A Comparative Study on Stance Adverbs in Abstracts of Doctoral Dissertations by Chinese and Americans — A Case Study in Petroleum Engineering

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Abstract: Stance adverbs are one of the main means to express the author's attitude and views on proposition information. This study bases on self-built corpus, taking the English abstracts of Chinese and American doctoral dissertations in the field of petroleum engineering as the corpus and analyzing the characteristics of stance adverbs used by Chinese and their American counterparts. The results show that: 1) there is no statistically significant difference in the overall frequency of stance adverbs between Chinese and American doctors, and both of them show a tendency of "epistemic stance adverbs > attitude stance adverbs > style-of-speaking stance adverbs"; 2) There is no significant difference in the frequency of using epistemic stance adverbs between Chinese and American doctors, but Chinese doctors significantly use more boosters, a subcategory of epistemic stance adverbs, showing the rigid traces of English writing style. Chinese doctors significantly use certain hedges, the other subcategory of stance adverbs; 3) There was no statistically significant difference in the frequency of using attitude stance adverbs between Chinese and American doctors, but Chinese doctors use more attitude stance adverbs to express affect than evaluation; 4) There is no significant difference in the frequency of style-of-speaking stance adverbs between them, and the fact that the use of this kind of stance adverbs is used least may be affected by the stylistic characteristics of the English abstract.

Keywords: Stance Adverbs, English Abstract, Petroleum Engineering, Epistemic, Attitude, Style-of-Speaking

1. Introduction

Dissertation is one of the most important standards to test the cultivation quality of masters and doctors. According to the traditional concept, the purpose of academic writing is to explain the research content and transmit information objectively and neutrally without including the author's personal feelings and attitudes. However, research has sought to reveal how academic writers intervene in their texts not only to present but comment their findings to interact and reach a consensus with their readers [25]. Hyland has mentioned that academic research articles are interactive, and authors actively try to involve the reader in the communication process [20, 22, 23]. Stance is an important medium. Biber et al. mentioned that stance adverbials are adverbials that overtly mark a speaker’s or writer’s attitude to a clause or comment about its content [9]. Xv Hongliang mentioned that single adverbs take the most part in stance adverbials [42]. Biber considered that stance adverbs not only tell of the writer’s attitude toward the proposition typically conveying an evaluation, value judgement, or assessment of expectations, but also express a range of epistemic meanings, such as doubt, actuality, limitation or viewpoints [9]. It is conducive to using stance adverbs properly to convey information and interact with potential readers in academic writing. However, Casagrande pointed out that adverbs are the best-kept secret of the grammar world [11]. Day pointed out that abstract is an indispensable part of dissertation which has independent stylistic features and discourse structure, and abstract should be viewed as a miniversion of the paper [17]. Therefore, the author needs to master an appropriate way to write the abstract of the
dissertation so that readers are not only able to identify the basic content of a dissertation accurately and concisely but also participate in it. The expression of stance adverbs cannot be ignored in academic writing. However, the ability to express stance appropriately in English is a complex task for language learners [24]. Based on the self-built corpus, this study statistically analyzes the use of stance adverbs in 200 English abstracts of doctoral dissertations in petroleum engineering written by Chinese doctors and their American counterparts from three dimensions—epistemic stance adverbs, attitude stance adverbs and style-of-speaking stance adverbs. This paper is organized as follows. Section 2 provides the general notion and research status of stance adverbs. Section 3 is devoted to the methodology of this paper, mainly about the construction of corpora and framework. Section 4 discusses the result of research from the perspective of pragmatics, semantics and prosody in order to compare the frequency of stance adverbs used by Chinese doctors and their counterparts more clearly. Section 5 is about the conclusion of this paper.

2. Literature Review

2.1. Previous Studies in Abroad

Scholars have taken different perspectives to explore stance adverbs. International studies on stance adverbs mainly focus on three aspects: theoretical research, semantic exploration and pragmatic function analysis.

2.1.1. Theoretical Research

Biber and Finegan [7, 8] firstly identified stance as “the lexical and grammatical expression of attitudes, feelings, judgments, or commitment concerning of the message, including the indication of the message.” It means that there is a deep relationship between the speaker’s degree of commitment and the truthfulness of the content. According to the function of adverbs, Quirk et al. divided adverbs into adjuncts, subjuncts, conjuncts and disjuncts, and disjuncts are used to convey speaker’s comment on the style of what he is saying and make an observation on the actual content of the utterance and its truth condition [36]. Disjuncts contain some stance adverbs. Biber et al. [9] and Conrad and Biber [6] categorized stance into three types, which include epistemic stance adverbs, attitude stance adverbs and style stance adverbs. Stance has been discussed by Hyland under the concept of meta-discourse, which includes four dimensions hedges, booster, affect and self-mention [23], and the first three dimensions contain stance adverbs. Crompton discussed the definition and taxonomy of hedges [15], and Hyland and Meyer discussed hedges used in academic register respectively [20, 21, 33]. Adverbs in hedges belong to stance adverbs. Simon- Vandenbergen and Aijmer divided adverbs of certainty into four dimensions: epistemic certainty adverbs, evidential adverbs, expectation adverbs and speech act adverbs [40]. These adverbs are included in stance adverbs. Moreover, stance adverbs are intersected with or included in other terms and concepts, such as, evidentiality [12], modality and attitudinal meaning [18], evaluation [19] and appraisal [30, 31].

2.1.2. Semantic Exploration

Chafe discussed the semantic categories of evidently, clearly, obviously and surely [12]. McEnery and kifle summarized 11 English adverbs expressing possibility [32], which belong to stance adverbs. Waters discussed the meaning of actually and found that its meaning is influenced by position in sentence [45].

2.1.3. Pragmatic Function Analysis

Barbarei analyzed the pragmatic functions of obviously and certainly [3]. Capone discussed the discourse function of obviously, certainly and really with the concept of Conversational Implicature and pointed out that adverbs can express the speaker's commitment to the truth value of a proposition [10]. Biber regarded stance adverbs as one of subcategories in the whole research and discussed the expression of stance and evaluation in spoken and written university registers [5]. Wierzbicka discussed the evidentiary meaning of certainly and obviously [46]. Myers discussed three functions of really [34]. Ahmad discussed stance adverbials used by L2, which include stance adverbs [2]. Adams and Quintana analyzed how English learners use stance adverbs to express their views in academic English writing and pointed out that certainly, clearly and obviously were often used to enhance their certainty in propositional information [1]. Özdemir analyzed meta-discourse used by English learners and their American counterparts in abstracts of master thesis [35], which includes stance adverbs. Crosthwaite et al. discussed stance expression in learner and professional academic writing, which include stance adverbs, such as generally, mainly, maybe [16]. Rozumko has discussed the interpersonal functions and rhetorical strategies of clearly and obviously [39]. Pérez-Paredes studied the three most frequent certainty stance adverbs, obviously, really and actually used by native English speakers and Non-native English speakers [38]. Keizer discussed the discourse-pragmatic function of stance adverbs [27].

2.2. Previous Studies in China

Chinese scholars focus on the empirical research of stance adverbs. They often study stance adverbs through comparing academic discourse corpus of Chinese English learners with that of native speakers. Zhao Xiaolin has compared the characteristics of stance adverbs between Chinese English learners and native English speakers [47]. Pan Fan has discussed the frequency, distribution and applicable register of stance adverbs, basing on Chinese mechanical English journals and Corpus of Contemporary American English (COCA) [37]. Lou Baociu and Yao Wenting has discussed the characteristics of stance adverbs used in Chinese master's thesis and international authoritative journals in the field of linguistics [29]. Li Zhi and Cheng Xiaomin have analyzed the overall distribution of stance markers in abstracts of Chinese and foreign journal papers and compared differences between them [28]. Chen Qingbin has compared the distribution characteristics of stance markers (including stance adverbs) in English abstracts of Chinese and international journals, and He has found that Chinese doctors tend to use
boosters to construct their authoritative stance and achieve the purpose of persuasion [14].

2.3. To Sum up

International and Chinese scholars have made some achievements in the research of stance adverbs, but they usually discuss stance adverbs as a subcategory of research objects or only focus on the case study of stance adverbs, especially on obviously, really and certainly. Therefore, there is a necessity to have a systematic research of stance adverbs based on macro data statistical analysis. In addition, some empirical studies often regard journal papers as the source of corpora, and they often carry out intercultural analysis of the whole pages. However, the intercultural research on the English abstracts of Chinese and American doctoral dissertations is relatively scarce. As Bhatia mentioned that the abstract aims to enable readers to accurately and concisely understand the full text and present a faithful and accurate outline of the full text [4]. Therefore, this paper takes 200 English abstracts of doctoral dissertations as the source of corpora and reports a study of stance adverbs used by Chinese doctors and their American counterparts. We hope that this research will shed light on English academic writing and teaching.

3. Research Methodology

3.1. The Collection of Corpora

Firstly, 100 Chinese doctoral dissertations published in petroleum engineering are selected from the "CNKI Full-Text Database of Doctoral Dissertations" and the other 100 American doctoral dissertations are selected from "ProQuest Full-text Database of Doctoral Dissertation". In order to narrow the margin of error, the publication period of all doctoral dissertations is limited between 2016 and 2021. As Wang Shuwen and He Sheng pointed out that experimental research is one of the most common research types in natural science [44]. Therefore, all of these dissertations are based on experimental study to decrease error. Secondly, the selected corpora are purified, only retaining abstracts but deleting titles, keywords, texts, references, thanks, appendices, charts, etc. Thirdly, the purified corpora are converted into plain text version and divided into Corpus of Chinese Doctoral Dissertation Abstract (CAA), whose total words are 40,163. 100 papers in CCA are marked as CAA1, CCA2, CCA3,…, CCA100 and 100 papers in CAA are marked as CAA1, CAA2, CAA3,…, CAA100.

3.2. Research Questions

1) What are the similarities and differences between Chinese and American doctors in the overall use of stance adverbs?
2) What are the similarities and differences between Chinese and American doctors in the use of epistemic stance adverbs?
3) What are the similarities and differences between Chinese and American doctors in the use of attitude stance adverbs?
4) What are the similarities and differences between Chinese and American doctors in the use of style-of-speaking stance adverbs?

3.3. Analysis Framework

This research mainly refers to the study of stance adverbs made by scholars [3, 9, 25, 32, 40, 43] in order to confirm the list of stance adverbs. Then, these confirmed adverbs are divided into three major semantic categories: epistemic stance adverbs, attitude stance adverbs and style-of-speaking stance adverbs. Epistemic stance adverbs focus on the speaker’s judgement or comment about information and show speaker’s certainty about the proposition [9, 43], which are able to divide into hedges and boosters according to semantic characteristics. Hedges are devices that indicate the writer’s decision to withhold complete commitment to a proposition, allowing information to be presented as an opinion rather than accredited fact [23]. Boosters, on the other hand, allow writers to express their certainty in what they say and to mark involvement with the topic and solidarity with their audience [23]. Therefore, hedges weaken the certainty of the author’s epistemic judgment so as to accommodate and respect different voices, and readers are given the discursive space to debate. Boosters emphasize the certainty of epistemic judgment. Attitude stance adverbs tell the speaker’s attitude, evaluation, assessment and value judgment toward the proposition’s content [9], which mainly fall into two subcategories: marking attitude and evaluation. Style-of-speaking stance adverbs present the style and manner of conveying the message [9]. The specific analysis framework is shown in Table 1.

### Table 1. Categorization of stance adverbs.

<table>
<thead>
<tr>
<th>Stance adverbs</th>
<th>Subcategories</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>epistemic stance adverbs</td>
<td>hedges</td>
<td>perhaps, likely, generally, mainly, primarily, often, approximately…</td>
</tr>
<tr>
<td></td>
<td>boosters</td>
<td>clearly, obviously, certainly, undoubtedly, apparently, absolutely…</td>
</tr>
<tr>
<td>attitude stance adverbs</td>
<td>affect adverbs</td>
<td>fortunately, ironically, unfortunately, surprisingly, predictably…</td>
</tr>
<tr>
<td>style-of-speaking adverbs</td>
<td>evaluation adverbs</td>
<td>adequately, incorrectly, properly, appropriately, successfully…</td>
</tr>
<tr>
<td></td>
<td>briefly, hopefully, seriously, strictly, broadly…</td>
<td></td>
</tr>
</tbody>
</table>

3.4. Analysis Tool

This study refers to the adverbs summarized by scholars [25, 43] and bases on dictionary interpretation and similarity description. Therefore, there are 127 adverbs are taken as stance adverbs to research in this paper. According to analysis framework, AntConc 3.2.0w is used to retrieve
the original frequency of stance adverbs and three subcategories in the two corpora, and the search items are screened out when they don’t present the functions of stance adverbs. Then the original frequency is standardized in 10,000 words; Finally, Excel and SPSS 24.0 are used for data plotting and chi square test. At the same time, Corpus of Contemporary American English (COCA) is used to investigate the frequency of those adverbs in academic register which are significantly more or less used by Chinese doctors to check if those adverbs are suitable for academic register.

4. Findings and Discussion

4.1. The Overall Use of Stance Adverbs

There is no significant difference in the overall frequency of stance adverbs used by Chinese and American doctors (p=0.543 > 0.05). Chen Jiansheng and Zhang Yan also found that there is no difference between Chinese English learners and English native speakers on the total frequency of stance adverbs [13]. As shown in Table 2, both of Chinese and American doctors show a tendency of "epistemic stance adverbs > attitude stance adverbs > style-of-speaking stance adverbs ". It proves that Chinese doctors basically master the semantic features and pragmatic functions of stance adverbs in the field of petroleum engineering. This may be because the corpora are selected from experimental research, which has experienced relatively long period of development, moreover, English teaching in the field of petroleum engineering has been paid more attention under the background of increasingly close cooperation and exchange between Chinese energy enterprises and other international energy enterprises. Therefore, the academic English writing standard of Chinese petroleum engineering doctors is gradually close to that of English native speakers.

However, glossary quantity of stance adverbs is 65 in CCA but 53 in CAA. It can be found that the lexical richness of stance adverbs used by Chinese doctors is higher than that of native speakers. Specifically, the difference of lexical richness mainly presents on epistemic stance adverbs. Though there is no significant difference in the frequency of three types of stance adverbs used by Chinese and American doctors, there are significant differences in the frequency of subcategory of epistemic stance adverbs and attitude stance adverbs. The reason is worth exploring.

<table>
<thead>
<tr>
<th>Stance adverbs</th>
<th>CCA</th>
<th>CAA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Glossary quantity</td>
<td>Rfreq.</td>
</tr>
<tr>
<td>EPISTEMIC</td>
<td>48</td>
<td>343</td>
</tr>
<tr>
<td>ATTITUDE</td>
<td>12</td>
<td>74</td>
</tr>
<tr>
<td>STYLE-OF-SPEAKING</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>434</td>
</tr>
</tbody>
</table>

Note: p-value < 0.05 indicates significant difference, the same below.

4.2. The Use of Epistemic Stance Adverbs

Chinese and American doctors most commonly use epistemic stance adverbs, which is consistent with research results of Zhao Xiaolin [47] and Xv Hongliang [43]. As shown in Table 3, there is no significant difference in the frequency of epistemic stance adverbs used by Chinese and American doctors (P=0.514 > 0.05), but Chinese doctors significantly use more boosters (P=0.012 < 0.05). Li Zhi and Cheng Xiaomin [28] believe that "the use of boosters in academic abstracts can enhance the certainty of propositions to obtain readers' recognition." However, the excessive use of boosters will make the tone stiff, which is not conducive to building a good academic interpersonal relationship with readers. Many scholars unanimously consider that Chinese English learners tend to express their views in a more authoritative tone [29, 42, 43]. The result of this research also shows similar characteristics. Chinese doctors may pay more attention to establish the image of experts and highlight academic authority but leave relatively fewer discursive spaces to readers.

Specifically, Chinese doctors use boosters that express the semantic feature of "can't deny", such as obviously and positively, but their American counterparts don’t use these adverbs to express that meaning. Although these adverbs can convey the author's high reliability of his own proposition, excessive use may have the risk of exaggerating fact and is not conducive to the embodiment of academic authority. Panfan pointed out that Chinese authors lack sufficient understanding of the means to realize interpersonal function in academic discourse, and it is difficult to express their stance accurately and appropriately [37]. However, Jiang and Hyland also believe that successful academic writing not only needs to clarify authorial stance but also obtain the emotional recognition of the readers [26]. Therefore, realizing interpersonal interaction is an important element of dissertation writing. Chinese doctors use obviously to put forward their own views in an authoritative tone. It makes readers passively accept the proposition and reduces the space for readers to participate in the discussion. There is a suspicion of making a rash judgment. Therefore, the proper use of boosters plays an important role in the construction of doctor's authority image.
Although there is no statistically significant difference in the overall use of hedges between Chinese and American doctors, there exists differences in the use of some adverbs between Chinese doctors and their American counterparts. As shown in table 3, Chinese doctors significantly use mainly and greatly (p=0.000 < 0.05, p=0.014 < 0.05). Chinese doctors may learn the two adverbs earlier so as to be more familiar with their semantic and pragmatic functions and to form a fixed mind-set. As interactional resources, hedges show the speaker’s unwillingness to present propositional information categorically [25]. There are a large range of hedges chosen to realize this function. However, with the influence of mind-set, Chinese doctors incline to their familiar adverbs but use significantly less adverbs such as commonly, typically and usually to realize the function of hedges. These hedges are checked in Corpus of Contemporary American English (COCA), the result shows that mainly and greatly are not as frequent as commonly, typically and usually in academic register. Moreover, many scholars have pointed out that Chinese English learners significantly use mainly more [13, 29]. According to the corpora, it is found that mainly normally collocates with prepositional phrase. It is used to focus on the research object and limit the research content. In CCA, mainly often co-occurs with focus on, rely on, dependent on, consider of, concentrate in, etc., but American doctors use these expressions significantly less. Moreover, mainly has high lexical similarity with other two hedges, mostly, primarily. The similarity between mainly and mostly is 0.638, while the similarity between mainly and primarily is 0.780 (http://worldsimilarity.com). With the help of COCA, the data shows that primarily is most frequently used while mainly is least frequently used in academic register among the three. Therefore, it’s confused to Chinese doctors to choose correct words in specific register and master the pragmatic functions of some words. The fact shows that Chinese doctors have not fully mastered the applicable register of synonyms mainly, mostly and primarily in academic writing.

### Table 3. Statistics of the use of epistemic stance adverbs.

<table>
<thead>
<tr>
<th>Epistemic stance adverbs</th>
<th>CCA</th>
<th>CAA</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boosters</td>
<td>Rfreq</td>
<td>Sfreq</td>
<td>Rfreq</td>
</tr>
<tr>
<td>Hedges</td>
<td>47</td>
<td>7.90</td>
<td>8</td>
</tr>
<tr>
<td>total</td>
<td>343</td>
<td>38.24</td>
<td>144</td>
</tr>
</tbody>
</table>

### Table 4. Statistical of hedges existing significant difference.

<table>
<thead>
<tr>
<th>Hedges</th>
<th>COCA</th>
<th>CCA</th>
<th>CAA</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sfreq.(PER MIL)</td>
<td>Rfreq</td>
<td>Sfreq</td>
<td>Rfreq</td>
</tr>
<tr>
<td>commonly</td>
<td>59.19</td>
<td>1</td>
<td>0.11</td>
<td>13</td>
</tr>
<tr>
<td>greatly</td>
<td>43.06</td>
<td>20</td>
<td>2.23</td>
<td>2</td>
</tr>
<tr>
<td>mainly</td>
<td>51.57</td>
<td>66</td>
<td>7.36</td>
<td>3</td>
</tr>
<tr>
<td>typically</td>
<td>103.05</td>
<td>1</td>
<td>0.11</td>
<td>6</td>
</tr>
<tr>
<td>usually</td>
<td>144.90</td>
<td>6</td>
<td>0.67</td>
<td>10</td>
</tr>
</tbody>
</table>

### Table 5. Statistics of the Use of Attitude Stance adverbs.

<table>
<thead>
<tr>
<th>Attitude stance adverbs</th>
<th>CCA</th>
<th>CAA</th>
<th>( p )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rfreq</td>
<td>Sfreq</td>
<td>Rfreq</td>
</tr>
<tr>
<td>Affect</td>
<td>13</td>
<td>1.43</td>
<td>1</td>
</tr>
<tr>
<td>Evaluation</td>
<td>61</td>
<td>6.80</td>
<td>44</td>
</tr>
<tr>
<td>total</td>
<td>74</td>
<td>8.25</td>
<td>45</td>
</tr>
</tbody>
</table>

### 4.3. The Use of Attitude Stance Adverbs

There is no significant difference in the frequency of attitude adverbs between Chinese and American doctors \((p=0.110 > 0.05)\). However, Chinese doctors significantly use more attitude stance adverbs to express affect \((p=0.029 < 0.05)\) but significantly use less to express evaluation \((p=0.018 < 0.05)\). Specifically, Chinese doctors frequently use the attitude stance adverb seriously the express affect, but American doctors do not use it. Through observing the corpora, it is found that seriously is mainly used to modify verbs with negative semantics, such as endanger, pollute, hinder etc. (eg. CCA028, CCA056, CCA094). The fact that the Chinese equivalent of seriously is often paired with verbs with negative semantics, which reflects the influence of Chinese language habits on English writing.

CCA028: The sudden failure of the pipeline will seriously endanger people’s lives and property.

CCA056: The emission of diesel particles with poor quality seriously pollutes the urban environment.

CCA094: The occurrence of fingering in reservoirs will seriously affect the recovery efficiency of crude oil, which should be avoided in practical engineering.

The reason that Chinese doctors significantly use less adverbs to express evaluation may be due to the maintenance of academic objectivity. Therefore, they do not tend to express their own evaluation for propositional information. However, both Chinese and American doctors frequently use significantly. According to the analysis of corpora, it is found that significantly mainly matches with verbs indicating increase and decrease, such as increase, decrease, improve,
reduce, change (eg. CAA006, CAA020, CCA015, CCA046) and with adjectives indicating change of degree, such as lower, higher etc. (eg. CCA043, CCA097). Therefore, the high frequency use of significantly may also be based on the demands of statistics and analysis of experimental research data. Stotesbury also pointed out that "significantly means "statistically significant" at the technical level [41].

CAA006: However, matrix swelling significantly reduces the permeability of the matrix and fractures, reducing oil recovery.

CAA020: Massive multi-cluster, multi-stage hydraulic fractures have significantly increased the complexity of the flow behavior in shale.

CCA015: A large number of acidic sites on the surface of the catalyst multistage pores can significantly improve the catalytic reaction performance for macromolecules.

CCA046: Contact metamorphism will significantly change composition, geochemical properties and pore structure of shales.

CCA043: The amount of surfactant and alkali used in Plan1 is significantly lower than that of Plan 2.

CCA097: The total oil displacement rate of C-2 fermentation broth was significantly higher than that of control water flooding (p < 0.05).

4.4. The Use of Style-of-speaking Stance Adverbs

In terms of frequency of style-of-speaking stance adverbs, there is no statistically significant difference between Chinese and American doctors (p=0.097 > 0.05). Style-of-speaking stance adverbs are used with the lowest proportion by Chinese and American doctors within the scope of stance adverbs. This may be due to the unique stylistic characteristics of the abstract, whose length is limited. It focuses on the summary of the full text and strives to be concise and comprehensive. This kind of stance adverbs are used to guide potential readers to comprehend information step by step. For example, briefly is used to predict how the reader will give information in the text and guide the reader to understand the content of the text (Pan Fan, 2012: 11). It is more often used in the main part of the dissertation, Therefore, Chinese and American doctors reduce the demand for style-of-speaking stance adverbs.

5. Conclusion

In terms of the total frequency of stance adverbs, there is no significant difference between Chinese and American doctors, and they show the frequency of stance adverbs with same tendency: epistemic stance adverbs > attitude stance adverbs > style-of-speaking stance adverbs. Moreover, there is no statistically significant difference between Chinese and American doctors according to the frequency of three types of stance adverbs respectively. It shows that Chinese doctors basically master the semantic characteristics and pragmatic functions of stance adverbs in the field of petroleum engineering English abstract writing. Chinese doctors' English writing level is gradually close to their counterparts. However, the lexical richness of Chinese and American doctors exists differences.

In terms of the frequency of boosters, which are subordinated to epistemic stance adverbs, Chinese doctors use boosters more significantly and they show higher lexical richness. The fact that Chinese doctors incline to boosters reflects a relatively stiff tone in the English abstract writing. In terms of the frequency of hedges, which are the other part of epistemic stance adverbs, Chinese doctors overuse and underuse some hedges, reflecting a kind of thinking set formed in the process of learning English and reflecting the lack of competence to choose proper stance adverbs in academic register. In terms of the frequency of attitude stance adverbs, which are used to express affect, Chinese doctors significantly use more specific adverbs. Specifically, Chinese doctors significantly use more more seriously. It may be affected by the expression of mother tongue. The reason why Chinese doctors use less evaluation adverbs may be to maintain academic objectivity. Both Chinese and American doctors seldom use style-of-speaking stance adverbs least in the abstracts of their dissertations, which may be affected by the length and style of the abstracts.

The results of this study have reference and enlightenment for the writing and teaching of English dissertation abstracts. First of all, stance adverbs are an important medium for authors to convey their own views and attitudes. It is important to guide learners to be familiar with the functions of stance adverbs in order to master their appropriate use methods. Secondly, the fixed mind-set formed in the process of learning affects learners' vocabulary choice. Teachers can pay more attention to those words which are significantly used more or less by students and correct errors for them. Thirdly, it's indispensable to understand how to choose stance adverbs in specific register. Teachers are supposed to help students raise awareness to consider academic register when they are writing. Fourthly, the different characteristics between English and Chinese expressions are one of the most important reasons to cause the different use of stance adverbs between English learners and English native speakers. Therefore, it's favorable to guide learners to compare the differences between English and their language so that their English writing level is increasingly close to English native speakers.

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