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Analysis of Discourse Markers and Their Combinations in Nonnative Academic Writing

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***Abstract*—This study aimed to give a full account of discourse marker use in nonnative academic discourse. This study is a qualitative and quantitative investigation of discourse markers used in a corpus of 14 dissertations in applied linguistics from a Saudi university that uncovers the use patterns and DM combinations in abstracts, discussions, and conclusions. The model employed in the analysis was that of Fraser (2006), who classified discourse markers into four categories. The findings reveal a specific hierarchy of discourse use where elaborative discourse markers are the most frequent, followed by temporal discourse markers, contrastive discourse markers, and finally, inferential discourse markers. A notable tendency towards discourse marker clustering is also observed in the corpus.**

***Index Terms*—discourse markers, elaborative discourse markers, contrastive discourse markers, inferential discourse markers, temporal discourse markers**

I. Introduction

Mastery of discourse marker use in academic writing is essential for creating text coherence. Discourse markers are usually held as the "glue" of conversation, as they mark the speaker's attitude towards the listener and the ongoing discourse (Schiffrin, 1987). In written discourse, discourse markers play similar roles by helping to establish structure and organization in the discourse, building up relationships between ideas, and marking the writer's attitude or stance towards what is being discussed. The most widely recognized and used model of DMs is that of Fraser (1999), in which he defines discourse markers as:

> a class of lexical expressions drawn primarily from the syntactic classes of conjunctions, adverbs, and prepositional phrases…..They have a core meaning, which is procedural, not conceptual, and their more specific interpretation is 'negotiated' by the linguistic and conceptual context. (Fraser, 1999, p. 995)

Fraser (2009) classifies discourse markers into four classes: contrastive discourse markers (CDMs), elaborative discourse markers (EDMs), implicative discourse markers (IDMs), and temporal discourse markers (TDMs). They typically take the initial position in the second segment in a segment1-segment2 combination, signalling a semantic bond between the two segments. Discourse markers usually tend to occupy sentence initial position, although they sometimes can be found in different positions within a sentence (Šiniajeva, 2005).

According to Fraser (2021), several studies have proven that employing discourse markers can improve the cohesion and naturalness of discourse. Sun (2013), for example, considers DM use in academic writing as a way of making texts more comprehensible, improving the text's global coherence. Although not using discourse markers (DMs) does not mean the text does not conform to grammatical accuracy, their absence can make writing not natural enough (Brinton, 1996). This critical role discourse markers play in creating text unity and naturalness in texts makes investigating them in academic writing worthy of extensive research as it can deepen our understanding of the functions and effects of DM use across various contexts, providing direct insights into the use of these linguistic devices for language learners, educators, and researchers.

Though Ph.D. dissertations have been widely studied, there is a great scarcity of research directed explicitly at investigating the DMs used by EFL doctoral students in their abstracts, discussions, and conclusion sections of their dissertations. The findings of this study are hoped to contribute to the existing body of research on DM use in academic writing and provide valuable insights for improving EFL doctoral scholarly discourse. Understanding the specific discourse marker use patterns and combinations in dissertations can inform the development of writing curricula and materials designed according to the needs of EFL writers. It can shed light on the development of coherence, cohesion,

and pragmatic competence in the EFL context and open a new horizon for throwing light on the underexplored area of discourse markers combinations in EFL scholarly discourse. An example[1] of an instance of DM combination is (1),

(1) This clearly uncovers the teachers' tacit beliefs in preserving the same style of teaching not only by the same teacher, **but also** among different teachers.

Studying the use of discourse markers and their combinations in nonnative discourse is an interesting research direction this paper seeks to take. Despite the in-depth research conducted on the use and function of discourse markers (DMs) by scholars like Schourup (1985), Schiffrin (1987), Lenk (1998), Jucker and Smith (1998), Fraser (1999), Aijmer (2002), Fischer (2006), Heine (2012), and Degand et al. (2013), there is still one area that has yet to be explored. This new aspect involves looking at the phenomenon of DM combinations and the factors that cause the combination and sequence of individual DMs in clusters involving two or more adjacent or nonadjacent elements, commonly given terms such as clustering (Maschler, 1994), sequencing (Fraser, 2011; Lohmann & Koops, 2016), or combining (Fraser, 2015; Pons Bordería, 2018). Many studies consistently demonstrate that DMs frequently co-occur in natural speech across different languages (Pons Bordería, 2018; Cuenca & Marín, 2009; Dostie, 2013; Cuenca & Crible, 2019). These studies investigate various aspects, including the degrees of juxtaposition, the elements of co-occurring combinations, the scope, and functions of individual DMs in sequences, and distributional patterns. In summary, regardless of the extensive research on DMs, the combination of DMs in sequences, referred to as clustering, is an area that requires further investigation.

II. Significance of the Study

According to Leuckert and Rüdiger (2021), the amount of research conducted on discourse markers in countries like the United States, United Kingdom, and Canada is significantly greater compared to research focused on countries where English is spoken as a foreign language and used by speakers who primarily learn English in classroom settings and do not extensively use it in their daily lives outside of the classroom.

The study of discourse markers aligns with the growing trend in linguistic research beyond analyzing individual sentences. This trend, which started around 60 years ago, concentrates on investigating language at the discourse level (Schiffrin, 1987). Discourse markers have received significant attention in linguistic research due to their fundamental role in establishing text cohesion and coherence (Fraser, 1999). Text linguistics highlights how discourse markers play a key role in building relations that improve the overall coherence and comprehension of a text.

The ability of discourse markers (DMs) to combine has explicitly given new perspectives to investigating their combinatory properties. Trying to understand how learners acquire and use discourse markers, in addition to studying their ability to combine in combinations such as *but I mean* or *and so*, would broaden our knowledge of their pragmatic abilities and proficiency in the language. Comparing the present study's findings to earlier research on discourse marker use among undergraduate students is hoped to illuminate the developmental path of DM use along different proficiency levels. The scarcity of research on acquiring and developing discourse markers makes this comparative analysis very important. Thus, by investigating the DM use patterns of undergraduate students arrived at in previous studies about the present study's findings, researchers can understand how DM use develops as students advance into different proficiency levels (Taguchi, 2011). Although we are making progress in understanding how speakers, both native and non-native, engage in pragmatics through language use, there remains a significant knowledge gap in our understanding of the development of pragmatic competence in foreign language speakers. These studies inform pedagogical approaches and curriculum design aimed at effectively teaching academic writing skills to students at various proficiency levels. "While Discourse Markers (DMs) have been studied as individual markers (e.g., *but*, *so*, *instead*), little work has been done on their ability to combine" (Fraser, 2015, p. 1).

III. Previous Studies

The previous research on the use of discourse markers (DMs) among English language learners has been limited in the context of the Arab World, primarily focusing on the description of use patterns in EFL undergraduate learners. Many studies have focused on the use patterns of DMs, including the works of Ali and Mahadin (2016), Alghamdi (2014), Al-Yaari (2016), Al-Sharif (2017), Alsaawi (2022) and Ahmed et al. (2023). These studies generally indicate that Arab EFL learners face difficulties in writing, including misusing, overusing, or underusing DMs. Their primary focus was on using markers, such as *however*, *furthermore,* or *so,* rather than on their development or combinations. It is worth noting that Alsaawi (2022) briefly touched upon DM combinations, but the bulk of the research has centred around the individual functions and meanings of discourse markers. Other scholars, such as Romero Trillo (2002), Müller (2005), Fung and Carter (2007), and others, have also undertaken DM use analyses to gain further insights into the use of discourse markers use as a part of academic writing conventions. To the best of the researchers' knowledge, there is currently a scarcity of research focusing on the clustering properties of discourse markers (DMs) in EFL scholarly discourse. Although the research on the use of discourse markers in native speech and English as a foreign language (EFL) context has been proliferating, there has been a noticeable lack of research specifically directed to the use and sequencing (combinations) of discourse markers in EFL doctoral dissertations.

[1] All examples are taken from the corpus.

Research on the combinations of discourse markers in English originated from Fraser's (2009) study, which focused on investigating the sequencing of contrastive discourse markers (CDMs). Fraser's study revealed that only "but" could be the first element in combination with all other CDMs. Importantly, Fraser noted that the sequencing of discourse markers had not been extensively examined in previous literature before his study. He emphasized the need to explore not only the restrictions on the acceptable and unacceptable occurrence of specific CDM sequences (e.g., *but* + *instead*) but also the combinations involving elaborative discourse markers (EDMs) and inferential discourse markers (IDMs) with CDMs. Further research is still required to delve into these areas and comprehensively understand the combinations and sequencing patterns of different discourse markers (Fraser, 2011, p. 35).

Fraser's research, which shed light on the sequencing of DMs in English, resulted in increasing attention to DM combinations, particularly following Models of marker sequencing in English, such as those proposed by Koops and Lohmann (2015), which reveal a surprising level of systematicity in the ordering of discourse markers. Vicher and Sankoff (1989) originally suggested the presence of an *emergent syntax* of discourse markers. Cuenca and Marín (2008) conducted a semasiological analysis of DM combinations in oral narratives in Catalan, classifying DMs into four categories: conjunctions, parentheticals, pragmatic connectives, and interjections. The patterns of combinations are as follows: conjunction + conjunction (e.g., "I / quan" meaning "and / when"), conjunction + parenthetical (e.g., "perquè / a més" meaning "because / moreover"), conjunction + pragmatic marker (e.g., "I / bueno" meaning "and / well"), and parenthetical + pragmatic marker (e.g., "clar / a veure" meaning "sure / well"). The resulting three combinations are *juxtapositions* where DMs co-occur but do not combine, *addition* where DMs combine but keep their individual functions, and *composition*, where co-occurring DMs function as a complex unit.

Maslauskienė (2020) maintains that the syntactic position and the potential for DMs to combine can impact their semantic-pragmatic functioning. According to Aijmer (2016), the DM exhibits functional variations when used independently versus when combined with other DMs. Fraser (2015) conducted a study explicitly examining combinations of CDMs like *but* and, *on the other hand,* and IDMs such as *so* and *as a result.* Fraser could not provide a clear explanation for the occurrence of these combinations, but he suggested factors such as genre and style could be worth further examination. Fraser's study included a table representing acceptable combinations of CDMs (see Table 1). The analyzed corpora are COCA (450 million words, mostly written text) and BNC (100 million words, all written text). To organize the collected data effectively, a matrix featuring all 12 CDMs considered in the study and illustrating their combinations with one another was created. The left column represents the first CDM in a combination (e.g., but, however, yet), while the remaining columns represent the second CDM in a combination (e.g., but-however, but-yet).

TABLE 1
RESULTS OF COMBINATION MATRIX OF CDMS[2]

	But	However	Yet	Still	Nevertheless	OTOH	Instead	Conversely	In contrast	Rather	OTC	Alternatively
But		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
However	X		*	?	?	✓	✓		✓	*	?	?
Yet	X	✓		✓	✓	✓	✓	✓	✓	*	?	?
Still	X	✓			✓	?	?	*	*	*	?	?
Nevertheless	X	?	*	?		?	?	*	*	*	*	?
OTOH	X	✓										
Instead	x	✓										
Conversely	x	✓										
In contrast	x	✓										
Rather	x	*										
OTC	x	✓										
Alternatively	x	✓										

Each category of DMs is divided into primary and secondary subclasses; primary refers to the most general DM in the category (as *but* in CDMs), whereas secondary refers to DMs that convey a more specific relationship (as in *in contrast*, however, and *rather*). Two DMs can make up a DM combination if they occur acceptably as a single discourse marker in the combination of "S1. DM+S2" (Fraser, 2015, p. 2). The class of CDMs consists of at least the following 12 terms, one truly Primary CDM (but), but, however, yet, still, nevertheless, on the other hand, alternatively, on the contrary, in contrast, in comparison, conversely, instead, rather four, semi-Primary CDMs (however, yet, still, nevertheless), and seven Secondary CDMs (on the other hand, alternatively, on the contrary, in comparison, conversely, instead, rather). This categorization helps differentiate between broad and specific functions of DMs within a class. Due to a lack of in-depth study on the ability of the discourse marker *like* to co-occur with other discourse markers (DMs), Blanchard (2021) conducted a study to analyse the clustering tendencies of *like* in DM combinations, shedding light on how *like* interacts with other DMs and the most common combinations of *like* with other DMs. Based on conversational data in English

[2] Adopted from Fraser B. (2015, p. 339)

extracted from a corpus, Ceunca and Crible (2019) qualitatively analyse co-occurring discourse markers, precisely examining sequences of adjacent markers that belong to the same DM class but serve different functions. Various functional features of these co-occurring sequences were examined, including function, syntactic category, and position . The findings of the analysis reveal different degrees of combination. The study pays particular attention to cases that fall in between or are ambiguous, such as *and so* or *and then,* which represent different degrees of co-occurrence on a continuum based on the interpretable meaning of the cluster. The implications of these fine-grained differences are discussed. It emphasizes the importance of carefully analyzing co-occurring DMs.

Ph.D. researchers can be considered learners trained in academic writing skills. This type of analysis can cast light on areas where students may struggle or deviate from the established norms and conventions of the genre. It can also help identify areas where instruction tailored to the needs of researchers may be helpful for students in their journey toward becoming competent academic writers. A key feature of academic writing is maintaining argumentative coherence and adhering to conventions of writing (Andrews, 2007).

Discourse markers research has been a highly active and dynamic pragmatic research domain for the past three decades. Scholars have primarily focused on theorizing and analyzing the individual usage of discourse markers in different discourses, often overlooking their sequencing or clustering patterns. Bruce Fraser's 2011 work, "Sequencing of Contrastive Discourse Markers in English," particularly touched upon the study of the combinatory potential of DMs. The sequencing of DMs is a research area that has been under investigation. Hence, the principal objective of this study is to explore the use patterns of discourse markers in nonnative English speaker PhD discourse in applied linguistics. This study aims to add to the existing body of research on the topic by giving a full account of all possible combinations of DMs in nonnative scholarly discourse.

IV. Methodology

The taxonomy of discourse markers used in this study is based on Fraser's (1996) work, which provided a framework for analyzing and categorizing DMs based on their functions in discourse. Data collection and analysis procedures were both quantitative and qualitative. The phenomenon at hand in this article is the use of discourse markers in academic nonnative discourse. The prevailing assumption in discourse marker research suggests that only one marker or discourse relation exists in a sentence. By shedding light on this phenomenon, the study aims to contribute to a more comprehensive understanding of the co-occurrence and ordering of CDMs within scholarly nonnative discourse. Combinations from the same class as well as cross classes were studied. The researchers argue that occurrence of multiple CDMs and their respective characteristics should be investigated to better understand the text discourse structure and relations.

The present study is a corpus-based study in which the researcher compiled a corpus of EFL Saudi doctoral dissertations in Applied Linguistics written between 2017 and 2021. Later, researchers extracted and analyzed occurrences and distribution of discourse markers employed by nonnative speakers in their written discourse, specifically focusing on the abstracts, discussion, and conclusion sections of dissertations to examine the discourse marker patterns employed by EFL Saudi doctoral students in the parts of their dissertations where argumentation and synthesis of findings occur. The frequency of each discourse marker was quantified and examined using the Key Words in Context approach to gain deeper insights. ALL discourse markers were reviewed, and the surrounding context was studied to understand its use. Spreadsheets were studied individually to extend the corpus investigation beyond the limited scope of typical KWIC concordances. This detailed examination helped identify the items that genuinely demonstrated discourse marker use and allowed for the exclusion of any hits that were not functioning as discourse markers. By employing this in-depth process, the analysis ensured that only valid instances of discourse marker usage were considered, enhancing the accuracy and reliability of the findings. The study precisely highlighted and investigated adjacent and non-contiguous combinations of DMs. The objective was to investigate the complete range of DM combinations in non-native discourse and compare them to the patterns identified in Fraser's (2011, 2015) studies. Comparing nonnative and native DM use highlights potential differences in DM use and sequencing strategies. The present study adopted Fraser's framework of discourse marker (DM) classification as a basis for analyzing the use patterns of DMs (Table 2). Fraser's framework was chosen due to its comprehensive categorization of DMs, with a specific focus on contrastive discourse markers that indicate an explicit contrast between the interpretations of two different sentences (S1 and S2).

TABLE 2
FRASER'S TAXONOMY OF DISCOURSE MARKERS (1996, PP. 339-341)

Category	DMs
Contrastive Markers:	*All the same, Anyway, But, Contrariwise, Conversely, Despite (this/that), Even so, However, In any case/rate/event, In spite of (this/that), In comparison (with this/that), In contrast (to this/that), Instead (of doing this/that), Nevertheless, Nonetheless (This/That point), notwithstanding, On the other hand, On the contrary, Rather (than do this/that), Regardless (of this/that), Still, That said, Though, Yet*
Elaborative Markers	*Above all, Also, Alternatively, Analogously, And, Besides, Better, By the same token, Correspondingly, Equally, For example/instance, Further(more), In addition, In any case/event, In fact, In other words, In particular, Indeed, Likewise, More accurately, More importantly, More precisely, More specifically, More to the point, Moreover, On that basis, On top of it all, Or, Otherwise, Similarly, That is, To cap it all off, Too, What is more*
Inferential Markers	*Accordingly, After all, All things considered, As a consequence, As a logical conclusion, As a result, Because of this/that, Consequently, For this/that reason, Hence, In this/that case, It can be concluded that, It stands to reason that, Of course, On this/that condition, So, Then, Therefore, Thus* *Variations: for example, as a consequence, in accordance with*
Temporal Markers	*then, after, as soon as, before, eventually, finally, first, immediately afterwards, meantime, meanwhile, originally, second, subsequently, First and foremost*

The corpus was analyzed using the latest release of Ant Conc (4.2.4), a corpus toolkit that helps generate wordlists, concordances, and keywords (Anthony, 2023). The frequency and types of DM combinations in the corpus were highlighted. Examining potential errors or overuse can provide insights into the challenges non-native speakers face in acquiring and accurately employing DMs in their writing. Overall, using these tools in the analysis process allowed for a detailed exploration of DM usage in the corpus, providing valuable insights into the patterns and challenges associated with DM use by non-native speakers. Adjacent and nonadjacent combinations were examined to capture different syntactic and semantic relationships within the corpus. The discourse context in which the DM combinations occur was explored to see how the combinations contribute to the discourse's overall coherence and cohesion.

V. RESULTS AND DISCUSSION

The corpus analyzed in this study consists of 83,480 tokens, which is a substantial amount of data or examining the frequency and patterns of discourse marker use among EFL doctoral students. The highest frequency of discourse marker (DM) category in the corpus was observed in elaborative discourse markers (EDMs), followed by contrastive discourse markers (CDMs), then temporal discourse markers (TDMs), and the least frequent category was inferential discourse markers (IDMs). According to the data presented in Table 3, EDMs had the highest frequency as they occurred 1088 times, representing 49.18% of the total occurrences with *and* as the most frequently used EDM. CDMs appeared a total of 355 times, accounting for 16.04% of the total occurrences. *However* was the most frequently used CDM. IDMs appeared 299 times, making up 13.51% of the total occurrences, and the most frequently used IDM was *therefore*. TDMs appeared 470 times, accounting for 21.24% of the total occurrences. The most frequently used TDM was *when.* The most frequently used TDM was *when.* In total, 2212 occurrences of discourse markers were analyzed in the data. The percentage of each DM category is presented in Figure1.

TABLE 3
DISTRIBUTION OF CATEGORIES OF DISCOURSE MARKERS IN THE CORPUS

Type	Raw frequency	%	Most used DM
CDMs	355	16.04	However
EDMs	1088	49.18	And
IDMs	299	13.51	Therefore
TDMs	470	21.24	When
Total	2212	100	-

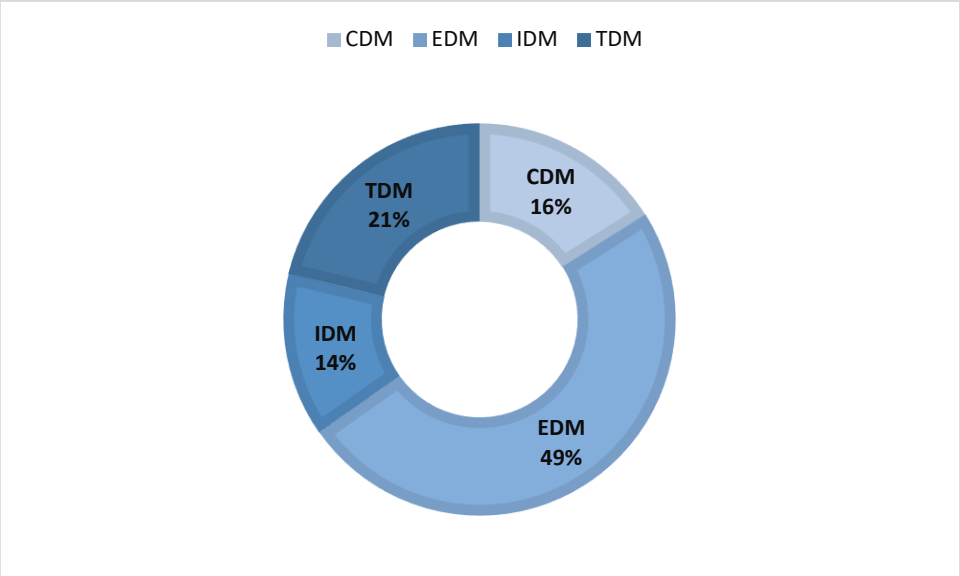

Figure 1. Percentage of DM Category in the Discourse

These findings align with previous studies that have also demonstrated EMDs as the most employed discourse markers. It is consistent with earlier studies conducted by Jalilifar (2008) and Prommas and Sinwongsuwat (2014), which have all confirmed that non-native speakers (NNS) tend to overuse discourse markers and that elaborative discourse markers are the most frequently employed DM category. The findings of this study are also in accordance with that of Alsaawi (2022) in that that the top frequency is for EDMs in both studies. However, they differ in the second-ranked category, which is CDMs in Alsaawi's study and TDMs in the present study. This might be attributed to the nature of research in applied linguistics, which often involves the reporting of quantitative data that includes temporal patterns and associations. As researchers investigate language acquisition and language change, it is inherent in their studies to explore temporal aspects. This emphasis on temporal aspects may contribute to the higher frequency of temporal discourse markers (TDMs) observed in the collected data.

The high frequency of EDMs in the corpus may be a sign of the nature of argumentative writing, as PhD authors often strive to introduce persuasive arguments and influence their readers. PhD authors' heavy reliance on the discourse marker *and* is likely due to several factors. Firstly, *and* is easily accessible and understandable to readers, making it a convenient choice for connecting ideas and maintaining coherence in academic writing. Additionally, L1 transfer could play a role in this preference, as authors may unconsciously transfer their Arabic DM use patterns, where *"wa" and* is often the default choice as it not only play a role in text cohesion but also fulfils other tasks such as introducing topics, being a conjunction of two or more entities, events or propositions, introducing units of discourse functioning as an adjunct to modify an event, and marking companionship and an association semantic roles, etc. (Alazzawie, 2014).

TABLE 4
FREQUENCY OF TOP 10 EDMS, TDMS, CDMS, AND IDMS

EDM	Freq.	IDM	Freq.	CDM	Freq.	TDM	Freq.
Also	244	Therefore	89	However	79	When	136
And	544	As a result	17	But	64	Already	16
As well as	56	Because of that	14	instead	18	Before	40
For example	35	Consequently	18	OTOH	22	Finally	25
in addition	58	Hence	20	Rather	47	First	18
Furthermore	39	So	30	in Comparison	14	Then	31
Moreover	67	Then	31	Still	16	After	50
That is	21	Accordingly	12	Whereas	13	While	71
in other words	14	In Accordance with	4	Despite this	12	Previously	13
Likewise	10	As a consequence	2	Yet	10	Until	9

Table 4 illustrates the top ten discourse markers used within each of the four categories and Figure 2 shows the top ten DMs used in the discourse. The most frequently used EDM is *and* with a frequency of 544. Other markers in this category, such as *also*, *in addition*, *as well as,* and *moreover,* also appear in the data, although with lower frequencies. This indicates that writers frequently use these DMs to add information, introduce additional points, or point out the accumulation of ideas. The data includes CDMs such as *however,* and *but*. These markers indicate contrast or opposition between ideas. *However* has a higher frequency (79) compared to *but* (64), suggesting that writers often use *however* to introduce

contrasting information or viewpoints. The data includes the causal marker *therefore* with a frequency of 89. This DM is used to indicate cause-and-effect relationships or logical conclusions. Its relatively high frequency suggests that writers frequently employ it to express the consequences or results of previous information or arguments. The data includes the temporal marker *when* which occurred 136 in the corpus. It is used to signify specific time relationships between events or actions. Its relatively high frequency suggests that authors frequently use it to introduce temporal information or describe a sequence of events.

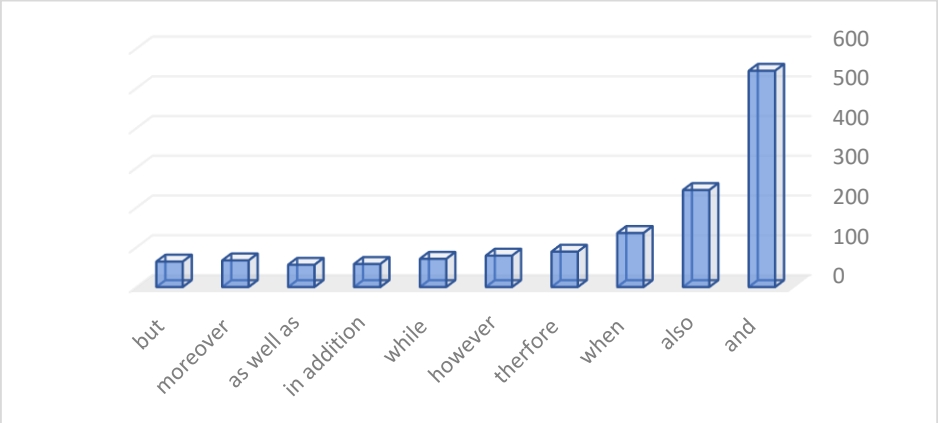

Figure 2. Top Ten DMs Used in the Corpus

VI. Discourse Marker Combinations

While Fraser's study mainly focused on combinations of CDMs, the present study sought to provide a broader account by examining combinations of all four categories of DMs. This cross-class combination exploration was suggested by Fraser. According to Fraser, "A whole world of combinations waits the curious" (Fraser, 2015, p. 339). However, it is important to note that the size of the corpus used in this study is limited. Thus, it can be assumed that larger corpora, as well as different registers or other sections of doctoral dissertations, may reveal additional combinations of DMs. By acknowledging the limitations of the current corpus size, future research can explore the potential for a more inclusive understanding of DM combinations in various linguistic contexts.

Table 5
Adjacent and Nonadjacent DM Combinations in the Corpus

	Adjacent DM Combinations	Nonadjacent DM Combinations
CDMs	But also	In spite of- despite
	But rather	OTOH[3]- as well as
	But instead	OTOH- when
	However after	
	However when	
	However although	
EDMs	Also conversely	Besides-also
	And further (to this)	In addition -also
	And when	Moreover also
	And also	
	And accordingly	
	And, therefore	
	And consequently	
	And in particular	
	Besides when	
	Moreover when	
IDMS		Accordingly—in addition
		Consequently-and
		Consequently- therefore
		Accordingly-in addition

Table 5 shows various DMs and their corresponding clusters in adjacent and nonadjacent formulas. In the discourse, the DMs *but*, *also*, *on the other hand*, *on the contrary*, *in spite of*, and *in particular* exhibited combinatory behaviour indicating a tendency to appear together in specific contexts or discourse structures. CDMs demonstrated the highest tendency to combine with other DMs, constituting 46.4% of all DM combinations. EDMs followed closely behind with 42.8%, while IDMs showed a lower tendency at 7.1%. TDMs exhibited the least tendency to combine, accounting for

[3] OTOH: on the other hand
OTC: on the contrary

only 3.5% of the total occurrences, which is considered negligible in comparison. In alignment with the results of Fraser's (2011) research, the CDM *but* occurred initial in combination with other CMDs like *instead* and *rather*. In all instances, it signals contrast between segment 1 and segment 2 while the second CDM clarifies the nature of the contrast. For example, the interpretation of *but*, in (2),

(1) (a) Some of them, for example, realized the difficulty of using only the target language in the classroom, **but instead** of removing this belief from their repertoire, they elaborated/polished it by allowing a certain amount of mother-tongue use to facilitate learning and understanding.
(b) Discernibly which targets the possibility of addressing the topic under investigation not from a specific-oriented dimension **but rather** from a universal perspective.

This is further specified in the use of *instead* which emphasizes the contrasting action being a response to the difficulty of just using L1 mentioned earlier. In (b), *but* introduces a contrasting idea between addressing the topic from a universal perspective compared to a specific-oriented dimension. *Rather* here strengthens the contrast presented by *but*. In Fraser's (2015) study, contrastive discourse markers show the greatest inclination towards combining when compared to other categories of DMs. The occurrence of cross-class combinations, such as CDM-IDM and IDM-CDM, is infrequent. The existence of cross-class combinations is demonstrated by the following examples.

(1) **Because** the study reveals that the effectiveness of OCF depends on the linguistic foci, teachers should adjust their OCF feedback strategies **accordingly**.
(2) **Accordingly**, the students were offered more than one activity to choose from, **in addition** to allowing them to choose their favourite role in role play to personalize their learning process.
(3) **Consequently**, the analysis of the students' eye movements indicates that there are differences in the students' visual word recognition, **and** these differences rely on the degree of the orthographic regularity of the language.
(4) **Consequently,** English proficiency is highly crucial for Saudi judges affiliated to Criminal Courts; it decreases the possibility of depending on translators **and**, **therefore**, guarantees a high level of justice and certitude concerning legal decisions and criminal rulings.
(5) Some of them, for example, realized the difficulty of using only the target language in the classroom, **but instead** of removing this belief from their repertoire, they elaborated/polished it by allowing a certain amount of mother-tongue use to facilitate learning and understanding.
(6) Discernibly which targets the possibility of addressing the topic under investigation not from a specific-oriented dimension **but rather** from a universal perspective.

The examples show instances of single-class clusters, as seen in (1), as well as clusters consisting of different classes, as observed in (2), (3), and (4). Examples (5) and (6) illustrate combinations of primary and secondary discourse markers of the same class (namely, CDMs).

1. Contrastive Discourse Markers

The primary discourse marker *but* is the most frequently occurring marker in the discourse, appearing 64 times. It is mostly bracketed together with the IDM *also* (13 occurrences), which is also another primary marker. The discourse marker *however* occurred 79 times and demonstrated various clusters, including *however when, however after,* and *however although. In spite of* occurred 6 times and sometimes associated with *despite* in a non-adjacent cluster as in (3),

(2) ***In spite of*** a lengthy duration of exposure to the L2, most of the pragmatic features are not obvious for learners **despite** all the opportunities that L2 environment may provide for the development of the pragmatic competence.

On the other hand occurred 6 times coupled with the EDM *also* in a non-adjacent sequence as in (4),

(3) ***On the other hand***, integrative motivation was ***also*** enhanced through many of the module activities, for example in the lesson entitled Where are you from?, the students adopted different names and nationalities.

2. Elaborative Discourse Markers

And occurred repeatedly in the corpus, revealing a high tendency to cluster with other discourse markers like *also, therefore, consequently,* and *accordingly.* Additionally, it was found to cluster with the contrasting DM *conversely.* Moreover, *besides* occurred in clusters, particularly combined with a temporal discourse marker (*when*), which was rare in the corpus, and also with the EDM *also. Besides* occurred in sequences such as *besides when*, *besides – also* in an adjacent and non-adjacent combination as in (5),

(4) (a) **Besides**, **when** students read and reread the wiki, they become more equipped and motivated to actively build on each other's work, unlike individual writing assignments.
(b) **Besides**, the instructor served as a facilitator for the students, who **also** scaffold each other; as mentioned before.

3. Inferential Discourse Markers

Accordingly occurred in a non-adjacent cluster along with *then* as in (6),

(5) **Accordingly**, they learn spelling and grammar skills better, since they use them in their compositions, **then** when they are drilled in these skills without the opportunity to compose,

Consequently also occurred in a non-adjacent cluster in (7),

(6) **Consequently**, scholars studying interlanguage pragmatics have stressed the importance of providing learners with explicit instruction on different pragmatic features, **as well as** raising their pragmatic awareness or consciousness in L2.

The DM *therefore* occur 89 times and is part of clusters like "*Therefore*, *it can be concluded*".

TABLE 6
DISCOURSE MARKER SEQUENCE ORDER

DM Category	First DM in Cluster
Contrastive	Yes
Elaborative	Yes
Inference	Yes
Temporal	No

It was observed that TDMs do not occur as the first element in a discourse marker combination. On the contrary, EDMs, IDMs, and CDMs have been found to occupy the initial position in discourse marker clusters (Table 6).

The results indicate that TDMs demonstrate the lowest tendency to combine with other discourse markers as opposed to TDMs which show the highest tendency to combine with other discourse markers. Particularly, the discourse marker *but* is the most frequent in combining with other discourse markers, often appearing as the first element in DM sequences involving various types of DMs from all four categories. These findings are consistent with Fraser's (2011) proposal that the functions of *'but'* are go beyond expressing direct contrast depending on the specific contrastive discourse marker it pairs with.

VII. CONCLUSION

Given their significance, this study aimed to examine the frequency, types, and combinations of DMs utilized by EFL doctoral students in the abstracts, discussion, and conclusion sections of their dissertations. In this study where a corpus of 83,480 tokens was investigated, the frequency of discourse marker use among EFL doctoral students revealed that elaborative discourse markers occupied the first place in the hierarchy of discourse marker use, followed by temporal, contrastive, and finally inferential discourse markers in descending order of frequency. The analysis revealed that contrastive discourse markers had the highest bent to combine with other discourse markers, followed by elaborative DMs, while inferential DMs showed a lower tendency, and temporal DMs exhibited the least inclination to combine. Cross-class combinations were infrequent but present in the corpus. Particularly, temporal DMs did not occur as the first component in DM combinations, while other DM categories tended to occupy the initial position. The findings are hoped to shed light on the most commonly used DMs in the field of applied linguistics.

This research is a contribution to laying the foundation for future investigations that can examine the specific acquisition patterns of DMs in other academic disciplines or explore the change in use patterns. It is hoped to facilitate the exploration of common challenges confronted by EFL learners in employing DMs in academic discourse. We can better understand of the development and patterns of discourse marker use as learners advance in their language proficiency by comparing these results with those of lower proficiency levels. This comparison can pinpoint the specific areas of development that EFL learners may have in their journey toward mastering the skill of using DMs in academic writing. Instructional methods and curriculum design can be enlightened by this knowledge, which is hoped to eventually support the development of EFL learners' discourse marker proficiency. The findings are hoped to have implications for language instruction and curriculum design. Investigating the sequencing of IDMs and EDMs is an area that Fraser (2011) regarded as an area awaiting further research. This can result in a deep understanding of the specific difficulties encountered by non-native speakers and consequently lead to design interventions to aid their effective use of DMs in academic writing. Previous research in this area is limited to undergraduates and does not specifically tackle DM use in EFL scholarly discourse.

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