



A Study on the Acquisition of Hedges in Chinese College Students' English Writing Under the Complex System Framework

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Abstract

Hedges, as a typical and universal linguistic phenomenon, are one of the important factors affecting the quality of Chinese college students' English writing. Therefore, the ability to use hedges properly is helpful for Chinese college students to improve their English writing. Based on the Written English Corpus of Chinese Learners (WECCCL), this study investigates the use of hedges in Chinese English learners' writing and finds that Chinese English learners have a limited grasp of hedge types, with a small number and frequent misuse or overuse of more difficult hedges. Applying Complex System Theory, the study points out through quantitative analysis that: 1) The use of hedges in Chinese English learners' writing varies across genres; 2) Learners' second language proficiency is significantly positively correlated with the use of hedges; 3) The semantic transparency and frequency of hedges interactively influence their use. The findings of this study provide insights into English writing practice and teaching.

Keywords

Complex system; English writing; hedges

1. Introduction

In the field of natural language processing, hedges are a common and typical linguistic phenomenon. Zadeh (1965) published the paper "Fuzzy Sets," which first proposed the concept of "fuzzy sets," marking the emergence of fuzzy theory. Lakoff (1972) defined hedges as "words whose job it is to make things fuzzier or less fuzzy."

As a subjective language practice, writing can effectively coordinate the relationship between the author and the reader through hedge strategies, enhancing objectivity and acceptability. Hedges are the linguistic means to achieve this interactive strategy (Wu Guangting 2011). Due to their rich pragmatic functions and semantic features, hedges are one of the important factors affecting the fluency of second language writing. With multiple attributes, hedges have become a hot topic in the field of language acquisition research at home and abroad (Duan Shiping 2015). However, in recent years, domestic research has mostly focused on the analysis of similarities and differences in the use of hedges by second language learners in spoken language, political news discourse, and academic writing, neglecting the application of hedges in different genres. Moreover, the research perspective is single, overlooking the multi-perspective and multi-factor comprehensive analysis that affects hedges. With the widespread application of Complex System Theory in the field of language acquisition, more and more scholars advocate using Complex System Theory to study hedges (de Bot et al. 2007; Larsen-Freeman & Cameron 2013).

In view of this, this paper attempts to conduct a multi-perspective holistic study on the use of hedges in Chinese college students' English writing under the guidance of Complex System Theory, combined with a corpus-based

comparative analysis method, in order to change the single perspective of hedge research and provide a reference for the teaching of hedge use in second language writing.

2. Literature Review

Lakoff (1973) defined hedges as words with vague meanings, primarily adverbs of degree, focusing on their degree of membership rather than their truth value. After the 1980s, with the rise of pragmatics and discourse analysis, Prince, Frader, and Bosk (1982) inherited and developed Lakoff's (1973) concept, classifying hedges into two categories from a pragmatic perspective: approximators and shields. Approximators are further divided into adaptors and rounders, while shields are further divided into plausibility shields and attribution shields. The former affects the truth conditions of speech propositions, while the latter does not affect the truth conditions of speech propositions, only reflecting the degree of responsibility the speaker assumes for the truth value of the speech proposition.

Wang Jingjing and Lv Zhongshe (2016) investigated the use of hedges, one of the interactive resources of meta-discourse, in academic writing by Chinese science and engineering doctoral students. Yang Kun (2022) selected televised debates of American presidential candidates as the corpus and adopted a combination of quantitative and qualitative methods to explore the use of hedges by candidates during the debates. Wang Jiangang and Sun Fenglan (2018) explored the use of English mitigation hedges in oral academic communication, focusing on the influence of speaker gender, discourse mode, and different academic fields on the use of mitigation hedges. Contrary to previous research, Hinkel (1997, pp. 361-386) found no significant difference in the use of hedges between second language learners and native speakers in writing. This result may be related to the students' English proficiency and the genre of writing required (Wang Jingjing & Lv Zhongshe, 2016).

Complex System Theory (Larsen-Freeman, 2006) has emerged as an academic hotspot in the field of second language acquisition research in recent years and represents a new research paradigm. The theory posits that everything is an interconnected complex system, with all components within the system being interconnected, interacting with each other, and constantly changing (de Bot et al., 2007). Hedges, being a relatively complex linguistic phenomenon influenced by many factors, also constitute a complex system. Their acquisition is influenced by the interaction of subsystems such as cognition, culture, and situational context (Larsen-Freeman & Cameron, 2013, p. 80; Duan Shiping, 2014b, p. 67).

Some scholars have explored the application of hedges in academic discourse from a cross-cultural rhetorical perspective (Chen Chenghui, 2016), while others have conducted interdisciplinary research on hedges in academic English writing by Chinese science and engineering doctoral students (Wang Jingjing & Lv Zhongshe, 2016). Some have also conducted usage-based second language chunk acquisition research from a cognitive psychological perspective (Behrens, 2009; Wang Chuming, 2011). However, it is difficult to provide a comprehensive explanation by studying from a single perspective alone (Wang Min & Liu Ding, 2013).

In summary, this paper attempts to apply Complex System Theory, combined with a corpus-based approach, to explore the influence of four factors—genre, second language proficiency, semantic transparency, and frequency—on the learning of fuzzy language. It thoroughly investigates the characteristics of hedge use in Chinese college students' English writing and their related influencing factors, with the aim of providing a new perspective for analyzing hedges in college students' English writing and offering targeted inspiration for English writing instruction in China.

3. Research Design

3.1 Research Questions

Based on the framework of Complex System Theory, this study integrates a cross-genre research perspective, cognitive psycholinguistics, and usage-based second language acquisition theory to examine the influence of genre, second language proficiency, semantic transparency, and frequency on the use of hedges in Chinese college students' English writing. It aims to answer the following questions:

- (1) What are the characteristics of hedge use in different genres of Chinese college students' English writing? What are the similarities and differences in usage compared to native speakers?
- (2) What impact does genre have on the use of hedges in college students' English writing?
- (3) What impact does learners' second language proficiency have on the use of hedges in college students' English writing?

writing?

(4) What impact do semantic transparency and frequency have on the use of hedges in college students' English writing?

3.2 Research Methodology

The research methodology is divided into three steps. The first step involves employing a corpus-based comparative analysis method to analyze genre differences in hedges. Specifically, the sub-corpus generator is utilized to extract the argumentative (AGR02) and expository (EXP01) sub-corpora from the WECCL corpus, in order to analyze the usage of hedges in different genres of English writing. The second step involves utilizing the sub-corpus generator to extract the first-year (low-proficiency learners) and fourth-year (high-proficiency learners) sub-corpora from the WECCL corpus. After processing the data, the impact of second language proficiency on the use of hedges is analyzed. The third step involves analyzing the impact of semantic transparency and frequency on the use of hedges, based on the usage patterns of 20 hedges.

3.3 Research Framework

Based on Prince et al.'s (1982) classification of hedges according to their pragmatic functions, combined with Duan Shiping's (2014a, p. 37) classification system, and based on the actual usage in the WECCL corpus, we identified 20 common hedges in writing as search targets (see Table 1).

Table 1. Classification and Selection of Hedges

Shields		Approximators	
Plausibility	Attribution	Adaptors	Rounders
I think, I believe, as far as I am/I'm concerned, in my opinion, I hope, I suppose	According to, it is/It's said that, sb says that	To some extent, kind of, sort of, a little bit, in a sense, and so on	Less than, more than, at least, something between, or so

3.4 Research Corpus

The corpus used in this study is selected from the written corpus of the "Spoken and Written English Corpus of Chinese Learners" (WECCL) Version 2.0, compiled and established by Wen Qiufang, Liang Maocheng, and Yan Xiaoqin (2008). This corpus includes a total of 4,950 essays from English learners at various colleges and universities across China, spanning the years from 2003 to 2007. The WECCL corpus provides a sub-corpus generator software that allows for the extraction of different sub-corpora based on research needs. The specific information for the four corpora is shown in Table 2.

Table 2. Basic Information of Sub-corpora

Noun	Token	Type	Type-Token ratio/%
AGR02	90195	4327	4.80
EXP01	40508	1978	4.88
Low-level	282676	8373	2.96
High-level	269580	9428	3.50

4. Analysis of Research Findings

4.1 Genre-based Differences in the Use of Hedges

In this study, 20 hedges were retrieved from the ARG02 argumentative essay corpus and the EXP01 corpus under the Written English Corpus of Chinese Learners (WECCL). The frequency of these hedges was then calculated, with the results presented in Table 3.

Table 3. Frequency of Use of Various Hedges in Different Genres

	Hedges types	ARG02	EXP01	Chi-square value	P-value
Shields	plausibility (I think, I believe, In my opinion)	349	23	108.66	0.000***
	attribution (according to, sb says that)	50	61	29.82	0.000***
Approximators	adaptors	58	4	17.47	0.000***
	rounders (less than, more than)	26	157	257.31	0.000***
Total	20 hedges	535	251	0.32	0.567

As can be seen from Table 3, in terms of the types of hedges used, there is no significant difference between argumentative and expository essays overall. However, there are significant differences in the use of specific hedges. By comparison, argumentative essays use direct mitigation and procedural variation hedges more frequently (e.g., "I think," "I believe," "in my opinion"), while expository essays use indirect mitigation and scalar variation hedges more frequently (e.g., "less than," "more than," "according to"). It was also found that Chinese college students exhibit similar characteristics in both argumentative and expository writing: they are able to use a limited number of hedges proficiently, but the types are single, and they are not used in context, which is consistent with the findings of other scholars that second language learners have problems such as underuse, misuse, limited types, and contextual inappropriateness in the use of hedges (Yu Qiangfu, 2021). This also indicates that Chinese students' ability to use hedges reasonably and correctly in English writing needs to be improved.

Genre is "a communicative event in which the participants share the same communicative purpose" (Swales 1990, p. 58). People use argumentative essays to argue for a certain viewpoint or position, so they tend to use direct mitigation hedges more often. Through data analysis, it was found that "I believe," "I think," and "in my opinion" are widely used, which is consistent with the stylistic features of argumentative essays. The high frequency of procedural variation hedges is also because when the author expresses their own views, they will make some degree of correction to the original statement based on the actual situation to avoid being overly arbitrary in their views.

Domestic scholar Zhang Jinfeng (1999) believes that English expository essays are genres aimed at "explanation," generally answering questions such as "how" and "why." The main role of expository essays is to explain the content given in the topic, which is more objective than argumentative essays. Therefore, in expository genres, direct mitigation hedges are used less frequently, while indirect mitigation hedges such as "according to" are used more often. Scalar variation hedges such as "less than" and "more than" are used more frequently because in expository essays, writers do not want to set a fixed range to avoid discrepancies with the facts.

4.2 The Influence of Second Language Proficiency on the Use of Hedges

To examine the influence of second language proficiency on the use of hedges, first-year English majors were categorized as low-proficiency learners, and third-year English majors as high-proficiency learners. A chi-square test was conducted to compare the use of hedges between the two groups of learners, and the results are shown in Table 4.

Table 4. Frequency of Use of Various Hedges by High-level and Low-level English Learners

	Hedges types	Low-level GRADE1	High-level GRADE4	chi-square value	P-value
Shields	plausibility (I think, I believe, In my opinion)	927	535	87.62	0.000***
	attribution (according to, sb says that)	184	227	6.78	0.009**
Approximators	adaptors (to some extent, a little bit)	18	36	6.89	0.009**
	rounders (less than, more than, at least)	82	270	109.65	0.000***
Total	20 hedges	1440	1231	27.92	0.000**

Data analysis from Table 4 shows that there are significant differences in the use of hedges between high-level and low-level English majors. This indicates that second language proficiency has a significant impact on the use of hedges. Low-level learners primarily use direct hedges starting with "I" (e.g., "I think," "I believe," "In my opinion"), while their use of other types of hedges is lower than that of high-level learners.

From the perspective of the cognitive psychological process of processing prefabricated second language chunks, learners' ability to use prefabricated chunks is significantly influenced by their second language proficiency (Zhang Yuying, 2008). Students with higher second language proficiency have greater chunk recognition ability, while students with lower proficiency lack sensitivity in recognizing chunks. Sinclair (1991) proposed two conceptual principles: the idiom principle and the open-choice principle. Learners with higher second language proficiency tend to use the more "effort-saving" idiom principle due to their larger storage of prefabricated chunks in memory, which allows for faster retrieval. On the other hand, learners with lower second language proficiency often resort to the open-choice principle, generally understanding word-for-word and creating new expressions based on grammatical rules, resulting in lower fluency, limited variety, and inefficient retrieval.

From the perspective of the second language mental lexicon network, the lexicon network of low-level second language learners is primarily connected by phonology, and as second language proficiency improves, it gradually develops into a network primarily connected by semantics (Xie Mi, 2009). The higher the second language proficiency, the greater the proportion of semantic connections, and the familiarity and usage efficiency of chunks also improve.

As can be seen from Table 4, among the use of 20 hedges, only 10 show significant differences, while the rest are either not used or used with very low frequency. For example, "kind of" and "sort of" are not used by low-level learners, and their frequency of use by high-level learners does not exceed three times. This indicates that in addition to learners' second language proficiency, there are also other factors that affect the use of hedges. According to complex system theory, linguistic factors such as semantic transparency and chunk usage frequency also have an impact on the use of hedges.

4.3 The Influence of Semantic Transparency and Frequency on the Use of Hedges

The 20 hedging chunks were categorized based on two factors: frequency and semantic transparency.

In terms of frequency, the 20 hedging chunks were searched in the corpus, with the top 10 most frequent chunks categorized as high-frequency chunks and the bottom 10 as low-frequency chunks. An independent-samples t-test was conducted using SPSS 21.0 to examine the frequency differences between the two groups of chunks. The data in Table 5 shows that the mean frequency of high-frequency chunks is 329.4 with a standard deviation of 287.99, while the mean frequency of low-frequency chunks is 15.7 with a standard deviation of 18.28. This indicates a significant difference in the use of low-frequency and high-frequency chunks ($t=3.44$, $p=0.003$).

Table 5. T-test Results of High- and Low-Frequency Hedging Chunks

	Mean	SD	t	Sig.
High-Frequency (N=10)	329.4	287.99	3.44	0.003***
Low-Frequency (N=10)	15.7	18.28		

The chunk processing frequency effect can explain this phenomenon. The chunk frequency effect refers to the fact that high-frequency chunks have faster reaction times and more accurate judgments than low-frequency chunks (Zhang Yan, 2020). When learners frequently use chunks, they are strengthened to a certain extent. Learners can use the prefabricated chunks stored in their memory more proficiently and store them in their mental lexicon. Therefore, learners can use fewer cognitive resources to identify the meaning of the chunks, and their retrieval speed becomes faster, and their accuracy improves. The higher the frequency of chunk use, the more proficient learners become in using the prefabricated chunks stored in their memory. As a result, learners tend to use the "idiom" principle. For example, despite the low semantic transparency of "to some extent," as a conventional chunk stored in the mental lexicon, learners can quickly react to its meaning as "to a certain extent." Low-level learners, on the other hand, rely on the "open-choice" principle and tend to understand the meaning of chunks based on grammatical rules. They can quickly infer the meaning of high-transparency chunks such as "I hope" and "In my opinion" based on their

components. However, when faced with low-transparency chunks such as "sort of," they cannot infer the meaning of the chunk based on its components. In such cases, they need to mobilize more cognitive resources, which slows down retrieval speed and reduces accuracy.

The assessment of chunk transparency was conducted in the form of a questionnaire. Ten postgraduate students majoring in English were invited to evaluate the 20 hedging chunks. The operational definition of chunk transparency is the degree of relevance between the individual components of a chunk and the overall meaning of the chunk (Zhang Yan, 2020). For example, for the chunk "I believe," the raters were asked to score the semantic relevance of "I" to "I believe" and "believe" to "I believe" on a scale of 1-10. To ensure the objectivity and neutrality of the data, a six-point scale was used in the questionnaire, and the average score of the semantic relevance of the two components to the chunk was taken as the chunk's transparency score. The top 13 chunks with high scores were categorized as high-transparency chunks, and the bottom 7 chunks with low scores were categorized as low-transparency chunks (see Table 6). An independent-samples t-test was conducted using SPSS to examine the differences in semantic transparency between the two groups of chunks. The data in Table 7 shows that the mean transparency score of high-transparency chunks is 8.38 with a standard deviation of 0.67, while the mean transparency score of low-transparency chunks is 3.85 with a standard deviation of 0.64. This indicates a significant difference between high- and low-transparency chunks ($t=14.92$, $p=0.000$).

According to the operational definition of chunk transparency, high-transparency chunks have a high degree of relevance between their constituent parts and the overall meaning of the chunk, and their meaning can be inferred from their constituent parts. In contrast, low-transparency chunks have a low degree of relevance between their constituent parts and the overall meaning of the chunk, and it is difficult to infer their true meaning from their constituent parts. For example, the meaning of "I believe" can be easily inferred from its constituent parts as "I believe," but it is difficult to infer the meaning of "kind of" as "somewhat" based on its constituent parts, because "kind" means type or considerate, and "of" is a grammaticalization preposition. At the same time, the high-transparency chunk "I believe" is used very frequently, while the low-transparency chunk "kind of" only appears once in the corpus of high-level learners. This shows that the transparency of chunks has an inhibitory effect on the processing and retrieval of chunks. That is, the lower the transparency of the chunk, the slower the processing speed, and the lower the accuracy rate of learners.

Table 6. Correlation in the Use of Hedging Chunks

High-Transparency Chunks	MI values	Low-Transparency Chunks	MI values
I think	9.25	I suppose	4.85
I believe	9.2	Kind of	3.8
As far as I am/I'm concerned	7.55	Sort of	2.9
In my opinion	8.05	In a sense	3.6
It is said that	8.1	To some extent	4.1
I hope	8.95	And so on	4.3
A little bit	6.8	or so	3.4
According to	8.25		
Sb says that	8.6		
At least	8.6		
Something between	8.6		
More than	8.4		
Less than	8.55		

Table 7. T-test Results of Hedging Chunks with High and Low Semantic Transparency

	Mean	SD	t	Sig.
High-Transparency Chunks (N=13)	8.38	0.67	14.92	0.000***
Low-Transparency Chunks (N=7)	3.85	0.64		

5. Conclusion

The use of hedging expressions is one of the important factors affecting the quality of college students' English writing. Therefore, the study of hedging expressions in Chinese college students' written language has significant theoretical and practical implications, providing valuable theoretical insights for both students' writing practices and teachers' instructional practices. This study reveals that Chinese English learners tend to have a limited repertoire of hedging expressions, often misusing or overusing more complex ones. This phenomenon is mainly attributed to three factors - the genre of language learning, learners' cognitive levels, and the nature of hedging expressions themselves: 1) The use of hedging expressions in Chinese English learners' writing varies across different genres; 2) Learners' second language proficiency is significantly positively correlated with their use of hedging expressions; 3) The semantic transparency and frequency of hedging expressions interactively influence their usage. The acquisition of hedging expressions is a complex system influenced by multiple factors. Only by integrating the three subsystems of text genre, learner characteristics, and hedging expression features into a holistic analysis can we fully and accurately understand the effectiveness of hedging expressions in writing.

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