A Contrastive Study of the Use of Causal Connectives by Chinese EFL Learners and English Native Speakers in Writing

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Abstract—This study attempts to compare Chinese learners' use of causal connectives and that of English native speakers by a corpus-based approach. It finds that the density of causal connectives used by Chinese learners is higher than that of English native speakers, but their variety is smaller. It also finds that Chinese learners prefer an inductive thought pattern, while English native speakers are accustomed to thinking deductively. Furthermore, it finds that Chinese learners tend to put adverbial causal connectives at the initial positions of sentences, while English native speakers are more likely to put these words at the medial positions of sentences. Finally, this study finds that Chinese learners' use of causal connectives is more colloquial than that of English native speakers.

Index Terms—causal connectives, density, variety, thought pattern, adverbial connectives, colloquialism

I. INTRODUCTION

Connectives are useful for signaling logical or semantic relations between units of discourse. Altenberg and Tapper (1998) hold that connectives can be used to enhance the coherence and clarity of discourse. Causal connectives are capable of indicating cause or effect. The appropriate use of these words to elucidate the causal relationship will to a great extent determine the success or failure of an argumentative essay, which from a macro point of view is a causal relationship in itself.

II. LITERATURE REVIEW

Researchers have done many studies on connectives, although they used other terms. Chen (2002), who studied discourse markers from a pragmatic perspective, found that Chinese English major students are capable of consciously using discourse markers in argumentative writings. However, their variety is limited, and there are some misuses. Zhao (2003) adopted a more general approach, investigating how students of varied specialties and language proficiencies use logical connectors in writings of varied genres. She found that Chinese students lack the variety of logical connectors employed by English native speakers, although their density is higher. Pan and Feng (2004) examined the top 20 connectors used by non-English major graduate students in argumentative writings. They found that Chinese students overuse several connectors but underuse most of them, when compared with native English speakers. Although advanced Chinese learners and native speakers show great similarity in their preference for connectors, they differ from each other in the logic-semantic distribution of connectors. Xu (2004) compared the use of textual meta-discourse markers and interpersonal meta-discourse markers by English majors of different grades. He found that Chinese students display a non-linear development model in the quantity of meta-textual discourse markers they use, but a linear development model in the quality of their use.

It must be pointed out that discourse markers, logical connectors, connectors and meta-textual discourse markers, despite their unique names, heavily overlap with each other. Among them, logical connectors and connectors are almost the same. This study will adopt Pan and Feng's term to call these words connectors. However, in light of that connectors are widely referred to as connectives in English literature, this study will use both of these terms without any distinctions. In addition, it should be noted that the above studies have yielded consistent findings that the density of connectives Chinese students use is higher than native English speakers, but their variety is limited.

According to Zhang (2001 cited in Halliday & Hasan 2001), one direction of future cohesion studies is to continue to carry out micro studies. Although studies of connectives are micro in nature, it is possible to undertake studies on a more specific aspect of connectives. Luo (2001) conducted such a study, which focused on connectives of a particular part of speech --- the adverbial conjuncts in the academic writings of Chinese English major graduate students. She found that Chinese students use more adverbial conjuncts than native students. But they are not fully aware of the possible stylistic appropriateness and semantic subtle differences of these words.

III. METHODOLOGY

A. Research Questions

This study had four research questions to answer. (1) How does the density of causal connectives used by Chinese learners compare with that of native speakers? (2) How does the variety of causal connectives used by Chinese learners compare with that of native speakers? (3) How does the thought pattern based on causal connectives used by Chinese learners compare with that of native speakers? (4) How do the oral features of causal connectives used by Chinese learners compare with those of native speakers? (5) How does the use of adverbial causal connectives used by Chinese learners compare with that of native speakers?

B. Research Corpus

This study took a corpus-based approach. The data of this study were selected from Spoken and Written English Corpus of Chinese Learners or SWECCL, which is a large corpus of Chinese university students who major in English. This study randomly chose 240 argumentative compositions written by English major students in a Nanjing-based university to form a Chinese learner corpus. The control corpus used in this study is Louvain Corpus of Native English Essays or LOCNESS, which is a corpus of argumentative essays written by British and American university students. The details of these corpora are shown in Table 1.

TABLE 1:
CHINESE LEARNER CORPUS AND NATIVE SPEAKER CORPUS

	Chinese learner corpus	Native speaker corpus
Size (tokens)	79,549	182,832
Average sentence length (tokens)	19.22	27.59
Average word length (letters)	4.59	4.71

C. Data Classification

Drawing on the taxonomies of connectives developed by Yang (2000), Zhang (2000) and Zhao (2003), this study divided causal connectives into three distinct grammatical categories: conjunctive, adverbial and prepositional. Table 2 attempts to present an exhaustive list of causal connectives classified according to their grammar and their function.

TABLE 2:
TAXONOMY AND LIST OF CAUSAL CONNECTIVES

Part of speech	Function	Causal connectives
Conjunctive	Cause	As, because, for, since, now that
	Effect	So, it follows that
Adverbial	Effect	So, therefore, thus, hence, accordingly, for this reason, for that reason, as a result, consequently, as a consequence, in consequence
Prepositional	Cause	Because of, due to, owing to, thanks to, in that, out of, on account of, for fear of, for fear that, in view of, in response to, in reply to, as a result of, as a consequence of

D. Data Retrieval and Cleaning

The concordance tools this study used were Wordsmith Tools. To improve the efficiency of concordance, the author ran JCLAWS to tag all the target corpora first. JCLAWS is a corpus software which is capable of specific tagging with an accuracy rate of approximately 97%.

POS tagging with JCLAWS could substantially narrow down the scope of our search. Take "so" for example. When indicating consequence, it can act either as a conjunction within a compound clause or as a general adverb to connect two separate sentences. In the former case, it is tagged as <CS> while in the latter case <RR>. Its non-causal usages are all tagged in other ways, e.g. "so <CS21> that", and "so <RR32> on", etc. Unique tagging like this allows us to immediately get the results we want.

However, there are cases where JCLAWS cannot help. Take "as" for example. When "as" is used as a conjunction (<CSA>), it can perform multiple functions. Not only can it indicate cause, but also show a comparison (e.g. the second "as" in "as many as"), describe an accompanying state (e.g. "as" in "as time goes by"), to name just a few. Non-causal usages of causal connectives like this can be found in "as <CS>", "since <CS>", "thanks <NN2> to <II>", "out <II21> of <II22>", "in <II> that <DD1>" and "accordingly<RR>".

Among these six causal connectives, "as<CSA>" yields the maximum results. In LOCNESS alone, over 700 concordance lines are found. This huge number made it impossible for us to check the results line by line. So we selected a sample by examining the concordances every three lines. None of the other five causal connectives generated over 100 concordance lines, which made it possible for us to sort out the non-causal usages one by one.

E. Data Processing

In response to Luo's (2003) call for attention to the position of connectives in discourse, this study classified causal connectives into three groups according to their positions in sentences: initial, medial and final. It went on to divide cause into preceding cause and ensuing cause. For the purpose of direct comparisons, this study provided the number of causal connectives per 100,000 tokens instead of giving raw frequencies.

IV. RESULTS AND DISCUSSION

A. Density

TABLE 3:
DENSITY OF CAUSAL CONNECTIVES USED BY CHINESE LEARNERS AND NATIVE SPEAKERS

	Chinese learners	Native speakers
Density	702.71	694.08

Table 3 shows that the density of causal connectives used by Chinese learners is higher than native speakers. Luo (2003) reports the same finding in her study of adverbial connectives. Actually, this is a general characteristic of Chinese learners' use of connectives (Ma 2001; Zhao 2003). There is a traditional opinion among researchers and language teachers that the grammar of Chinese is featured by parataxis while that of English hypotaxis. Therefore, Chinese does not require overt marking of textual relations to the same extent as English. Chinese students might underuse explicit connectives as a result of L1 transfer (Yu 2001). However, this and other studies find that the opposite is true. Ma (2001) suggests three possible reasons for this unexpected finding. First, English teachers in China emphasize the use of cohesive devices, especially connectives. They encourage students to adopt overt connectives for coordination, subordination or other types of transition. Overemphasis of teachers is widely acknowledged as an important factor. Second, Chinese students write more coordinate sentences, which often involve the use of more connectives. Third, Chinese students tend to write simple rather than compound sentences, which leads them to adopt overt connectives for coordination and subordination rather than use other cohesive devices. The decrease of compound sentences is likely to increase the number of connectives.

B. Variety

TABLE 4:
VARIETY OF CAUSAL CONNECTIVES USED BY CHINESE LEARNERS AND NATIVE SPEAKERS

	Type	Std sum	Std variety
Chinese learners	19	702.71	0.0270
Native speakers	26	694.08	0.0375

Table 4 shows that the variety of causal connectives used by Chinese learners is smaller than native speakers. A high density with a limited variety is not just the characteristic of the use of causal connectives by Chinese EFL learners. Zhao (2003) finds that it is the general characteristic of all types of connectives used by Chinese learners. Chen (2002) and Luo (2003) also report this problem in their respective studies. It means that Chinese EFL learners have not learned to use connectives in English writing in a native-like way. They need to improve their use of connectives.

C. Thought Patterns

Preceding causal connectives play the same role as result signifiers. Both of them reflect a general causal relationship of providing reasons before results, namely cause-before-effect. Ensuing causal connectives reflect a reserved causal relationship of providing reasons after results, namely cause-after-effect. Cause-before-effect is an inductive way of thinking, while cause-after-effect is a deductive way.

TABLE 5:
EFFECT MARKERS USED BY CHINESE LEARNERS AND NATIVE SPEAKERS

Effect markers	Chinese learners	Native speakers
accordingly	0.00	0.55
as a consequence	0.00	0.55
as a result	26.4	2.19
consequently	8.8	8.75
for this reason	2.51	2.73
hence	1.26	11.49
it follows that	0.00	0.55
so	231.3	113.77
therefore	72.91	108.84
thus	40.23	53.05
Total	383.41	302.47

Table 5 shows all the connectives, which indicate result, in the Chinese learner corpus and the native speaker corpus.

TABLE 6:
CAUSE MARKERS USED BY CHINESE LEARNERS AND NATIVE SPEAKERS

Cause markers	Chinese learners		Native speakers	
	Preceding cause	Ensuing cause	Preceding cause	Ensuing cause
as	11.31	6.29	11.49	76.57
as a consequence of	0.00	0.00	0.00	0.55
as a result of	1.26	0.00	1.09	8.75
because	26.4	138.28	17.5	177.21
because of	13.83	35.2	1.09	2.73
due to	3.77	5.03	4.92	26.8
for	0.00	16.34	1.09	4.92
for fear of	0.00	1.26	0.00	1.64
for fear that	0.00	1.26	0.00	0.00
in response to	0.00	1.26	1.64	1.09
in that	0.00	0.00	0.00	3.83
in view of	0.00	0.00	0.00	0.55
now that	1.26	1.26	3.83	0.00
out of	0.00	0.00	0.00	8.20
owing to	0.00	0.00	0.55	0.55
since	35.2	6.29	13.13	20.78
thanks to	13.83	0.00	0.55	0.55
Total	106.86	212.47	56.88	334.72

Table 6 shows in a separate way the preceding causes and the ensuing causes in the Chinese learner corpus and the native speaker corpus.
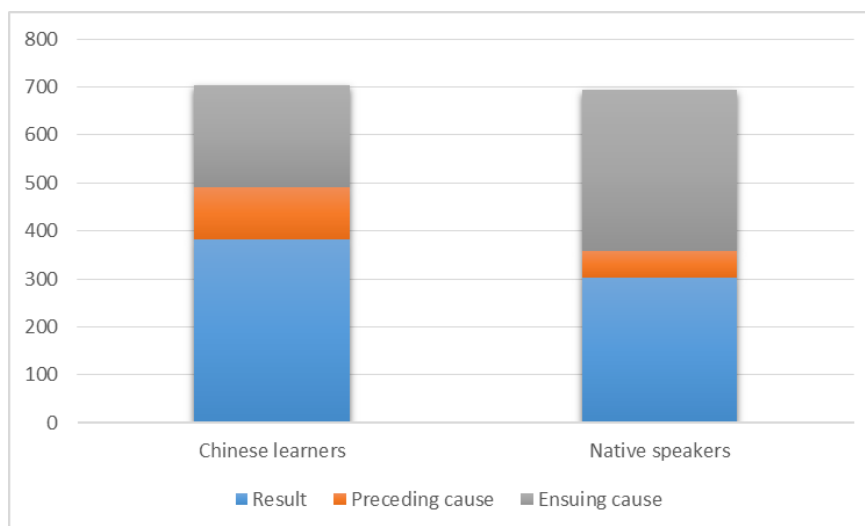

Figure 1: Two types of causal relationships used by Chinese learners and native speakers

Figure 1 shows that in Chinese student compositions, the cause-before-effect relationships significantly outnumber the cause-after-effect relationships, enjoying an overwhelming majority. However, it majority vanishes in the native speaker compositions, where both types of relationships are roughly on an equal footing. This discovery lends support to Chen's (2001 cited in Guo & Wang 2004) finding that Chinese students are fonder of inductive thought patterns than British and American people. Zhao (1999) attributes the textual and cognitive differences to character differences. Chinese people, under the influence of Confucianism, Taoism and Buddhism, are soft and gentle by nature, thus preferring to express themselves in indirect and implicit ways. By contrast, the western people, due to their belief in Christianity, are tough by nature and are more likely to be straightforward and outspoken.

D. Adverbial Causal Connectives

TABLE 7:
ADVERBIAL CAUSAL CONNECTIVES USED BY CHINESE LEARNERS AND NATIVE SPEAKERS

	Users	Total	Initial	Medial	Connecting two sentences alone	Using semicolons
Therefore	Chinese learners	72.91	69.14	3.77	3.77	0.00
	Native speakers	108.84	22.97	85.87	3.83	0.55
Thus	Chinese learners	40.23	20.11	20.11	7.54	0.00
	Native speakers	53.05	18.05	35.00	2.73	1.09
Thus	Chinese learners	1.26	1.26	0.00	0.00	0.00
	Native speakers	11.49	2.73	8.75	0.00	0.00

Table 7 compares the use of "therefore", "thus" and "hence" by Chinese learners and that by native speakers. One similarity and two differences can be identified. First, both groups of students employ these three words in the same order of frequency. That is, "therefore" is most frequently used, "thus" less frequently and "hence" least frequently. Secondly, Chinese learners underuse these three words, because they overuse "so". Third, Chinese learners tend to put these words at the beginning of a sentence, whereas native speakers prefer to use them medially.
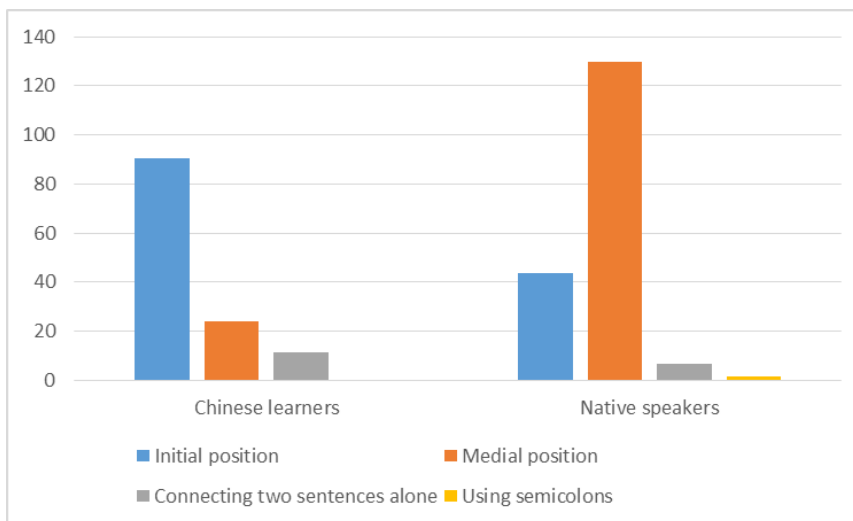
Figure 2: Adverbial causal connectives used by Chinese learners and native speakers

Figure 2 shows that the positional tendencies are radically different in the Chinese learners' and native speakers' essays. Chinese students have a much stronger preference for initial position than the English students but a weaker preference for medial position. There are two possible reasons for this positional difference. First, the mainstream sentence pattern in Chinese student compositions is simple sentence, whereas that of native speakers is compound sentence (Ma 2001). This can be partly seen from the average sentence length of both groups of learners. In this study, the average sentence length of Chinese students is 19.22 tokens, while that of native speakers is 27.59 tokens (see Table 1). Generally speaking, short sentences contain fewer elements than long sentences. Short sentences are more likely to be simple rather than compound sentences. As a result, adverbial conjuncts are allowed limited positions in sentences. Mostly they appear at the start of a sentence. The second reason is that Chinese students haven't fully mastered the usage of "therefore", "thus" and "hence". These three words are flexible in sentences. They can be put both initially and medially. But Chinese learners have overwhelmingly used them initially. Zhao (2003) suggests that the use of connectives should be parsimonious and inconspicuous. Overuse of connectives will distract readers from the global discourse to local concerns. Therefore, we recommend more use of connectives medially, which can not only reduce the visibility of explicit cohesive devices, but also enhance the inner coherence of discourse.

However, it must be pointed out that "therefore", "thus" and "hence" are adverbial connectives, which cannot be used to connect two separate sentences alone. However, nearly half of the cases where Chinese learners use these words violate this rule. Therefore, we suspect that Chinese learners don't know that "therefore", "thus" and "hence" are adverbial connectives. They confuse these words with "so", which can be both adverbial and conjuncts. It's true that some native speakers also use "therefore", "thus" and "hence" alone to connect two sentences. But usages like this occur much less frequently than those of Chinese learners. Furthermore, some native speakers use semicolon in such usages. Therefore, this study argues that using "therefore" and similar words to connect two sentences alone and without semicolon are misuses by a few native speakers. They are not good example for EFL learners to follow.

E.   Colloquialism

TABLE 8:
SEQUENCE AND FREQUENCY OF CAUSAL CONNECTIVES USED BY CHINESE LEARNERS AND NATIVE SPEAKERS

No.	Chinese learners	F	Native speakers	F
1	so	231.30	because	194.71
2	because	164.68	so	113.77
3	therefore	72.91	therefore	108.84
4	because of	49.03	as	88.06
5	since	41.48	thus	53.05
6	thus	40.23	since	33.91
7	as a result	26.40	due to	31.72
8	as	17.60	hence	11.49
9	for	16.34	as a result of	9.85
10	thanks to	13.83	consequently	8.75
11	due to	8.80	out of	8.20
12	consequently	8.80	for	6.02
13	now that	2.51	now that	3.83
14	for this reason	2.51	in that	3.83
15	in response to	1.26	because of	3.83
16	hence	1.26	in response to	2.73
17	for fear that	1.26	for this reason	2.73
18	for fear of	1.26	as a result	2.19
19	as a result of	1.26	for fear of	1.64
20			thanks to	1.09
21			owing to	1.09
22			it follows that	0.55
23			in view of	0.55
24			as a consequence of	0.55
25			as a consequence	0.55
26			accordingly	0.55

Table 8 shows that Chinese learners and native speakers share a lot in their choice of causal connectives. Six of the top 10 connectives used by Chinese learners also appear on the list of native speakers' top 10. Chinese learners all together use 19 types of causal connectives. 18 of them can be found in the native speakers' repertoire. Furthermore, this similarity extends to the avoidance of certain words by both groups of learners. For example, neither group uses "on account of" or "in consequence". Although Chinese learners and native speakers show great similarity in their choice of causal connectives, their usages are greatly different. Chinese students rely too much on several causality markers like "so", "because" and "therefore", underusing other connectives. In contrast, native speakers use these words less frequently by resorting to a wider range of causal connectives. Insufficient variety implies that Chinese learners' acquisition and manipulation of causal connectives are rather limited.

This study selected four stylistically loaded connectives for comparison. "So" is often used in oral discourse, while "therefore", "thus" and "hence" often in written discourse, despite the fact that all of them have the same function of signaling result.
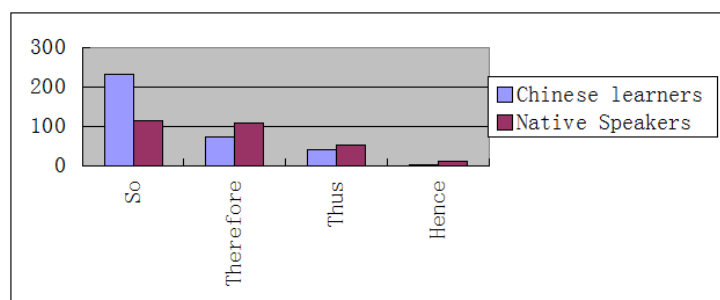

Figure 3: Four stylistically loaded causal connectives used by Chinese learners and native speakers

Figure 3 shows that the number of "so" used by Chinese students is twice more than that of native speakers, whereas their sum of "therefore", "thus" and "hence" is just two thirds of that of native counterparts. It is therefore apparent that there are strong oral features in Chinese students writing. This finding lends support to Wen, Ding & Wang's (2003) study, which takes a corpus-based contrastive approach to explore features of oral style in English compositions of advanced Chinese EFL learners. They find that advanced Chinese EFL learners clearly employed a spoken type of discourse in their English writing as EFL learners from other countries do, and they moved from a more "spoken" type of discourse to a more "written" type of discourse as they progressed in L2 learning.

V. CONCLUSION

This study conducted a contrastive study of Chinese learners' use of English causal connectives and that of native speakers. It found Chinese learners' use of causal connectives had a higher density, but a smaller variety, when compared with native speakers. It also found that Chinese learners tended to think inductively while native speakers

were inclined to think deductively. Furthermore, Chinese learners were fond of putting adverbial causal connectives at the initial positions of sentences, while English native speakers are more accustomed to the medial use of these words. Finally, Chinese learners' use of causal connectives had a strong oral style, which suggested that they lacked register awareness. In a word, there were marked differences of various kinds in the use of causal connectives between Chinese learners and native speakers. Chinese learners should get a deeper understanding of causal connectives, which are believed to be familiar to students and are supposedly not difficult for them, and sharpen their use of these words, if they attempt to approximate native speakers.

It must be pointed out that this study had some limitations. For instance, it did not consider non-typical connectives which can also indicate cause-effect, such as "and". Nor did it consider covert cohesive devices that have the same function. Future studies are recommended to be more focused with a greater in-depth. Given that studies of connectives are overwhelmingly concerned with students of English majors, future studies should also devote more attention to non-major students.

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