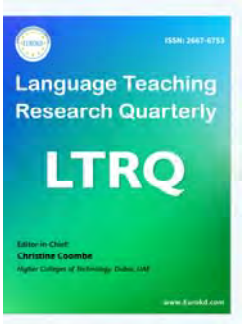

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A Study of the CP-based Model of Metadiscourse Marking across Disciplines and Q1-4 Journals

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Abstract

Writing for social engagement in an academic context indicates the authors' attitude towards the propositional content and the text's audience through metadiscursive maxims markers employment. This study tried to determine whether there are any differences in metadiscourse marking in research articles across different disciplines and different quartile ranks. To this end, Abdi's (2010) CP-based model of metadiscourse marking was used to study how writers use metadiscursive maxims markers to see any differences in metadiscourse maxims marking in their writings. To this end, we selected 193 research articles from recently published journals (2018-2020) and balanced them based on size. Then, we carefully went through them and extracted maxims markers manually. The results showed that the cooperation categories of quality, quantity, manner, and interaction were widely used among philosophy writers, which can help understand, study, and teach this critical area of language use. This empirical study of academic writing helps us attend to hidden rhetorical features and strengthen interpretation.

Keywords: *Maxims Marking, Quartile, Quantitative, Metadiscourse Markers*

Introduction

Teaching academic writing is a genuine concern among language teachers, and insight into rhetorical features of the academic genre like employment of metadiscourse is considered quite helpful. Metadiscourse is the interpersonal resource employed for discourse or the writer's stance

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towards both its content and the reader (Hyland, 2017). The central idea of metadiscourse indicates the author's rhetorical demonstration in the text. Writing in a second language (L2) involves observing the linguistic quality, like linguistic accuracy, and a trial to choose metadiscourse options to form a coherent written discourse. Examining the L2 writers' metadiscourse performances would provide a fuller understanding of L2 writing skills, including how students allocate their cognitive resources to different areas of writing and their degree of success in each specific area. This comparative study employed the CP-based model of the metadiscourse marking across the two disciplines to find out any differences in metadiscourse maxims marking between humanities and basic science research articles. This comparative study would reinforce the students' knowledge and writing skills. The project's goal was to assist students to boost their ability in the textual organisation of writing in various disciplines.

The Literature Review

Harris (1959) initially introduced metadiscourse though the central part started with Halliday (1973), and the term only gained traction in applied linguistics with the work of Kopple and William (1985) and Crismore and Farnsworth (1989). Kopple and William (1985) fully adopted Hallidayan terms to classify metadiscourse categories into two main types: textual and interpersonal. The textual subtypes are text connectives, code glosses, illocution marks, and narrators, while the interpersonal ones are validity markers, attitude markers, and commentaries. Crismore et al. (1993) presented an updated paradigm that maintained two main interpersonal and textual metadiscourse types and established two types of interpretive and textual markers as the subcategories. Hyland (2005) stated that metadiscourse is wholly interpersonal and defined metadiscourse markers in two distinct categories: interactive and interactional resources. Interactive resources are features that consider the relationship between the reader and the writer. Interactional resources describe the mechanism by which writers communicate and connect with their documents. Abdi et al. (2010) introduced a new model of metadiscourse markers (Table 1), which takes Grices' (1975) cooperative principle as its starting point. Then he conceptualised metadiscourse in his model across the four major categories: quantity, quality, manner, and interaction. While the theoretical perspective is quite different, this model is not much different in terms of metadiscursive strategies. The model has added two new strategies of disclaimers and collapsers. He defined disclaiming as a strategy to help writers prevent any interpretation that could potentially threaten the quality of their immediate and future statements and collapsers as tools to avoid lengthy repetitions (Abdi, 2012).

This model planned relevant maxims for each cooperative principle to materialise an article (Abdi, 2009). In the current metadiscourse model, disclaimers have a practical similarity with hedges in that both are primarily used to encourage politeness, reduce threats (Brown et al., 1987), or help accuracy (Salager-Meyer, 1994), thus improving communication efficiency. Although some believe that hedges are mitigation tools that adjust the propositions for empowering the evidence, disclaimers seem to act as blocking tools that disallow unsupported interpretations (Abdi, 2012).

Table 1
CP-based Model of Metadiscourse Marking (Abdi et al., 2010)

Metadiscourse strategy	Maxims	Cooperation category	Overall orientation
Endophoric markers	1. Make your contribution as informative as is required. 2. Refer the audience to other parts of the text to avoid repetition. 3. when repetition is inevitable, acknowledge it to avoid inconvenience.	Quantity	Avoiding prolixity to make the text manageable and friendly
Collapsers	Avoid undue repetition by using proper referents.		
Transitions	1. Properly signpost the move through arguments. 2. Be perspicuous.	Manner	Clarifying steps and concepts to make the text comprehendible
Frame markers	1. Be orderly. 2. State your act explicitly.		
Code glosses	1. Avoid ambiguity. 2. Avoid obscurity of expression.		
Evidentials	1. Do not say that for which you lack adequate evidence 2. Cite other members of the community to qualify your propositions.	Quality	Building on evidence to make the propositions tenable
Hedges	1. Do not say what you believe to be false. 2. Do not say that for which you lack adequate evidence. 3. Mark if the evidence is not enough. 4. Do not use hedges in widely accepted or supported propositions		
Boosters	1. Do not say what you believe to be false. 2. Do not say that for which you lack adequate evidence. 3. Mark if the evidence is notable. 4. Do not use emphatics if the evidence is not enough.		
Disclaimers	1. Do not say that for which you lack adequate evidence. 2. Outline the framework within which you would like your propositions to be interpreted 3. Explicitly distance yourself from untenable interpretations		
Attitude markers	Express your feelings or avoid them according to norms and conventions.	Interaction	Making people and feelings visible to promote rapport
Self-mentions	Enter your text or sidewalk it according to norms and conventions.		
Engagement Markers	1. Draw the audience in or ignore them according to norms and conventions. 2. Give directions to your readers to follow when appropriate.		

Some studies have been conducted to represent metadiscourse markers in research articles across various disciplines. A study was conducted by Ahmadi et al. (2021), for instance, to examine the authors' metadiscourse markers' use in the abstract section of 110 Applied Linguistics published by celebrity and non-celebrity authors. There were no significant

differences in interactive and interactional metadiscourse devices' usage between celebrity and non-celebrity authors.

Another study by Kustyasari et al. (2021) investigated the interpersonal metadiscourse markers and their functions in the discussion section of research articles written by Indonesian expert writers. The findings showed the employment of markers in the articles and indicated a relation between sentences, reader's involvement, and reference to the writer. Employing Hyland's (2005) model of metadiscourse, Alharbi (2021) considered the employment of metadiscourse items in 40 post-method sections of research articles and master's papers. The analysis indicated that the interactive metadiscourse features were more commonly used markers in both sets of writings.

The Study

The methodology focuses on concrete writings instead of institutional social practices in academic contexts and focuses on particular academic genres like research articles. Although students can write, their mastery in academic writing is not as great as their mastery in general English because they may be unfamiliar with the concepts of cohesion and coherence and incapable of making coherent content to structure their ideas in the text. Metadiscursive maxims markers as a significant element in writing research articles and as essential rhetorical devices can be used in creating writings and influencing scholars, and familiarity with metadiscourse maxims marking can, in part, solve the issue. Therefore, research on academic discourse is related to the description and analysis of language (Hyland, 2018), and for some reason, it is known as one of the most important aspects of writing.

Firstly, analysing the implicit aspect of discourse in English for foreign language and English for second language contexts could be effective in understanding the nature of writing research articles to contribute to academic writers (Abdi, 2012). Secondly, metadiscourse maxims marking are an effective way in the rhetorical structure area to uncover and discriminate the scholarly journals from quartile (Q)1-4 across distinct scientific disciplines to provide an in-depth study on teaching academic writing. Many studies have concentrated on shedding light on and investigating metadiscourse features and explaining the roles of these features used by Hyland's (2005) metadiscourse taxonomy. Numerous research has been done to determine how authors employ metadiscursive maxims markers in different disciplines. However, no attention has been paid to the authors' writing styles in different Q rank orders to see any differences between the novice writers and the expert ones across Q1-4 journals and also to find out whether novice and expert writers employ maxims markers across Q1-4 journals differently. The results of this research may help the teachers of the writing courses more broadly. By indicating the differences in metadiscourse devices usage between experienced and novice writers from the first Q to the last one, teachers would be aware of the various vital functions of maxims marking in academic texts. The results may be beneficial to graduate students because they need to understand these markers and their role in the text, and teachers can encourage students to apply these metadiscursive maxims markers to master them correctly. This research would also have

specific teaching significance for the courses, including English for specific purposes, especially master's thesis writing. Although the previously reviewed research has contributed to metadiscourse, much more research is needed to understand better how students use metadiscursive maxims markers based on the CP-based model (Abdi, 2010) of metadiscourse marking in different contexts and within the same discipline across Q1-4 journals. This comparative study employed the CP-based model of metadiscourse marking across two disciplines to determine any differences in using metadiscursive maxims markers between humanities and basic science research articles. These two disciplines were selected because academic writings in humanities are related to logic. Authors in philosophy study ideas about the meaning of life. They need to provide philosophical justifications to guide, influence, and inform people by developing the philosophy underlying abstract, intangible, and controversial issues in life. On the contrary, natural science is a branch of science that describes natural phenomena based on empirical, tangible, and concrete evidence from observation and experimentation. This study was designed to present any differences between research articles across these two diverse disciplines in Q1-4 journals. This comparative study was the learning program within the secondary level to reinforce the students' knowledge and writing skills. The project's goal would be helpful in assisting students to boost their ability in the textual organisation of writing in various disciplines. The study aimed to fulfil the following objectives: First, it would find out whether there are any differences in writing due to using different metadiscourse markers in different disciplines. Second, it would compare and contrast metadiscourse markers in humanities and natural science research articles between lower Q and upper Q within a journal for each discipline and between the journals as an interdisciplinary approach. Finally, it would identify the CP-based model of metadiscourse marking, used in humanities and natural science research articles.

Method

The CP-based model of metadiscourse marking was employed to examine any differences between the research articles across these two diverse disciplines across Q1-4 journals. The classes included two disciplines, philosophy as a representative of the soft discipline and biology as a representative of the hard one, and the clusters included the journals from Q1-4. For this purpose, we randomly selected the research articles from scientific journal ranking developed by SCImago Institutions Ranking (SJR) related to Scopus quartile ranking. Approximately 193 research articles were selected, about 110 in biology and 83 in philosophy. To ensure appropriate coverage, we randomly selected them from different journals, a total of 58 journals, 29 journals in basics, and 29 journals in humanities, at least six journals in each quartile. Finalising the corpus collection procedures, we carefully went through them and extracted metadiscourse markers manually according to the maxims definitions and list of markers. For more reliable estimates, some classmates carefully studied some parts to find maxims markers in the research articles. The results were tabulated and analysed in the following section.

Results

The data were analysed via descriptive statistics, Chi-square. The frequency of metadiscursive maxims markers in philosophy research articles was 59570, while it was 41142 in biology ones, and 50356 was the expected frequency obtained in SPSS. The data indicated that although articles in two disciplines employed metadiscursive maxims markers, the research articles in the soft discipline of philosophy contained the highest metadiscourse devices compared with the ones in biology, except for the maxims of endophoric and collapsing (see Table 2). The authors in Q1-4 journals almost took advantage of the metadiscourse markers significantly differently except for evidential in Q3 that they did not employ them significantly differently (0.425 > 0.05). Among the metadiscursive markers, authors extensively used the strategy of collapsing in both philosophy and biology disciplines; the authors across the two fields of philosophy and biology employed metadiscursive maxims markers significantly differently. Thus, concerning the first question and its associated hypothesis, and based on the total frequency of the metadiscursive maxims markers' usage, represented in Table 2, the results entirely rejected the first hypothesis. These findings aligned with Hyland (2004), who compared 240 research articles across eight disciplines, soft and hard disciplines in research articles. They were different. Moreover, in the study, various Q rank orders between two disciplines have been taken into consideration.

Table 2

Chi-Square Tests Analysing Metadiscursive Maxims between Humanities and Basic Sciences across Q1-4 Journals

Quartile	Philo-Bio	Total. No	Observed philo	Observed bio	Expected N	Residual	Chi-Square	df	Asym p. Sig
q1	Hedge	3295	2484	811	1647.5	836.5	849.447a	1	0.00*
	Booster	1624	1260	364	812	-448	494.345a	1	0.00*
	Disclaimer	28	28					1	
	Evidential	3492	1908	1583	1749.5	-161.5	29.868a	1	0.00*
	Endophoric M.	647	163	484	323.5	160.5	159.260a	1	0.00*
	Collapser	6942	3222	3720	3471	249	35.725a	1	0.00*
	Transitions	4567	3129	1438	2283.5	845.5	626.118a	1	0.00*
	Frame marker	572	430	142	286	144	145.007a	1	0.00*
	Code glosses	2901	1790	1111	1450.5	339.5	158.925a	1	0.00*
	Engagement M.	1206	1165	41	603	562	1047.575a	1	0.00*
	Attitude Marker	367	242	125	183.5	58.5	37.300a	1	0.00*
	Self-Mention	3182	2704	478	1591	1113	1557.221a	1	0.00*
	Total No. Straq1	28823	18526	10297	14411.5	4114.5	2349.389a	1	0.00*
q2	Hedge	2686	2096	594	1343	749	835.445a	1	0.00*
	Booster	1101	860	241	550.5	-309.5	348.012a	1	0.00*
	Disclaimer	22	21	1				1	
	Evidential	4326	2438	1888	2163	275	69.926a	1	0.00*
	Endophoric M.	687	203	267	343.5	140	114.936a	1	0.00*
	Collapser	7470	3438	4032	3735	297	47.234a	1	0.00*
	Transitions	4197	3004	1193	2098.5	905.5	781.444a	1	0.00*
	Frame marker	882	647	235	441	206	192.454a	1	0.00*
	Code glosses	2878	1341	1537	1439	98	13.348a	1	0.00*

	Engagement M.	503	480	23	251.5	228.5	415.207a	1	0.00*
	Attitude Marker	255	196	59	127.5	68.5	73.604a	1	0.00*
	Self-Mention	1621	1355	266	810.5	544.5	731.598a	1	0.00*
	Total No. Straq2	26632	16079	10553	1331	2763	1146.616a	1	0.00*
q3	Hedge	2122	1448	674	1061	387	282.317a	1	0.00*
	Booster	1142	734	408	571	163	93.061a	1	0.00*
	Disclaimer	12	12	0	0	0	0	1	
	Evidential	4214	2194	2020	2107	87	7.185a	1	0.007
	Endophoric M.	410	125	285	202	77	58.703a	1	0.00*
	Collapser	6884	3170	3714	3442	272	42.989a	1	0.00*
	Transitions	3453	2319	1134	1726.5	592.5	406.668a	1	0.00*
	Frame marker	757	487	270	378.5	108.5	62.205a	1	0.00*
	Code glosses	2917	1544	1373	1458.5	85.5	10.024a	1	0.002
	Engagement M.	378	368	10	189	179	339.058a	1	0.00*
	Attitude Marker	277	159	118	138.5	20.5	6.069a	1	0.014
	Self-Mention	1325	1245	80	662.5	582.5	1024.321a	1	0.00*
	Total No. Straq3	23889	13805	10084	11944.5	1860	579.591a	1	0.00*
q4	Hedge	1675	984	691	837.5	146.5	51.253a	1	0.00*
	Booster	966	589	377	483	106	46.526a	1	0.00*
	Disclaimer	3	3					1	
	Evidential	3920	1985	1935	1960	25	.638a	1	0.425
	Endophoric M.	525	71	444	280.5	209.5	312.943a	1	0.00*
	Collapser	5889	2746	3143	2944.5	198.5	26.763a	1	0.00*
	Transitions	3049	1906	1143	1524.5	381.5	190.938a	1	0.00*
	Frame marker	685	400	285	342.5	57.5	19.307a	1	0.00*
	Code glosses	3086	1287	1799	1543	256	84.946a	1	0.00*
	Engagement M.	347	321	26	173.5	147.5	250.793a	1	0.00*
	Attitude Marker	284	196	88	142	54	41.070a	1	0.00*
	Self-Mention	930	672	258	465	207	184.297a	1	0.00*
	Total No. Straq4	210522	11160	10238	10684	476	42.414a	1	0.00*
	Total	100712	59570	41142	50356	9214	3371.904a	1	0.00*

In the second hypothesis, we analysed maxims marking across Q1-4 journals in each discipline. Hence, the data were computed via a non-parametric test, i.e., Chi-square. The findings revealed that they were significantly different across four Qs in each domain.

Table 3
Chi-Square Tests Analysing Maxims of Quality between Humanities and Basic Sciences

MDSs	Discipline	Quartile	Total No.	Observed N	Expected N	Residual	Chi-Square	df	Asymp.Sig.
Hedge	Philo-Philo	q1	7008	2484	1752	732	761.224a	3	.000*
		q2	7008	2092	1752	340			
		q3	7008	1448	1752	-304			
		q4	7008	984	1752	-768			
	Bio-Bio	q1	2770	811	692.5	118.5	34.786a	3	.000*
		q2	2770	594	692.5	-98.5			
		q3	2770	974	692.5	-18.5			
		q4	2770	691	692.5	-1.5			
Booster	Philo-Philo	q1	3443	1260	860.8	399.3	289.648a	3	.000*
		q2	3443	860	860.8	-0.8			
		q3	3443	734	860.8	-126.8			
		q4	3443	589	860.8	-271.8			
	Bio-Bio	q1	1390	364	347.5	16.5	46.460a	3	.000*
		q2	1390	241	347.5	-106.5			
		q3	1390	408	347.5	60.5			
		q4	1390	377	347.5	29.5			
Disclaimer	Philo-Philo	q1	64	28	16	12	22.125a	3	.000*
		q2	64	21	16	5			
		q3	64	12	16	-4			
		q4	64	3	16	-13			
	Bio-Bio	q1	0	0	0				
		q2	0	0	0				
		q3	0	0	0				
		q4	0	0	0				
Evidential	Philo-Philo	q1	8225	1908	2131.3	-223.3	79.419a	3	.000*
		q2	8225	2438	2131.3	306.8			
		q3	8225	2194	2131.3	62.8			
		q4	8225	1985	2131.3	-146.3			
	Bio-Bio	q1	7432	1589	1858	-269	56.746a	3	.000*
		q2	7432	1888	1858	30			
		q3	7432	2020	1858	162			
		q4	7432	1935	1858	77			

In each part of Tables 3, 4, 5, and 6, articles from Q1-4 were studied; As can be seen in Tables 3, 4, 5, and 6, unlike the study carried out by Hyland (2000), in the present study various Q rank orders across journals were taken into consideration. The data indicated that there was a statistically significant difference across Qs in metadiscourse devices' usage. So, the writers in the two disciplines employed maxims markers significantly differently. Thus, about the second question and its associated hypothesis and based on the total frequency in using maxims markers represented in Table 3, 4, 5, and 6, the results thoroughly rejected the second hypothesis. Note that the distribution of metadiscourse markers employed across Q1–4 was shown in Figure 1.

Table 4

Chi-Square Tests Analysing Maxims of Manner between Humanities and Basic Sciences Research Articles

MDSs	Discipline	Quartile	Total No.	Observed N	Expected N	Residual	Chi-Square	df	Asymp.Sig.
Transitions	Philo-Philo	q1	10358	3129	2589.5	539.5	387.416a	3	0.00*
		q2		3004		414.5			
		q3		1319		-270.5			
		q4		1906		-683.5			
	Bio-Bio	q1	4908	1438	1227	211	20.026a	3	0.00*
		q2		1193		-34			
		q3		1134		-93			
		q4		1143		-84			
Frame markers	Philo-Philo	q1	1964	430	491	-61	74.041a	3	0.00*
		q2		647		156			
		q3		487		-4			
		q4		400		-91			
	Bio-Bio	q1	932	142	233	-91	53.039a	3	0.00*
		q2		235		2			
		q3		270		37			
		q4		285		52			
Code glosses	Philo-Philo	q1	5962	1790	1490.5	299.5	104.881a	3	0.00*
		q2		1341		-149.5			
		q3		1544		53.5			
		q4		1287		-203.5			
	Bio-Bio	q1	5820	1111	1455	-344	171.904a	3	0.00*
		q2		1537		82			
		q3		1373		-82			
		q4		1799		344			

Table 5

Chi-Square Tests Analysing Maxims of Interaction between Humanities and Basic Sciences

MDS	Disciplines	Quartile	Total No.	Observed N	Expected N	Residual	Chi-Square	df	Asymp.Sig.
Engagement markers	Philo-Philo	q1	2334	1165	583.5	281.5	795.546a	3	.000*
		q2	2334	480	583.5	-103.5			
		q3	2334	368	583.5	-215.5			
		q4	2334	321	583.5	-262.5			
	Bio-Bio	q1	100	41	25	16	19.440a	3	.000*
		q2	100	23	25	-2			
		q3	100	10	25	-15			
		q4	100	26	25	1			
Attitude markers	Philo-Philo	q1	739	242	198.3	43.8	17.477a	3	0.001*
		q2	739	196	198.3	-2.3			
		q3	739	159	198.3	-39.3	105.521a	2	.000*
		q4	739	196	198.3	-2.3			
	Bio-Bio	q1	390	125	97.5	27.5	28.195	3	.000*

		q2	390	59	97.5	-38.5			
		q3	390	118	97.5	20.5			
		q4	390	88	97.5	-9.5			
		q1	5976	2704	1494	1210			
	Philo-Philo	q2	5976	1355	1494	-139	1486.684 a	3	.000*
		q3	5976	1245	1494	-249			
Self-Mention		q4	5976	672	1494	-822			
		q1	1079	475	269.8	205			
	Bio-Bio	q2	1079	266	269.8	-3.8	290.212a	3	.000*
		q3	1079	80	269.8	-189.8			
		q4	1079	258	269.8	-11.8			

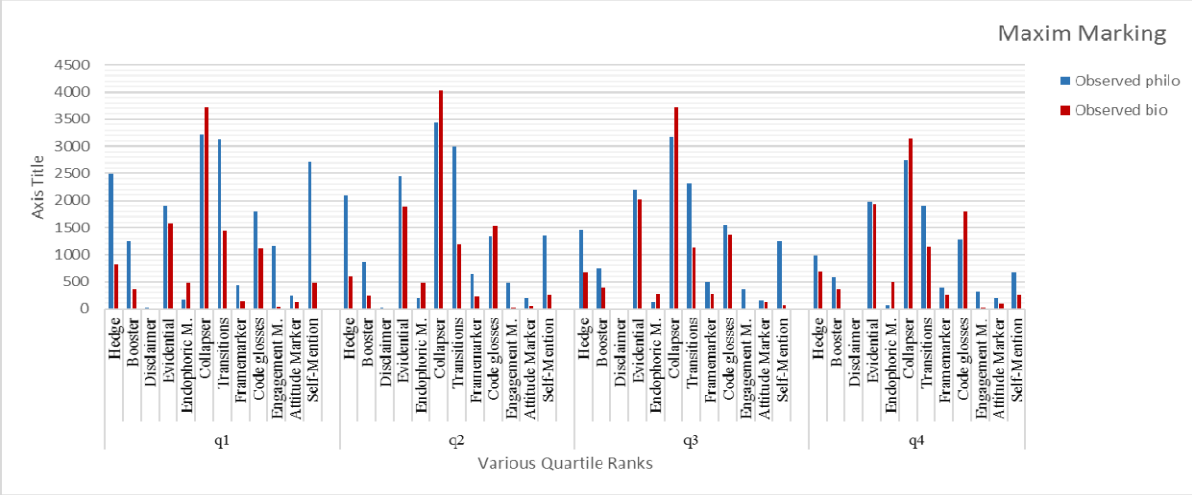
Table 6

Chi-Square Tests Analysing Maxims of Quantity between Humanities and Basic Sciences Research Articles

MDSs	Discipline	Quartile	Total No.	Observed N	Expected N	Residual	Chi-Square	df	Asymp.Sig.
Endophoric Markers	Philo-Philo	q1	562	163	140	22.5	67.495a	3	.000*
		q2	562	203	140	62.5			
		q3	562	125	140	-15.5			
		q4	562	71	140	-69.5			
	Bio-Bio	q1	1595	484	398.8	85.3	83.147a	3	.000*
		q2	1595	342	398.8	-56.8			
		q3	1595	279	398.8	-119.8			
		q4	1595	490	398.8	91.3			
Collapsers	Philo-Philo	q1	12576	3222	3144	-398	80.025a	3	.000*
		q2	12576	3438	3144	26			
		q3	12576	3170	3144	78			
		q4	12576	2746	3144	294			
	Bio-Bio	q1	14604	3720	3652.3	67.8	112.793a	3	.000*
		q2	14604	4032	3652.3	379.8			
		q3	14604	3714	3652.3	61.8			
		q4	14604	3143	3652.3	-509.8			

Figure 1

Bar Chart of the Distribution of Employed Maxim Marking in Two Disciplines



The first half of the third question was related to comparing maxims marking between the soft discipline of philosophy and the hard field of biology. In the third hypothesis, we intended to look at metadiscursive strategies in different subsections based on Abdi's (2010) model. So, the data were analysed through descriptive statistics, Chi-square. Like the tables in previous sections, to observe the writers' maxims markers' usage in their discourse community, Table 7 compares the cooperation categories of *quantity*, *quality*, *manner*, and *interaction* between philosophy and biology.

Table 7

Chi-Square Tests Analysing Metadiscursive Maxims Frequency Based on Q1-4 Journals

Philo-Bio	Total. No	Observed philo	Observed bio	Expected N	Residual	Chi-Square	df	Asymp. Sig
q1 quality	8438	5680	2758	4219	1461	1011.861a	1	.000*
q1 quantity	7589	3385	4204	3794.5	409	81.386a	1	.000*
q1 manner	8040	5349	2691	4020	1329	878.727a	1	.000*
q1 interaction	4755	4111	644	2377	1733.5	2527.884a	1	.000*
q2 quality	8135	5411	2724	4067.5	1343.5	887.519a	1	.000*
q2 quantity	8015	3641	4374	4007.5	366.5	67.035a	1	.000*
q2 manner	7957	4992	2965	3978.5	1013.5	516.367a	1	.000*
q2 interaction	2379	2031	348	1189.5	841.5	1190.622a	1	.000*
q3 quality	7752	4650	3102	3876	774	309.121a	1	.000*
q3 quantity	7288	3295	3992	3644	349	66.850a	1	.000*
q3 manner	7127	4350	2777	3563.5	786.5	347.177a	1	.000*
q3 interaction	1980	1772	208	990	782	1235.402a	1	.000*
q4 quality	6564	3561	3003	3282	279	47.435a	1	.000*
q4 quantity	6360	2817	3543	3180	363	82.874a	1	.000*
q4 manner	6820	3593	3227	3410	183	19.642a	1	.000*
q4 interaction	1561	1189	372	780.5	408.5	427.603a	1	.000*

q1 total	30889	19302	11589	15444.5	3857.5	1926.939a	1	.000*
q2 total	29252	13138	16114	14626	1488	302.768a	1	.000*
q3 total	29944	18284	11660	14972	3312	1465.314a	1	.000*
q4total	10675	9103	1572	5337.5	3765.5	5312.971a	1	.000*
Total	100790	59797	40935	50366	-9431	3531.897a	1	.000*

Although the data revealed that articles in two disciplines employed metadiscursive maxims markers, the research articles in the soft discipline of philosophy contained higher maxims markers' usage than the research articles in the hard field of biology except for the cooperation category of quantity. The findings also revealed that the writers in the two disciplines employed significantly different metadiscursive maxims markers. So, the findings entirely rejected the first half of the third question and its related hypothesis.

Table 8

Chi-Square Tests Analysing Maxims Markers in Two Disciplines across VQRs Based on the CP Model

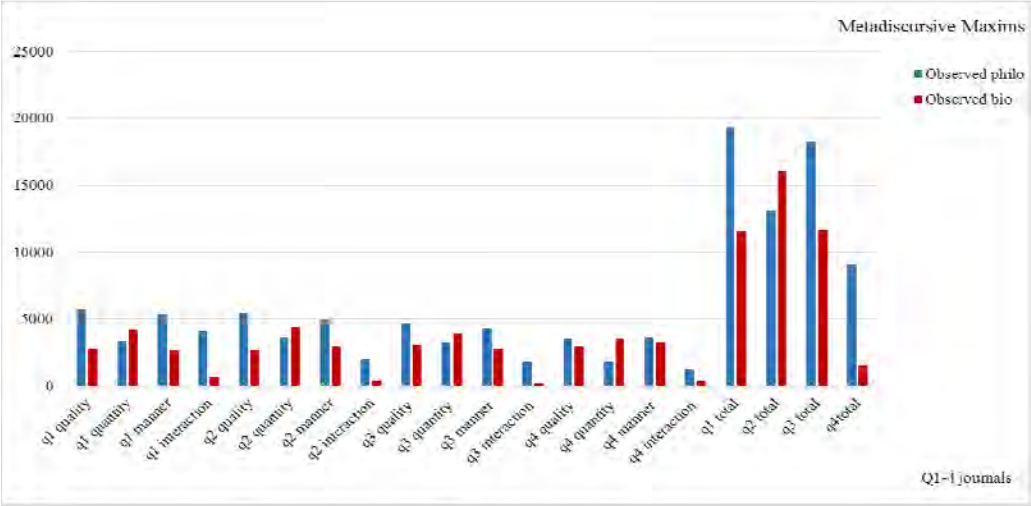
Maxim	Discipline	Quartile	Total No.	Observed N	Expected N	Residual	Chi-square	df	Asymp.Sig
quality	Philo-Philo	q1	19302	5680	4825.5	854.5	560.096a	3	.000*
		q2	19302	5411	4825.5	585.5			
		q3	19302	4650	4825.5	-175.5			
		q4	19302	3561	4825.5	-1264.5			
	Bio-Bio	q1	11587	2758	2896.8	-138.8	35.388a	3	.000*
		q2	11587	2724	2896.8	-172.8			
		q3	11587	3102	2896.8	205.3			
		q4	11587	3003	2896.8	106.3			
quantity	Philo-Philo	q1	13138	3385	3284.5	100.3	108.345a	3	.000*
		q2	13138	3641	3284.5	356.5			
		q3	13138	3295	3284.5	10.5			
		q4	13138	2817	3284.5	-467.5			
	Bio-Bio	q1	16114	4204	4028.5	175.5	96.101a	3	.000*
		q2	16114	4374	4028.5	345.5			
		q3	16114	3993	4028.5	-35.5			
		q4	16114	3543	4028.5	-485.5			
manner	Philo-Philo	q1	18284	5349	4571	778	391.129a	3	.000*
		q2	18284	4992	4571	421			
		q3	18284	4350	4571	-221			
		q4	18284	3593	4571	978			
	Bio-Bio	q1	11660	2691	2915	-224	57.998a	3	.000*
		q2	11660	2965	2915	50			
		q3	11660	2777	2915	-138			
		q4	11660	3227	2915	312			
interaction	Philo-Philo	q1	9103	4111	2275.5	1835.3	2136.805a	3	.000*
		q2	9103	2031	2275.5	-224.8			
		q3	9103	1772	2275.5	-503.8			
		q4	9103	1189	2275.5	-1086.8			
	Bio-Bio	q1	1572	644	393	251	253.669a	3	.000*

q2	1572	348	393	-45
q3	1572	208	393	-185
q4	1572	372	393	21

Various Q rank orders between two disciplines were considered in the present study. The second half of the third question compared metadiscourse maxims marking interdisciplinary in philosophy and biology. This comparison was associated with the distribution of maxims markers across Q1–4 (see Table 8), and the data indicated a statistically significant difference across Qs in using maxim markers in different categories.

Figure 2

Bar Graph of Metadiscursive Maxims Frequency Based on Q1-4 Journal



Thus, based on the findings and based on the total frequency of maxims markers in various categories in each discipline across Q1-4 journals, the second part of the third question and its associated hypothesis was entirely rejected as well. We represented the distribution of maxims markers in different categories across two disciplines in various rank orders in Figure 2.

Discussion

The present study indicated that research articles written by academic writers in humanity and basic science were significantly different in using metadiscourse maxims markers. Moreover, they were significantly different across Q rank orders between the two disciplines. Maxims in the cooperation category of quality, that is, hedges, boosters, evidential, and disclaimers look intriguing. They were all highly employed maxims by philosophy writers. It is not surprising that a philosophy paper does not report what different scholars have said on a particular topic; it does not represent tests or experiments. It does not show the writers' feelings or intuitions. Instead, it is a logical way of defence, and since philosophy writers have been dealing with people, it can be

reasonably acceptable (Abdi, 2011). The writers try to convince their readers to accept something through grounds or justification for its confirmation. Thus, hedges and boosters were the most commonly used maxims in philosophy research articles rather than biology ones. As already mentioned in the soft knowledge, writers need to interpret more than hard one because they are dealing with a more abstract area. Moreover, in soft knowledge, writers need to be more dialogic, while in biology, writers feel obliged to report their research with the shared assumption and facts in mind.

The case of evidential is the most commonly used metadiscourse maxims markers in philosophy in comparison with biology; thus, providing a discursive framework for argument and indicating a possible basis for claims are the reasons why writers in philosophy employ citation; however, writers in biology, unlike philosophy, follow defined paths (Hyland, 2000), and they just require a certain amount of theoretical background, and technical lexis and these shared assumptions lead them to use highly standardised code (Bazerman, 1988) in the citation. Additionally, disclaimers could give a more obvious picture of the rhetorical structure in research articles. Therefore, it could be why writers in philosophy employed disclaimers significantly differently from writers in biology in this study.

As shown in Table 6, the cooperation category of quantity, outlined by Murcia and Olshtain (2000), and Abdi et al. (2010), was a widely used category in research articles. As the study's findings revealed, the examined disciplines abounded in items related to quantity markers, and as shown in Table 2, most quantity markers were from the strategy of collapsing. Initials were also the most frequently used quantity marker types in biology research articles, though relatively meagre, the use of endnote/footnote was the most frequently used maxims in philosophy because it could be attributed to the nature of the discipline which requires such explanations. The use of citation, an abbreviation referring to an otherwise long work, exceeded other collapser types. Endophoric markers were found to be more commonly and significantly differently used maxims in biology than philosophy. Totally, the findings of this study indicated that collapsing was an ideal strategy for writers of both soft and hard disciplines compared to endophoric marking. Consequently, the high use of the maxims in the cooperation category of quantity in the hard discipline of biology showed that the writers in this area of the study tried to relate the propositions to the readers' presupposed ability to process and accept the ongoing claim (Hyland, 2005). Furthermore, hard knowledge tends to be more cumulative, which means the new findings come from "an existing state of knowledge" (Kuhn, 1970).

Maxims in the cooperation category of manner were used to make the text comprehensible through classifying steps and concepts (Abdi, 2009). To this end, transitions were used to help the readers through the perplexity of propositions (Thompson, 2001). It seemed that transitions were commonly employed maxims to make the text comprehensible and to keep away from vanishing the text into obscurity; otherwise, ambiguity might arise. So, it could be possible to believe that transitions could contribute to the "manner" of expression. On the other hand, frame markers were used to form and illustrate the schematic text boundaries like sequencing, additive relations, label stages, announce goals, and topic shifts. Using frame markers, the writers try to

make their text planned and make it orderly, brief, and clear, which is related to a critical part of the cooperation category of the manner in communication through the cooperative principle. In the present study, the writers in philosophy employed maxims markers of transitions significantly differently from those in biology. That is to say, transitions were highly employed metadiscursive markers in philosophy while code glosses were most frequently used in biology, and frame markers were commonly used maxims after transitions and code glosses in both disciplines across Q1-4.

In short, across disciplines, the cooperation category of manner, including maxims of transitions, frame markers, and code glosses, were the most frequently employed metadiscursive maxims markers in philosophy compared with biology. The high use of the maxims in the cooperation category of manner in philosophy in comparison with biology could represent the fact that writers in philosophy try to have a dynamic relationship with their readers to help them comprehend the pragmatic connections between the stages of an argument (Hyland, 2005) through showing the relationship between the stretches of the discourse. The cooperation category of interaction consisting of the maxims of attitude markers, self-mentions, and engagement markers, was employed to show the readers the authors' attitude and to share with them the authors' feelings, and to represent them the authors' presence in the research papers through which the authors make choices about their writing style. Abdi (2002) stated that different academic identities would be indicated through using these valuable rhetorical tools. For instance, the research paradigm of positivism expresses obvious disdain invisibility of the participant in academic writing (Abdi, 2010). The findings in the present study showed that in research articles written in philosophy, attitude markers were employed significantly differently from those written in biology. Moreover, in philosophy, the engagement markers were employed 23.34 times more than those in biology. The findings also showed that writers in philosophy took advantage of self-mentions 5.53 times more than writers in the biology discipline. Overall, in the study, the maxims in the cooperation category of interaction were the most frequently used maxims in philosophy. In other words, maxims markers in the cooperation category of interaction in philosophy as a representative of soft discipline were employed about six times more than the ones in biology as a representative of hard discipline. Finally, it was concluded that social interaction between the writers and the readers in the research articles written in the soft field of philosophy was much higher than that of the hard field of biology.

As shown in Table 7, in philosophy, the use of the maxims in the cooperation category of quality, quantity manner, and interaction across Q1-4 journals was slowly decreasing, except for the maxims in the cooperation category of quantity in Q2, specifically evidential has been increasing compared with Q1 journal. In philosophy, across Q1-4 journals, the first employed maxims marker in Q1 was hedge, while evidential was the first employed maxims marker for writers in Q2 and Q3 journals, and for all the mentioned quartiles, boosters and disclaimers were in the third and fourth order. The cooperation category of manner comprised of transitions, code glosses, and frame markers across Q1-4 journals were employed, respectively. In both

disciplines, the cooperation category of interaction consisting of self-mentions, engagement markers, and attitude markers were most frequently employed maxims in Q1 as compared with Q2-4, and also the findings showed that each Q had been rapidly decreasing in comparison with its next Q except for Q4 in biology that showed growth in comparison with its previous one (Q3). It seemed in biology Q4 journals, some topics in research articles, such as *Assessment of a pragmatic strategy to improve the health of Kacang goats in the Journal of Agriculture and Rural Development in the Tropics and Subtropics*, were related to pragmatic strategies, and it was the reason that the results of the study were partly influenced in the use of the maxims of interaction.

Across Q1-4 journals in both disciplines, the maxims in the cooperation category of quantity compared to the maxims in the cooperation category of interaction were decreasing slowly except for Q2 journals in philosophy and Q1 journals in biology, which indicated growth compared to their last quartiles. That was why in philosophy, the cooperation category of interaction in Q1 journals had ranked in third place, dropped to fourth place while the maxims of quantity moved to third place in Q2, Q3, and Q4 journals. Overall, in biology, the cooperation category of quantity was the firstly used category across Q1-4 journals. While the cooperation category of quality was the secondly used maxims in Q1 and Q3 journals, the cooperation category of manner took second place in Q2 and Q4 journals, and finally, the cooperation category of interaction across Q1-4 journals took fourth place.

In short, in philosophy, maxims of quality were the most frequently employed markers among four Qs, while in biology, maxims of quantity were the most frequently used ones. In philosophy, writers need to be more dialogic, while in biology, writers need to report their research with the same confidence of shared assumption. Maxims of manner were approximately the second most frequently employed maxims in philosophy, while in biology, it was different. The high use of the maxims of manner in philosophy in comparison with biology could represent the fact that writers in philosophy try to have a dynamic relationship with readers to help them to comprehend the pragmatic relations between steps (Hyland, 2005) through showing the relationship between stretches of discourse. Finally, the cooperation category of interaction across Q1-4 journals was significantly different from its next Q, so it indicated that professional writers in philosophy take advantage of maxims of interaction significantly differently compared to novice writers in which they have placed the next quartile. This study aimed to examine the distribution of the CP-based model of metadiscourse marking across two disciplines and Q1-4 Journals according to Abdi's (2010) model within the research articles written in philosophy and biology. It appeared that although articles in two disciplines employed maxims markers, philosophy contained the highest metadiscourse devices compared with biology. It was also observed that the employed maxim markers in philosophy were much more than the employed maxim markers in biology, except for the maxims of endophoric and collapsers. The data indicated that maxims markers were employed statistically differently across Q1-4, and the data also indicated that across two disciplines from Q1-4 journals, the writers employed maxims markers significantly differently. Therefore, based on these findings, it was concluded that

contrary to soft sciences that encourage the authors' dynamic relationship with the readers and a clear picture of the rhetorical structure employed in the research articles, in hard sciences, the research paradigm of positivism expresses obvious disdain in the visibility of the participant in the academic writings. Although post-positivism allows more interaction between the researchers and their research participants and the postmodern paradigm opens new doors for the researchers in this field, scientific knowledge is at best a model of the invisible scholar yet and remains forever contingent and open to challenge. Studies on academic writing have tended to be increasingly based upon linguistic-based writing research (e.g., Gray & Biber, 2012; Hyland, 2012; Hyland & Jiang, 2018; Jomaa & Alia, 2019).

For this purpose, the present study investigated metadiscursive maxims marking in 83 research articles in the soft discipline of philosophy and 110 ones in the hard discipline of biology employing Abdi's (2010) CP-based model of metadiscourse marking. This study provides insight into the writing process in materials and teacher training courses. There is a need to train teachers and equip them with functional and structural elements in different disciplines in academic language that resulted in equipping learners with the communicative skills to manage any particular academic and professional cultures, and finally, in helping students deal with the challenges of writing academically (Aguirre-Muñoz et al., 2009). Similarly, Jomaa and Alia (2019) stated that authors could fulfil their functions by understanding the linguistic structures and comprehending metadiscursive propositions in every discipline. In the end, advanced academic literacy could be achieved following the disciplinary practices and improving students' control over different cultural and linguistic structures by which they are fundamentally important for engaging in the text (Hyland & Jiang, 2018). Consequently, the findings of this study suggest explicit awareness of and reasonable attention to teaching metadiscursive maxims markers to second language learners. Instructing the markers systematically with some practice and feedback might help writers overcome inappropriacy related to using these markers (El-Dakhs, 2020). Teachers should raise the learners' awareness of these markers' functions and contributions to produce a legitimate and plausible discourse and lead them to employ them effectively in writing. It is also important to qualify the writings of the learners with familiarising the rhetorical structures in the varied genres, and EAP teachers, specifically those teaching writing for publication, could use the findings of this study as a basis for increasing students' awareness of metadiscourse marking in relation to paradigm-specific academic writing (Liu, & Tseng, 2021), as well as for raising their awareness of using metadiscursive markers in association with publication in different Q rank orders.

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