

Choice and Use of Context Frames to Augment the Writing of Result and Discussion Section of Research Articles across Four Disciplines

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ABSTRACT

This study focuses on the use and discourse functions of context frame markers in the result and discussion section of research articles across four disciplines. Sixteen result and discussion sections from four disciplines, namely, English Language Teaching, Economics, Biology, and Civil Engineering (four from each discipline) were analysed by adapting Gosden's (1992) taxonomy. Findings showed disciplinary differences in relation to the realisation of the context frame types, frequencies, and associated discourse functions. These differences in terms of types, frequencies, and discourse functions of context frames are imposed by the nature of the rhetorical section of result and discussion, the nature of the discipline, and both the nature of rhetorical section of result and discussion and the discipline, respectively. Findings suggest that context frames are an important means which the writer uses to deliver claims and arguments in results and discussion. As a result of the dictums imposed by the generic RA section and the nature of the discipline, marked disciplinary differences are found in the writing endeavour.

Keywords: context frames, discourse function, result and discussion section, disciplinary difference

INTRODUCTION

In recent decades, research on academic writing has concentrated on the genre of research article (henceforth RA) and its sections which comprise the introduction, method, result, and discussion (IMRD). This concentration on the genre of RA comes from importance of this genre of writing which undergoes a very thorough screening especially when an article is submitted for possible publication in reputable journals. As Johns and Swales (2002) say, the article gets to be “valorised and ratified by the very fact of being published”. An RA also plays a significant role in the circulation of academic knowledge (Peacock 2002) and it is well acknowledged as the key means of legitimating claims and disciplines (Berkenkotter & Huckin 1995, Hyland 1996).

Many researchers have investigated RA or its sections for different linguistic features in one discipline or across different disciplines focusing on elements such as theme (Ebrahimi, Chan & Ain 2014, Lores 2004), first person pronoun (Harwood 2005), metadiscourse markers (Gillaerts & Van de Velde 2010, Hu & Cao 2011, Khedri et. al. 2013), and lexical bundles (Kashiha & Chan 2014, Hyland 2008). These studies have consistently concluded that writers from different disciplines use different linguistic features in different ways. In

other words, some linguistic features could show the disciplinary differences more evidently establishing the notion that such differences are worthy for investigation as it would significantly inform the operations of writing in a similar genre but using dissimilar disciplinary expressions. One of these linguistic features is Halliday's notion of theme. Theme exists as a writing element in a particular structural configuration taken as a whole; it organises the clause as a message; and the message could configure as the theme and rheme (Halliday 1985). In exploring theme, Davis (1988) forwards a two-part analysis, namely obligatory topic realised by the grammatical subject (GS) (example 1) and optional context frames (CF) (example 2) realised by any element preceding the GS.

1. **Table 3** shows the short run and long run Granger causality within the Error-Correction Mechanism (ECM). (Eco 2)
2. **As mentioned above**, reading comprehension is affected mainly by two factors, namely listening comprehension and word decoding. (ELT 1)

A considerable amount of literature has been published on the manifestation of theme in the genre of RA and its sections in the last two decades (Ebrahimi, Chan & Ain 2014, Gosden 1992, 1993, Jalilifar 2010, Martinez 2003, Whittaker 1995). Martinez (2003) investigated the manifestation of theme in the method and discussion sections of Biology RAs. Jalilifar (2010) focused on the thematic structures of ELT RAs published in local and international journals. Ebrahimi, Chan and Ain (2014) investigated result and discussion section of RA for the GS types and discourse functions, focusing on disciplinary differences. Gosden (1992, 1993) studied GS and CF types and discourse functions in different rhetorical sections (IMRD) of scientific RAs. This review attests to the claim that far too little attention has been paid to the study of the CFs. Given this paucity of research, this study aims to contribute insights to the existing literature of theme in RA by tracing the manifestation and discourse functions of the CFs in the result and discussion section of RA across four disciplines, namely, English Language Teaching (ELT), Economics (Eco), Biology (Bio), and Civil Engineering (CE). To this aim, this study put forward the following questions:

1. What are the types of CFs used in the result and discussion sections of ELT, Eco, Bio and CE RAs?
2. What are the discourse functions of CFs used in the result and discussion sections of ELT, Eco, Bio and CE RAs?

METHOD

CORPUS

This study is grounded on the analysis of sixteen result and discussion sections. First, the result and discussion sections were selected from four disciplines of ELT, Eco, Bio, and CE. Second, the result and discussion sections were extracted from regular original RAs published in four journals, namely, Social Sciences and Humanities, Science and Technology, Economics and Management, and Tropical and Agriculture Science. The four journals are international journals published by Universiti Putra Malaysia Press. The rationale behind this selection was to have texts of the same level of recognition, as these journals are all indexed in Scopus. Third, all the RAs from which the result and discussion sections were extracted were published in the 2011 and 2012 issues of these four journals.

RHETORICAL SECTIONS OF RESULT AND DISCUSSION

The rationale behind the selection of result and discussion section is that the result section is a rhetorical section, which allows the researcher to present, highlight, and give comments on findings (Brett 1994). In this section, the researcher presents qualitative and quantitative analysis to provide answers to stated research problems. These analysis can be defined “as studying the organised materials from many angles in order to find out inherent facts” of RA writing (Jalilifar 2009, p. 65). The importance of this section is highlighted by Brett (1994), Swales (1990), and Williams (1999). They believe that this section point out the disciplinary differences in more explicit ways compared to other RA sections.

In the case of discussion section, Writing this section poses a challenge to many writers. It plays a significant role in an RA as it pulls and presents information from different parts of the research, holistically merging the literature review, method, and results to emulate its content (Basturkmen 2009). In this section, the researcher discusses the significance of the results, compares the findings gained with earlier reported ones, and makes claims concerning how findings contribute to and integrate with the disciplinary existing literature (Basturkmen 2012, Hunston 1994). To Ruiying and Allison (2003), it is through this section that the researcher “seek(s) to establish their importance”(p. 366). Sometimes, as in this study, result and discussion sections in an RA are merged and presented together under the heading of result and discussion (Swales 1990) representing a single genre.

ANALYTICAL FRAMEWORK

To analyse the gathered data, Gosden’s (1992) functional categories of CFs were adopted. The functional categories of the CFs along with their linguistic realisations are illustrated as below:

TABLE 1. Functional categories of CFs

Functional categories		Linguistic realisation
1	Time	<i>Yet, Still, After concluding, After completing the research, During the phase of failure, Starting from the puzzling observation, First, Finally, Then, In consequence, On the immediate post test,</i>
2	Location in discourse (data)	<i>In this study, In the present study, In the current study, In fig. 2, In the analysis, In the 1-step system,</i>
3	Addition	<i>For example, For instance, In other words, Furthermore, Further, And, In addition to, What is more,</i>
4	Contrast/Concession	<i>However, Although, In contrast, Though, Despite that, While the relatively strong emphasis was on Ex ante,</i>
5	Cause	<i>Therefore, Hence, With the improvement of the outer grower scheme, Depending on the measure of certainty used</i>
6	Means	<i>To this end, For LI lexicalization, In order to obtain HL cells,</i>
7	Condition	<i>In this way, By further studies, With this construction, Using both Instrumental Variables and GMM techniques</i>
8	Validation	<i>In doing so, Giving their centrality evaluative nature, When joint ventures are possible, In principle, Perhaps, Under the assumption that, If this is justified,</i>
9	Viewpoint	<i>In particular, Following Rouke et al. (1999), As is well known, As noted earlier, Significantly, Clearly, Certainly, Evidently, Based on 10 month observation, Drawing from interviews of 15 Latin American women in the USA,</i>
		<i>Quite surprisingly, More specifically, In the view of these findings,</i>

UNIT OF ANALYSIS

T-unit was adopted as the basic unit of analysis in this study. Following Fries (1994, p.318), T-unit is a clause complex that contains a main independent clause along with all clauses that

are dependent on it. The justifications behind this selection are: a) T-unit helps to trace and focus on theme in large amounts of text and, b) theme of the dependent clause is often constrained in the independent clause (Fries & Francis 1992). Thus, identification of T-unit, having the above definition in mind, is quite clear.

DATA ANALYSIS PROCEDURE

First the result and discussion sections were extracted and collected from the 2011 and 2012 issues of the four journals. Once the data collection was compiled, the CF types and their discourse functions in each T-unit were identified based on Gosden's (1992) adapted taxonomy. Following this, a sample of the analysed result and discussion section was also verified by two raters and an agreement was achieved. Finally, the frequency and percentage of the CFs in each of the disciplines were calculated, tabulated and discussed. It needs to be noted here that CFs that did not reach 5% in frequency in its manifestation in at least one discipline, were not discussed.

FINDINGS AND DISCUSSION

The data was analysed for the manifestation of the nine CFs and results are presented in Table 2.

TABLE 2. Frequency and Percentage of CF Types across 4 Disciplines

CF	ELT		Eco		CE		Bio	
	Fre.	Per.	Fre.	Per.	Fre.	Per.	Fre.	Per.
1 Addition	28	27%	19	25%	20	30%	29	21%
2 Validation	13	13%	5	7%	16	24%	30	22%
3 Cause	21	21%	20	26%	14	21%	18	13%
4 Contrast	18	17%	8	10%	9	13%	29	21%
5 Condition	7	7%	8	10%	2	3%	8	6%
6 Time	5	5%	4	6%	-	-	11	9%
7 Location	6	6%	6	8%	5	7%	5	4%
8 Viewpoint	3	3%	3	4%	1	2%	6	4%
9 Means	1	1%	3	4%	-	-	-	-
Total	102	100%	76	100%	67	100%	136	100%

ADDITION

As is evident in Table 2, there is a telling disciplinary difference between the four groups of writers in use of the addition CF in result and discussion section. The highest and lowest rate of occurrences of this CF were notably evident in the CE (30%) and Bio (21%) result and discussion sections, respectively. The higher rate of occurrence of this CF in the CE result and discussion section might assert that CE writers are more inclined to provide the reader with a more detailed elaboration of the argument, which helps to enhance interpretation of the argument. The least occurrence of this CF in Bio result and discussion section might suggest the Bio writers least favour to expand on preceding statements through positive emphasis.

The data analysis illustrates that the Addition CF is used to serve only one discourse function in the four sets of result and discussion sections. It is to add elements to results, claims, and arguments (Example 1). This discourse function probably intends to show the writer's intention to tie the reported results, claims, and arguments, positively. This patterning of the discourse is likely to strengthen the arguments presented.

Example 1

In addition, the higher water velocity at the upstream stations (St-1 and St-2) was associated with higher DO as the turbulence waters mixed air into the water bodies. (Bio 3)

VALIDATION

In relation to the manifestation of the validation CF, a noticeable disciplinary difference is reported in the data analysis (see Table 2). Among the four disciplines, CE writers dedicated a greater number of validation CFs compared to their counterparts in ELT, Eco, and Bio. This finding indicates the CE writers are inclined to validate their study by comparing and contrasting their findings with those found in the literature. This strategy helps in justifying the procedure, objectives or assumptions of the research. It also helps writers in claiming generalisability of research findings (Holmes 1997, Kanoksilapatham 2005). The greater use of the validation CF in CE result and discussion section could be discipline specific as these writers could be more governed by the belief that their findings in its own may not convincingly speak for themselves. Thus, it would prudent in order to convince the community members to situate their results with this CF to assure the members about the soundness of their arguments, for instance, that stated in the methodology section from which the results were obtained (Kanoksilapatham 2005).

The results also show that in all four disciplines, writers use the validation CF to serve the discourse functions of validating: a) the interpretation of the findings by referring to a table or figure (Example 2), b) the procedure from which the findings are generated (Example 3), and c) the substantiating of findings by reference to earlier ones in literature through comparing and contrasting (Example 4).

Example 2

According to Table 2, it could be easily identified that the post-SR gained 0.11% over the pre-SR, which could be considered as having a slight gain. (ELT, 1)

Example 3

Based on the statistical analysis, there was no significance found between the physico-chemical properties of the water for the different irrigation system. (Bio, 2)

Example 4

Based on Volodin and Nom (n.d.), 25% or less is desirable for the cut-off value of coefficient of variation. (CE, 3)

CAUSE

An evident disciplinary difference is illustrated through the data analysis concerning the use of the cause CF. As is evident in Table 2, the employment of this CF ranged from 13% in Bio to 26% in Eco result and discussion sections. The greater lean towards the use of this CF by the Eco writers demonstrates a preference to state the cause of their finding and claim. The use of such a structure can imply the objective nature of the results and discussion section in Eco discipline.

The data analysis indicates that the cause CF is used to serve two discourse functions in the four sets of result and discussion sections. The first discourse function is to report the findings and claims using a reason-result structure (Example 5). This discourse function

results in an approach that draws attention to the causal link to present the findings in this section. It also indicates that the finding and claim should not be left to inference but made explicit for the benefit of reading clarity.

Example 5

As there were no concrete irrigation canals in the study area, the total number of species in both the recycled irrigation water and uncontrolled flow plots was not very different. (Bio2)

The second discourse function is to justify the research action, method, procedure, or hypothesis (Example 6). Such an employment helps the writer to state the rationale behind the selection or use of a particular research action, method, procedure, or hypothesis. This rational presentation convinces the reader that the finding and claim are valid and reliable. This is because writers have to defend their use of the available research actions, methods, procedures or hypothesis in their studies; therefore, justification needs to be stated explicitly.

Example 6

Due to this reason, this model was considered to be acceptable. (ELT 3)

CONTRAST

In the case of the contrast CF (see Table 2) the results indicate that it ranged between 10% in the Eco result and discussion sections and 21% in Bio. It would appear that the Bio writers prefer to highlight their findings by contrasting them with existing literature. This helps to indicate that findings are unexpected, unique and deserving of attention. Thus, this CF used as a method of text development to create a necessary polarising tension to lend weight to the expounded findings.

The results indicate that the contrast CF perform two discourse functions in the four sets of the result and discussion sections. The first discourse function that is common in all four sets of the result and discussion sections is contrasting findings with others (Example 7). This discourse function helps to substantiate findings. Such an employment could be based on the intention of writer to point out the soundness of findings. Kanoksilapatham (2005) opines that this discourse function helps to make a petition for consideration of the findings of the current study as a part of the consensual knowledge of the disciplinary community.

Example 7

It is most likely that some people may argue that the finding of this study is not that convincing. *However*, the study is at least valid based on the present situation. (ELT 1)

The second discourse function is to contrast findings with literature (Example 8). It is markedly found in ELT and Bio result and discussion sections. It assists writers in highlighting the difference between their findings and the ones in the literature. It also acts to convince the reader that the study is of value and has a novel contribution to existing disciplinary community literature. This contrast may suggest the worth of the further investigation of area of study.

Example 8

However, it did not corroborate Smythe's argument (1973), who reported slight but significant attrition in the overall reading comprehension. (ELT 1)

CONDITION

An ostensible disciplinary difference in the use of the condition CF is depicted in Table 2 which shows CE writers having the least inclination to use this CF. Eco writers stand out most in the application of this CF. This finding may suggest that Eco writers prefer to thematise the conditions from which the results or claims emerged to convince the reader about the validity and objectivity of finding or claim. Reporting the findings or claims next to the condition from which emerged helps the reader to know what are the expected findings or claims.

The results show that two discourse functions are carried out through the use of the condition CF. The first discourse function, which is found in all four sets of result and discussion sections is presenting conditional context for the reported findings and claims (Example 9). It could be concluded that in experimental studies, the writers prefer to justify their findings and claims based on the condition from which they emerged. This gives a logical flow to the reporting of the findings and claims and is likely to appeal to the objectivity of experimental studies.

Example 9

In the case of short run inter-relationship, there exist a unidirectional relationship from income (Y) to table trade (T). (Eco 2)

The second discourse function, which is served by the use of the condition CF helps to justify a research action (Example 10). This discourse function was found only in the ELT result and discussion sections. ELT writers could be more prone to use this CF to establish a plausible rationale and reasons that account for the research actions. Much of the work in the discipline could be based on logical inferences rather than experiments. Non experimental postulations are seen to be well served by an appeal to conditions upon which the arguments develop to engage the reader.

Example 10

If the data are continuous, normally or not normally distributed, the Wilcoxon signed-rank test (one kind of non-parametric two-related-sample tests) can be used because the test incorporate more information about the data, and it is more powerful than the sign test. (ELT)

TIME

Disciplinary difference is reported concerning the manifestation of the time CF. Bio writers showed the greatest disposition towards using this CF while CE writers did not apply this CF at all in developing the result and discussion sections of their RAs. This may suggest that the Bio writings tends to resort to this technique to organise the information in the result and discussion section. Using the time CF “helps to create textual cohesion and interaction” (Gosden 1992, p. 212).

The time CF is used to serve three discourse functions in the analysed result and discussion sections from the four disciplines. The first discourse function shows the time location of the result gained in relation to the experiment (Example 11). This discourse function is found in Bio and ELT result and discussion sections.

Example 11

After the experimental period, the CI values of *A.granosa* was decreased as compared to those in the controls. (Bio)

The second discourse function was to restate the procedures chronologically (Example 12). This discourse function was found in both the Bio and ELT result and discussion sections. The employment of the time CF restate the procedures, which plays a crucial role in convincing the reader about the validity of the upcoming results and claims.

Example 12

Subsequently, independent sample t-test was carried out to find whether or not the differences were significant. (ELT)

The third discourse function which was unique to the Eco result and discussion section was finalising and summarising the results through the use of the time CFs (Example 13).

Example 13

In short, the results indicated that there were no statistically significant discrepancies between the observed covariance and the implied matrices, implying that the data fit the model. (Eco)

LOCATION

With regard to the application of the location CF, disciplinary difference was revealed based on the figures in Table 2. While Eco writers showed the greatest tendency, Bio writers presented the least disposition towards providing the reader with the location of the presented information.

ELT, Eco and CE writers showed the greatest emphasis to locate their findings in discourse-related circumstances mostly by the use of *in this study/in this paper* (Example 14). This emphasises that they are going to present the reader with important findings, which might help in a better interpretation.

Example 14

In this study, the number of participants in the high strategy group (n=104) is double than that of the medium strategy group (n=52). (ELT 2)

All four groups of writers used this CF to locate the findings within the smaller discourse circumstance or discourse data mostly with the use of *in fig. 2/ in the next step* (Example 15). This discourse function could take the reader's attention to other parts of the text, which might help in a better interpretation.

Example 15

In the next step, the time history of the nodal points or Gaussian points are plotted to evaluate the seismic response of the RCC dam. (CE 2)

CONCLUSION

In tracing the realisations of CF types and discourse functions in the result and discussion section of RAs across four disciplines (ELT, Eco, Bio, and CE) the study affirms earlier claims that linguistic features are used in relation to the context in which they are situated as embodiment of the rules, aims, and conventions of specific disciplines (Hyland 2004). Each discipline appears to lay different emphasis on CF use as the writers present their findings and discussion.

The findings revealed that the selection, frequency, and discourse functions of the CFs were directly imposed on writers by the nature of discipline and rhetorical section of result and discussion. As for the selection of the CF types, we could see that the selections were predominantly imposed by the nature of the rhetorical section of result and discussion as most of the CF types were used by the four groups of writers. It seems that only the selections of the time and means CFs were imposed by the disciplinary nature. With regard to the frequency of CFs, findings illustrated that the frequency was imposed by the nature of the discipline. Rules, aims, and conventions of one discipline may require writers to use one type of CF more frequently compared to other three disciplines. The contrast CF could be a clear instance for this claim. In relation to the discourse functions performed by the CFs, we could argue that the discourse functions were imposed by the nature of the discipline and the rhetorical section of result and discussion. The discourse function performed by the use of the validation, addition, cause, and location CFs were required by the nature of the rhetorical section of result and discussion. The discourse functions enacted by the use of the contrast, time, and condition CFs were required by both the discipline and rhetorical section of result and discussion.

The findings of this study have implications for writing and reading result and discussion section of RA. Writers become aware of how the use of CFs could help to carry out the discourse functions imposed by the nature of the a) rhetorical sections of result and discussion and b) context of writing in their discipline. The findings could help those new to the act of RA publication. These writers are given new interpretative insights into how the use of CFs could help in delivering a piece of cohesive and coherent result and discussion section.

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