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A Corpus-Based Study of Temporal and Causal Conjunctions in Clause Complex: A Case of British and Pakistani Research Discourse

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Abstract

The current corpus-based study investigates the frequency distributions of temporal and causal conjunctive relations in British and Pakistani research discourse by utilizing Halliday and Hassan (1976) framework of conjunctive relations. The study achieves its objectives by developing two corpora, British and Pakistani, each consisting of one million words. A mixed-methods approach (QUAN→qual) was employed to analyze the frequency distributions of temporal and causal conjunctions in both British and Pakistani corpora (Cresswell, 2007). The findings of the study show that temporal and causal conjunctions are less frequently used in the Pakistani corpus than in the British corpus. The study implies that Pakistani researchers' access to the native research discourse will enable them to widen their knowledge about the correct and variant use of temporal and causal conjunctive relations in their research discourse.

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INTRODUCTION

Halliday and Hasan (1976) define conjunction as indirect cohesive elements that are meaningful in themselves and predict the existence of other elements in the discourse or text. Emphasizing the coherent role of conjunctions, Malmkjaer and Anderson (1991) also consider conjunction an essential part of speech that joins other parts. Similarly, Aarts (2001) categorizes conjunctions as closed-class words with a linking function. Functionally, conjunctions are not the modifiers like adverbs; they function as logical linkers that bind the meaning over two or more clauses (Dixon, 2006).

Halliday and Hasan (1976) divide conjunctions into four types such as additive, adversative, temporal, and causal. These types are also called conjunctive relations by Halliday and Hasan (1976) as these conjunctions describe different kinds of relations of addition, negation, time sequence, purpose and reason in the sentences or clauses.Causal conjunctions illustrate the text's purpose, result and reason relations. These conjunctions are further divided into four sub-categories: causal general, reversed causal, conditional causal, and respective causal. Temporal conjunctions demonstrate the time and sequence relations in the clause complex. These conjunctions are divided into four sub-categories: temporal simple, complex temporal, internal temporal and 'here-and-now' temporal conjunctions. Halliday and Hasan (1976) argue that the use of conjunctions is considered to be meaningful in the text because conjunctions not only connect a word or sentence with other ones but also predict the presence of other elements in the context. McClure and Steffensen (1980) point out that conjunction is a clue that helps grab attention and show explicit logical relationships between clauses. Leung (2005) claims that conjunctions enable the reader to understand the discourse better. It also affects the ways of a text's perception.

Moreover, Siddiqui (2014) describes that using conjunctions is an essential part of sentences as it maintains the successful flow in any language's verbal and written communication. The use of conjunctions has become an attention-grabbing area of research due to its significant position in discourse (Biber, 2000; Conrad, 2000; Crewe, 1990; Geoffrey Leech & Svartvik, 2002). It has been studied in multiple branches of applied linguistics and different languages worldwide, i.e., Hebrew,

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Chinese, French, German, Danish, English, Finnish, etc. Logical connectors have been studied in different genre, such as health (Heritage & Sorjonen, 1994), Classroom interaction (Chaudron & Richards, 1985), newspaper (Cotter, 1996), political interviews (Wilson, 1993), tutorial sessions (Moser & Moore, 1995) and talk-shows (Cotter, 1996).

Chen (2014) states that it is observed at a large scale by many scholars, such as Crewe (1990), Altenberg and Tapper (1998), and Sanders and Noordman (2000) that conjunctions are considered to be a problematic concept by many second language learners due to several major reasons such as transfer of L1, wrong input methods and inter-language effects (Biber et al., 2004). Another drawback of second language learners is that they do not know the proper place of conjunctives in a sentence and a clause. Moreover, multiple types of conjunctions depend on the different types of speech events and registers.

Research Questions

1. What is the frequency distribution of temporal and causal conjunctive relations across British and Pakistani research discourse?
2. How does the use of conjunctive relations differ in British and Pakistani research discourse?

LITERATURE REVIEW

Several studies have explored the use of conjunctions by non-native learners. Some of these studies show the direct connections between the use of conjunction and the quality of the written text. These studies include the works of (Intaraprawat & Steffensen, 1995; Field & Oi, 1992; Jin, 2001); while other studies do not create a connection between the use of conjunction and writing styles and quality. These studies merely focused on identifying the frequent used, misused and underused connectors in native and non-native compositions (Johnson, 1992; Karasi, 1994).

Liu et al. (2018) compared the causal connector usage in the writings of graduate Chinese learners of English and non-English majors. The study used Quirk et al (1985) taxonomy of causal connectives, including prepositional, adverb, and conjunctional phrases. The findings showed that English majors were more proficient in using causal conjunctions than English non-majors. Furthermore, it was also found that English non-majors' use of causal connectors was confined to a low repertoire moreover, it was also less frequent and more complicated. The study suggested that Chinese learners should adopt a more careful selection of causal conjunctions according to different linguistic and social contexts. Secondly, it was emphasized that teachers should use divergent techniques and methods to teach different learners in different social contexts.

Fattah (2010) made a comparable corpus-based study of Arabic-translated and non-translated texts of philosophy and history. The study investigates the different types of discourse markers in the clause complex. The primary focus of the research was to search for lexico-grammatical features in the texts written by the same authors. The SFL approach was used for the analysis of logico-semantic features in two different clauses in the Arabic language. Moreover, the concessive and causal conjunctives examined through Arabic texts were compared to the English text of the same author in order to identify typical features and characteristics of translated texts. The result of the study showed an overuse of casual and concessive conjunctions in the translated texts compared to the non-translated texts. The study favored the explicitness hypothesis presented by many researchers who studied the features of translated texts.

Jamalzadeh (2017) investigated the use of conjunctions in the medical research discourse produced by Iranian and non-Iranian researchers by applying corpus-based techniques. The study size was limited to four hundred articles in each corpus. The taxonomy and framework of Halliday and Hassan (1976) was used in the study. The analysis showed that the overall frequency of tokens and types was equal in both Iranian and non-Iranian corpora. On the other hand, it was evident through the statistical analysis that additives were the most frequent type of conjunction in both Iranian and non-Iranian research papers, while temporal conjunctions were least used in both types of corpora.

The previous studies have focused on classroom-based tests, essays, and research articles in the written academic genre to analyze logical connectors. The present study fills the gap and investigates the frequency distributions of the comparatively substantial number of conjunctive relations, such as temporal and causal conjunctions, along with subcategories of each type in the Pakistani academic research discourse (Ph.D. dissertations) and compares them with that of British research discourse to analyze differences in the use of conjunctive relations.

METHODOLOGY

The present study utilized the sequential explanatory design (QUAN→qual) of the mixed method approach presented by Creswell and Clark (2017) in order to produce qualitative analysis of the quantitative data collected by the corpus tool Ant conc. First, Quantitative data in frequency is collected and then analyzed qualitatively in the light of research hypothesis. The study adopts the convenience sampling technique in order to collect native and non-native dissertations because the samples undertaken are readily available and accessible. The Ph.D. dissertations by the native researchers are

downloaded from the internet website WWW.ethos.bl.uk while the non-native researchers are downloaded from the internet source of Pakistan research repository of the National University of Modern Languages Pakistan.

Method of Data Collection

Study Samples and Study Size

Study samples are the miniature representatives of a large population (Fink, 2003). The study adopted the convenience sampling technique to collect native and non-native dissertations. According to Bryman (2008), the convenience sampling technique includes the selection of study samples that are easily accessible by the research. The dissertations of linguistics and literature by the native researchers are downloaded from the internet website www.ethos.bl.uk, while the theses of linguistics and literature by the non-native researchers are downloaded from the internet source of Pakistan Research Repository of HEC, Pakistan. The total words in native and non-native dissertations determine the study size. Native and non-native researcher's dissertations were used to compile two different corpora called native and non-native corpus. The total number of words (tokens) in the native corpus is 1,084,208 while in the non-native corpus is 1,064,446, also shown in table 3.1. Normalized frequency (frequency per million) of overall and type-wise conjunctives in both native and non-native corpora is derived in order to ensure representativeness and balance in both corpora. Normalized frequency is measured by applying the following formula:

Normalized frequency = Frequency of obtained words / total words in a corpus x 1,000,000

B) Compilation of Native and Non-Native Corpus

After downloading the native and non-native dissertations, the data is converted into plain text (.txt format) by using a PDF convertor (software that converts PDF files into plain text) to bring it into a machine-readable format. Afterwards, the data in plain text format is saved as different files. The study has compiled two different corpora named native and non-native corpus .The native corpus comprises dissertations of linguistics and literature by British scholars. The non-native corpus consists of dissertations by non-native Pakistani researchers at the National University of Modern Languages Islamabad.

Table-3.1: Description of Data Collection in Native and Non-native Corpus

Type of corpus	Total number of dissertations in linguistics and literature	Total words (tokens)

Native corpus	12	1084208
Non-native corpus	12	106446

Methods of Data Analysis

Use of Corpus Tool (AntConc)

The present study is a corpus-based comparative investigation of the use of conjunctive relations, i.e., additive, adversative, temporal, and causal in the native and non-native research discourse. AntConc is used as a tool of the study in order to measure the frequent use of conjunctives in both native and non-native corpora quantitatively. Computational linguistics has given birth to many new and innovative techniques and methodologies that have made the work easier. AntConc is software that is created by Laurance Anthony for conducting multiple type of corpus linguistics research. It comprises seven different tools such as concordance tool, concordance plot tool, file view tool, N-Grams, word list, collocates and keyword list. This software presents results in range, frequency, and rank after scanning the required words. It has been used by many researchers such as Muddhi (2014), and Uzun, (2018) for conducting corpus-based comparative studies of the frequent use of conjunctions in the native and non-native written discourse.

The present study used the concordance tool of Antconc version 3.5.8 to measure the frequency of conjunctive relations in native and non-native corpora. This tool presents results in the form of (KWIC) Keyword in context. The frequency of conjunctive relations temporal and causal conjunctions is measured by entering native and non-native files in the antconc separately by clicking on the open directory option in the file menu. After that, different conjunctives are entered in the search bar one by one to find out the concordance hits (total frequency of a search item in the corpus). The contextual use of the conjunctives is also examined by clicking on the highlighted search item in order to discover the category of the conjunctive. For example, the conjunctive ‘then’ falls into two types of conjunctives i.e., sequential and temporal. The concordance hits of ‘then’ provides only the overall frequency of the conjunctives; therefore, contextual use of ‘then’ is analyzed by observing it in KWIC

Use of Table and graph

The mixed-methods approach as presented by Creswell (2007) is used to analyze the frequent

use of conjunctives in the native and the non-native corpora. After measuring the frequency of conjunctive relations in both corpora through a concordance program AntConc (version 3.5.8), tables showing the comparative frequency of conjunctive relations such as temporal and causal conjunctions in both native and Pakistani corpora are presented to describe the overall and category wise comparative differences found in the use of conjunctive relations quantitatively. Afterward, bar graphs are produced in order to explain the frequent and infrequent use of conjunctive relations in both native and non-native corpora, respectively. The corpus-based analysis of concordance hits through a quantitative approach revealed the extent to which variations in the usage of temporal and causal conjunctions exist, while graphical representations explained the reasons and implications of the conjunctive variations in the British and the non-native Pakistani corpora qualitatively.

Theoretical Framework

According to Halliday and Hasan (1976), conjunctions are considered to be different in nature compared to other cohesive devices. The main reason for the difference lies in the functions of conjunctions. Unlike other cohesive devices, i.e., substitution, ellipsis, and references, conjunction also creates meanings in the text while performing its referential purpose. According to Halliday and Hasan (1976), many other complex categories of conjunctions exist, but preferred to use only four categories of conjunctions i.e., additive, adversative, temporal, and causal in relation to their semantic functions in the text. Halliday and Hasan (1976)) argued that the reason behind this selection was to elaborate the cohesive function of conjunctions in a simple way rather than making it more intricate. These categories of conjunction are known as conjunctive relations as these types are in fact sources of creating different types of positive, negative, and sequential relations in the text. All these types of conjunctions can be used externally and internally in the text. External conjunctions show the ideational function of language. These are also known as situation time conjunctives. On the other hand, internal conjunctions show language's interpersonal function and are also known as thesis time conjunctions. Halliday and Hasan's's (1976) categories of conjunctive relations that are selected for the present study are explained in the following sections.

Causal Conjunctions

According to Halliday and Hassan (1976), causal conjunctions illustrate the text's purpose, result and reason relations. These conjunctions are further divided into four sub-categories: causal general, reversed causal, conditional causal, and respective causal. Causal general includes conjunctions such as 'hence', 'so', 'then' and 'therefore', emphatic relation includes the use of conjunctions i.e., accordingly,

consequently, specific reversed causal relations include conjunctions showing reason, consequence, and objective while conditional relations comprise of conjunctions like under these circumstances, because then and otherwise. General reversed causal relations include conjunctions such as because and for in the Hallidayan framework. Respective causal relations include conjunctions showing direct causal relation like here, in this respect, and aside from this, while some causal show reversed polarity, i.e., the use of otherwise, in other respects and aside from this.

Temporal Conjunctions

According to Halliday and Hassan (1976) temporal conjunctions demonstrate the time and sequence relations in the clause complex. These conjunctions are divided into four sub-categories: temporal simple, complex temporal, internal temporal and 'here-and-now' temporal conjunctions. Simple temporal conjunctions include use of sequential temporal i.e., next, after that, firstly, secondly, and then. Simultaneous simple temporal relations include conjunctives such as, before that, simultaneously, and, in the meanwhile, etc. Conclusive simple temporal conjunctives include use of connectors like in the end, finally, to sum-up, to conclude with, to resume, and briefly. The second type of temporal complex comprises of conjunctions showing immediate, interrupted, repetitive, specific terminal, and durative relations. Internal temporal conjunctions show the sequential, conclusive, and correlative forms, i.e., sequential and conclusive relations in the text. The fourth temporal type is termed 'here-and-now' as it explains the text's time sequence, such as past, present and future relations. Moreover, the use of summarizing conjunctives, i.e., to sum up, briefly, to resume, and to return to the point, is also described in this temporal category.

ANALYSIS AND DISCUSSION

The present research article has set specific research objectives that must be achieved using the corpus-based approach. These research objectives include identifying the overall distribution and differences of conjunctive relations, such as additives and adversatives, in native and non-native research discourse. Furthermore, two research questions are set by the researcher of the present study to achieve these certain research objectives. The answers to these research questions were explored by applying the mixed method approach proposed by Creswell (2007) to determine the frequency distributions of conjunctive relations in native and non-native corpora. Finally, the objectives will be achieved by answering these research questions.

Overall Frequency Distribution of Temporal and Causal Conjunctive Relations

The overall frequency of conjunctives in both native and non-native corpora is measured by calculating total words in both corpora and the overall frequency of concordance hits of conjunctives. A total number of words (Tokens) in the native corpus is 1,084,208, while in non-native corpus it is 1,064,446. On the other hand, it is found by the corpus-based analysis that total number of conjunctives in the native corpus is 39,433, while in the non-native corpus frequency of conjunctives is 50,881. The corpus-based analysis also shows that the overall frequency of conjunctives in the native corpus is 3.63%, while in the non-native corpus it is 4.78%. The result of the study shows noticeable differences in the use of frequent conjunctives in both native and non-native corpora. It is found that the frequency of conjunctive usage is 1.15% higher in the non-native corpus as compared to the frequency distribution of conjunctives in the native corpus.

On the other hand, lexical density in each native and non-native corpus is also measured by the type-token ratio (TTR). Lexical density refers to the concept of having a more significant number of different types of lexical words. Token refers to the total number of words in a corpus, while type refers to diverse types of words in a corpus. The token ratio is measured by dividing total word types by total tokens in native and non-native corpora. The total number of tokens in the native corpus is 1084208, while the non-native corpus is 1064446.

On the other hand, total number of word types in the native corpus is 45480, and in the non-native corpus is 28593. So, the results show that the type-token ratio in the native corpus is 4.19% while in the non-native corpus it is 2.68%that is comparatively lower than the type-token ratio in the native corpus. The higher rate of type-token ratio in the native corpus demonstrates that the native corpus is denser than the non-native corpus. The findings of the study prove that the non-native researchers used less variety of conjunctive connectives than the native researchers or scholars.

In the same way, overall comparative variation in the use of conjunctives, i.e., additives and adversatives in both native and non-native corpora is also measured by calculating the type-token ratio of these conjunctive relations. In order to find TTR of conjunctives in both native and non-native corpora, total number of different conjunctives is divided by the total frequency of conjunctive relations in both native and non-native corpora. Total number of conjunctive tokens in the native corpus is 39433 while in non-native corpus is 50881 as shown in table 4.1. On the other hand, total number of different conjunctives in native and non-native corpora is 98. The results of the study showed that the native corpus comprised of 0.248% conjunctive variation while the non-native corpus showed comparatively a

low type-token ratio of 0.192%. The type-token ratio of conjunctives in both native and non-native corpora indicates that the native corpus has a higher rate of TTR, meaning that the native scholars used a higher variety of conjunctives in their academic compositions with less repetition. While non-native corpus showed a low rate of TTR of conjunctives, it indicates the non native scholars' tendency to use less variety of conjunctives in their academic writings with greater repetitions of the same conjunctions. The results of the study are also supported by the corpus-based study of Martínez (2015), who has studied the use of logical connectors in secondary level learners' compositions and exposed through quantitative analysis that native speakers showed a higher variety of conjunctions in their academic writings as compared to the non-native learners who tend to overuse the same logical connectors rather than the usage of different variety of conjunctions in their academic writings. Moreover, research by Heino (2010) has also supported the present study's findings by declaring that native writers showed quality writing due to having more comprehensive knowledge of a variety of logical connectors.

Differences in the Use of Conjunctive Relations

The study has revealed that the Causals are 25.72% frequently used in the native corpus while 23.93% in the non-native Pakistani corpus. On the other hand, the total frequency of temporal is 4.47% in the native corpus while 3.24% in the non-native corpus, which is a lower frequency of conjunctive relations as compared to the adversative. Temporal and casuals are less frequently used in the non-native Pakistani corpus when compared to that of the British corpus. The frequency distributions of temporal and causal conjunctions in both corpora are shown in table 4.1.

Table-4.1: Frequency and Percentage of Types of Temporal and Causal Conjunctions in the Native and Non-native Corpus

Serial No	**Types of conjunctive relation**	**Frequency in native corpus**	**%**	**Frequency in non-native corpus**	**%**
1	**Temporal**	**1761**	**4.47**	**1647**	**3.23**
2	**Causal**	**1042**	**25.72**	**12174**	**23.92**

The frequency analysis of different types of conjunctive relations in both native and non-native corpora shows that the overall frequency percentage of temporal is 1.24% while frequency of casuals is 1.8% higher in the native corpus than that of the non-native Pakistani corpus. The research results are

consistent with the results produced by many other researchers' studies (Muddhi & Hussein, 2014; Uzun, 2017; Yoon, 2006). Uzun, K (2017) through a quantitative approach analyzed the use of linkers in the argumentative essays of Turkish students and compared with that of native writers. The corpus of Turkish writings was comprised of 160 essays by 40 students. By applying Hassan and Halliday's (1976) model of conjunctions the researcher revealed that the ELT learners used more additives than the temporal conjunctions. Another research by Ishikawa (2009) explored the divergent usage of conjunctive relations in Asian, Chinese, and Japanese compositions. Three types of corpora, ANNS, CLE, and JLE, were compared to the ICLE (International Corpus of Learner English). The results of the research exposed that there was a considerable difference between the native and non-native use of linkers. Asian ESL learners overused the additives that functioned as additional markers and intensifiers, whereas they underused adversatives and temporal.

Table-4.2: Frequency and Percentage of Temporal Conjunctions in the Native and the Non-native Corpora

Serial No	Type of conjunctive relation	Words	Frequency in Native corpus	%	Frequency in Non-native Corpus	%
1	Temporal Simple	Next	302	17	312	19
2		after that	22	1	17	1
3		just then	0	0	0	0
4		at the same time	107	6	99	6
5		Previously	86	5	41	2
6		before that	7	0	3	0
7		Then	656	37	408	25
8		Finally	189	11	155	9
9		at last	11	1	8	0
10		first…then	42	2	39	2
11		as first	3	0	8	0

12		in the end	18	1	38	2
		Total	**1443**	**82**	**1128**	**68**
13	**Complex**	at once	15	1	8	0
14		there upon	0	0	0	0
15		Soon	68	4	26	2
16		after a time	1	0	0	0
17		next time	3	0	4	0
18		on another occasion	2	0	4	0
19		next day	8	0	4	0
20		an hour later	1	0	0	0
21		at this moment	1	0	7	0
		Total	**99**	**6**	**53**	**3**
22	**Internal Temporal**	Secondly	56	3	81	5
23		in conclusion	5	0	3	0
24		first…next	39	2	15	1
		Total	**100**	**6**	**99**	**6**
25	**Here and Now**					
26		up to now	0	0	1	0
27		Hitherto	14	1	2	0
28		at this point	35	2	2	0
29		Here	4	0	281	17
30		from now on	0	0	0	0
31		hence forward	0	0	0	0
32		to sum up	6	0	10	1
33		in short	16	1	41	2
34		Briefly	39	2	30	2
35		to resume	1	0	0	0

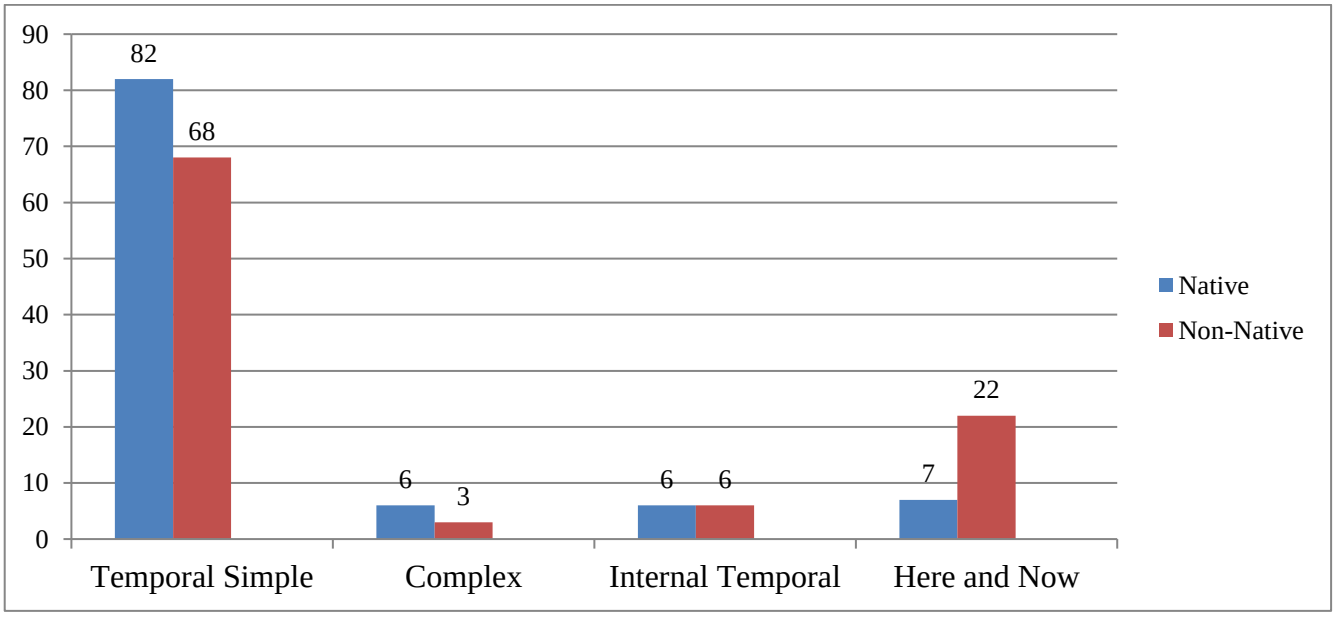
36		to return to the point	0	0	0	0
		Total	**119**	**7**	**367**	**22**

The above-given table (4.2) shows comparative frequencies of four types of temporal conjunctions i.e., temporal simple, complex, internal temporal, and here and now in both native and non-native corpora. The findings show that temporal simple is the most frequently used type of the temporal conjunction followed by the other types of temporal conjunctions such as here and now, internal temporal and complex temporal conjunctions, respectively in both native and non-native corpora, as shown in figure 4.2. The overall frequency of temporal simple conjunction is 82% in the native corpus and 68% in the non-native corpus. The frequency in the native corpus is 14% higher than that of the non-native corpus. The simple temporal 'then' is found to be the most frequently used temporal in the native and the non-native corpora showing 37% frequency in the native corpus and 25% frequency in the non-native corpus. The native corpus shows 12% more frequent use of 'then' as compared to that of the non-native corpus. The other simple temporal conjunctives according to their higher frequencies are next, at the same time, finally, first…..then, in the end, at last and before that respectively. The least frequently used simple temporal in the native and the non-native corpora are 'as first and before that' with the frequencies of 0% in both corpora. On the other hand, the use of temporal 'just then' is not found in both native and the non-native corpora. The results are variant with Fakhra (2009) study who analyzed through a corpus-based study on conjunction that the use of temporal simple 'then' followed by 'finally' was excessively used by the Syrian EFL learners than the native learners. On the other hand, native learners tend to overuse the simple temporal 'finally' in their compositions.

The results reveal that the second most frequent type of temporal conjunctions is found to be 'here and now' in both native and non-native corpora as shown through figure 4.2. The overall frequency of here and now temporal conjunction in the native corpus is 7% while in the non-native corpus is 22% which shows that the non-native researchers tend to use 15% more frequent use of here and now temporal conjunctives in their academic writings than the native researchers. The use of here and now temporal conjunction 'briefly' is found to be most frequent (2%) in the native corpus followed by other here and now temporal i.e. at this point, hitherto, in short, to sum up, here and to resume respectively. On the other hand, the here and now temporal conjunction 'here' is found to be the most frequently (17%) used temporal conjunction while 'up to now' shows lowest frequency (1%) in the non-native corpus. It is

found through the table 4.2 that the use of internal temporal is equally frequent (6%) in both native and non-native corpora. The use of internal temporal is found to be equally frequent in the native and the non-native corpus as their overall frequency is 6% in both corpora. However, the analysis shows that the use of internal temporal 'secondly' is most frequently used in the non-native corpus (5%) as compared to that of the native corpus (3%). The other internal temporal conjunctions followed by 'secondly' are 'first', 'next' and 'in conclusion' in both corpora respectively. The fourth and least used type of temporal conjunction is complex temporal. The results show that overall frequency of complex temporal conjunctions is 6% in the native corpus while it is only 3% in the non-native corpus. The native corpus shows 3% higher usage of complex temporal conjunctions than the non-native corpus. Although the use of complex temporal conjunctions 'soon' is found to be the most frequently used conjunction in the both native and non-native corpora as compared to other complex temporal i.e. at once, after a time, next time, next day, on another occasion and at this moment yet it is 2% more frequently used in the native corpus than the non-native corpus.

Figure-4.3: A Bar Graph Showing Frequencies of Different Types of Temporal in the Native and Non-native Corpora



The above-mentioned graph 4.3 shows the comparative frequencies of different types of temporal conjunctions i.e., temporal simple, complex, internal temporal and here and now. It is evident through

the graph that temporal simple is the most frequent type of temporal in the both native and the non-native corpora and complex is the least frequently used in the non-native corpus with the frequency of 3%. The graph also demonstrates that the here and now is only type of temporal that is more frequently used in the non-native corpus (22%) than the native corpus which shows only 7% frequent use of Here and Now. The results show that the overall use of temporal in the non-native researcher's compositions is less frequent as compared to the native researcher's academic writings. The use of internal temporal is found to be same 6% in both native and non-native corpora as shown in the graph 4.3.

Table-4.4: Frequency and Percentage of Causal in Native and Non-native Corpora

Serial No	Type of Conjunctive Relation	Words	Frequency in native Corpus	%	Frequency in Non-native Corpus	%
1	**Causal General**	So	1354	13.35	973	7.99
2		Hence	180	1.77	149	1.22
3		Therefore	351	3.46	636	5.22
4		Consequently	126	1.24	90	0.74
5		because of this	3	0.03	2	0.02
6		for this reason,	17	0.17	24	0.20
7		on account of this	0	0.00	0	0.00
8		as a result	49	0.48	103	0.85
9		in consequence	5	0.05	1	0.01
10		for this purpose	7	0.07	51	0.42
11		with this in	4	0.04	1	0.01

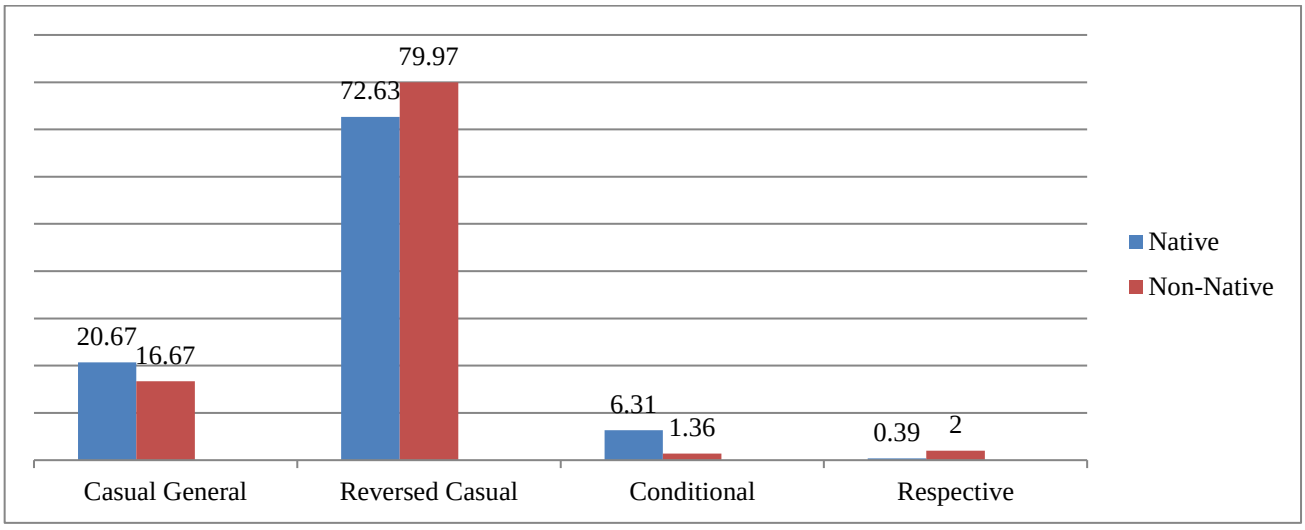
		mind				
		Total	**2096**	**20.67**	**2030**	**16.67**
12	**Reversed Causal**	For	6613	65.20	8919	73.26
13		Because	683	6.73	809	6.65
14		it follows	54	0.53	4	0.03
15		on this basis	7	0.07	2	0.02
16		arising out of this	0	0.00	0	0.00
17		to this end	9	0.09	2	0.02
		Total	**7366**	**72.63**	**9736**	**79.97**
18	**Conditional**	Then	556	5.48	102	0.84
19		in that case	6	0.06	2	0.02
20		in such an event	0	0.00	0	0.00
21		that being so	3	0.03	1	0.01
22		under the circumstance	0	0.00	0	0.00
23		Otherwise	75	0.74	60	0.49
24		under other circumstance	0	0.00	0	0.00
		Total	**640**	**6.31**	**165**	**1.36**
25	**Respective**	in this respect	29	0.29	12	0.10
26		in this regard	7	0.07	124	1.02

27		with reference	4	0.04	107	0.88
28		aside from this	0	0.00	0	0.00
29		in other respects	0	0.00	0	0.00
		Total	**40**	**0.39**	**243**	**2.00**

The above- mentioned table 4.4 illustrates the frequency distribution of four different types of causal i.e., causal general, reversed causal, conditional and respective conjunctives in both native and non-native corpora. The findings reveal that the use of reversed causal is the most frequent in both native and the non-native corpora. The other types of causal i.e., causal general, conditional, and respective are followed by the reversed causal respectively as also shown in the graph 4.6. The findings show that the overall frequency of causal general is 20.67% in the native corpus and 16.67% in the non-native corpus. The overall frequency of causal general conjunctions is found to be 4% higher in the native corpus as compared to that of the non-native corpus. Although the use of the causal general conjunction 'so' is found to be the most frequent in both native and non-native corpora as compared to other causal generals i.e. hence, therefore, consequently, for this reason and with this in mind yet the frequency of 'so' on the whole is found to be 5.36% higher in the native corpus as compared to that of the non-native corpus. The results are supported by Hays (1992) study that has analysed the use of discourse markers in the writings of Japanese EFL learners and exposed that the causal 'so' was most frequently used conjunction by the non-natives as compared to other causals. On the other hand, the use of the causal general conjunction 'because of this' is found to be least frequent in the native corpus with the total frequency of 0.03% while the usage of causal general 'in consequence and with this in mind' are found to be least frequent (0.01%) in the non-native corpus. Moreover, the use of causal general conjunction 'on account of this' is not found in both native and non-native corpora. The second type of causal conjunction is reversed causal in Hallidayan (1976) framework of conjunctive relations. The results demonstrate that the overall frequency of reversed causal conjunctions in the native corpus is 72.63% and it is 79.97% in the non-native corpus. The non-native corpus shows 7.34% more frequent usage of reversed causal conjunctions than that of the native corpus. The findings show that 'for' is the most frequently used reversed causal in the native and non-native corpora. The least used reversed causal is on 'this bases'

with the frequency of 0.07% in the native corpus on the other hand reversed causal ’on this basis and to this end’ are least frequently used in non-native corpus. Moreover, the use of reversed causal conjunction “arising out of this” is not found in the both native and the non-native corpora. The findings of the study show that conditional causal conjunctions are 4.95% more frequently used in the native corpus than that of the non-native corpus. The conditional causal ’then’ is the most frequently used conjunctive in both native and non-native corpora as compared to the other conditional causal conjunctions. However, the overall frequency of ‘then’ is found to be 4.64% more frequent in the native corpus than that of the non-native corpus. Moreover, the use of conditional causal conjunctions such as ‘in such an event’, ‘under the circumstances’, and ‘under other circumstances’ are not found in both native and the non-native corpus.The fourth type of causal respective conjunction is found to be the least frequently used in both native and the non-native corpora as compared to other types of causals such as causal general, reversed causal and conditional causal conjunctions. The overall frequency of respective is 0.39% in the native while 2% in the non-native corpus which shows that the overall frequency of respective causal conjunctions is 1.61% higher in the non-native corpus than the native corpus. The respective causal conjunction ‘in this respect’ is found to be the most frequent conjunctive with the frequency of 0.29% in the native corpus as compared to the other respective causals conjunctions, i.e., in this regard and with reference to this. On the other hand, the conjunctive conjunction ‘in this regard’ is found to be the most frequently used respective causal conjunction in the non-native corpus with frequency of 1.02%. The results are in contrast with the findings of Muddhi, S (2014) study which shows that the use of conjunctives in the writings of native and Kuwaiti non-native learners through a corpus-based study. It was revealed by the findings of the study that the use of causal general conjunction ‘so’ was 31.7% most frequently used in the non- native corpus rather than the native corpus. The use of conditional ‘then’ was 18.2% more excessively used in the native corpus than the non-native corpus. Moreover, the use of reversed causal conjunction ‘because’ was found to be 3.8% more excessively used in the native corpus as compared to that of the non-native corpus.

Figure-4.5: Comparative Frequencies of Different Types of Causal in the Both Native and Non-native Pakistani Corpora



The above-mentioned figure 4.5 gives the frequency distribution among four types of causal i.e., causal general, reversed causal, conditional and respective causal conjunctions. It is revealed by the findings that reversed causal conjunctions are more frequently used by both native and non-native researchers as compared to other types of causal i.e., causal general, conditional and respective conjunctions. However, over all reversed causal conjunctions are more frequently used in the non-native corpus with the frequency of 79.97% while native corpus shows less frequency 72.63% comparatively. Causal general conjunctions are found to be more frequently used in the native corpus with frequency of 20.67% as compared to that of the non-native corpus which shows 16.67% frequent use of causal general conjunctions. Conditional conjunctions are less frequently used in the non-native corpus (1.36%) compared to the native corpus (6.31%). Respective causal conjunctions are the least frequently used type of conjunctions by both native and non-native researchers. However, overall usage of respective temporal is 2% in the non-native corpus, which shows higher frequency than that of the native corpus, which shows only 0.39% frequency of respective causal conjunctions.

The variation in the use of conjunctives was measured in terms of the overuse and underuse of conjunctive relations in both native and non-native corpora. Overused conjunctives show the excessive use of conjunctives in the non-native corpus compared to the use of conjunctives present in the native corpus, while underused conjunctives in the non-native corpus demonstrate the less frequently used conjunctives in the non-native corpus against the native corpus. The study finds that causal conjunctions are 1.8% underused in the non-native corpus. On the other hand, the use of temporal conjunctions is almost the same in the native and non-native corpora. The results of the study reveal that the major causes of underuse of adversative and causal conjunctives in English are the impact of ESL (English as

second language) learner's first language over their use of second language and insufficient knowledge of wide range of conjunctive relations by the ESL scholars.

These reasons of variations in the use of conjunctives are also supported by many studies which have attempted to find out the reasons behind the overuse and underuse of conjunctives in the non-native written discourse such as Mouranen (1993), Crewe (1990), Hinkle (2001), Kuo (2002), Mohammed, A (2014) and Muddhi (2014) Mauranan (1993) argued that overuse and misuse of connectors by the EFL learners depict their poor writing skills and results in the form of incoherent piece of writing. He further states that the major reason for differences in the use of logical connectors in the non-native writings is the impact of their first language. Crewe (1990) and Kuo (2002) argued that wrong depiction and explanation of logical connectors in the text books is a major reason for misleading information of conjunctions. Mohammed, A (2014) also argued that the major cause for the differences in the use of conjunctions in the non-native written discourse is the interference of first language in the second language of ESL learners. Granger and Tyson (1996) pointed out that the inadequate knowledge of grammar, especially the use of logical connectors caused the differences in the use of conjunctive relations by the non-native learners.

CONCLUSION

The present study is a corpus-based investigation of conjunctive relations in native and non-native research discourse. The purpose of the study was to find out the frequency distribution and differences in the use of conjunctives i.e., temporal and causal, with their sub-categories by using the framework of conjunctive relations proposed by Halliday and Hasan (1976). Two research questions were constructed in order to achieve the objective of the study, such as overall frequency distribution and differences according to sub-categories in the native and the non-native Pakistani research discourse. The study used mix method approach (QUAN-qual) as proposed by Creswell (2007) for the collection and analysis of the data. After compilation of the native and the non-native corpora, the conjunctive frequency of conjunctives was measured using the concordance software AntConc version 3.5.8. The first research question was answered by generating a list of conjunctive relations along with their frequencies per million (Table 4.1) and a bar graph (4.1) representing the overall frequency distribution into the four types of conjunctives. The results show that the non-native corpus comprised 1.15% more frequent use of conjunctive relations as compared to the non-native corpus. Moreover, the overall use of

conjunctives variation was also investigated, and the findings revealed that the native corpus comprised more of variety of conjunctive relations than the non-native corpus as the frequency of conjunctives variety in the native corpus was 0.248%. In comparison, in the non-native corpus the frequency of conjunctives variation was only 0.192%.

The study's second objective was achieved by analyzing the comparative frequency differences found in the use of two types of conjunctive relations such as causal and temporal. It was found that the temporal conjunctions (1.24%) and causal conjunctions (1.8%) were underused by the non-native Pakistani researchers compared to the native researchers. Furthermore, the study highlights the conjunctive relations, such as insufficient knowledge of syntactic and semantic use of conjunctive relations.

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