



CONJUNCTIONS AS COHESIVE FEATURES OF PROBLEM STATEMENT SECTION IN DOCTORAL DISSERTATIONS ENGLISH STUDIES IN MALAYSIAN UNIVERSITY

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Received: 21 December 2024

Accepted: 1 January 2025

Published: 21 January 2025

Abstract: As the most significant part of a doctoral dissertation, the Problem statement (henceforth PS) aims to convince the advisory committee and examiners about the importance of a topic under investigation. To convey intended meaning, PS requires explicit and unambiguous connections between the various parts of the problem statement by using cohesive markers. One of the cohesive devices is conjunctions. Undoubtedly, the existence of conjunctions in PS writing at the tertiary level helps maintain the flow of ideas within written texts. Thus, conjunctions play a vital role in the clarity of any written academic discourse by student writers. This study aims to investigate the conjunctions and their different types as cohesive devices and their role in the cohesion of PS writing. For this purpose, the current study used 60 doctoral dissertation problem statements published during 2010-2022 from English discipline via Hallidayan Systemic Functional Grammar (Halliday, 1994; Halliday & Matthiessen, 2004). This study employed the discourse analysis method, using a descriptive interpretive approach. TagAnt 2.0.5 software application was used to examine the occurrences and frequency of conjunctions in the PSs of doctoral dissertations. Overall, the results suggest that conjunctive adverbs are a crucial device in problem statement writing in the present work. The PS writers indeed employ different types of conjunctive adverbs such as additive, causal, adversative, and temporal to support the cohesive structure of the Problem Statement. However, the findings indicate that PS writers have a limited number of linguistic devices in their repertoire to show cohesion in their writing. In terms of frequency, the highest number of those employed belongs to the groups of additive connectors. It proves that the addition of information or variation of information for appropriate argumentation to support the claims and the establishment of connections is the most important in Problem Statement writing. In addition, the findings of the present research have implications for PS writers and supervisors to produce cohesive PS. Writers need to be aware of how the conjunctions as cohesive devices contribute to the development of their PS texts.

Keywords: Problem Statement, doctoral dissertation, cohesion, conjunctions, cohesive device



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Cite This Article:

Nasreen Bhatti, Ilyana Jalaluddin, Vahid Nimehchisalem & Hui Geng. 2025. Conjunctions as Cohesive Features of Problem Statement Section in Doctoral Dissertations English Studies in Malaysian University. *International Journal of Contemporary Education, Religious Studies and Humanities (JCERAH)*, 5(1), 52-69.

INTRODUCTION

According to Miles (2017), when writing a problem statement, student writers should make explicit and unambiguous connections between the various parts so that the information being presented, what has already been said, and what will be said are all connected most fluently and appropriately. To convey the intended meaning, the writer should connect sentences by using cohesive markers. This means that in most cases, it is required to explain how one statement relates to another, or how the elements of one statement relate to what has been discussed previously, using a variety of linguistic devices. According to Tangkiengsirisin (2010), grammatical features such as conjunctions that represent discourse structure and organizational patterns serve as indicators of these relations. The primary function of conjunctions is to connect words, phrases, and sentences within the text and to put the ideas in an appropriate semantic order. Namaziandosta, Nasria, and Keshmirshekan (2019) highlight that conjunctions are semantic relations in which the conjunctive element indicates how the immediately following textual segment is systemically combined with the preceding segment. Conjunction, one of the most important cohesive devices, contributes to cohesion by expressing certain meanings that help create relations with other parts of discourse (Halliday & Hasan, 1976). The literature reviewed has shown that the use of conjunction as cohesive devices in student writing is of paramount importance for second language learners.

A widely acknowledged classification of conjunctions is suggested by Halliday and Hasan (1976) who categorize the whole list of conjunctions in English into four groups according to their functions as additive, adversative, causal, and temporal, which are used respectively to add a piece of information to the text, present contradicting information, relate causes and effects and mark simultaneity.

Regarding conjunctive, most of studies found additive conjunctions as the most used conjunctive ties in writing (Afful & Nartey, 2014; Cabrejas, 2022; Dania, 2018; Episiasi, Syaputri, Suramto & Kasriyati, 2022; Junina, 2022; Meisuo, 2000; Prasetyaningrum, Asrobi, Surayya & Fikni, 2022; Suwandi, 2016). However, in contrast to these studies, Warna, Wijaya, Sartika and Riznanda (2019) found adversative conjunction type as the most used in writing. The significance of adversatives in writing is claimed by researchers that the characteristics of good writing include highly frequent uses of adversatives (Dania, 2018; Namaziandosta, Nasria & Keshmirshekanb, 2019; Ngadiman & Tanone, 2014).

However, most studies found an overuse and misuse of additives, adversative and temporal conjunction which made the writing look redundant and misleading. In other words, the conjunctions are used in an inefficient, incorrect, or excessive manner in writing (Afrianto, 2017; Episiasi, Syaputri, Suramto & Kasriyati, 2022; He, 2020; Suari, Udayana & Parthama, 2022; Ludji, Hambandima & Christiani, 2022; Meisuo, 2000). On the contrary, Warna, Wijaya, Sartika, and Riznanda (2019) found that in terms of the correctness of using the conjunctions,

most of them were all used properly. Junina (2022) and Suari, Udayana and Parthama (2022) found that the conjunction ‘*and*’ seems to be overused. The use of these additive conjunctions *and* to add information are categorized as unnecessary and those should be omitted to make a clear and effective sentence. He (2022) demonstrated the overuse of temporal conjunctions and the underuse of conjunctions in their initial positioning. Whereas Mohammed (2015) discovered a noteworthy distinction in the way high and low-rated texts used additive conjunctions, such as “and”. As “and” is seen to serve a less unifying purpose, therefore, it is avoided in high-rated texts however it is heavily used in low-rated texts.

Though these studies have made a significant contribution to our knowledge of conjunctions as cohesive features in L2 learners’ writing and found that this feature helps to develop discourse and make it more accurate and contextually understandable. However, there are certain limitations to many earlier studies. First, most of these studies have concentrated on specific categories of cohesive grammatical devices that students employ most frequently when writing theses. Second, these studies largely involve counting frequencies, comparing the overall frequencies, and examining realizations of them in written texts. These studies found that a higher use of conjunctions was a good predictor of text organization. They also demonstrate that the type of conjunctions as cohesive devices used in writing affects its quality, so writing quality cannot be predicted solely by the frequency of their use. However, there has been little discussion about the impact of these devices on creating discourse. Third, studies examined the use of grammatical cohesive devices within certain sections of thesis writing, and suggest that L2 learners tend to use a particular set of conjunctions depending on the type of section. On the other hand, little is known about what a particular set of conjunctions as cohesive devices are used in the section of the problem statement, and how they impact the discourse of the problem statement is unexplored yet.

Thus, the current study argues that to identify cohesion within PS texts is to examine connections between text segments including conjunctions to connect ideas. These analyses of grammatical features can provide a greater understanding of the features of the PS in a corpus of actual texts of the Doctoral dissertation.

THEORETICAL FRAMEWORK OF THE STUDY

The current study based its theoretical framework on systemic functional linguistics (SFL). It underpins the study for a number of reasons. First, SFL a system network theory views language as a resource for ‘meaning-making’ in which every system represents a choice rather than a set of rules or unconscious decisions while these choices may be lexicogrammatical, semantic, or phonological (Halliday, 1985, 1993a, Halliday & Martin, 1993). In accordance with this perspective, SFL offers various lexicogrammatical choices ‘expressed by grammars as well as vocabularies’ (Halliday, 1994, p. xvii) for student writers to develop cohesive text, and is not simply following prescriptive rules (Forey, 2002). The present study focuses on the grammatical choices (conjunctions) of student writers in developing problem statement text. The system is also functional in terms of how language is used. Therefore, SFL is useful in analyzing PS texts and finding out the functional role of these types and cohesive features in Problem statement text.

The notion of SFL is helpful for the present study as it is important for the student writers to create explicit and unambiguous connections between the various sections of problem statement text (the focus of the current study) in the most fluent and appropriate ways to develop the more cohesive text. Student writers can utilize cohesive components to achieve cohesion (Halliday, 1994). A cohesive component that is realized through the means of cohesive ties: references, ellipsis, substitution, lexical cohesion in particular conjunctions (which is the focus of the current study).

In Problem Statement writing, it is generally important to indicate, using various linguistic devices, how one statement connects to another, or how the elements in one statement link to earlier discussion. These relations are signaled by grammatical features such as conjunctions which represent discourse structure and organization patterns (Tangkiengsirisin, 2010).

METHODOLOGY

Method

The current study adopted the discourse analysis method, using a descriptive interpretive approach. In this line, the quantitative analysis was applied. The quantitative analysis was used to determine the patterns of occurrences of cohesive features namely conjunctions of problem statement section in doctoral dissertations. For this purpose, the TagAnt 2.0.5 software was adopted to identify the conjunctions and count their frequency of occurrences. With the help of this software, a wordlist was created and then used to manually identify the occurrences of conjunctions, while any overlaps were removed.

Data Collection

To probe into the conjunctions as a cohesive feature of the Problem Statement section, the doctoral dissertations published from 2010 to 2022 formed the corpus of the current research. The doctoral dissertations were selected from the Department of English, Faculty of Modern Languages and Communication to be investigated in this research. Several inclusion criteria were put in place to build the corpus of doctoral dissertations for the present research. First, all the selected dissertations were written as requirements for the fulfillment of doctoral degrees by ESL students. Second, the selected dissertations had stand-alone problem statement sections that were separated from other sections in the introduction chapters because the focus of this research was on the problem statement sections, alone. Finally, besides the above-mentioned criteria, a publication date and time range had to be decided for selecting PSs. With the view that language is a dynamic and flexible phenomenon (Paltridge & Starfield, 2007), attempts were made to collect up-to-date data. Therefore, the investigated theses were chosen from the time interval of 2010 to 2022. The next step was to analyze the text in light of the adopted analytical framework. Finally, each selected sample was assigned a unique code and a number (e.g. PS1, PS4, and PS10).

Analytical Framework

Although Halliday and Matthiessen (2004) mentioned four elements are involved in the creation of cohesion in discourse (conjunction, ellipsis, reference, and lexical organization), the present study followed Schleppegrell (2004), who suggested conjunctions as cohesion elements of cohesive academic text and more appropriate in textual analysis of academic discourse (Naderi, 2014). Thus, for the cohesive features (i.e., conjunctions), the examination of the PS corpus was informed by the framework developed by Halliday and Matthiessen (2004) given below. Halliday and Matthiessen (2004) categorized conjunctions into four categories. They are temporal, causal, adversative, and additive. There are distinct markers for each type of conjunction that indicate a relationship between textual elements.

Elaboration is a re-expression for clarification with the help of which the previous sentence is re-said. The main examples are: *in other words, I mean (to say), that is (to say), for instance, for example, to illustrate, in fact, as a matter of fact*. Extension is “either addition or variation” (Halliday & Matthiessen, 2004, p.543) such as *and, also, moreover, in addition, nor, but, on the other hand, however, on the contrary, instead*. Enhancement is when a sentence develops on the meaning of another sentence. There are different types of enhancement conjunctives like: *meanwhile, similarly, therefore, as a result, still, all the same, nevertheless*. The whole system of conjunctions is presented in Figure 1

Conjunctions are a vital aspect of writing that contributes to cohesion in discourse. Unlike other cohesive devices like reference, substitution, and ellipsis, conjunctions do not simply create an anaphoric relation (Yeom, 2016). According to Halliday and Hasan (1976), conjunctive devices are cohesive indirectly through their specific meanings. Ghasemi (2013) explains that conjunctions are used to combine different parts of a text based on the meaning or purpose of the sentences. These devices are beneficial for learners in writing as they help to signal new points and connect ideas between sentences and paragraphs. Therefore, it is crucial to use conjunctions according to their purpose to connect and establish meaningful ideas.

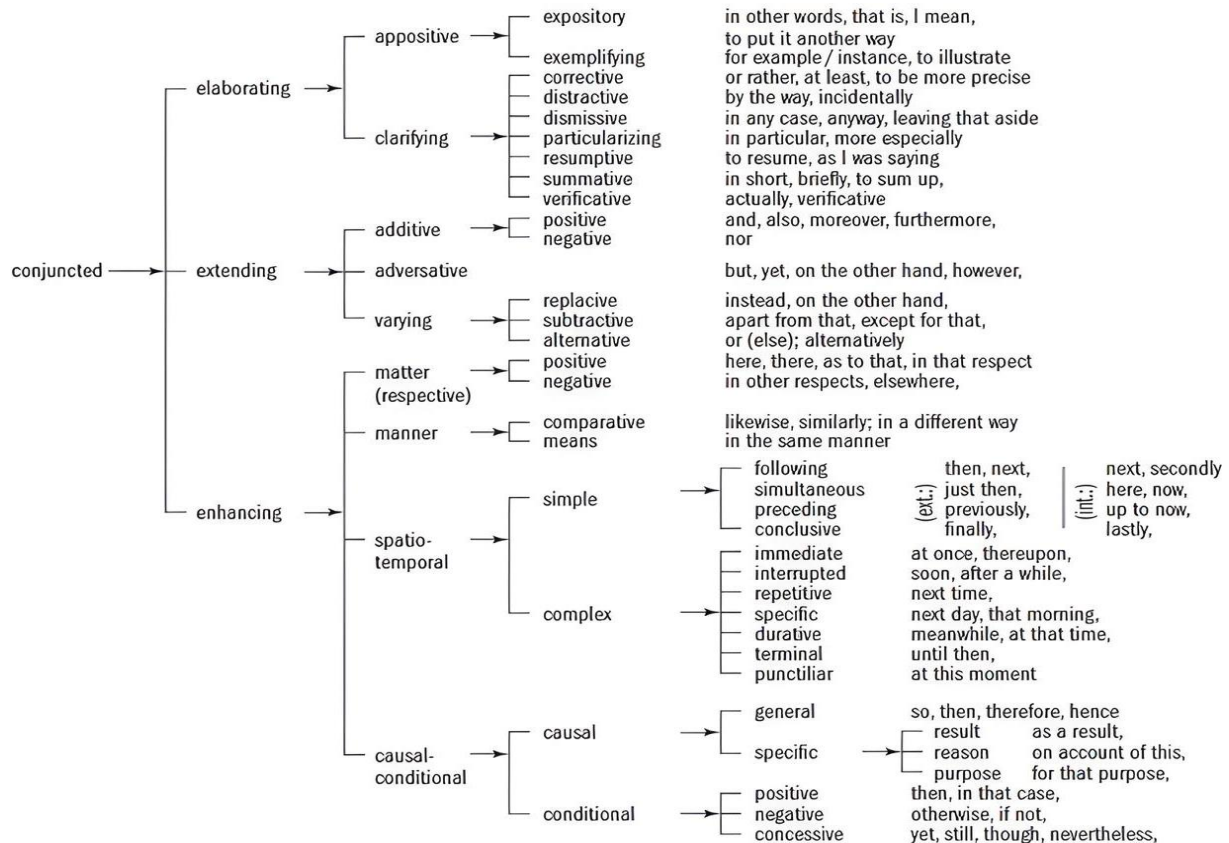


Figure 1 Conjunction system

DATA ANALYSIS TOOLS

THE SOFTWARE TOOL USED IN DATA ANALYSIS- TAG ANT 2.0.5

To analyze conjunctions, Tag Ant version 2.0.5 was used to assign parts of speech to each word (and another token), such as nouns, references, conjunctions, adjectives, etc., and their frequency of occurrences. TagAnt is a freeware, multi-language tagging tool built on top of the SpaCy natural language processing (NLP) framework. Laurence Anthony (2022) developed this program to generate the following components for each word: WORD, PART-OF-SPEECH (POS) NAME PART-OF-SPEECH (POS) TAG, LEMMA. Users can select language, display component information, choose output format, and adjust line endings using various options.

This computer software was chosen for this research for three reasons. First, it was free software that could be downloaded online and installed on a computer with an excellent user-friendly interface. Second, the software application was practical, providing useful and appropriate tools for the study. In this sense, it helped to make the analysis processes easier and faster as it would have been very difficult and time-consuming to assign parts of speech to cohesive features (conjunctions and references) that could appear in the corpus manually. The whole corpus was analyzed using Tag AntConc 2.0.5 to see occurrences of cohesive features.

DATA ANALYSIS PROCEDURE

To answer the research questions of the present study, all collected data needed to be analyzed and interpreted. This section explains the methods of data analysis and the instruments used in the current study.

To answer the research question, conjunction ties and their functions were analyzed in doctoral dissertations PSs. To meet the requirement of the software, the PS Word files were saved in Plain Text format (*.text file). The quantitative analysis of the conjunctions was done using the TagAnt 2.0.5 software application. There were two options for text input. It takes either direct input (typed into the interface) or an input list of TEXT files (.txt) and processes them to generate the following components for each word: word, part-of-speech (POS) name part-of-speech (POS) tag, and lemma. To identify conjunctive ties, the current research chose the combination of word and POS. The results were shown as an output display. For example, in the following Figure 3.2, there is a screenshot showing the conjunction *and* displayed as CCONJ.

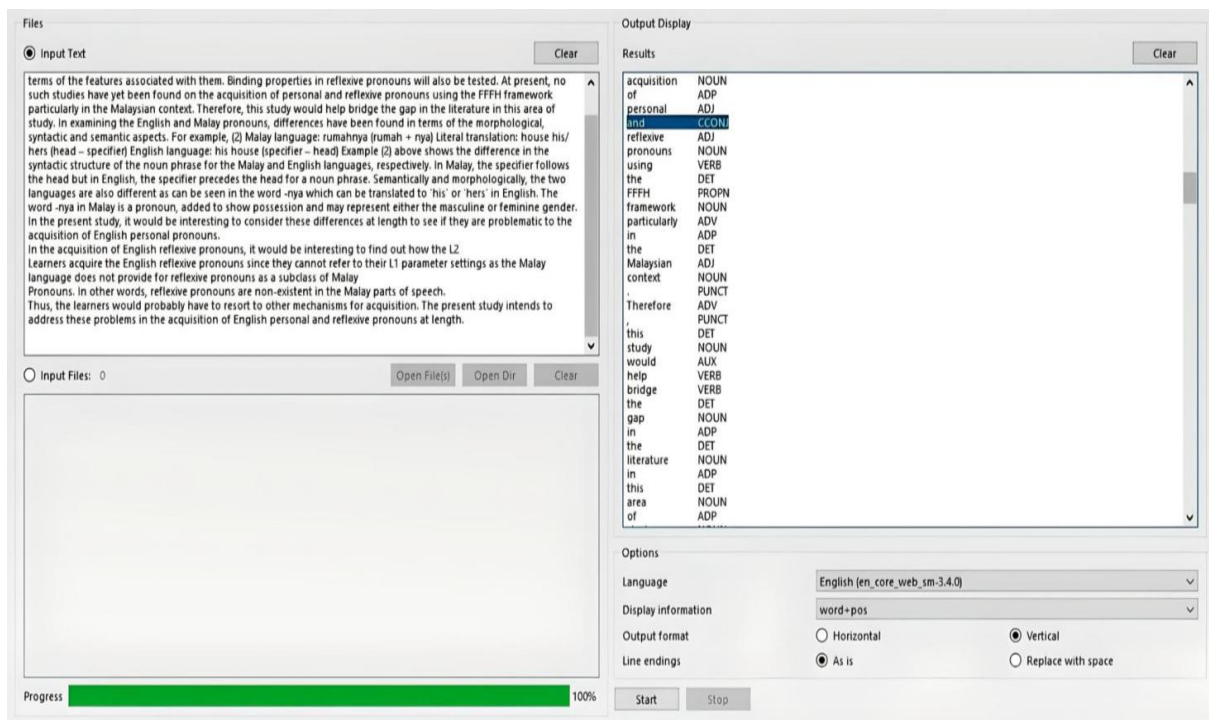


Figure 2 A screenshot showing the identification of conjunctions

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
192	Malay	PROPN												
193	and	CCONJ												
194	English	PROPN												
195	languages	NOUN												
196	,	PUNCT												
197	respective	ADV												
198	.	PUNCT												
199	In	ADP												
200	Malay	PROPN												
201	,	PUNCT												
202	the	DET												
203	specifier	ADJ												
204	follows	VERB												
205	the	DET												
206	head	NOUN												
207	but	CCONJ												
208	in	ADP												
209	English	PROPN												
210	,	PUNCT												
211	the	DET												
212	specifier	ADJ												
213	precedes	NOUN												
214	the	DET												
215	head	NOUN												
216	for	ADP												
217	a	DET												
218	noun	NOUN												
219	phrase	NOUN												
220	.	PUNCT												
221	Semantics	ADV												
222	and	CCONJ												

Figure 3 A screenshot showing the Excel file

The results were saved in an EXCEL file. Figure 3 is a screenshot showing conjunctive ties clearly. As the software application could only report the occurrences and frequencies of words, their functions were analyzed manually. To analyze conjunctions, the criteria suggested by Naderi (2014) were employed. He designed these criteria to examine conjunctions in the corpus of his study since many transition words appeared both as prepositions and conjunctions. Similarly, several transition words appeared in the corpus of the current study which had a function of both prepositions and conjunctions. Moreover, the criteria were also helpful in reaching more reliable results through the verification of the function of each conjunction found in the corpus. Hence, the current study found Naderi's criteria (2014) suitable and appropriate.

By employing the above-said criteria, first, the conjunctions were counted manually (repeating twice as suggested by Naderi, 2014) to ensure that they had relative/conjunctive functions in the texts. In other words, conjunctive ties were counted manually as this research was only interested in conjunctions that function in linking clauses, sentences, and paragraphs. Secondly, the conjunctions that were used in parallel structures were not included in the conjunction frequency counts because they do not develop the cohesion of the texts through connecting the clauses, according to Hallidyan's functional grammar. For example, conjunctive *and* appeared in the parallel structures (eg. *the acquisition of personal and reflexive pronouns*) rather than collecting a clause, so they had nothing to do with the cohesion of the text. After investigating the corpus for conjunctions, the final conjunctive ties were categorized according to the classifications that Halliday and Matthiessen (2004) suggested for the conjunctions: elaboration, extension, and enhancement. Based on their total number of occurrences, frequencies, and percentages of each conjunction and each category were determined. The final list was saved in a separate file with a Code name (e.g. *Extension conjunction*, *Elaboration conjunction*, *Enhancement conjunction*) as shown in the figures below.

Figure 4 A screenshot showing Extension conjunction

Figure 5 A screenshot showing Enhancement conjunction

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	Conj	in other w	that is (to	I mean(to	to put it a	for examp	for instani	thus	to illustra	or rather	at least	to be mor	by the wa	incidental	in any cas	anyway	leaving th	in particu	more spec
2	2010					2													
3	2011 (2)					1													
4	2011 (24)	1				3												1	
5	2011 (13)							3											
6	2011 (43)	NA																	
7	2012(2)																		
8	2012 (16)					2		1											
9	2012 (21)					1													
10	2012 (32)							2											
11	2013 (22)																		
12	2013 (56)							1											
13	2014 (4)																		
14	2014 (8)					1		2											
15	2014 (15)							2											
16	2014 (24)							1											
17	2014 (30)																		
18	2014 (64)							1											
19	2015 (39)					3												1	
20	2015 (46)	1				1													
21	2015 (54)						1												
22	2015 (55)							1											
23	2015 (84)	1																	
24	2015 (93)							2										1	
25	2015 (104)	1						1											
26	2016 (34)						1	1											

Figure 6 A screenshot showing Elaboration conjunction

RESULTS AND DISCUSSION

The analysis of the corpus of this study identified 42 conjunctions that occurred 1618 times. All three classifications of conjunctions according to Hallidayan Systemic Functional Grammar (which are Elaboration, Extension, and Enhancement) existed in these identified conjunctions although their distribution was not equal among the three types. While there were 23 types of conjunctions of enhancement class, there were 12 different types of extension conjunctions and there were only 7 types of elaboration conjunctions (Table 1). However, the frequency of the extension category of conjunctive elements was so high that these 12 types made 75.3% of the total conjunctions. The enhancement category which is the most diverse category with 23 different types of conjunctive ties constitutes 14.3% of the clausal and sentential linkers of the corpus. Only 10.3 % of the conjunctives of the texts under analysis belonged to the elaboration category. The results are presented in Table 1.

Table 1 Distribution of Conjunction.

Conjunctions	Frequency	No. of types	Percentage
Extension	1238	12	75.3%
Enhancement	235	23	14.3%
Elaboration	170	7	10.3%
Total	1643	42	100%

Extension conjunctions that have been used more than any other conjunctions generally could serve two functions: they can be employed to add information (*and, additionally, moreover*) or to vary information (*but, yet, however, on the other hand, on the contrary*) (Naderi, 2014). In terms of their functional relationship combined with expansion, these conjunctive elements, according to Halliday (2004), play two important roles: either they highlight the interdependency between clauses in clause complexes (*and, but, however*), or they increase cohesion between complex clauses (*also, moreover, therefore*).

Table 2 Distribution of Extension Conjunction.

Extension Conj.	Sub-Types	Frequency/ Percentage	Examples
Addition	Positive	709/(60%)	and, also, moreover
	Adversative	229/(19%)	but, yet, however, on the
	Negative	2/(0.16%)	other hand nor
Variation	Alternative	227/(19.2%)	or
	Replacive	12/(1.0%)	instead, on the contrary
	Subtractive	1/(0.08%)	apart from that
Total	1643	1180	

The result of the present study (see Table 2) indicates that the additive conjunctions were the common conjunctions since half of the conjunctive ties in the table of most frequent ones are additive ties making 60% of the total extension conjunctions. Additive conjunctions serve two main purposes in grammar: they connect two grammatically equal clauses and signal the introduction of new objects or referents into the discourse. When additive conjunctions—such as *and, or, similarly, furthermore*—are used in a sentence, they frequently highlight previously stated facts or utterances to provide background and diversity for those facts. They are relatively common in academic writing because they can establish continuity between phrases and help the discourse develop more naturally when additive conjunctive adverbs are incorporated (Janulienė, Aušra, & Dziedravičius, 2015).

The findings of the current study regarding the frequent use of extending conjunctions, in general, and additives, in particular, are in line with the findings of several other studies (Afrianto, 2017; Amayreh & Abdullah, 2022; Cabrejas, 2022; Kurniati, 2019; Kuswoyo, Sujatna, Indrayani & Rido, 2020; Mohammed, 2015; Prasetyaningrum, Asrobi, Surayya & Fikni, 2022; Safari & Mahdavi, 2021) which suggest that additive feature is prominent types of conjunctions. These findings are in congruence with the previous study (Afful & Nartey, 2014) which found that the frequent use of additives may stem from the writers' strong desire to explicitly itemize their points or advance their arguments chronologically.

This finding suggests additive as the most significant feature in doctoral dissertation Problem Statements, in particular 'Positive' conjunctives that play a significant role in the cohesion of the PS writing. The corpus exhibits much more positive additives than, for instance, adversatives and/or enhancing conjunctions. In the corpus of the current study, the most

frequently used additive conjunction was ‘*and*’ with 454 occurrences which alone made up 36% of the total extending conjunctions. The use of ‘*and*’ in the PS corpus indicates that PS writing is mainly dependent on adding new information, adding relevant new information to the previously mentioned information, and showing continuity in writing. In PS writing, the use of ‘*and*’ tends to lengthen what was written by giving more information. It is positive since it serves as a backup detail that never contradicts what the writer previously mentioned. While research confirms that additives are highly important in establishing idea relations, the findings of the current study indicate that there is not much variety of additives used in the Problem Statements. Instead, they were limited to ‘*and*’. The other additives such as ‘*also*’ (216), ‘*In addition*’ (58), and ‘*Moreover*’ (39) are the least used in PS writing. This may suggest that the PS writer’s knowledge of conjunctions may be limited, or they are more open and comfortable using the more common ones rather than other alternatives that establish extension.

Although, several studies (BayBay, 2022; Suari, Udayana & Parthama, 2022; Meisuo, 2000; Saeed, 2023) have agreed that the conjunction ‘*and*’ is common to be used as a cohesive feature in writing. However, these studies confirm there is an overuse and misuse of additives which made the writing look redundant and misleading. In particular, the use of additive conjunction ‘*and*’ (Saeed, 2023) as to add information is categorized as unnecessary. According to McLaughlin (2006), there is a noticeable difference in the use of ‘*and*’ between high and low-rated texts and argues that the conjunction ‘*and*’ signals a low level of proficiency in the conjunction’s usage on behalf of the writers. Since the conjunctive is thought to serve a less unifying purpose, it is avoided in high-rated texts but heavily used in those with low ones (Mohammed, 2015). As indicated in the findings of the current study, there is a high frequency of additive conjunctions, particularly ‘*and*’. This may imply that PS writers may avoid taking the risk of attempting structures they are not familiar with, or they lack a lexical range that would facilitate phrasing grammatical structures differently. The overuse of some conjunctions implies that it could have roots in a lack of language competence (Safari & Mahdavi-rad, 2021).

Another common extending conjunctive class in the current study is adversatives (*but*, *yet*, *however*, and *on the other hand*). Similarly, those of the additive type, create a link between sentences or clauses. Conjunctive adjuncts, on the other hand, establish an oppositional relation between constituents by connecting two or more contrasting arguments; consequently, contra-arguments are established semantically. Adversative conjunctions typically help academic writers establish a strong foundation for their work. They help in establishing the opposing views, which are essential for an objective evaluation of any phenomenon (Janulienė & Dziedravičius, 2015).

Even though the adversative conjunctions as one of the frequently used conjunctions, play a vital role in cohesion (Wu & Wang, 2019), the current study reported the lower frequencies of them. The corpus in the current study exhibits *however*, 108 occurrences, *and* 93 occurrences, *yet* with 14 occurrences, and *on the other hand* with 14 occurrences. This finding contrasts with other studies (Dania, 2018; Junina, 2022; Prasetyaningrum, Asrobi, Surayya & Fikni, 2022) with the most occurrences of adversative conjunctions for example, *but*, *on the other hand*, and, *however*.

As far as adversative connectors are concerned, ‘*however*’ is by far one of the most universal conjunctives (Janulienė & Dziedravičius, 2015) and is reported as the most frequently

used adversatives in research writing (Dania, 2018; Namaziandosta, Nasria & Keshmirshekanb, 2019; Ngadiman & Tanone, 2014). These studies claimed that the characteristics of good writing included highly frequent uses of adversatives, and a more frequent use of adversative, *however*. In the current study, the most exploited contrastive conjuncts are *however*, which are in fact the most frequent semantic conjuncts in the analysed PSs. It is in most cases used to indicate a gap in PSs where it presents a contrast to the previous literature or findings and indicates an argument. In simple terms, in PSs, it functions as a conjunctive to initiate an opposing argument or a contrary statement. In PSs writing, contra-arguments require a certain niche to maintain the stability of an unbiased problem statement. Hence, '*however*' is the principal tool for creating a well-balanced cohesive structure.

In the current study, another common conjunctive is '*but*' with 93 occurrences that appears to confirm Biber, Johansson, Leech, Conrad and Finegan's (1999) assertion that '*but*' is less common and prevalent in academic writings than all the other conjunctions. It implies that the occurrence of '*but*' may be attributable in reference to the idea that in PS writing, contrast is emphasized more frequently by the use of '*but*' instead of other ways such as *although*, *though*, and, *nevertheless*. As reported by Wu and Wang (2019) in their study that in the process of writing, there is not much importance attached to the use of the adversative conjunction to express the contrastive relationship between two sentences. The general pattern of the adversative connector employment in PS writing revealed that the writers tended to use connectors that seemed more familiar or simple to them, and they also tended to avoid connectors that seemed unfamiliar or complex to them. There is another noteworthy remark that using a greater range of connectives with the words *but*, *yet*, and *however* improves the writing quality. Hence, it may suggest that lower frequencies of adversative conjunctions in writing may have an impact on writing quality.

Another category of conjunction is Enhancement conjunctions which have been classified into four main categories by Halliday (1994); causal-conditional (causes and conditions), manner (means and comparison), temporal (time and sequences), and spatial (place). Among all four, causal conjunctives were found to be the most common in the corpus of the current study with 181 occurrences making 77% of total enhancement conjunctions as shown in Table 3 below.

Table 3 Distribution of Enhancement Conjunction.

Enhancement Conj.	Frequency/ Percentage	Examples
Causal-Conditional	181/ (77%)	therefore, hence, as a result, then, otherwise, yet, if not, still, though, nevertheless, despite this
Temporal	30/(12.7%)	then, next, finally, at once, meanwhile, at the same time
Manner	22/(9.3%)	likewise, similarly
Matter	2/(0.85%)	here, as to that
Total	235/(14.5%)	

Causal conjunctions establish a clear and direct cause-effect link between clauses or sentences. This suggests that there is a causal relationship between the two elements of discourse. Even though adversative conjunctions are frequently used in writing, how they are used can elicit different senses.

The current study found '*therefore*' as the most common causal conjunctive with 97 occurrences in the corpus. This finding is in conjugation with the findings of several studies (Cabarjas, 2022; Episiasi, Syaputri, Suramto & Kasriyati, 2022; Ludji, Hambandima & Christiani, 2022; Afrianto, 2018; Dania, 2018) which found *therefore* as the most common causal-conditional in research writing. However, this finding contrasts with the study of Suari, Udayana and Parthama (2022). This conjunctive is the primary means to indicate the phenomenon of cause-effect. To use it correctly, PS writers established a link between the two statements in the middle of which this conjunctive stands. In simple terms, a statement, made at some point in the surrounding context must be indicated because it connects to the forthcoming effect. In PS writing, the use of '*Therefore*' indicates a consequence, a particular result present in the following sentence. Based on the results from the corpus, the conjunctive '*therefore*' has a significantly wider usage, this could be because "therefore" is easy to incorporate within a clause and does not always imply a conclusion. Temporal conjunctions are used in writing to denote the introduction, argumentative section, and conclusion as checkpoints. Since temporal connectors create the framework for the writing in which the argumentative process takes place, their placement is of utter importance. According to Janulienė, Aušra, and Dziedravičius (2015), when temporal conjunctions are misused or omitted, the entire structure of an essay collapses and it is no longer regarded as a genuine academic work.

There are several studies (Afful & Nartey, 2014; Afrianto, 2017; Cabrejas, 2022; Dania, 2018; Episiasi, Syaputri, Suramto & Kasriyati, 2022; He, 2020; Ludji, Hambandima & Christiani, 2022) which show the use of temporal conjunction. However, in contrast to these studies, the current study found least instances of temporal conjunctions. Hence, the current study indicates '*therefore*' as the significant enhancement feature of problem statements in doctoral dissertations.

The Elaboration conjunctions are the least used (10.5%) in the corpus of the current study with 170 occurrences making 10.5 % of the total conjunctions. Their detailed sub-classifications according to Halliday and Matthiessen (2004) are presented in Table 4.

Table 4 Distribution of Elaboration Conjunction.

Elaboration Conj.	Frequency/ Percentage	Examples
Apposition	155/ (91.1%)	In other words, for example, for instance, thus
Clarification	15/(8.8%)	At least, in particular, actually
Total	170/(10.5%)	

This finding is in line with Mohammed's (2015) findings which suggest that the least employed conjunction was elaboration, with only 4 instances that form just 3% of the items. There are two conjunctives 'thus' with 71 occurrences and 'for example' with 45 occurrences used in the corpus of the current study. As far as elaboration conjunctions are concerned, they are not exclusively important for the desired cohesive effect (Janulienė, Aušra & Dziedravičius, 2015). However, the present study indicates the use of 'for example' and 'thus' as the significant elaboration features of PS in doctoral dissertations.

CONCLUSION

Overall, the results suggest that conjunctive adverbs are a crucial device in problem statement writing in the present work. The PS writers indeed employ different types of conjunctive adverbs such as additive, causal, adversative, and temporal to support the cohesive structure of the Problem statement. However, the findings indicate that PS writers have a limited number of linguistic devices in their repertoire to show coherence in their writing. In terms of frequency, the highest number of those employed belongs to the groups of additive connectors. These numbers prove that the addition of information or variation of information for appropriate argumentation to support the claims and the establishment of connections is the most important in Problem statement writing.

The findings of the present research have implications for PS writers and supervisors. To produce cohesive Text, PS writers need to be aware of the communicative purpose performed by Problem statements in the doctoral dissertations. Moreover, they need an awareness of the available linguistic resources that could help realize those communicative purposes. This is particularly important for non-native-speaking writers whose texts "are not perceived as appropriate" for professional practice (Martínez, 2003, p.104). Therefore, writers, especially ESL researchers should pay particular attention to the conjunctions as cohesive features to increase the cohesion in the problem statement writing.

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