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"The Limitation of This Study Is…": A Diachronic Corpus Analysis of Hedges and Boosters in Communication Research Articles

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Abstract

This diachronic corpus analysis investigates shifts in hedges and boosters within the "Limitation" rhetoric of Communication Research Articles (RAs). By investigating data from Communication journals of selected two periods, the study reveals a significant increase in the incorporation of limitation rhetoric, hedge markers, and a small increase of boosters. The study contributes insights into evolving scholarly communication, emphasizing the delicate balance between caution and confidence in addressing study limitations.

Keywords

Diachronic, Hedge, Booster, Rhetoric

1. Introduction

Language is constantly changing although slowly, its use, form, and even function response to social changes. The academic language, particular research articles (RAs, hereinafter), and the most prestigious genre in the research world (Yang & Allison, 2003) are subject to change in response to the needs of the research world and society as a whole. Over the last few decades, there has been an increasing interest in examining academic discourse through a diachronic perspective. Research has focused on how various linguistic features, in general, have changed across time (e.g., Biber & Gray, 2010; Hyland & Jiang, 2016, 2018, 2019; Vinkers et al., 2015; Li, 2021; Wu & Pan, 2023; Xie et al., 2024; Holtz et al., 2017). These studies went across many disciplines and periods, evidenced that the linguistic choice of academic genre is not fixed and static, but rather is seen as being interwoven with complexities and dynamism of disciplinary, technolo-

gy, and social changes.

Of the series of studies, one noticeable line is diachronically tracing changes of metadiscourse markers in RAs. Based on a 360 million corpus, it has been found that there is an overall trend that the interactive markers show a dramatical increase while the interactional features decreased over the period in 1965, 1985, and 2015 across Applied linguistics, Sociology, Biology, and Electronic engineering (Hyland & Jiang, 2018). They further argued that the linguistic changes, particularly in the soft fields in which knowledge construction is on logical interpretation by negotiating the possibility, certainty, and conviction of the statement with the reader (Hyland & Jiang, 2016). The observed decline of hedges and boosters in RAs in Applied Linguistics and Sociology suggests that social science disciplines are more cautiously interpreting results; conversely, the increasing use of code gloss and endophorics may indicate that contemporary social science research relies more on data and facts, akin to the natural sciences, to strengthen arguments (Hyland & Jiang, 2016, 2018). The series of studies by Hyland and Jiang raise our linguistics awareness in terms of the overall trend the metadiscourse markers and disciplinary changes from a language perspective.

However, it should be noted that the research writing is conventionalized by a set of rhetorical patterns in each RA section (Swales, 1990, 2004) as well as personalized, constrained by the accessibility and availability of knowledge, resources, and research circumstances. Self-mention that indicates the author's presence and visibility in RAs has been observed in Biology in Hyland and Jiang's (2016) study, in all forms over the three years. While the study of a focal writer in biology RA revealed the use of self-mention, both in plural and single form fluctuates in the years 2008, 2011, 2014, and 2017 (Junnier, 2020). The fluctuations, as argued by Junnier, were "highly contingent on contextual variables" that the role of the focal writer shifted from a Ph.D. student to an assistant professor over the years and co-authorship dynamics. In addition, disciplinary changes are another important factor that influences linguistic choices. In some interdisciplinary fields that are interested in certain research topics, their writing style, rhetorical pattern, and preferred discourse markers could be more varied, as the stronger influence of related and even heterogenic disciplines. As an abovementioned study by Hyland and Jiang (2018) the interactional discourse markers, including hedge markers, have dramatically increased in the 3-year periods, however, the RA with a focus on Chemotaxis, a relevant discipline of biology has shown an overall decrease (Poole et al., 2019). They explained that the difference can be largely attributed to the development of a field from emergence to maturation that new questions, novel methods, and fresh observation featured greater levels of uncertainties. When the field matured, greater understanding and consensus were achieved, and therefore the need to hedge a claim decreased over time.

The abovementioned studies are on a whole RA basis, different diachronic observations are subjective to wider disciplinary shifts and personalized expe-

rience. Besides, the diachronic changes of RA in different sections could also vary, as the Result and Method section is descriptive while Introduction and Discussion are interpretive. Even in individual sections, the changes of discourse markers in different rhetorical units could vary due to multiple communicative purposes in that section. The Discussion section, for example, goes beyond the factual description of the results by interpreting, evaluating, and discussing the implications of the results (Liu & Buckingham, 2018; Ash'ari et al., 2023). Each rhetorical unit, for example, evaluating results, could be achieved by pointing out negative features or limitations of the current study, evaluating the state of knowledge or practice in broad terms, stating the contribution of the current study, pointing out positive features of the current or proposed study, and noting specific gaps in knowledge or deficiencies in other research or practice (Moreno & Swales, 2018).

In the evaluating rhetoric, acknowledging limitations serves a pivotal role by enabling a critical examination of one's methodology to prevent misinterpretation (Montgomery, 2023), minimize the impact of limitations on validity (Sun and Crosthwaite, 2022), and preemptively address potential reviewer criticism, fostering direct engagement with other scholars, strategically navigating conflicts in the discussion sections (Cheng & Unsworth, 2016). To successfully achieve the rhetorical function of limitation, skillful manipulation of hedges and boosters that indicate the level of caution and certainty of their self-claimed limitation is necessary. As with other discourse markers, it is also subjective to changes of disciplinary and social changes as a whole. This study aims to conduct a diachronic corpus analysis of hedges and boosters in the "Limitation" step of the Communication Discussion section, exploring historical trends and linguistic shifts over time. It seeks to identify how scholars navigate the balance between expressing caution and emphasizing findings when addressing study limitations. The research contributes to understanding the evolving nature of scholarly communication in the field by examining the rhetorical strategies employed in discussing limitations.

2. Hedges and Boosters

Stance involves attitudes, judgments, feelings, or commitments related to the content of a proposition (Biber & Finegan, 1989). It reflects various personal assessments, including the speaker's attitudes towards information and, notably for this study, the certainty they attribute to its veracity (Biber, 2006). Hedges and boosters represent the epistemic or evidential aspects of stance, indicating degrees of certainty, doubt, actuality, precision, or limitation (Hyland & Jiang, 2016). Hedges provide a cautious approach for authors, creating discursive space to mark statements as provisional. This engages readers as participants in the ratification process while conveying respect for colleagues' perspectives through grammatical devices like modal auxiliaries (e.g., may, could, should) and adverbial hedges (e.g., presumably, usually relatively). Conversely, boosters express

confidence, categorically asserting claims and potentially limiting alternative viewpoints, achieved lexically (e.g., find, no doubt, indisputably).

The use of hedges and boosters plays a crucial role in effectively communicating the certainty or uncertainty associated with the identified limitations. Hedges, such as modal auxiliaries and adverbial qualifiers, allow researchers to diplomatically convey the provisional nature of their findings, inviting readers to engage in critical examination and interpretation. This not only fosters a sense of open discourse but also demonstrates respect for diverse perspectives. On the other hand, boosters, expressing conviction, help researchers assert their claims with confidence. This is particularly important when addressing limitations, as it allows authors to clearly delineate the boundaries of their study, minimizing the potential for misinterpretation and preemptively addressing any concerns raised by reviewers or other scholars. Balancing hedges and boosters ensure a nuanced and transparent discussion of limitations in academic discourse.

3. Literature Review of the Studies on Limitation

Limitations in past studies have been observed in the Discussion or Conclusion section (Tessuto, 2015; Kanoksilapatham, 2015; Ash'ari et al., 2023). This step, at first glance, undermines the perceived robustness of the research findings, potentially casting doubt on the overall validity and generalizability of the study. However, by openly acknowledging the limitation of a study, it shows the researcher's awareness of shortcomings, serving as valuable information for others to refine methodologies and contribute to the advancement of the field (Lindeberg, 2004). This step has become indispensable rhetoric that either appears in the closing section of an RA, is an independent section, or is merged with future recommendations separate from the Discussion or Conclusion section (Lin & Evans, 2012).

In a study of P-frame research in limitation and recommendation steps, some notable patterns have been observed (Montgomery, 2023). In this study, limitations often employ double negatives, for example: this framework is not without limitations, presenting limitations as factual rather than unexpected outcomes. Secondly, of the categorized 3 types of frames: referential, stance, and discourse, stance frames were prevalent in limitation, for instance: it is important to acknowledge that… As argued by the author, evaluative markers like "importance" clearly strengthen the author's voice and take an authoritative role in making limitation statements. Interestingly, the study revealed that hedges, typically used for modesty, were not prominent, indicating the authors' intention to assert authority and actively engage in dialogic research writing. The author further explained that the infrequency of hedges could be due to some suggestions from the thesis writing guiding books that approach limitations straightforwardly and unapologetically. This finding is interesting considering that limitation statement often potentially instills people's skepticism on the overall validity of the study that it is supposed to be expressed cautiously with hedge markers. Given the di-

verse presentation of hedges and boosters, in the form of noun phrases (e.g., certain level and on the whole) that the 5- and 6-word frames in Montgomery's study could exclude some of the epistemic markers, it is thereby necessary to investigate the nuanced usage of hedges and boosters to understand the discoursal behavior of limitation.

4. Methodology

In this study, we will examine diachronic changes of hedges and boosters in the limitation step. Specifically, this study will answer the following two questions:

   1) Has the inclusion of the limitation rhetoric in Discussion section changed over time and to what extent?

   2) Has the distribution of hedges and boosters in the limitation rhetoric changed over time and to what extent?

4.1. Data Collection

The study draws its data from four prominent Communication journals: Communication Research (CR), Human Communication Research (HCR), Journal of Applied Communication Research (JOACR), and Communication Quarterly (CQ). The objective is to diachronically analyze the changes in step and epistemic markers in the limitation rhetoric. RAs from the years 1980-1981 and 2020-2021 were gathered to track these changes over time. To ensure a comprehensive analysis, a random selection of five articles from each of the four journals was made for each year, resulting in a total of 40 RAs in each period. As argued in the previous section, the limitation rhetoric can be found in the Discussion, Conclusion, or in the form of an independent section, titled Limitation. To build a comparable corpus, this study only focuses on the limitation rhetoric in the Discussion section, as a corpus in the 1980-1981 period often ended with the Discussion section.

4.2. Analytical Procedure

The identification of limitation rhetoric employed the genre-based approach outlined by Swales (1990, 2004), building upon the insights from Lindeberg (2004), Moreno (2021), and Montgomery (2023) in their respective studies. The identification process includes linguistic clues, such as: "The limitation of this study is…", and textual analysis when the linguistic clue is not explicit, for example: "we were not able to…".

   To quantify the use of hedges and boosters in the limitation rhetoric across the two time periods, the categorization is based on the framework of Hyland (2005). As suggested by Hyland and Jiang (2018) metadiscourse is essentially an open category to which writers can add new items according to the needs of the context. The proposed hedges and boosters' framework were used as a basis and all the limitation rhetoric was carefully read to ensure the words or phrases in a particular context denoted epistemic meaning. For example: in this sentence:

"focus on highlighting potential differences", the word "potential" expresses the author's uncertainties towards the limitation, excluding from Hyland's (2005) framework. However, in another limitation statement, for instance, "allows for the potential of researcher error", the potential here refers to the proposition rather than denoting any epistemic meaning. Considering some context-based meanings of hedges and boosters in the limitation rhetoric, the annotation of limitation rhetoric, and epistemic markers are manual based.

5. Changes of Limitation Rhetoric and the Epistemic Markers

5.1. Changes of Limitation Rhetoric

The limitation rhetoric serves the purpose of diminishing the significance of the contribution and toning down the assertiveness of the statement, as emphasized by Lindeberg (2004) and Moreno (2021). As depicted in Table 1, there has been a noteworthy rise in the incorporation of this step in RAs, increasing from 16 RAs in the 1980-1981 period to 30 in the 2020-2021 period, accounting for 40% and 75% in the two periods. Given that the corpus in 2020-2021 contains RAs that ended with other sections, such as Conclusion and perhaps a separate Limitation section in which the factual employment of limitation rhetoric, on a whole RA basis could be higher than the 1980-1981 period.

The step in the corpus has quadrupled, from just 38 to 168 which is a massive 324 % increase. When comparing the step frequency with the literature under the same annotation framework of Yang and Allison (2003), the number of Moves or of Steps in the data was just 2 in its original study and 11 in Liu and Buckingham (2018). Given that the study of Liu and Buckingham (2018) is a replica study of Yang and Allison, in which the same number of 20 articles were selected. The only difference is the period of the corpus, with the previous one sourced from 1996-1997, while the latter was from 2011 to 2015. In a more recent study, Montgomery (2023) observed the appearance of a Limitation between 52% - 95% in Applied Linguistics whose 200 RAs corpus was selected from 2016-2019. Although the limitation observed in Montgomery's study includes both the Discussion and Conclusion sections, we still can conclude that the overall changes of the Limitation step in the Communication Discussion section align consistently with the literature. Given that a large share of the 2020-2021 corpus ended with a Conclusion and perhaps a separate Limitation section while the corpus of 1980-1981 ended with just a Discussion section, it suggests that discussing the limitation of a study is not a necessary rhetoric in earlier Communication study. The remarkable increase in the use of limitation

Table 1. Diachronic changes limitation rhetoric over the two periods.

	Frequency in Number of RAs		Occurrence in Corpus		Changes
	1980-1981	2020-2021	1980-1981	2020-2021	
Limitation rhetoric	16 (40%)	30 (75%)	38	168	342%

rhetoric suggests that authors of Communication RAs may be more inclined to openly acknowledge and address the limitations of their studies and consider it as a powerful to strengthen the credibility of the research.

5.2. Changes of Hedge Markers in Limitation Rhetoric

As illustrated in Table 2, the employment of hedge markers increased significantly over the two periods. In the 1980-1981 period, there were only 27 items while the figure increased to 138, and Table 2 just shows the top 10 items, which means the hedged item not only increased in quantity but also showed a greater variety in the 2020-2021 period. Hedge item "may" which indicates a lower level of certainty towards a statement remains the most frequent item. Example (1) and (2) below illustrate a cautious attitude towards the representativeness of the results or possible bias due to the data collection methods. Although most of the items are modal auxiliaries over the two periods, the use of hedge markers in the 2020-2021 periods shows more diversity, such as "potential" and the verb "suggest". Moreover, it is noticeable that the hedging devices such as "should" and "most" show a stronger stance in making limitation claims. As Examples (3) and (4) show authors when authors evaluate their studies, the stronger hedge markers "should" in Example (3) draw more attention than "could" and "possible" while "most" emphasize the inherent limitation of a method. However, the increased number of hedge markers in the second period could be due to more limitation rhetoric observed in the 2020-2021 period as indicated in section 5.1. The varieties of hedge devices and the stronger voice in the second period still support that Communication RAs are more openly discussing the limitations of their studies and regard it as a valuable rhetoric resources to increase the credibility of the study.

Table 2. Diachronic changes hedge in limitation rhetoric over the two periods.

1980-1981		2020-2021	
Item	Frequency	Item	Frequency
may	8	may	39
possible	3	could	10
can	3	can	8
could	3	should	6
should	2	most	5
perhaps	1	might	4
only	1	potential	4
relatively	1	suggest	3
should	1	would	3
fairly	1	only	3
	26	…	138

(1). Third, the extent to which these findings are typical or representative may also be question. (1980-1981 corpus)

(2). Additionally, our data collection approach, which combined survey and trace data, may have incurred a systematic sampling bias due to issues related to data privacy perceptions. (2020-2021 corpus)

(3). Several limitations should be addressed. (2020-2021 corpus)

(4). As with most meta-analyses, some limitations of this study arise from the availability and the quality of studies and from their reporting… (2020-2021 corpus)

5.3. Changes of Booster in Limitation Rhetoric

As illustrated in Table 3, in a sharp contrast, the number of boosters is far less than the hedges, and except for the word "acknowledge", there are not any overlapping boosters over the two periods. Unlike hedging devices which show uncertainties and ambiguities, the boosters indicate a greater level of confidence in the claims. As illustrated in examples (5) (6) and (7), the booster words enhance the intensity of the "limitation" that may include some errors in the data collection and measuring process, or need for future refinement. Although booster is another device that shows the author's research transparency and openness of research shortcomings, the assertiveness of boosters, on the other hand potentially shuts down alternative arguments. Unlike hedges, the ambiguity opens space for future discussions, the large use of boosters could potentially substantiate

Table 3. Changes of booster in limitation rhetoric.

1980-1981		2020-2021	
Item	Frequency	Item	Frequency
obviously	1	acknowledge	3
evident	1	recognize	2
acknowledge	1	certainly	1
additional	1	largely	1
more	1	confirm	1
Admittedly	1	did	1
warrant	1	must	1
concretely	1	greater	1
entirely	1	reasonable	1
		reasonably	1
		of course	1
		highlight	1
		insight	1
	9		16

the research weakness, undermining the validity of the study. Moreover, as other studies indicate the limitation rhetoric often follows the recommendation (Joseph & Lim, 2019; Montgomery, 2023). If the assertive of limitation may hinder authors make future recommendations.

(5). It should be acknowledged that some rounding error may have inflated this estimate. (1980-1981 corpus)

(6). We also recognize measurement-related limitations which one should consider when interpreting our results. (2020-2021 corpus)

(7). While the concept certainly needs future refinement. (2020-2021 corpus)

6. Conclusion

In conclusion, the diachronic analysis of hedges and boosters in the "Limitation" section of Communication RAs reveals significant changes over time. Firstly, the inclusion of the limitation rhetoric in the Discussion section has quadrupled from 1980-1981 to 2020-2021, indicating a notable shift in scholarly communication practices. This increase suggests a growing trend among Communication researchers to openly acknowledge and address the limitations of their studies, enhancing the credibility of their research. Secondly, the distribution of hedge markers in the limitation rhetoric has shown a substantial increase in both quantity and variety, emphasizing a nuanced approach to expressing uncertainties. The expanded use of diverse hedge devices, including stronger ones like "should" and "most", highlights a more open discussion of study limitations. On the other hand, boosters, are less frequent and exhibit limited overlap across the two periods. The assertiveness of boosters, while enhancing research transparency, may potentially limit open discussions and hinder future recommendations. This study contributes to understanding the evolving nature of scholarly communication in Communication research by exploring rhetorical strategies in addressing study limitations. The findings underscore the importance of balancing transparency and assertiveness in academic discourse. Pedagogically, future Communication researchers benefit from explicit training in using hedges and boosters. This equips them to navigate transparency and assertiveness effectively when addressing study limitations, enhancing scholarly discourse.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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