	72	10.67%
Interactional dimension	197	78	275	40.74%

Table 5 provides the percentage of the functional use of negation. According to the statistics, in general, the use of interactive dimension is more than interactional dimension. In terms of interactive dimension, the consequence function accounts for 38.07%, which is the highest proportion among all categories. However, the *comparison* function occupies the least part, 3.56% in the distribution, which shows that authors use negation less in marking contrastive relations between elements. On the other dimension, *hedging* owns 23.70%, the largest ratio in the interactional dimension, meaning that authors of RAs use negation as a hedging function to express a cautious attitude and academic humility in stating their opinions, thus providing readers with comprehensive and objective viewpoints, and to encourage them to

active thinking and further exploration. In a word, we just can observe the result from the overall distribution, so we will analyze the use of negation in detail, from each function to two dimensions in different moves in the two corpora.

Table 5 presents the distribution of functions of negation. For specific functions in the two corpora, there are significant differences in the functional use of negation whether in interactive dimension or interactional dimension, including almost all subcategories. They are *consequence* (LL=23.70, $p<0.001$), *addition* (LL=27.92, $p<0.001$), *comparison* (LL=5.29, $p<0.05$) in interactive dimension (LL=53.63, $p<0.001$), and *hedging* (LL=33.85, $p<0.001$) in interactional dimension (LL=25.51, $p<0.001$). There is no significant difference only in boosting and affect which belongs to the interactional dimension.

3.3 Functional Analysis of Negation in Each Move

In this section, the frequency distribution of functional use of negation in each move will be discussed. From Table 6, we can observe detailed information about the frequency of functional use of negation in the two corpora across different moves. Overall, authors of RAs use a relatively similar frequency in M1 (43.70%) and M2 (41.33%), while the least in M3 (14.96%). However, between the two corpora, writers in soft disciplines use more negation in functions than authors in hard disciplines in each move.

Table 6. The Distribution of Functional Use of Negation in Each Move

	SDCC	HDCC	LL	*p*
M1	209	86	24.43	0.000***
M2	207	72	36.06	0.000***
M3	79	22	20.27	0.000***

According to the data, we can find that writers in soft disciplines use a lot of negation in functional use to summarize the study, evaluate the study, and recommend further study, from describing background information, and introducing the study, to indicating the gap, significance and limitation, while writers in hard disciplines use less in those aspects.

Figure 1 shows in detail the percentage of negation with different functions in each step of the two corpora. As shown in Figure 1, apart from in M3 of HDCC, the interactive dimension accounts for a large proportion, over 50% in other moves, most of which is *consequence*. In the two corpora, *consequence* takes up 38.76% in SDCC-M1 and 40.70% in HDCC-M1, 38.65% in SDCC-M2 and 44.44% in HDCC-M2, while in M3, it occupies a relatively small proportion, 29.11% in SDCC and 27.27% in HDCC. This finding indicates that the *consequence* function of negation used by writers in RA conclusions mostly uses this function in expressing the incomplete result in example (3), or the undesirable outcome in examples (4) and (5). In M3, the main content is to deliver some pedagogical implications or suggestions for further research, so the author in this part tends to use less *consequence*, compared with other moves, thus strengthening their persuasive voice.

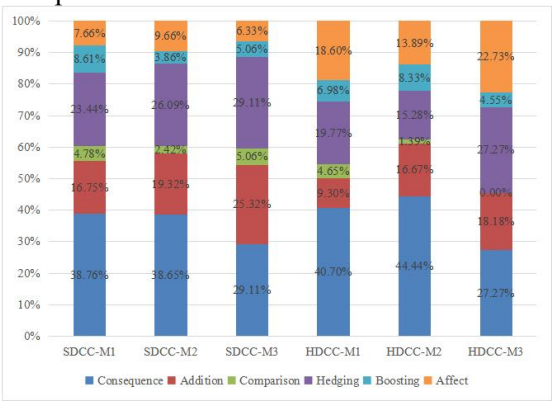

Figure 1. Proportional Distribution of Functions of Negation in Each Move

(3)*The results indicate that the dimensions of previous studies are* ***not*** *enough to fully capture the determinants of use, satisfaction, and success of e-learning.* (2-2-2)

(4) *The negotiation between practitioners of FO general and F2F mathematics CoPs is* ***not*** *a two-becoming-one alloy of practice...* (2-3-8)

(5) *Short but not so intense quarantine (red ellipse) does* ***not*** *work.* (3-4-6)

For the secondary part in the interactive dimension, in SDCC, *addition* takes up 16.75% in M1, 19.32% in M2 and 25.32% in M3, while it takes up a smaller proportion in HDCC, 9.30% in M1, 16.67% in M2, 18.18% in M3. Though with higher data in SDCC, the two corpora share a same tendency that *addition* is on the rise from M1 to M3. In the M3, authors always emphasize their significance again and then put forward new applications, so they will use less negation in this function to expand the horizon of readers. The function of *addition* mostly is used in the structure of "*not...but...*", "*not only...but also...*", "*neither...nor...*", such

as the examples (6), (7) and (8), to interrelate the elements of a text so as to realize the coherence and cohesion. The result implies that the authors in soft disciplines pay more attention to constructing text structure. In other words, authors in soft disciplines tend to convince readers through knowledge explanation and logical reasoning construction (Hyland, 2008), so the authors need to use the function of *addition* to strengthening connection.

(6)*In this respect, it is* ***not*** *an autonomous discipline but a sub-field of applied linguistics.* (1-2-15)

(7)*The IDS procedure and the combination of the process model is general it holds for any other systems* ***not*** *only for machining applications.* (4-4-7)

(8)*But because resource books have neither the international reach* ***nor*** *the commercial clout of global coursebooks, the sort of pedagogical eclecticism they offer is marginalised.* (1-2-16)

In terms of *comparison*, it plays an important role in making comparisons between elements to assist readers in understanding the structure of a text and accepting the information conveyed by authors. Also, in this study, we noted that the *comparison* function occupies the least part in the interactive dimension, even with no hits in the HDCC-M3, while it owns a shared potential between the two corpora that the proportion in M1 is a little higher than it in M2. The least part in the interactive dimension means that authors of RAs attach less importance to the comparison, no matter what disciplines they belong to. However, with little attention, *comparison* not only contributes to stress the importance of the research, but also provides readers with a brand-new point, just as examples (9), (10) and (11).

(9)*The mouthings in question are* ***not*** *strictly linked to individual manual signs, but contribute their own meaning through a parallel articulatory channel.* (2-1-15)

(10)*More fundamental issues in L1 and L2 acquisition concerned with (a) explaining why some structures are comprehended and produced by all L1ers while many others are* ***not*** *and (b) describing the acquisition over time (development) of lexical grammatical structures comprehended or produced by all L1ers.* (1-4-12)

(11)*This peculiar non-local behavior takes origin from the presence of off-diagonal coherent terms in the reduced density matrix which do* ***not*** *vanish in the thermodynamic limit, but are missing in the continuum description.* (3-3-11)

In the interactional dimension, as an important metadiscursive resource, *hedging* is the most part of the two corpora in each move, which is important for writers to mark their epistemic stance and identify the relation between writers and readers. The finding is consistent with the previous studies that hedging is frequently employed in academic writing, particularly in the genre of RA.[35] The two corpora also show the same tendency that the proportion is rising from M1 to M3 basically, excluding the HDCC-M2. The result indicates that authors of RAs pay more and more attention to using *hedging* from M1 to M3, due to their need to emphasize certainty about a proposition or confidence in an assertion,[36] or strengthening the asserted position, such as examples (12) and (13). Another reason is that in the final move, different from the other moves, authors shift their focus from presenting the result itself to recommending further study, which requires them to take more *hedging* to announce their statements in examples (14) and (15).

(12) *I do* ***not*** *claim that the idea of construing the category of multilingualism in terms of a natural category (i.e., radial, gradient, and fuzzy in Rosch, 1978 technical sense) is completely new and unheard of.* (1-4-15)

(13) *Like any non-linear programming method, MOST may* ***not*** *necessarily achieve a global optimum or force every performance index to reach its optimum, especially when some objectives conflict with others that are concurrently being considered during the optimisation.* (4-3-6)

(14) *Finally, the relationships between LMS measures and course achievement that were obtained in this study were based on correlations,* ***not*** *necessarily causation.* (2-4-2)

(15) *However, the mechanism of cavitation and mechanical effects on the surface integrity of the processed surface and crystal phase transformation in the subsurface layer in ultrasonic vibration has* ***not*** *been fully revealed.* (4-4-6)

Boosting is crucial in increasing the illocutionary force of speech acts,[37] expressing authorial commitment to a proposition,[38] while in this study, overall, the use of boosting takes up the least proportion in

each move of two corpora, which is similar to the falls found in affirmative boosters by Hyland and Jiang.[39] In M2, authors of soft disciplines use *boosting* least, while authors of hard disciplines use the function most, which indicates that authors in different disciplines tend to use distinct ways in evaluating their study, as shown in examples (16), (17) and (18). This result can also explain why *hedging* in soft disciplines is higher than in hard disciplines. In this vein, authors of RAs use less negation in boosting to strengthen their emphasis on certainty, in that they need to create a relative communication space between writers and readers.

(16) *Although we get a good sense of the extent of these issues within our study of online university learners in Korea, by* ***no*** *means does this definitively represent the online learning community as a whole.* (2-3-14)

(17) *However, we have shown that this is* ***no*** *longer the case in free-charge-conducting FERRO-systems, as the Gibbs free energy approach becomes invalid.* (3-2-17)

(18) *Therefore, in-depth studies are thus warranted to address the issues of uncertainty in the forecasted evaporation data which can* ***no*** *doubt assist range of stakeholders.* (4-2-18)

Finally, *affect*, contributes to presenting authors' attitudes towards the previous studies or research methods, by their comments on those specific issues. Also, we noted that another different tendency of the use of negation is in *effect* between the two corpora. In contrast to *boosting*, *affect* appeared the most frequently in SDCC-M2, while the least in HDCC-M2. This result shows that writers of soft disciplines pay more attention to evaluating the study by injecting their attitudes, responding to that authors of soft knowledge disciplines pay more attention to the construction of the section of *evaluating this research*, and tend to disseminate more information and ideas in this section, as the following examples (19), (20) and (21).

(19) *Even though faculty members at other Jordanian universities have agreed to be interviewed, on completion of this paper, those interviews were* ***not*** *yet available to the researchers.* (1-3-14)

(20) *I have argued such an approach is* ***not*** *feasible in contexts such as the state educational systems in East Asia that I am familiar with.* (1-2-8)

(21) *Very clearly, what we estimate to be the major source of uncertainty, should* ***not*** *surprise practitioners in this field.* (3-3-7)

4. Discussion

In many studies, rhetorical moves have been analyzed in a small number of texts, while in others, linguistic interactive sources such as negation have been extracted from a specific part of research articles. Few studies have combined these two aspects of discourse analysis. In this study, we took a corpus-based approach to identify the rhetorical moves associated with five negative markers generated from our SDCC and HDCC, and analyzed negative markers from the overall distribution, the functional use across disciplines and moves. From the results, it can be seen that there are some differences and similarities in the use of negation by authors of soft disciplines and hard disciplines. In summary, the major findings of this study can be concluded as follows:

Firstly, in terms of the overall distribution of the five negative markers, *not*, *no* and *little* present significant differences between SDCC and HDCC, while the difference between *nor* and *few* is not obvious. For specific moves, *not* has a significant difference between the two corpora from M1 to M3, and *no*, *little* also has an obvious difference in M1. On the whole, the main differences between the two corpora mostly center on the Move1. Apart from the above, other differences cannot be deduced from the mentioned data. One reason relies on that authors of RAs mostly use the explicit negator not and no, while other types, few, little are used to indicate a lack or insufficiency in quantity, but without providing specific. Additionally, avoiding vague or imprecise expressions, authors in academic writing emphasize accuracy and objectivity, which is crucial in presenting factual information in academic contexts.[40] Hence, scholars prefer to use more precise and specific language in academic papers to ensure the credibility and scientific validity of their research or arguments. Another possible reason is that our samples are not enough to cover all negative markers in the two corpora which resulted in the frequencies of some negative markers are less than 3 in the specific move. Therefore, in the following text, we will analyze the use of negation in detail, from the overall distribution of negation in move-step to the function of negation in the

interpersonal model in different moves between two corpora.

Secondly, as regards the distribution of the functions of negation in the two corpora, in the interactive dimension, writers of soft disciplines use consequence, comparison, and addition more frequently than writers of hard disciplines, while in the interactional dimension, writers in the two corpora are similar in the choice of the less frequently used *boosting* and *affect*. Specifically, there is no significant difference only in *boosting* and *affect* which belongs to the interactional dimension, while among subcategories of the interactive dimension, writers of soft disciplines use these functions more frequently than writers of hard disciplines. As the aforementioned information, the interactive dimension contributes to creating connections between discourse elements to give readers cohesive and persuasive information in understanding the writer's meaning. The emphasis on the interactive dimension indicates that writers of soft disciplines put more attention to constructing the structure of a text by making consequential, additive, and comparative relations.

As for the interactional dimension, writers in the two corpora are similar in the choice of the less frequently used *boosting* and *affect*, which are centered on expressing authors' opinions in a relatively robust and unambiguous way, so they tend to avoid the uncertain expressions to voice down. However, writers use *hedging to* attempt to "withhold complete commitment to a proposition, allowing information to be presented as an opinion rather than accredited fact".[41] In terms of these, writers in soft disciplines use more this kind of function than those in hard disciplines, which means that writers in soft disciplines are prone to persuade audiences with their opinion in example (22), while writers in hard disciplines tend to adopt an objective way to express their results in example (23).

(22)*This would be a way of explaining the contradiction perhaps, but I would* ***no*** *agree with this position.* (1-2-11)

(23)*We have* ***not*** *shown details of the well-known scalar-isoscalar channel, but IAM computations in the 1990 already predicted a meson pole at MeV.* (3-3-7)

Thirdly, functional analysis reveals both similarities and differences in the use of negation in each move of the two corpora. In the interactive dimension, two corpora share a similar tendency in *consequence*, about 40% in M1 and M2, while no more than 30% in M3. Also, with higher data in SDCC, *addition* presents the same tendency that it is on the rise from M1 to M3. Apart from that, *comparison* occupies the least part in the interactive dimension, even with no hits in the HDCC-M3. In the interactional dimension, *hedging* is the most part of the two corpora in each move. However, in M2, two corpora show different circumstances. For *boosting*, it emerges as a bottom in SDCC, while a top in HDCC. In addition, *affect* presents a completely opposite scene, with the most proportion in SDCC, while the least in HDCC.

The results reflect that writers in hard disciplines are obsessed with traditional traits and high standards in writing. In other words, the rules of the community of hard disciplines command them to use less in the RA conclusions.[42] Apart from that, Hyland (2008) pointed out that authors in hard knowledge disciplines prefer to stress their research method, equipment, and process, so as to lay a solid research foundation. Therefore, this is consistent with our results that authors in hard disciplines put more attention on research. However, authors in soft disciplines need more expressions to illustrate the importance of their research, differences with other research, and implications for further research, thus activating readers' interest in the text, which may result from the fuzzy boundary of soft disciplines and the lack of a clear research paradigm.[43]

5. Conclusion

The genre of research conclusions holds particular importance within the broader context of academic writing, providing the readers with the main results, significance, limitations, and future implications. Due to the difference between disciplines, the knowledge of different disciplines is manifested through different ways of negotiation and presentation. Negation, an essential resource of communicative behaviors, plays both interactive and interactional roles in the rhetorical construction of research conclusions. In this study, the results confirm the point again by examining the functions of negation construction in the texts of different disciplines

with specific moves.

All of those results clarify that authors in different disciplines construct a text and present their knowledge in different ways. Consequently, our study shows that different disciplines have different choices when they present their research in research article conclusions. Authors of soft disciplines are inclined to use more negation than those of hard disciplines. In terms of functions of negation, our study shows that negation is used most in *consequence* to construct the structure of a text, least in *boosting* to strengthen their statements. Specifically, negation plays a crucial role in interactive and interactional communication between writers and readers. Negation signals a writer's involvement in the rhetorical preferences of disciplinary practice. The distribution of negation across disciplines and moves indicates that authors in different disciplines use different patterns of uses in different moves to achieve a specific function.

According to those results, some pedagogical implications are obtained for English academic writing and teaching, especially in conclusion writing. Firstly, English learners can strengthen their awareness of discourse construction. Move analysis is to analyze the organization of discourse, providing learners guidance in academic writing. Moreover, by using corpora, some genre-based classes help students analyze the tendencies in the use of linguistic characteristics and discourse organization. Teachers can conduct comparative teaching methods through the relevant corpus, and improve students' levels in academic writing. In addition, on the characteristics of language in different disciplines for communicative purposes, this study explores a new way for researchers, which will be of great help to them in the related studies. There are still some limitations in this study. This study focuses on those characteristics only by a synchronic approach. Also, the corpus was annotated manually, so there exist some divergences between those who make decisions of annotation. Therefore, in further study, we will expand our corpus for a diachronic study, and expect to have a more unified standard of annotation.

References

[1] Parkinson Jean. Representing own and other voices in social science research articles[J]. International Journal of Corpus Linguistics, 2013, 18(2), 199-228.

[2] Samraj Betty. An exploration of a genre set: Research article abstracts and introductions in two disciplines[J]. English for Specific Purpose, 2005, 24(2), 141-156.

[3] J. M. Swales. Genre Analysis: English in Academic and Research Settings[M]. Cambridge university press, 1990.

[4] J. M. Swales. Research genres: Explorations and applications[M]. Cambridge University Press, 2004.

[5] Hopkins Andy and Tony Dudley-Evans. A genre-based investigation of the discussion sections in articles and dissertations[J]. English for Specific Purposes, 1988, 7(2), 113-121.

[6] Ruiying Yang and Desmond Allison. Research articles in applied linguistics: Moving fromresults to conclusions[J]. English for Specific Purposes, 2003, 22, 365-385.

[7] J. Bitchener. Writing an applied linguistics thesis or thesis: A guide to presenting empirical research[M]. Bloomsbury Publishing, 2010.

[8] Amnuai Wirada and Anchalee Wannaruk. A move-based analysis of the conclusion sections of research articles published in international and Thai journals[J]. The Southeast Asian Journal of English Language Studies, 2013, (2), 53-63.

[9] Kashiha Hadi. Recurrent Formulas and Moves in Writing Research Article Conclusions Among Native and Nonnative Writers[J]. 3L, Language, Linguistics, Literature, 2015, 21(1), 47-59.

[10] Zheng Xinmin and Feilong Jing. A Genre and Metadiscourse Analysis of the Correspondence Effects Between Introduction and Conclusion in Empirical Articles: Focusing on Chinese Foreign Language Journals[J]. Foreign languages and their teaching, 2017, 295(04), 42-51+147-148.

[11] Wang Hua and Zhiqing Hu. A Cross-disciplinary Investigation of Lexical Bundles in the Moves of Research Article Conclusions[J]. Foreign Language Education, 2020, 20(00), 91-104.

[12] Li Liang, Margaret Franken and Shaoqun Wu. Bundle-driven move analysis: Sentence initial lexical bundles in PhD abstracts[J]. English for specific purposes,

2020, 60, 85-97.
[13] Lu Xiaofei, Jungwan Yoon and Olesya Kisselev. Matching phrase-frames to rhetorical moves in social science research article introductions[J]. English for specific purposes, 2021, 61, 63-83.
[14] Liu Luda, Feng Kevin Jiang, and Zhongquan Du. Figure legends of scientific research articles: Rhetorical moves and phrase frames[J]. English for specific purposes, 2023, 70, 86-100.
[15] D. Biber, S. Johansson, G. N. Leech, et al. Grammar of spoken and written English[M]. John Benjamins, 1999.
[16] Tottie Gunnel. Lexical diffusion in syntactic change: Frequency as a determinant of linguistic conservatism in the development of negation in English[J]. Historical English syntax, 1991, 439-467.
[17] Tottie Gunnel. Any as an indefinite determiner in non-assertive clauses: Evidence from Present-day and Early Modern English[J]. Studies in early modern English, 1994, 413-27.
[18] Martínez Ignacio Miguel Palacios. Notes on the use and meaning of negation in contemporary written English[J]. Atlantis, 1995, 17(1/2), 207-227.
[19] Martínez Ignacio Miguel Palacios. Multiple negation in modern English: A preliminary corpus-based study[J]. Neuphilologische Mitteilungen, 2003, 104(4), 447-498.
[20] Martínez Ignacio Miguel Palacios. “It ain’t nothing to do with my school”: Variation and pragmatic uses of ain’t in the language of British English teenagers[J]. English Studies, 2010a, 91, 548-66.
[21] Martínez Ignacio Miguel Palacios. The expression of negation in British teenagers’ language: A preliminary study[J]. Journal of English Linguistics, 2010b, 39(1), 4-35.
[22] Romasanta Raquel. Negation as a predictor of clausal complement choice in World Englishes[J]. English Language & Linguistics, 2022, 26(2), 307-329.
[23] Labov William. Negative attraction and negative concord in English grammar[J]. Language, 1972, 48: 773-818.
[24] Gil Kook-Hee, Heather Marsden, and Melinda Whong. The meaning of negation in the second language classroom: evidence from ‘any’[J]. Language Teaching Research, 2017, 23(2), 218-236.
[25] Sun Shuyi Amelia and Peter Crosthwaite. “The findings might not be generalizable”: Investigating negation in the limitations sections of PhD theses across disciplines[J]. Journal of English for Academic Purposes. 2022, 59, Article 101155.
[26] Li Xuelan, Feng Kevin Jiang and Jing Ma. A cross-sectional analysis of negation used in thesis writing by L1 and L2 PhD students[J]. Journal of English for Academic Purposes, 2023, 64, Article 101264.
[27] Jiang Feng Kevin and Ken Hyland. “The datasets do not agree”: Negation in research abstracts[J]. English for Specific Purposes, 2022, 68, 60-72.
[28] Becher Tony. Disciplinary discourse[J]. Studies in Higher Education, 1987, 12(3), 261-274.
[29] Becher Tony. The significance of disciplinary differences[J]. Studies in Higher Education, 1994, 19(2), 151-161.
[30] J. Sinclair, M. Airlie, R. Scrimgeour, et al. (2017). Collins cobuild English grammar (4th ed.)[M]. Collins Cobuild, 2017.
[31] M.A.K. Halliday. Language as Social Semiotic: The Social Interpretation of Language and Meaning[M]. Foreign Language Teaching and Research Press & Arnold, 2001.
[32] Holmes Richard. Genre Analysis, and the Social Sciences: an Investigation of the Structure of Research Article Discussion Sections in Three Disciplines[J]. English for Specific Purposes, 1997, 16(4), 321-337.
[33] Hyland Ken. As can be seen: Lexical bundle and disciplinary variation[J]. English for Specific Purposes, 2008, 27(1), 4-21.
[34] K. Hyland. Metadiscourse: Exploring interaction in writing[M].Continuum International Publishing Group, 2005.
[35] Hyland Ken and Polly Tse. Metadiscourse in academic writing: a reappraisal[J]. Applied Linguistics, 2004, 25(2), 156-177.
[36] Holmes Janet. Doubt and certainty in ESL textbooks[J]. Applied Linguistics, 1988, 9(1), 21-44.
[37] Holmes Janet. Modifying illocutionary force[J]. Journal of Pragmatics, 1984, 8(3), 345-365.
[38] Millán Enrique Lafuente. Epistemic and Approximative Meaning Revisited: The use of hedges boosters and approximators when

writing research in different disciplines[J]. English as an additional language in research publication and communication, 2008, 61, 65.

[39] Hyland Ken and Feng Jiang. Change of attitude? A diachronic study of stance[J]. Written Communication, 2016, 33(3), 251-274.

[40] Conrad Susan, and Douglas Biber. The Frequency and Use of Lexical Bundles in Conversation and Academic Prose[J]. Lexicographica, 2005, 20, 56-71.

[41] Hyland Ken. Stance and engagement: A model of interaction in academic discourse[J]. Discourse Studies, 2005, 7(2), 173-192.

[42] Hyland Ken. Genre, discipline and identity[J]. Journal of English for Academic Purposes, 2015, (19), 32-43.

[43] T. Becher and Trowler, P. Academic Tribes and Territories: Intellectual enquiry and the culture of disciplines[M]. McGraw-Hill Education (UK), 2001.