

DISCIPLINARY VARIATIONS IN FRAMING RESEARCH ARTICLES IN THE SOCIAL SCIENCES AND HUMANITIES

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Abstract

Metadiscourse is now a widely used term in academic discourse analysis. How academics employ rhetorical devices to structure their texts, establish reader-writer interaction and stamp their authorial stance regarding the conventions of the disciplines, cultures, and genres has been the subject of many studies. Despite the growing prominence of the term, however, some features of it, one of which is frame markers, have gone unnoticed. Frame markers signal the boundaries in the academic discourse for the readers' understanding, and they are a crucial rhetorical feature of metadiscourse. The present study examines the deployment of frame markers in research articles written between 2010 and 2019. Based on the analysis of frame markers in a corpus of research articles across four disciplines in social sciences, there were marked variations across the four disciplines in the use of frame markers and the occurrences of their sub-categories. The findings suggested that academic communities have a decisive role in constructing text structures in research articles. The results might offer guidance to academic writers on shaping the texts that their readers find persuasive.

Keywords: academic writing, metadiscourse, frame markers, research articles, social sciences

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For scholars, academic texts are the tools for gaining credibility in their disciplines which their research's originality and importance can provide. In these texts, scholars negotiate their findings and comments to anticipate the readers' expectations. In other words, they organize the propositional content to display solidarity with their readers and to persuade them about the truth of the propositional content and their comments. In this sense, academic texts can be seen as the outcomes of a reader-oriented approach to displaying the propositional content, which requires the use of certain linguistic devices. A widely employed linguistic device in academic texts is metadiscourse among these linguistic elements. It has been a means of academic interaction, and hundreds of articles and postgraduate dissertations have been written on it (Hyland, 2017).

Since Zellig S. Harris first proposed metadiscourse in 1959, the term has received growing scholarly attention with the pioneer works of Vande Kopple (1985), Hyland and Tse (2004), Hyland (2005), and Adel (2006), who suggested different metadiscourse taxonomies. For Hyland (2017), the term is 'concerned with exchanging information of various kinds, but also to itself: with material which helps readers organize, interpret and evaluate what is being said' (p. 17). Among the taxonomies of metadiscourse, Hyland's framework of metadiscourse (2005), which distinguishes interactive and interactional metadiscourse, has been widely employed in the previous metadiscoursal studies.

As Hyland (2005) points out, interactive metadiscourse guides readers in the direction of the writer's argument. The way writers state their problems, support their claims, and make conclusions influence readers' acceptance of the writers' claims in academic texts. Thus, interactive metadiscourse usage is crucially prominent for the persuasive force of academic texts. Analysis of interactive metadiscourse can provide information about how it functions for persuasion in academic texts. Various studies (Bunton, 1999; Hyland, 1999; Dahl, 2004; Cao & Hu, 2014) have focused on interactive metadiscourse to examine the common mechanisms affecting its use as a whole.

Hyland (2005) identifies five main categories of interactive metadiscourse: Transitions establish links among processes by adding, comparing, and explaining them. Endophorics fulfills the functions of making the visual and verbal contents more transparent. Evidentials reflect an idea from another source to help readers' interpretation, while code glosses provide additional information about writers'

intentions. Frame markers are references that indicate text boundaries by sequencing, labeling, predicting, and shifting arguments.

Seemingly, frame markers that organize the discourse in a text are one of the most crucial categories of interactive metadiscourse, but the least emphasized features of it (Hyland & Zou, 2020). In the literature on interactive metadiscourse, the relative importance of frame markers has not been treated in much detail. The prevailing studies draw on a systematic analysis of the use of five main categories of interactive metadiscourse in research article abstracts (El-Dakhs, 2018; Ozdemir & Longo, 2014), in research articles (Mu et al., 2015), in different genres (Hempel & Degand, 2008), and cross-linguistic contexts (Dahl, 2004, Mur Duenas, 2011). Up to now, far too little attention has been paid to the specific employment of frame markers (Hyland & Zou, 2020). Hence, the specific objective of this study is to examine the use of frame markers in research articles in four disciplines (Applied Linguistics, Marketing, Philosophy, and Political Sciences). We chose to concentrate on frame marker usage in research articles in four disciplines in the social sciences since research articles are the most common genre in the international academic world where the medium of communication is English. Specifically, we hope that studying disciplinary differences in the employment of frame markers in research articles will facilitate our understanding of linguistic conventions regarding text boundaries in this specific academic genre. With this concern in mind, we designed the present study to answer the following research questions:

1. What is the overall distribution of frame markers in research articles in the social sciences?
2. What is the categorical distribution of frame markers in research articles in the social sciences?
3. Is there a disciplinary variation in frame marker usage in research articles in the social sciences?

Literature Review

The conventions of academic writing vary across cultures, disciplines, and genres. Since Swale analyzed genre in 1990, the concept of genre has been regarded as a powerful means of understanding the language variations in particular academic genres. Additionally, cross-cultural analysis helps us harness the power of cultures in academic

texts. Disciplines, perceived as ‘institutional conveniences, networks of communication, domains of values and modes of enquiry’ (Hyland, 2006, p. 18), also shape the language conventions of academic texts and reader-writer interaction.

The claim that academic writing is a highly disciplinary-based practice has become a key point in academic discourse studies that examine the language norms of academic texts and the reaction of disciplinary communities to these texts. As Hyland (2005) emphasizes, genre and disciplinary communities complement each other's domain by providing a framework for constructing meanings produced in academic texts. Each member of disciplinary communities uses the sets of rhetorical conventions of their specific disciplines to create and interpret academic texts. These conventions cannot be seen simply as the fixed forms of language use but as a disciplinary tool to present arguments, mitigate authorial stance and engage readers into the texts.

Metadiscourse, a prominent rhetorical convention in academic writing, offers a framework for academic writers to involve themselves in the practices of their academic disciplines. Hyland (1998) defines metadiscourse as ‘aspects of the text which explicitly refer to the organization of the discourse or the writer’s stance towards either its content or the reader’ (p. 438). He also states that metadiscourse rests on norms and expectations of academic communities. Hence, research on metadiscourse has often concentrated on the cross-disciplinary differences since each discipline has its conventions and expectations for knowledge production and interpretation (Cao & Hu, 2014).

Hyland (2005) distinguishes two types of metadiscourse: interactive and interactional. While the first one is associated with shaping the propositional content based on the readers’ expectations, the latter one concerns the ways of involving readers and stamping authorial stance. The text organization in an academic text depends on the writer's assessment of their readers' needs and expectations, so interactive metadiscourse is one way academic writers use to organize text on the basis of disciplinary recognized purposes.

As a sub-category of interactive metadiscourse, frame markers, which is the focus of this study, contribute to the organization of the text. The parts of the discourse in academic texts need labeling explicitly to ensure readers comprehend the writers’

arguments by following the sequence of steps in the arguments. In this sense, frame markers, which refer to linguistic devices that show text boundaries or elements of text structure (Hyland, 2005), are essential linguistic features of academic writing. The term denotes how the writers connect a number of related texts to produce coherent texts. These help readers to grasp an important point emphasized in the texts that require careful decisions of the writers on structuring the discourse.

For Garcia and Marco (1998), frame markers fulfill two main functions: shifting the topic and signaling the steps in a process, as can be seen in the examples drawn from the corpus of the present study.

*(1) Further, we contribute by identifying nuances regarding the TRI dimensions and smart home technology perceptions, which we will **now** detail. (Marketing)*

*(2) **Finally**, and perhaps most significantly, King's criticism appears to have been instrumental in Locke's new emphasis on the agent's capacity to determine what to value. (Philosophy)*

Hyland and Tse (2004) suggest that the term represents four main functions: 'to sequence, to label text stages, to announce discourse goals and to indicate topic shifts' (p. 168). Hyland and Zou (2020, p. 32) categorize frame markers under four sub-categories:

- **Sequencers:** They are the markers used to sequence parts of the text or to internally order an argument (*there are several reasons why, first, then, 1, 2, a, b, at the same time, next*).
- **Labelers:** They are the markers that explicitly label text stages (*to summarize, in sum, thus far*) or that state the aims of the following text (*by way of introduction, to repeat*).
- **Goal announcers:** They indicate the author's purpose in the text (*I argue here, my purpose is, the paper proposes, I hope to persuade*).
- **Topic shifters:** They announce a shift in the direction of the text (*right, OK, now, let us return to, with regard to*).

Studies on frame markers have revealed different usage rates of frame markers across genres, languages, and disciplines. El-Dakhs (2018) investigated the difference

between research article abstracts and theses and found that more frame markers were utilized in research article abstracts due to the space limitations compared to theses abstracts. In an analysis of three genres of academic writing, journalese, and fiction, Hempel and Degand (2008) revealed the genre's influence on the use of frame markers. Their results suggested that academic writing is the most structured genre by the greater use of sequencing frame markers compared to journalese and fiction. Focusing on academic blog posts and journal articles, Hyland and Zou (2020) reported important differences in the use of frame markers in these two genres. In a recent study, Herriman (2022) analyzed frame markers in instruction manuals in English and displayed the dominant use of frame markers and code-glosses that can be explained by the particular purpose of instruction manuals, i.e., to explain clearly how the machine works. Comparing the two disciplines, Khedri et al. (2013) reported that academics in applied linguistics tended to use more frame markers to highlight text boundaries and show discourse organization than those in economics. In another study, Dahl (2004) examined interactive metadiscourse in research articles in three disciplines across English, Norwegian and French and observed the complex relationship between language and discipline. She attributed less use of frame markers in French texts to the reader-responsible culture of this community.

Methods

This study adopted a corpus-based approach to exploring frame marker usage in research articles written in the English language. To attain this aim, we analyzed a corpus consisting of research articles written in four disciplines within the social sciences: *applied linguistics, marketing, philosophy, and political sciences*. Focusing on frame marker usage in the research articles, we investigated whether there is a relationship between scientific discipline and frame marker usage concerning their frequency counts and functions.

The corpus used in the present study was originally compiled by Yakut et al. (2021) for another study. They explained that the corpus included research articles published in five different journals, all indexed in the Web of Science according to its 2017 impact factor. Constructed from research articles written between 2010 and 2019 within the social sciences, the corpus presented a broad cross-section of academic practice in the related fields.

As the data was convenient to split into four sub-corpora in line with the aim of this study, we redesigned the corpus into four specialized corpora in terms of the four disciplines in the social sciences. We present the details of the four corpora in Table 1. Due to the length differences across the four corpora, all comparisons were normed to a base of 1000 words to ensure comparability.

Table 1
Corpus size and composition

Discipline	Number of Texts	Corpus Size
Applied Linguistics	40	414.185
Marketing	20	241.315
Philosophy	20	186.624
Political Sciences	20	224.635
Total	100	1.066.759

The formulation of the abbreviations in the present study was based on the publication year, name of the discipline, and article number in the corpus. For example, *2010-AL-1* stands for the first article in Applied Linguistics in 2010.

We analyzed the frame markers based on Hyland's model (2019) of frame markers, including four sub-categories: sequencers, labelers, goal announcements, and topic shifters (see Appendix). We searched the four corpora through vertical reading for the items of frame markers' sub-categories using AntConc (Anthony, 2022). To ensure each retrieved frequency of the items had a metadiscursive function, we horizontally checked the concordance lines concerning every occurrence of items. We excluded the occurrences that were not functioning metadiscursively. We normalized the overall and categorical frequencies of frame markers to 1000 words. We utilized a Statistical Package for the social sciences (SPSS) to determine statistical significance among the disciplines regarding the use of frame markers. We employed the Levene test to analyze normal distribution. We ran an analysis of variance (ANOVA) and post hoc comparison using Tukey tests to see whether there were significant differences among the disciplines regarding the overall and categorical use of frame markers.

Results and discussion

The present study's first aim was to examine the overall distribution of frame markers across the four disciplines in the social sciences. The frequency counts per 1000

words indicated the importance of frame markers in research articles in philosophy (6.4). There was a similar number of frame markers in applied linguistics and political sciences (4.3), while they were the least frequented (3.7) in marketing. This finding aligns with Hyland (2005), who found that frame markers were more frequent in research articles in applied linguistics than in marketing. Occurrences evaluated over 1000 words in the four disciplines made us mention disciplinary variations in the frame marker usage in the corpus. Consistent with Khedri et al. (2013), we see that academic writers in the four disciplines organized their research articles in different ways, which is confirmed by the overall distributions of the frame markers in the corpus.

Table 2

The overall distribution of frame markers in the four disciplines

	Applied linguistics	Marketing	Philosophy	Political sciences
Corpus size in words	414185	241315	186624	224635
n	1807	896	1201	983
n/1000	4.3	3.7	6.4	4.3

n: raw frequency of frame markers

n /1000: frequency of frame markers per 1000 words

Since the metadiscourse usage is closely related to disciplinary-specific conventions, it is not surprising to observe disciplinary variations in the corpus. However, identifying these differences enables academic writers to justify the appropriate presentation of the content and arguments in their texts based on the expectations of the disciplinary communities. Frame markers are central to academic writing for the production of coherent discourse that helps readers to follow the propositional content and arguments. In a way, they provide insights into the disciplinary-situated organization practices. In the present study, research articles in philosophy revealed more common frame marker usage than articles written in the other three fields. Philosophy writers were much inclined to apply explicit ways to signal relations among stretches of texts. This explicit tendency to organize cohesion and coherence facilitates readers' understanding of the texts.

Turning now to the categorical comparisons of frame markers which is the second concern of the present study, Table 3 revealed that sequencers appeared at the frequency counts of 1.9, 1.4, 2.9, and 1.7 per 1000 words in the fields of applied linguistics, marketing, philosophy, and political sciences, respectively. The functional analysis of

frame markers in Khedri and Kritsis (2018) revealed that sequencing the propositional meaning was a common rhetorical strategy in applied linguistics.

Table 3
Sequencers in the corpus

Frame markers	Applied linguistics		Marketing		Philosophy		Political Sciences	
	n	n/1000	n	n/1000	n	n/1000	n	n/1000
Sequencers	812	1.9	346	1.4	554	2.9	387	1.7

n: raw frequency of sequencers

n /1000: frequency of sequencers per 1000 words

Research articles in the philosophy field included greater amounts of sequencers than the three disciplines, which supported the overall findings above. 'Used to sequence parts of the text or to internally order an argument' (Hyland & Zou, 2020, p. 32), sequencers increase readers' understanding of the message conveyed by the writers. Here, we see greater attempts of philosophy writers to organize their discourse for the comprehension of their readers with the use of sequencers. Jordan (1985) explains that a philosophical text is more than a combination of sayings. It has a more controlled and ambiguous semantic structure that gives room for the interpretation of complex authorship. Hence, in our case, it would not be wrong to claim that with the use of sequencers, philosophy writers embrace the explicit structure of the texts to allow their readers to make comments on their claims. This rhetorical strategy might be a discipline-specific expectation of textual coherence in philosophy. Besides, academic writers make conventional linguistic choices to be persuasive in the lens of their readers, which varies among disciplines (Hyland, 1998), as can be seen in the present study. Hyland and Zou (2020: 35) distinguish three types of sequencers:

- **listing sequencers:** numbers, bullet points, roman numerals
- **numerical sequencers:** adjective/adverbial phrases such as first, secondly, first of all
- **temporal sequencers:** adjective/adverbial phrases next, finally, to begin with

The most frequented sequencer in the four disciplines was then which is a temporal sequencer. In the first two examples, the use of the item is a rhetorical strategy to draw on the sequence of personal conclusions of the writers. At the same time, the third one indicated the chronology of the ideas. In the three examples drawn from

different disciplines in the present corpus, the deployment of *then* simplified long sentences allowing readers to understand the content.

(3) *The amendment, **then**, is presented as a move designed to protect such rights and, therefore, a democratic change for the benefit of individuals rather than the state (2010-AL-3).*

(4) *If true, **then** any would-be physical effect of a mental cause has sufficient physical causes, such that nothing outside the physical domain is ever required to explain their occurrence (2015-P-11).*

(5) *Yet this raises the further question of how such rights ought to be defined, since only **then**, Aristotle emphasizes, can we decide whether one comes to be part of the people "rightly or wrongly" and "if wrongly" whether one can be considered part of the people "at all," since "'wrongly' means the same as 'not truly.'" (2017-PS-16).*

Listing sequencers were at high frequencies in applied linguistics, philosophy, and marketing, while they were not common in political sciences. In the following examples, we see the writer's attempt to clarify the presentation of the propositional content with the overt marking of the stages of arguments.

(6) *We might call **(1)** the existence dimension of Armstrong's realism about universals, while **(2)** is the independence dimension (2012-P-6).*

(7) *What concept of law can accommodate the unauthorized presence of immigrants **(i)** without reducing them to bare life, struggling to survive and/or assigning them a political agency, and **(ii)** without taking recourse to the use of force and violence in a zero-tolerance policy? (2019-PS-20).*

Two items of numerical sequencers, first and second, were also quite common in the four corpora. Hyland and Zou (2021) explain that these rhetorical devices are used in articles to explicitly present research-based arguments, procedures, and findings. As seen in the examples, the use of numerical sequencers contributed to the clearness and legibility of the text. Explicitly structuring papers, these items help readers to process longer texts (Hyland & Jiang, 2020).

(8) *The resulting intervention was comprised of two elements. **First**, a co-created, community-organized initiative to increase awareness of the clearest and most simple symptom **Second**, a program of engagement with local GPs and other*

primary-care professionals like health visitors and health trainers to increase their awareness of lung-cancer symptoms ... (2010-M-1).

*(9) Today, most central banks around the world meet the two demands that inform this ideal. **First**, as an independent institution, the central bank does not receive direct instructions... **Second**, an important aim of monetary policy is price stability... (2019-PS-19).*

Hyland and Zou (2020) define labelers as frame markers ‘which signal the current discourse activity and offer an explicit means for writers to mark upcoming text stages or rhetorical functions’ (p. 38). In the present study, labelers were observed more frequent in philosophy (1.5) and political sciences (1.0), while their occurrences were below 1.0 in applied linguistics and marketing, 0.7 and 0.4, respectively. Such marking strategy of text stages in both fields might contribute to 'reader friendliness of the text primarily includes the management of information flow' (Tse & Hyland, 2008, p. 1242). In this way, authors can engage readers in the text, and they can be in alignment with the developing argument increasing the possibility of academic persuasion.

Table 4
Labelers in the corpus

	Applied linguistics		Marketing		Philosophy		Political Sciences	
	n	n/1000	n	n/1000	n	n/1000	n	n/1000
Frame markers								
Labelers	296	0.7	116	0.4	286	1.5	229	1.0

n: raw frequency of labelers

n /1000: frequency of labelers per 1000 words

The analysis of frequencies of each item enabled us to claim that academic writers used labelers used a limited variety. *Here* was highly frequented and *now* was the second most common applied item in the four corpora. In example 10, the writer explicitly pointed out how readers should interpret the results. In the second example, the writer gave a pause to the discourse, emphasized the result that they had reached, and stated what would come next. In 12, the writer reviewed a key point, which is a conventional rhetorical strategy in research articles (Hyland & Zou, 2020).

*(10) **Here**, we see no difference in terms of accessibility and tenant mix (2016-M-13).*

(11) **Here**, as in the previous section, the problem that the apps were intended to solve is complexity (2019-AL-39).

(12) We **see now** as well that the traveler-host is continually displaying and weaving together that most slender and fragile of human communities: the one constituted by the negative bond shared by the consciously vulnerable and mortal. (2015- PS-12).

Goal announcers reflect writers' attempts for the intended goals for a particular part of the text (Hyland and Zou, 2020). As displayed in Table 5, goal announcers were used the most in marketing (n=1.4), followed by applied linguistics (n= 1.2). They nearly shared the same occurrences in political sciences and philosophy, 0.9 and 0.8, respectively. This might be because marketing is a socially-driven discipline concentrating on habits and specific norms of the communities (Vázquez & Giner, 2009). Hence, the data in research articles in this discipline are based on speculations. The frequent deployment of goal announcers in this field might likely be due to the need for explicit presentation of these speculations. As stated by Khedri and Kritsis (2018), presenting the aim of the study through the employment of frame markers is a prevalent rhetorical strategy in applied linguistics.

Table 5

Goal announcers in the corpus

	Applied linguistics		Marketing		Philosophy		Political Sciences	
Frame markers	n	n/1000	n	n/1000	n	n/1000	n	n/1000
Goal announcers	532	1.2	350	1.4	151	0.8	215	0.9

n: raw frequency of goal announcers

n /1000: frequency of goal announcers per 1000 words

The main reason behind the prominence of goal announcers is the explicit presentation of goals and purposes to ensure that the readers can effectively recover them. This explicit reflection of purposes is an effective rhetorical tool (Hyland & Jiang, 2018). They play a crucial role in presenting the essence of the argument (Lim et al., 2015). The following examples illustrate the deployment of goal announcers used to state the overall aim of the research (13 and 14) and specific goals in the text (15 and 16). We need to note that goal announcers' functions are not limited to declaring the overall and local purposes. They may also be mitigation of authorial stance. In 14, there is an apparent

stance in stating the writer's purpose using a self-mention item (*my*). As Molino (2010) emphasizes, 'announcing goals or purposes is the most frequent use of personal authorial references' (p. 92). Another function of goal announcers is illustrated in example 17, which prepares readers for the next stage.

(13) The **purpose** of this paper is to consider the question of whether we have a duty to forgive those who repent and apologize for the wrong they have done (2010-P-1).

(14) However, my **purpose** here is to show that the key concept connecting these dimensions of the theory is trust and not, as Hoekstra thinks, tacit consent (2013-PS-7).

(15) The main **focus** of the analysis was qualitative, the researcher rejecting the causes and effects of themes and words. (2019- AL- 39).

(16) Their central **aim** is to develop a network of competent neighbors, acting as an interface with new residents to reduce marginalization and build value for local people (2014-M-9).

(17) From this stance, we **seek to** offer a gendered reading of the objective body interaction (2015-M-12).

Indicating a shift in the change of the focus (Hyland & Zou, 2020), topic shifters were the least frequented sub-category in marketing (0.3), applied linguistics (0.4), and political sciences (0.6), as shown in Table 6. There were high frequencies of topic shifters in philosophy with an occurrence of 1.1. Seemingly, Philosophy writers employed these linguistic devices to signpost the shift of arguments, making the text clear for the readers.

Table 6
Topic shifters in the corpus

	Applied linguistics		Marketing		Philosophy		Political Sciences	
Frame markers	n	n/1000	n	n/1000	n	n/1000	n	n/1000
Topic shifters	167	0.4	84	0.3	210	1.1	152	0.6

n: raw frequency of topic shifters
n /1000: frequency of topic shifters per 1000 words

Three items of topic shifters, *now*, *so* and *regarding*, emerged in the corpus more frequently compared to the other items. They fulfilled some specific functions: drawing

attention to a relevant topic (18), returning to a topic discussed earlier (19), moving to a new topic (20), and drawing on specific conclusions (21).

(18) *Care simply is the most relevant moral outlook **regarding** those in society that are deeply dependent on others for meeting their basic needs (2018-PS-18).*

(19) ***So**, again, our earlier use of the deviant expression cannot be what matters, since in the foreigner case there is no such earlier use at all (2011-P-4).*

(20) *A question **now** arises as to the evaluative slant the humorous metaphor gives rise to in (3b) (2016-AL-26).*

(21) ***So**, if the mental supervenes the physical, then no change is possible in the mental without a corresponding change in the physical (2015-P-11).*

Given to categorical distribution of frame markers in the four disciplines, we can now examine whether there was a disciplinary variation in the use of frame markers in research articles in the four corpora. Beforehand, it would be better to summarize the results regarding the overall and categorical distribution of frame markers in the corpus. As can be deduced from Table 7, frame markers were quite different across the four disciplines. The manifested variations show that philosophers strongly preferred the frame marker usage to display discourse organizations and text boundaries ($n/1000=6.4$). The occurrences of 4.3 in both fields enabled us to claim that there was a shared convention of reliance on frame markers in applied linguistics and political sciences while they were not substantial in marketing ($n/1000=3.7$).

Table 7

Sub-categories of frame markers in the corpus

Frame markers	Applied linguistics		Marketing		Philosophy		Political Sciences	
	n	n/1000	n	n/1000	n	n/1000	n	n/1000
Sequencers	812	1.9	346	1.4	554	2.9	387	1.7
Labelers	296	0.7	116	0.4	286	1.5	229	1.0
Goal announcers	532	1.2	350	1.4	151	0.8	215	0.9
Topic shifters	167	0.4	84	0.3	210	1.1	152	0.6
Total	1807	4.3	896	3.7	1201	6.4	983	4.3

n: raw frequency of frame markers

n/1000: frequency of frame markers per 1000 words

We conducted several SPSS analyses to calculate whether there was a disciplinary variation in frame marker usage in research articles in the four corpora. Initially, we conducted Levene's test for homogeneity of variances to assess the equality of the frequency counts of frame markers in research articles in the four disciplines. Since the test result ($p=.00$) was not greater than 0.5, it proved that the assumption of homogeneity of variance was not violated (Pallant, 2020). As the data were normally distributed, we ran an ANOVA test to measure whether there was a statistical difference among the four disciplines regarding the use of frame markers. It revealed a statistical difference ($p=.00$) in the overall use of frame markers among the four corpora, which was consistent with Cao and Hu (2014), who compared the use of frame markers in research articles in linguistics, economics, and psychology.

Table 7 also compares the categorical use of frame markers in the four corpora. A closer inspection of the table shows similarities across applied linguistics and marketing. In both fields, sequencers were the most frequented category ($n/1000=1.4$). In marketing, goal announcers shared the same occurrences with sequencers while they had a frequency of 1.2 in applied linguistics. Labelers were the third most prominent markers in both fields, whereas topic shifters were the least frequently used category. There was a clear trend of employing sequencers and labelers in philosophy and political sciences. Sequencers emerged 2.9 and 1.7 times in philosophy and political sciences, respectively, while the second had the occurrences of 1.5 and 1.0 in every 1000 words. Topic shifters were more frequented (1.1) than goal announcers (0.8) in philosophy, while the reverse trend existed in political sciences. We ran the ANOVA test again to measure whether there was a statistical difference among the four disciplines regarding the categorical use of frame markers. The calculated p -value of .00 proved a statistical difference in the categorical use of frame markers across the four corpora.

Post hoc comparison using the Tukey test indicated that the overall frequency counts of frame markers in applied linguistics were statistically different from those in marketing ($p=.02$). Marketing differed significantly from philosophy regarding the overall employment of frame markers ($p=.03$). Again, we conducted the Tukey test to explain which sub-categories of frame markers caused differences between applied linguistics and marketing. This post hoc test found a statistical difference between sequencers and goal announcers ($p=.00$) and labelers and goal announcers ($p=.00$) in

these two fields. We ran the same test to comprehend the stem of the difference between marketing and philosophy. In this comparison between the two fields, we calculated statistical differences regarding the use of the sub-categories of frame markers (sequencers and goal announcers =.00; labelers and goal announcers = .00; labelers and sequencers =.00).

Conclusion

The ways that academic writers choose to structure the propositional content and their arguments result from the rhetorical conventions of their disciplines. Within each discipline, academic writers need to acquire competence in the appropriate use of these conventions. For instance, an ability to label rhetorical units of academic texts is essential for creating familiar patterns for the readers, which involves deploying disciplinary and genre-specific conventions of frame markers. Namely, writing as a member of a discipline requires framing texts and arguments in a way familiar and convincing for readers.

This study aimed to explore disciplinary influences on the use of frame markers in the four disciplines of social sciences. By examining the overall and categorical distribution of frame markers in a corpus of 1.066.759, including research articles written between 2010 and 2019, we found clear evidence of disciplinary variations in the deployment of frame markers. In terms of the overall distribution, the academic authors of philosophy employed frame markers more frequently than the authors in the other three fields. We observed statistically significant differences among the four disciplines in terms of using these devices. The considerable sequencer usage in the four disciplines indicated writers' preferences for structuring the propositional content comprehensible for their readers. Goal announcers adopted to declare the intended goals for the overall or a specific part of the research articles were greater in applied linguistics and marketing than in philosophy and political sciences. In these two fields, marking the upcoming text stages with the heavy use of labelers was paid more attention than announcing goals. In the four corpora, topic shifters did not appear as frequently as in the other three sub-categories of frame markers. We found statistical differences between applied linguistics and marketing and marketing and philosophy regarding the sub-categorical frequencies of frame markers after implementing several SPSS statistics.

The present study does not provide a complete picture of frame markers' usage in academic discourse. More detailed results would arise from contrastive analyses covering more social and hard sciences disciplines and more academic genres. Further complementary investigations might concentrate on the employment of frame markers in cross-cultural contexts. Such kinds of studies would assist academic writers in being aware of the rhetorical conventions of text structure and making appropriate rhetorical decisions in their texts. Moreover, the functions of frame markers need to be investigated in academic genres following a qualitative approach.

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APPENDIX

Frame Markers

Sequencers	Labelers	Goal announcers	Topic shifters
in chapter X	all in all	in this chapter	back to
in part X	at this point	in this section	digress
in section X	at this stage	in this part	in regard to
in the X chapter	in a word	aim	move on
in the X part	by far	desire to	now
in the X section	for the moment	focus	resume
finally	in brief	goal	return to
first	in conclusion	intend to	revisit
first of all	in short	intention	shift to
firstly	in sum	objective	so
last	in summary	purpose	to look more
lastly	now	seek to	closely
listing a-b-c	on the whole	want to	turn to
numbering 123	overall	to better	well
bullet pointing	so far	understand	with regard to
next	thus far	wish to	regarding
second	to conclude	would like to	
secondly	to repeat		
subsequently	here		
then	to sum up		
third	to summarize		
thirdly			
to begin with			
to start with			