A Corpus based analysis of the application of “concluding transition signals” in academic texts

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Abstract: This corpus-based study aimed at investigating Concluding Transition Signals’ (CTS) frequency, functions, and grammatical formula within the academic texts. Accordingly, nine CTSs were taken based on the taxonomy described in the introduction section. Then, 400 different samples of CTSs were selected and analyzed within the Corpus of Contemporary American English (COCA) both qualitatively and quantitatively. Findings revealed that the frequency of concluding terms were varied based on both the nature of the CTSs and the genre in which they were employed. The first three most widely used CTSs were “thus,” “finally” and “in short” with a high frequency of occurrence in “Geography” and “Social Sciences” genres. Moreover, the analysis indicated that these nine terms can have diverse textual functions from which “summarizing the paper’s main points,” “suggesting the results or consequences” and “evoking a vivid image of the discussion” were the most prevailing ones. Furthermore, the results implied that CTSs were mostly used in the initial position of the main clause rather than within the subordinate clauses. Comparing to subordinate or relative clauses coming after the concluding terms, main clauses are also preferred to be used by the authors. The study includes some extracts from the academic texts and provides implications regarding the academic writing instructions.

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PUBLIC INTEREST STATEMENT
The ability to write academic texts effectively depends on many factors. One of these factors is the writer’s knowledge of concluding transition signals. So, this study attempted to study such signals in different academic genres found in COCA. The findings demonstrated that the frequency of concluding terms were different based on various factors including the nature of the concluding transition signals and the kind of genre in which they are used. It is suggested that the correct use of these terms plays an important role in maximizing students’ experience in writing concluding paragraphs and can be highlighted by drawing students’ attention to the writing process, particularly in the concluding paragraphs. The finding can also be used by instructors to use these terms as exemplar to introduce the different signals and their popularity by different authors in different genres of academic texts.
1. Introduction
The ability to write well has been highly important in the global community. Nowadays, possessing a high command of English writing skills is more essential than ever before (Hyland, 2008 cited in Jafari, 2019). Improving these skills is important for students to become successful not only in their academic courses but also in their future professional careers since communicating knowledge effectively and compellingly is strongly related to a good writing ability (Parina & de Leon, 2013).

Transitional devices are one of the metadiscoursal devices which pose a great challenge for L2 learners (Walková, 2020). According to Oshima and Hogue (2007) “transition signals” are words and phrases that attach the idea in one sentence with another sentence and show their connections. A transition signal is usually used at the beginning of a sentence or paragraph to show its relationship to what is said previously. In some occasions these signals come in the middle of a sentence to connect one idea to another within the sentence. Particularly, transitional markers can indicate addition, comparison and contrast, time, introducing examples, cause and effect, and conclusion (Oshima & Hogue, 2007; Zemach & Rumisek, 2003).

Many studies have investigated the use of transitional signals in the course of the texts (e.g., Eun & Jeon, 2009; Granger & Tyson, 1996; Hinkel, 2001; Mahendra & Dewi, 2017), but there is a dearth of research studies conducted on Concluding Transitional Signals (CTSs), especially through using corpus-based approaches on academic texts. Familiarity with these signals takes on an added importance in academic texts since learning how to write conclusions comprehensibly is a major component in an authoritative academic text. In this way, CTSs not only function as the helpful devices by which the reader recognizes the author’s reference to some points mentioned previously but also complete a discussion by drawing a lucid conclusion. Considering Oshima and Hogue (2007) taxonomy, this study thus, investigated nine CTSs, namely, “in conclusion,” “in summary,” “in brief,” “to conclude,” “in short,” “thus,” “to summarize,” “to sum up,” and “finally” through the corpus analysis of academic texts to answer the following questions:

1. Which one of the CTSs has the most frequency in academic texts compared to the others?
2. How are the distributions of the CTSs in different genres of academic texts?
3. What are the textual functions of the CTSs in different genres of academic texts?
4. How are the CTSs employed grammatically in the academic texts’ sentences?

2. Literature review
Transition signals appear with different names in literature including “linking adverbials” (Biber et al., 1999; Peacock, 2010), “linking adverbs” (Richards & Schmidt, 2010), “conjunctive adverbs” (Gardezi & Nesi, 2009), “connectors” (Intaraprawat & Steffensen, 1995), “logical markers” (Mur Dueñas, 2009), “linkers” (Thornbury, 2006), “linking words” (Harrison et al., 2016) and “concluding transition signals” (Oshima & Hogue, 2007). These signals benefit the writers to classify their discourse on one hand and assist the readers in understanding and engaging efficiently in the text on the other hand (Hyland, 2005). As stated by Oshima and Hogue (1998), a good piece of writing necessitates an appropriate use of CTSs to create the connections among the ideas of the discourse.

In the same vein, Poudel (2018) acknowledges that using transitional signals supports the writer to add cohesion to writing. Transitional markers are used to specify the relationships between the independent clauses and sentences at the micro-level of discourse or between the paragraphs at the macro levels of discourse, guiding the readers to accurately understand and interpret the intended meaning within the text.
CTs as one of the significant types of transition markers determine the relationships between sentences as well as between paragraphs which results in cohesion and consequently better understanding of the text (Djahimo, 2018). Showing the relationship among the sentences across the text, they have this potentiality to reduce the sophisticated cognitive processing on the side of the readers which allow them to predict the underlying meaning in the context. They also support the readers moving along the text in order to make logical inferences and interpretation while studying the text (Olshtain & Cohen, 2005).

It has been hypothesized that academic writers restrict themselves to use some concluding terms more than the others in their texts or in some specific genres. Moreover, it can be inferred that the “transition signals” which are expected to be properly used in any genre of texts need to be practiced by the students and exemplified by the teachers in teaching writing skills. It seems that there is a relative paucity of studies on CTs and their usage by different authors in different areas of academic genres. It is also an important issue to know about CTs’ general conception to make a text easier to be followed and understood (Harris, 1959 as as cited in Dewi, 2015, p. 15). In other words, these terms can structure the whole information in a piece of writing in order to be less problematic in mind. Having different functions, each CST can be a support for boosting the comprehension and the ease of reading tasks in reader’s favor. Moreover, since CTs strengthen the internal cohesion of any piece of writing, they support the writers in helping the readers understand how different previously mentioned ideas are presented without any ambiguities (Djahimo, 2018).

3. Method

3.1. Research design
Corpus linguistics is considered as a relatively new linguistic study technique (Hongyan, 2018) and it has been established on the basis of this belief that language is basically a social phenomenon (Abdugafurovna et al., 2020). By having quick access to immense bodies of naturally occurring texts on the computer, researchers can examine the robustness of linguistics descriptions, can obtain new insights into language structure and use, and can get a better understanding of how language is actually used rather than how language is thought to be employed (Recski Brasilheiro, 2006, p. 304).

The Corpus of Contemporary American English (COCA), which was created by Mark Davis in 2008, is the largest freely available corpus of English and it is composed of more than 520 million words (Rafatbakhsh & Ahmadi, 2019). This study was not an experimental research but a survey which has tried to depict the real language use in academic papers.

3.2. Materials
The materials employed in this study were the CTs available in the academic genre of Corpus of Contemporary American English (COCA), which contains more than 600 million words of American English. Considering the fact that more than 70% of academic papers were written and practiced by American authors, the academic genre of COCA was selected as the pool of the needed data for this enquiry. The scripts ranged in genre and year from 1992 to 2019. Corpus research has employed computer-assisted approaches to analyze language patterns in general and text patterns in particular (Biber, 2004). Corpus-based sociolinguistics have recently come to the fore as a mature area of research (Nevalainen, 2006; Nevalainen & Raumolin-Brunberg, 2003) it may be because of the availability of the comprehensive and valid data in this field. Moreover, corpus-based analysis allows the researchers to have access the endless number of data (Baker, 2006).

3.3. Data collection procedure
From the available genres of Corpus of Contemporary American English (COCA), “academic” texts and the sub-genres including “History”, “Education,” “Geography,” “Social Science,” “Law/Political Science,” “Humanities,” “Philosophy and Religion”, “Science and Technology,” “Medicine,” and “Business” texts were chosen and checked. Consulting the Krejcie and Morgan (1970) table for the appropriate sample size considering the confidence level of 95% and the margin of error (degree of accuracy) of 5%, the
recommended sample size was set to be about 400 cases which were selected randomly and were explored in terms of their frequencies, functions, and grammatical formula in sentences.

CTSs were checked and compared first regarding their frequencies in the corpus and then in terms of their distributions. Moreover, their functions have been analyzed to find the authors’ distinctive purposes of using CTSs. Furthermore, through a corpus-based discourse analysis, verb voice, tense, and clause types subsequent to the CTSs were analyzed. The result has been explained both quantitatively and qualitatively to clarify the possible differences. The results indicated how frequent each of these CTSs was and by what pattern and function they appear in different genres of academic texts. This may indicate how to utilize CTSs in academic tasks and how to classify and teach in language learning classrooms Figure 1.

4. Results
In order to answer the first research question, frequencies of CTSs were analyzed and compared across different academic genres. As represented in Table 1, significant differences among the frequency of these signals can be observed: “Thus” and “Finally” were the most frequent words with 6640 (17.8%) and 22,583 (60.5%) occurrences, respectively. On the other hand, the least used types of concluding transition signals are “in brief” and “to sum up” which revealed only 1.1 and 0.4 percent of occurrence, respectively. Other CTSs, “In short” (9.2%), “to conclude” (3.8%), “in summary” (3.4%), “in conclusion” (2.4%), and “to summarize” (1.4%) had the highest to the lowest frequencies.

To specify the most frequent CTSs throughout the academic genre, the frequency of each of the concluding terms in 10 different genres provided by COCA were analyzed and compared. As

| Concluding Transition signals | Frequency | Percent |
|-------------------------------|-----------|---------|
| In conclusion                 | 899       | 2.4%    |
| In summary                    | 1278      | 3.4%    |
| In brief                      | 394       | 1.1%    |
| To conclude                   | 1409      | 3.8%    |
| In short                      | 3436      | 9.2%    |
| Thus                          | 6640      | 17.8%   |
| To summarize                  | 535       | 1.4%    |
| To sum up                     | 155       | 0.4%    |
| Finally                       | 22,583    | 60.5%   |

Figure 1. The frequency of CTSs in Academic texts.
depicted in Table 2, while a high frequency of occurrence observed in “Geography and Social Science” genres, a low frequency of usage observed in “Business” genre. While “Law and Political Sciences” reveal the higher frequency of all concluding terms collectively (n = 37,201), “Business” contains less frequency of use with regard to CTSs (n = 983).

After calculating the frequencies of CTSs, a chi-square test was used to determine whether the results were statistically significant. The results were significant for all the rows and columns of variables with P-value<0.05 (See Table 3).

To answer the third question, the CTSs were analyzed to find their functions in concluding paragraphs. The findings have shown that these terms can “summarize the paper’s main points”, “ask a provocative question”, “use a quotation”, “evoke a vivid image”, “call for some sort of action”, “end with a warning”, “universalize (compare to other situations)” or “suggest results or consequences”. The results are given separately through Table 4.

As it is depicted, CTSs whose functions were “summarizing the paper’s main points,” “suggesting results or consequences” and “evoking a vivid image of the discussion” were more common than other functions. Evidence from the findings revealed that functions of “asking a provocative question” and “ending with a warning” were not found in the analysis. Moreover, all the CTSs do not have the function of “using a quotation” except “Thus”. A chi-square test has also been used to check the statistical importance of the observed difference. Based on the results, reliable inferences were made about the frequency of CTSs functions with P-value<0.05 (See Table 5).

To answer the fourth question, the nine CTSs were analyzed to find their grammatical position in the paragraphs; they can be used within a single sentence or between two different sentences, or paragraphs. To decide whether the concluding terms are between paragraphs or two different sentences in the corpus of COCA, head titles such as “Conclusion,” “Comparison and conclusions,” “Summary” and alike which were inserted between two hashtags (#) were considered as a clue that a new paragraph has been started. An example has been provided as below:

“This is particularly relevant for racial and ethnic minorities who may be marginalized from traditional healthcare services. # Comparisons and Conclusions # To summarize, this study shows college students are likely to have easy access to the Internet and readily obtain personal health information online …”

The results of the frequency of occurrence and the position of each category are given separately below through Table 6 and the related examples are following:

4.1. Examples of CTSs used within a sentence
In this case, the concluding terms are utilized to match two parts of a sentence. As Table 6 shows, “in conclusion” and “in summary” had the least frequencies (0.9% and 1.2%, respectively). This finding also illustrates that the highest frequency belongs to “to summarize” (24.1%). The following is an example of this situation.

“As a conclusion, I wish to summarize the findings with regard to the frequency of negation types in …”

4.2. Examples of CTSs used between two sentences
As Table 6 demonstrates, “to conclude” is considered as the least frequent concluding term in the corpus (1.1%), whereas “in conclusion” and “in summary” are considered as the most frequent concluding terms in the corpus (18.5% & 18.5 %). Table 6 depicts the frequencies of each concluding term from the highest to the lowest. The excerpts show how the authors related their previous mentioned ideas through concluding terms;
| Table 2. Frequencies of CTSs in the texts of different academic genres |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|                  | In Conclusion %  | In Summary %     | In Brief %       | To Conclude %    | In Short %       | Thus %           | To Summarize %   | To Sum Up %      | Finally %         | Sum %            |
| Business         | 0.7%             | 0.9%             | 0.3%             | 1.7%             | 0.4%             | 1.1%             | 1.7%             | 3.87%            | 1.2%             | 1.1%             |
| Miscellaneous    | 1.3%             | 1.0%             | 3.6%             | 3.4%             | 5.7%             | 2.5%             | 2.6%             | 4.52%            | 4.1%             | 3.0%             |
| Medicine         | 25.5%            | 14.5%            | 16.2%            | 4.5%             | 2.4%             | 6.6%             | 10.7%            | 1.29%            | 6.7%             | 6.8%             |
| Phil/Rel         | 6.0%             | 5.7%             | 9.1%             | 7.8%             | 8.2%             | 8.8%             | 8.0%             | 12.26%           | 7.3%             | 8.3%             |
| History          | 5.6%             | 3.1%             | 8.4%             | 15.5%            | 17.1%            | 11.6%            | 5.6%             | 9.03%            | 11.9%            | 11.7%            |
| Education        | 17.4%            | 23.1%            | 13.5%            | 10.4%            | 8.6%             | 10.8%            | 20.0%            | 7.10%            | 14.6%            | 12.0%            |
| Sci/Tech         | 10.6%            | 15.4%            | 14.7%            | 9.4%             | 6.6%             | 12.6%            | 12.9%            | 7.10%            | 12.1%            | 12.2%            |
| Humanities       | 6.5%             | 5.6%             | 8.4%             | 14.2%            | 16.4%            | 15.2%            | 10.5%            | 23.23%           | 13.0%            | 14.4%            |
| Geog/SocSci      | 21.6%            | 23.9%            | 16.8%            | 15.2%            | 17.5%            | 18.8%            | 19.8%            | 18.71%           | 18.1%            | 18.6%            |
| Law/PolSci       | 5.0%             | 6.7%             | 9.1%             | 17.6%            | 17.0%            | 11.9%            | 8.2%             | 12.90%           | 10.8%            | 42.3%            |
Table 3. Comparing the use of CTSs in different academic sub-genres

| Chi-Square Tests                     | Value  | df | Asymp. Sig. (2-sided) |
|--------------------------------------|--------|----|-----------------------|
| Pearson Chi-Square                   | 32,000 | 16 | .010                  |
| Likelihood Ratio                     | 22.181 | 16 | .137                  |
| Linear-by-Linear Association        | 6.109  | 1  | .013                  |
| N of Valid Cases                     | 10     |    |                       |

As a result it is not very reliable for large scale applications. In the same manner, RG suffers from undersegmentation and unreliable performance even in neighboring slices, as it was shown in both quantitative and qualitative results. Moreover, it needs intelligent seed initialization, which is usually done manually and is neither trivial nor fast. In conclusion, both of these methods provide medium to low performance under normal or noisy conditions.

4.3. Examples of CTSs used between paragraphs

Table 6 shows that the concluding term “in summary” was the most frequent concluding term (41.2%) in the academic texts. On the other hand, “finally” is the least frequent term in the location of between paragraphs. As such, they were not detected in the corpus. Below is an example of this situation.

# CONCLUSION # The sea never dies, it just suffers sometimes 76 and will never stop providing opportunities and motivations to get involved with it. And, where necessary, someone will intervene and cure the “illness.” Endless legal discussions may arise from it and then all the experts’ views can be unfolded so as to solve all the problems arising. # To sum up and as a conclusion of this discussion, vetting is a method used by chartered experts to protect their interests and reputation.

Moreover, according to Table 6, the academic texts have not used the concluding term “in brief” between two paragraphs.

Yet, to know in what formula mostly these terms have been used, the same processes have been done and a sample of each concluding term was analyzed and checked based on a pattern of verb tense, verb voice and type of clause that follow each of the concluding terms. As Table 7 illustrates, regarding the present tense, the concluding term “in short” had the highest frequency (n = 302) while “to sum up” had the lowest (n = 84). With respect to past tense, “finally” had the highest frequency (n = 76), whereas “to sum up” had the lowest (n = 9). Regarding the use of future tense, the data revealed that nearly half of the CTSs were not used in this tense. With respect to the use of perfect tense, “to conclude” had the highest frequency (n = 18) and “to summarize” had the lowest frequency (n = 2).

Analyzing the concluding terms in concluding paragraphs revealed that some excerpts written by writers apply future tense after concluding terms such as “to conclude,” “thus,” “in short” and “finally.”

Thus, it is wrong to conclude that the United States will be unable to afford military interventions to support its foreign policy goals, for instance, compelling Iran to give up its nuclear sites—although they are likely to be substantially higher than the interventions just cited—as long as no nation-building follows.

Table 8, on the other hand, depicts different types of clauses that come after CTSs in academic texts analyzed in the corpus of COCA. As it is shown, “finally” is considered as a CTS that had the
Table 4. Functions of CTSs in academic texts

| Functions                          | In Conclusion % | In Summary % | In Brief % | To Conclude % | *In Short % | Thus % | **To Summarize % | ***To Sum Up % | Finally % |
|-----------------------------------|-----------------|--------------|------------|---------------|-------------|--------|-----------------|----------------|-----------|
| summarizing the paper's main points | 58.1%           | 64.5%        | 2.6%       | 2.5%          | 13.5%       | 6.8%   | 64.7%           | 73.7%          | 81.8%     |
| Asking a provocative question     | 0.0%            | 0.0%         | 0.0%       | 0.0%          | 0.0%        | 0.0%   | 2.6%            | 0.0%           | 0.0%      |
| Using a quotation                 | 0.0%            | 0.0%         | 0.0%       | 0.0%          | 0.0%        | 0.0%   | 2.7%            | 0.0%           | 0.0%      |
| Evoking a vivid image of discussion | 6.8%            | 5.5%         | 30.8%      | 85.0%         | 83.0%       | 30.8%  | 4.3%            | 10.1%          | 5.3%      |
| Calling for some sort of action   | 0.0%            | 0.0%         | 0.0%       | 0.0%          | 0.0%        | 0.0%   | 0.0%            | 0.0%           | 0.0%      |
| Ending with a warning             | 0.0%            | 0.0%         | 0.0%       | 0.0%          | 0.0%        | 0.0%   | 0.0%            | 0.0%           | 0.0%      |
| Universalizing                    | 5.1%            | 7.3%         | 30.8%      | 0.5%          | 1.3%        | 2.2%   | 13.8%           | 5.1%           | 3.3%      |
| Suggesting results or consequences | 29.9%           | 22.7%        | 35.9%      | 12.0%         | 2.3%        | 57.5%  | 14.7%           | 11.1%          | 9.8%      |
| SUM                              | 100.0%          | 100.0%       | 100.0%     | 100.0%        | 100.0%      | 100.0% | 100.0%          | 100.0%         | 100.0%    |

** Out of 400 frequency of this concluding term, only 394 of them were the indicator of concluding signals

** Out of 400 frequency of this concluding term, only 116 of them were the indicator of concluding signals

*** Out of 155 frequency of this concluding term, only 99 of them were the indicator of concluding signals
highest frequency of using main clauses after that (n = 390), while “to conclude” had the lowest frequency for employing that type of clause.

As can be seen in Table 8, “thus” (n = 41) had the highest frequency in utilizing subordinate clause and “to sum up” (n = 1) had the lowest use of that type of clause. Considering the use of relative clause by each of these concluding terms, “to conclude” had the highest frequency (n = 215), whereas “to sum up” had the lowest use of relative clause (n = 3). Below is an example of “To sum up” in an excerpt taken from COCA.

To sum up, as the editors of a recent collection titled “Homecomings” point out, “return can result in a heightened sense of attachment to the place of diaspora, and indeed to the construction of new diasporas in the ethnic homeland.  

5. Discussion

Regarding the frequency of CTSs, the findings were in line with Mahendra and Dewi (2017) who used their own corpus and concluded that “thus” was a dominant signal by their participants. However, investigating 146 academic expository writings, the Alshaboul et al. (2013) found out that “in conclusion” occurs more frequently among other concluding terms. The variety of findings in this regard may due to the fact that different genres of academic writing are likely to use some particular concluding terms which is investigated in the subsequent questions.

| Table 5. Comparing the structural functions of CTSs in academic texts |
|-------------------------|---------|--------|----------------|
| Chi-Square Tests         | Value   | df     | Asymp. Sig. (2-sided) |
| Pearson Chi-Square       | 32.000<sup>a</sup> | 16 | .010 |
| Likelihood Ratio         | 22.181  | 16 | .137 |
| Linear-by-Linear Association | 6.818  | 1  | .009 |
| N of Valid Cases         |         |       | 8   |

*Out of 400 cases, 245 cases had the function of concluding signals.
**Out of 400 cases, 6 cases were distinguished as the prepositional phrase (i.e. in + short + noun).

| Table 6. The grammatical positions of CTSs in academic texts |
|--------------------------|-----------------|-----------------|-----------------|
| Concluding Transition signals | Within a Sentence | Between two Sentences | Between Paragraphs |
| In conclusion            | 11   | 0.9%  | 285  | 18.5%  | 193  | 38.1%  |
| In summary               | 14   | 1.2%  | 285  | 18.5%  | 209  | 41.2%  |
| In brief                 | 46   | 4.0%  | 154  | 10.0%  | 20   | 3.9%   |
| *To conclude             | 218  | 18.8% | 17   | 1.1%   | 10   | 2.0%   |
| **In short               | 122  | 10.5% | 220  | 14.3%  | 52   | 10.3%  |
| Thus                     | 262  | 22.6% | 121  | 7.8%   | 15   | 3.0%   |
| To summarize             | 279  | 24.1% | 116  | 7.5%   | 5    | 1.0%   |
| To sum up                | 53   | 4.6%  | 99   | 6.4%   | 3    | 0.6%   |
| Finally                  | 155  | 13.4% | 245  | 15.9%  | 0    | 0.0%   |
| Sum                      | 1160 | 100%  | 1542 | 100%   | 507  | 100%   |

* Out of 400 cases, 245 cases had the function of concluding signals.  
** Out of 400 cases, 6 cases were distinguished as the prepositional phrase (i.e. in + short + noun).
Table 7. Verb tense and voice after CTSs in academic texts

| Concluding Transition signals | Tense | Voice |
|-------------------------------|-------|-------|
|                               | Present/Pass | Future/Perfect | Active/Passive |
|                               | N | % | N | % | N | % | N | % |
| In conclusion                 | 300 | 13.9% | 40 | 9.7% | 0 | 0.0% | 60 | 25.3% | 350 | 13.3% | 50 | 23.3% |
| In summary                    | 280 | 13.0% | 40 | 9.7% | 0 | 0.0% | 65 | 27.4% | 365 | 13.8% | 35 | 16.3% |
| In brief                      | 330 | 15.3% | 30 | 7.3% | 0 | 0.0% | 40 | 16.9% | 370 | 14.0% | 30 | 14.0% |
| To conclude                   | 160 | 7.4%  | 61 | 14.8% | 15 | 32.6% | 18 | 7.6%  | 232 | 8.8%  | 13 | 6.0%  |
| In short                      | 302 | 14.0% | 68 | 16.5% | 7  | 15.2% | 17 | 7.2%  | 372 | 14.1% | 22 | 10.2% |
| Thus                          | 293 | 13.6% | 74 | 17.9% | 18 | 39.1% | 15 | 6.3%  | 369 | 14.0% | 31 | 14.4% |
| "To summarize"                | 99  | 4.6%  | 15 | 3.6%  | 0  | 0.0%  | 2  | 0.8%  | 111 | 4.2%  | 5  | 2.3%  |
| "To sum up"                   | 84  | 3.9%  | 9  | 2.2%  | 0  | 0.0%  | 6  | 2.5%  | 96  | 3.6%  | 3  | 1.4%  |
| Finally                       | 304 | 14.1% | 76 | 18.4% | 6  | 13.0% | 14 | 5.9%  | 374 | 14.2% | 26 | 12.1% |
| Sum                           | 2152| 100% | 413| 100% | 46 | 100% | 237| 100% | 2639| 100% | 215| 100% |

* Out of 400 frequency of this concluding term, only 116 of them were the indicator of concluding signals
** Out of 155 frequency of this concluding term, only 99 of them were the indicator of concluding signals
Table 8. Structure of clauses after Concluding terms in a piece of writing

| Concluding Transition signals | Main Clause | Subordinate Clause | Relative Clause |
|-------------------------------|-------------|--------------------|-----------------|
|                               | N  | %   | N   | %   | N   | %   |
| In conclusion                 | 300| 15.3%| 24  | 20.0%| 17  | 5.23%|
| In Summary                    | 245| 12.5%| 20  | 16.7%| 11  | 3.38%|
| In brief                      | 125| 6.4% | 9   | 7.5% | 4   | 1.23%|
| To conclude                   | 28 | 1.4% | 2   | 1.7% | 215 | 66.15%|
| In short                      | 351| 17.9%| 14  | 11.7%| 29  | 8.92%|
| Thus                          | 323| 16.4%| 41  | 34.2%| 36  | 11.08%|
| To summarize                  | 107| 5.4% | 5   | 4.2% | 4   | 1.23%|
| To sum up                     | 95 | 4.8% | 1   | 0.8% | 3   | 0.92%|
| Finally                       | 390| 19.9%| 4   | 3.3% | 6   | 1.85%|
| Sum                           | 1964 | 100.0% | 120 | 100.0% | 325 | 100.00%|

Moreover, the frequencies of CTSs were indicative of the fact that transitional signals were employed by the writers with different degrees of occurrence. In this line, Walková (2020) asserted that genres partly influence the frequency of transition markers in a text. And also, Gardner and Han (2018) hypothesized that the frequency of using transition markers depends on the vastness of ideas across a genre and the length of the text in a genre.

While writers in the field of soft sciences including “Law and Political Sciences” (n = 37,201), “Geography and Social Sciences” (n = 16,358), “Humanities” (n = 12,633) use more CTSs in their text, writers of “Business” and “Medicine” genres (n = 983 and n = 2652, respectively) tend to use less CTSs. This may imply that soft science writers prefer intensely to include more concluding markers in their professional discourse to avoid less misunderstanding and misinterpretation.

The studies in the field of soft are basically and highly subjective. Therefore, there is an increase of transition markers in terms of occurrence and frequency. In agreement with this finding, Hyland (2005) claimed that while soft sciences are argumentative in nature, hard sciences are based on the proofs and uncovering the interpretation of the tables and figures. Therefore, it is not surprising that the frequency of transition markers is much higher in soft sciences than that of hard sciences.

Regarding the functions of CTSs in sentences, the findings indicated that most of the academic writers tend to concentrate on some functions more than the others. They prefer to use CTSs to provide a brief summary of the main points in the paper and to show clear representation of their ideas as well as to suggest results or consequences. However, the frequency of using the above-mentioned functions varies based on the nature of the used terms. That is, as CTSs imply the meaning of some functions more than others, they are mostly served in the form of special functions in the context. In the same vein, Djahimo (2018) argued about the appropriateness of transition signals used by students and concluded that most of CTSs are applied correctly if they are used appropriately with their grammar and functions.

The findings also showed that the authors mostly preferred to use active present voice in their concluding paragraphs. This may imply that many writers prefer to express their viewpoint explicitly through the active voices in order to provide the ease of understanding for readers. This finding is in agreement with Taavitsainen’s (1999) study of metadiscourse use in scientific writing in which he
indicated that the scientific writing has geared not only towards more interactive and reader-oriented rhetoric but also to a significant growth in the use of active voice and metadiscursive commentary.

6. Conclusion

The present piece of research was one of the first attempts to investigate the use of CTSs in academic text through corpus-based analysis. The results of the study indicated the frequency, function and position of concluding terms taken from Oshima and Hogue (2007) and Zemach and Rumisek (2003) framework. The most frequent concluding terms were “thus” and “finally” whereas “in brief” and “to sum up” were the least used ones. Moreover, the authors preferably used main clauses after their concluding terms rather than subordinate and relative clauses. The findings reflect the author’s priority to use present-active voice comparing to other tenses and passive voice.

The findings show the importance of being familiar of the frequency, functions and positions of concluding terms in academic texts. The correct use of these terms has a vital role in maximizing students’ experience in writing concluding paragraphs and can be highlighted by drawing students’ attention to the writing process, particularly in the concluding paragraphs. The finding can also be used by instructors to use these terms as exemplar to introduce the different signals and their popularity by different authors in different genres of academic texts. For instance, students need to know how some of these terms can lose their function as a concluding signal when they appear within a sentence. The variety of concluding signals is most likely attributed to the explicit instruction students receive in writing instructions emphasizing the importance of marking their end of paragraph or essay.

In addition, material developers can also gain some insight regarding the frequency, popularity, position and function of these signals to be used in their material. In fact, teachers of writing courses can design activities that concluding transitional signals beside grammatical issues become the priority of teaching. It can be a judging task in which students are provided with a model text containing concluding terms, and they have to judge whether its place has been appropriate or not. If these implications are made clear, students’ writing skills regarding the connection of sentences as a conclusion and their function can be greatly improved. Nevertheless, the frequency of transition markers with specific function or position in the text is due to the writers’ rhetorical strategies and rhetorical conventions and norms of the given genres. Thus, it is necessary for language learners to be aware of the rhetorical functions, grammatical correctness and context-bound semantic appropriateness of each transition markers within the academic text.

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