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Dependency Features of English Nouns in China News English

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Abstract

Nouns are one of the most frequently used word classes in English. As one variety of "World Englishes", China English has received much concern in recent years. However, most research on nouns is still at the cognitive aspect or in the traditional qualitative way. As a new quantitative method, dependency grammar reveals the internal relations among the words in the sentence. Therefore, the syntactic features of nouns in China News English can provide a new perspective. The raw material of China English in this study is randomly crawled from *China Daily*, and the News part in the Corpus of Contemporary American English (COCA) from 2013 to 2016is selected as the reference corpus. By using the Jupyter Notebook based on Python, the dependency treebanks are generated. After comparing the proportion of the word classes, dependency direction, and dependency distance of different dependents of nouns in *China Daily* and COCA, this paper finds that 1) On the whole, the categories of dependents in China English and American English are similar. Determiners, adjectives, nouns, prepositions, verbs, numbers, proper nouns, conjunctions, pronouns and particles are the top ten frequently-used modifiers of nouns. Compared with American English, China English tends to use more adjectives and nouns, while the determiners especially the articles and pronouns are relatively less used. 2) Both in China English and American English, the percentage of HI constructions and HF constructions is close to 50%. China English tends to be more right-embedded than American English. Compared with AmE, in ChiE, prepositions, conjunctions and participles are more frequently used as post-modifiers. 3) The mean dependency distance value of China English (2.68) is larger than American English (2.61). Both in China English and American English, the mean dependency distance of pre-modifiers is shorter than in post-modifiers. The longer the mean dependency distance value is, the more difficult is in processing the information. It indicates that in the News domain, China English is more difficult to be processed in expression. This research provides a new perspective to studying English variants and enriches the current research on nouns.

Keywords

Nouns, China English, Dependency Direction, Dependency Distance

1. Introduction

As one of the important word categories in English, nouns have attracted much attention in recent years. However, most of the research on nouns is still in the cognitive aspect or in the traditional qualitative way. The population of quantitative linguistics based on corpora generates many corpora with annotation, which are called dependency tree-

banks. It can describe unequal syntactic relations between two words in a sentence (Wang & Liu, 2016). Therefore, dependency treebanks can be used to analyze the syntactic features of the words and internal relationships between word pairs. Enlightened by dependency grammar, this paper aims to investigate the syntactic features of English nouns when they act as the governors in the news text in two English variants. This paper attempts to answer the following questions:

1) Is there any difference in the distribution of word categories of nouns' dependents between China News English and American News English?
2) Is there any difference in the distribution of pre-modifiers and post-modifiers of nouns between China News English and American News English?
3) Is there any difference in the dependency distance of pre-modifiers and post-modifiers of nouns in China News English and American News English?

2. Literature Review

2.1 Dependency Grammar

Dependency grammar is a descriptive method of natural language structures based on dependency structure (Liu, 2009). The relation between the governor and the dependent is called dependency relation. It can be connected by a directed arc from the governor to its dependent with a label (Tesniere,1959; Hudson, 1990, 2007; Liu, 2009). In addition, the dependency relation can be classified by a set of grammatical relations. Based on this, the dependency treebanks can be conducted as follows:

Take "The boy eats red apples." for example:

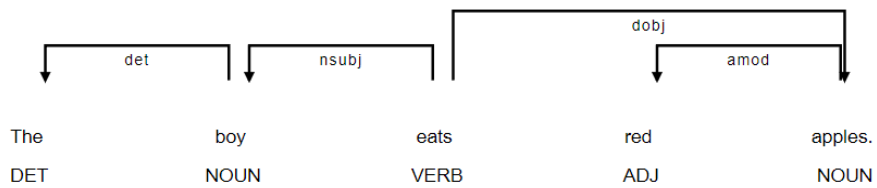

Figure 1. Dependency structure of "The boy eats red apples."

In this example structure, each word is connected by grammatical relations, and the labels such as "det", "nsubj" etc. on the top of words represent the dependency relations of the words in the sentence. For example, the subject "boy" and object "apples" are dependents of the main verb "eats"; the adjective "red" is dependent on the object "apples". In the noun phrase "red apples", "red" is the modifier of "apples. In dependency grammar, the "red" is called dependent and "apples" is the governor. The dependency grammar framework includes several important concepts. Here, in this study, several related concepts will be introduced.

2.2 Dependency Distance

Dependency distance (DD, or dependency length) refers to the linear distance between two linguistic units having asyntactic relationship within a sentence (Heringer et al., 1980; Hudson, 1995). One of the linguistic units is the head or governor and the other word is the dependent which is syntactically dependent on the governor. The dependency distance is often calculated as the difference between the head and the dependent. It measures how far two syntactically related words are away from each other in asentence (Wang, 2019). In Fig. 1, in the noun phrase "the boy", "the" is the dependent and "boy" is the head. The dependency distance between "the" and "boy" is 1.

In addition, dependency distance is a metric of both syntactic complexity and cognitive cost (Hudson, 1995; Ninio, 1998; Hiranuma, 1999; Liu, 2008, 2009). The value of dependency distance can manifest the intensity of the human working memory load and therefore, it is often used to reflect the cognitive difficulty in processing a sentence. The greater the dependency distance, the more difficult the sentence-processing analysis is (Liu et al., 2009; Jiang & Liu, 2015). Moreover, it is noteworthy that the study of dependency distance does not only be conducive to understanding the cognitive processes of human beings but also indicates the universality and specificity of natural languages (Jiang & Liu, 2015).

Mean dependency distance (hereafter MDD) indicates the sentence complexity, to a considerable degree (Liu, 2008),

because the long distance between the words means more memory decay or interference, and thus more energy committed to activating the stored words (Liu et al., 2017). Therefore, the more energy the sentence costs, the more complex the sentence is. MDD is used as a new measurement for differentiating human languages. The studies related to MDD are mainly about the decreasing tendency of MDD in human languages which is a universal phenomenon (Futrell et al., 2015; Liu et al., 2016). The quantitative research of dependency distance is mainly related to the study of dependency direction.

2.3 Dependency Direction

As one of the syntactic properties in Word Grammar, the dependency direction can be used to differentiate the word order of various languages. When the head precedes the dependent, the dependency direction is "head-initial" (HI), and when the head follows the dependent, it is "head-final" (HF). In Fig. 1, in the noun phrase "the boy", the dependent "the" precedes the head "boy", therefore, the dependency direction of this structure is head-final. Hence, by investigating the dependency direction of the constructions, the word order can be revealed. Zhang and Liu (2019) have found that both in native English and China English, the percentage of HI is slightly higher than HF. The previous studies related to dependency direction mainly focused on the cognitive factors in interpreting and code-switching research (Wang & Liu, 2013, 2016; Liang et al., 2017; Wang, 2019). However, few studies have investigated the use of dependency direction in the quantitative study of syntactic relations.

2.4 Noun Governor

According to Biber (1999), modifiers can be divided into pre-modifiers and post-modifiers. In this study, we adopt the concept proposed by Biber (1999). When the nouns act as the governor and collocate with other dependents, the dependents are modifiers or specifiers of nouns. The modifiers can be further classified into pre-modifiers—the head-final structure (HF) and post-modifiers—the head-initial structure (HI) of nouns. What is necessary to be noticed is that the noun governor in this study is one of the major categories of the governor rather than the major governor of the whole sentence.

Previous studies related to quantitative research on noun governors and modifiers were rare. Wang (2019) made comparative research on syntactic functions and patterns of nouns when it serves as governor and dependent respectively in Chinese and native English based on dependency treebanks. The *Reports on the Work of the Government* (Chinese-English bilingual) are selected as materials. The results indicate that in Chinese, no matter whether the nouns act as governors or dependents, the proportion of attributive dependency relations is much higher than that in English.

2.5 China News English

The definition of China English is various in recent years. Ge (1980) proposed that "Chinese use English to communicate with foreigners in listening, speaking, reading and writing, they use the language with Chinese characteristics to convey the things they want to express". According to his definition, this study holds that China English is English used by Chinese in daily life. As a kind of news English, *China Daily is* a variant of English and is an official political news that can reflect Chinese daily life.

Previous studies focus more on the linguistic commonality and peculiarity of different English variants. Ma (2015) made a research on *China Daily* from a discourse analysis perspective to explore the features of China News English. She found that from the perspective of language, "English with standard English as the core and Chinese characteristics" has become its main language feature. Besides, in China News English, there are some problems with the expression in the choice of words and sentences, and at the discourse level, it lacks dynamism due to the overemphasis on norms. Few studies based on dependency can be found, especially the exploration of syntactic features of noun governors in China News English.

2.6 Research Gap

From the above research, it is clear that most studies with dependency are related to a single language, and few are related to comparative studies between China English and native English. Few studies focus on noun governors in China English. In addition, few quantitative studies have focused on the syntactic impacts of the governors and the dependents in terms of the dependency distance and dependency direction, which is what the present study is concerned with. Therefore, it is of great significance to explore the use of noun phrases and the syntactic features in China News English based on dependency treebanks. Thus, this paper attempts to fill the gap. This paper focuses on nouns, which is the most frequently-occurred category in News English.

3. Methodology and Materials

3.1 Materials

This study is based on the data from *China Daily* and COCA (Corpus of Contemporary American English) news part. *China Daily* is the official newspaper in China. It is available by crawling from the official website of *China Daily*, the *Government and Politics* column. Besides, the News part of COCA is from the official website of COCA. In order to enhance the comparability, 1 million words were selected randomly from the above two corpora from 2013 to 2016.

3.2 Instruments

The analysis is carried out by several tools: Jupyter Notebook based on Python, Microsoft Excel 2019 and SPSS 25.0. In order to minimize the error and ensure the consistency of the annotation of these two corpora, this study used the code by professor Lei Lei and used the Jupyter Notebook based on Python to annotate and analyze the dependencies. Jupyter Notebook is an interactive programming environment and it is a web application for creating and sharing documents that contain code, visualizations, and text. It can be used for data science, statistical modeling, machine learning, and much more aspects (What Is Jupyter Notebook: Introduction | Oxylabs). Besides, the language model this study has selected is from Spacy, one of the packages in Python. By using this method, the dependency treebanks can be generated and the dependency formats will be formed. Although it is still inevitable for the current software to produce parsing errors, compared with the authoritative parsing tool — Standford Parser, the code this study used is more ideal in syntactic annotation and the data is more convenient to observe. Besides, the dependency distance can also be calculated easily in the format which is generated by Jupyter Notebook.

Excel is used for data analysis. SPSS is the name of a series of software packages used for data analysis. SPSS is used to analyze whether a significant difference exists or not between the data from the two language variants.

3.3 Data Processing

Before the processing procedure, the corpora need to be preprocessed. That is, deleting unnecessary information in the source text such as the repeated title and the irrelevant time and so on. To test the accuracy of this method, a trial source text which contains 100 sentences is prepared. Next, using Jupyter Notebook to generate the dependency treebanks, then all the data contains the part-of-speech tags and syntactic structure tags of sentences, which are automatically generated into Excel form. After manual checking of accuracy, 90% of the part-of-speech and syntactic relations are correct and the dependency formats of two corpora are generated by repeating the same operations.

Example 1. *Examples include Cambodia and Vietnam, which have stronger trade ties with the UK.*

Table 1. Dependency relations of Example 1

token.text	token.lemma	token.pos_	token_id	token.head.text	token.head.lemma_	token.head.pos_	governor_id	token.dep_	distance1	distance2
Examples	example	NOUN	1	include	include	VERB	2	nsubj	1	-1
Cambodia	Cambodia	PROPN	3	include	include	VERB	2	dobj	1	1
and	and	CCONJ	4	Cambodia	Cambodia	PROPN	3	cc	1	1
Vietnam	Vietnam	PROPN	5	Cambodia	Cambodia	PROPN	3	conj	2	2
which	which	PRON	7	have	have	VERB	8	nsubj	1	-1
have	have	VERB	8	Cambodia	Cambodia	PROPN	3	relcl	5	5
stronger	strong	ADJ	9	ties	tie	NOUN	11	amod	2	-2
trade	trade	NOUN	10	ties	tie	NOUN	11	compound	1	-1
ties	tie	NOUN	11	have	have	VERB	8	dobj	3	3
with	with	ADP	12	ties	tie	NOUN	11	prep	1	1
the	the	DET	13	UK	UK	PROPN	14	det	1	-1
UK	UK	PROPN	14	with	with	ADP	12	pobj	2	2

Table 1 represents the dependency relations between different word pairs in a sentence. In this study, Dependency distance is measured by the difference between the word order number of the dependents and heads, e.g. DD between "trade" and "ties" is -1. Here the negative value in "distance 2" column represents a negative dependency distance, indicating the dependency direction of these two words, which is "head-final" (HF). In contrast, the positive value stands for a head-initial construction (HI). Hence, the following calculation formula reveals the percentage of head-initial and head-final dependencies in sentences or treebanks.

$$\text{percentage of HI dependency}=\frac{\text{frequencies of the head}-\text{initial dependency}}{\text{total number of dependencies in the treebank}}\times 100\%$$

$$\text{percentage of HF dependency}=\frac{\text{frequencies of the head-final dependency}}{\text{total number of dependencies in the treebank}}\times 100\%$$

The total sum of HF and HI percentages is 100%. Therefore, when one of the construction percentages is figured out, the other also comes.

4. Results and Discussion

4.1 Word Categories of the Dependents

In the first question, this study figures out what kinds of word categories are usually headed by nouns and the frequency of each category. The top ten frequently-occurred dependent word categories of nouns and their proportions in two corpora are presented respectively in Table 2.

Table 2. The comparison of major word categories as dependents of nouns in ChiE and AmE

Categories	ChiE		AmE		Sig. (p-value)
	freq.	%	freq.	%	
DET	17822	24.07	18368	27.92	0.000
ADJ	15175	20.50	11762	17.88	0.000
NOUN	12056	16.28	9513	14.46	0.000
ADP	11055	14.93	8924	13.56	0.000
VERB	5060	6.83	4986	7.58	0.000
NUM	3771	5.09	2850	4.33	0.000
PROPN	3327	4.49	3435	5.22	0.000
CCONJ	2540	3.43	2201	3.35	0.378
PRON	2351	3.18	3107	4.72	0.000
PART	878	1.19	648	0.98	0.000

DET: determiners; ADJ: adjectives; NOUN: nouns; ADP: prepositions; VERB: verbs; NUM: numbers; PROPN: proper nouns; CCONJ: conjunctions; PRON: pronouns; PART: participles.

From Table 2, it is clear that the types of top-ten dependents are the same in ChiE and AmE. In these two variants, determiners, adjectives and nouns are the most frequently used as the dependents of nouns, while conjunctions, pronouns and participles are the least used. However, nearly all the proportion of these ten kinds of dependents in ChiE and AmE are all significantly different ($p<0.05$) except for conjunctions. When the noun is the governor, the word classes of dependents vary.

As presented in Table 2, it is obvious that the proportion of adjectives, nouns, prepositions, and numbers in ChiE is significantly higher than those in AmE ($p=0.000$). In contrast, the proportion of determiners, verbs and pronouns is significantly lower than those in AmE ($p=0.000$). Therefore, it can be roughly summarized that ChiE tends to use more adjectives and nouns than AmE in the News domain. We assume that compared with AmE, in order to convey more information in a limited space, ChiE tends to use more adjectives and nouns rather than verbs. Besides, in Chinese, determiners especially articles and pronouns are relatively less used to express semantic meaning. Therefore, influenced by the Chinese, the proportion of determiners in ChiE is relatively lower than in AmE.

4.2 Dependency Direction of the Dependents

In section 3, the constructions are divided into “head-initial” and “head-final” according to the dependency direction of dependents. Besides, the method for calculating the percentage of two different dependency directions is also introduced. In traditional grammar, the left-embedded dependents of nouns are called pre-modifiers, and accordingly, the right-embedded dependents are called post-modifiers. By distinguishing the dependency direction of the dependents, it is easier to classify them into pre-modifiers and post-modifiers. Therefore, it can help us to know the use of modifiers of nouns better.

The results of the dependency direction of different dependent categories in two variants are demonstrated in the following tables.

Table 3. The comparison of HI and HF constructions in ChiE and AmE

Variants	HI freq. (%)	HF freq. (%)	Sig.
ChiE	109822 (51.67)	102719 (48.33)	p=0.000
AmE	112534 (50.33)	111058 (49.67)	

Table 3 is the overall frequency and proportion of dependents in two directions in ChiE and AmE. It is noteworthy that the frequency of HI and HF constructions in ChiE and AmE is significantly different (R=0.013, P=0.000). Both in ChiE and AmE, the proportion of HI and HF vary in a small range, with the proportion close to 50% respectively, and the percentage of HI is slightly higher than the one of HF, which may be caused by the internal syntactic nature of English rather than the different variants. Because English tends to be right-embedded and this finding is in concordance with the findings in Zhang and Liu's paper (2019). However, the percentage of HI in ChiE is slightly higher than in AmE, different from the previous findings, which may be caused by pursuing standardization. It means that China News English is more standard than native English. We infer that the translators of *China Daily* are highly qualified and experienced, therefore, in the process of writing, they might generally consciously follow the English norms, so that they will subconsciously "sacrifice the source word order to keep the target text flowing" (Mauranen, 2004). This phenomenon enlightens us that in the writing process, it is not necessary to follow the strict norms of the target language to avoid the phenomenon of "overkill".

Table 4. The frequency and proportion of HI and HF constructions with noun heads in ChiE and AmE

Variants	HI freq. (%)	HF freq. (%)	Sig.
ChiE	22455 (30.12)	52101 (69.88)	p=0.638
AmE	20000 (30.00)	46659 (70.00)	

From Table 4, when the corpus size is basically the same in ChiE and AmE, the total frequency of noun phrase structures in ChiE is larger. ChiE tends to use more noun phrases in order to express information. Besides, the proportion of HF structure (70%) outweighs the proportion of HI structure (30%) (R=0.001, p=0.638) in both ChiE and AmE, which indicates that in English, no matter what kind of variant, the dependents of nouns are more likely to be pre-modifiers.

Table 5 presents the frequency and proportion of different dependents in HI and HF constructions in two language variants. In terms of the dependency direction of different dependents in ChiE and AmE, determiners, adjectives, nouns, numbers, proper nouns and pronouns tend to be left-embedded; prepositions, verbs, conjunctions and participles are right-embedded; nouns, verbs, proper nouns can be left-embedded or right. The overall tendency in the two variants is the same.

What's more, the frequency order of these dependents in ChiE and AmE is similar. In HI structure, prepositions, verbs, and nouns are the most frequently used. In ChiE, the frequency of determiners is higher than pronouns; in AmE, the occurrence of pronouns is higher than determiners. This finding is in concordance with the result of question 1, which compared with Chinese, English tends to use more pronouns. In head-final construction, both in ChiE and AmE, determiners, adjectives and nouns are more likely to be left-embedded compared with other dependents.

Besides, when the types of dependents and structure construction are the same, by comparing the percentage of two language variants, the similarities and differences in the use of different types can be found in terms of two constructions. It is noteworthy that the frequency of most of the categories in ChiE is different from those in AmE ($p<0.05$) except numbers and participles. Besides, in the HI structure, compared with AmE, in ChiE, most of the percentage of different dependent categories is lower, except prepositions, conjunctions and participles. It indicates that in China English, these three kinds of words are more frequently used to be post-modifiers than in AmE in noun phrases. Different from the previous inference that Chinese tend to use fewer conjunctions and prepositions compared with native English (Li, 2012), we infer that the material this study selected isn't totally influenced obviously by Chinese. To some extent, it obeys the rules of native English. In addition, the frequency of adjectives, nouns, verbs, proper nouns and pronouns as the dependents in ChiE is significantly different from those in AmE (p=.000). This result is consistent with the result in question 1 that AmE uses more verbs and pronouns compared with ChiE, while ChiE tends to use more adjectives and

nouns.

To notice that the occurrence of determiners and pronouns in HI structure and conjunctions and participles in HF structure still exist, which is contrary to the common use of these categories. We infer that it may be caused by the wrong annotation of the sentence or the inference of wrong punctuation in the source corpora. In future research, this kind of problem will be further handled.

Table 5. The comparison of different dependent categories of noun heads in ChiE and AmE

Categories	Direction	ChiE		AmE		Sig. (*p-value*)
		freq.	%	freq.	%	
DET	HI	17	0.10	33	0.18	0.031
	HF	17805	99.90	18342	99.82	
ADJ	HI	221	1.46	241	2.03	0.000
	HF	14954	98.54	11609	97.97	
NOUN	HI	3394	28.15	2967	30.98	0.000
	HF	11560	71.85	6609	69.02	
ADP	HI	10974	99.27	8833	98.99	0.035
	HF	81	0.73	90	1.01	
VERB	HI	3638	71.90	3923	78.63	0.000
	HF	1422	28.10	1066	21.37	
NUM	HI	218	6.47	196	6.88	0.068
	HF	3553	93.53	2654	93.12	
PROPN	HI	393	11.81	628	18.26	0.000
	HF	2934	88.19	2811	81.74	
CCONJ	HI	2523	99.33	2164	98.32	0.001
	HF	17	0.67	37	1.68	
PRON	HI	16	0.68	58	1.87	0.000
	HF	2335	99.32	3049	98.13	
PART	HI	847	96.47	670	95.04	0.156
	HF	31	3.53	35	4.96	

4.3 Dependency Distance of Dependents

In this part, this paper explored the top 5 categories of the dependents in the whole word classes in both two language variants, i.e. determiners, adjectives, nouns, prepositions and verbs.

This paper first calculated the MDD value of the whole text in two corpora. It is found that the MDD value of ChiE is 2.68 and AmE is 2.61. A previous study has found that the MDD value in Chinese is higher than in English (Li, 2012). She found that the MDD in Chinese is 2.69 and in English is 2.58. The result in this study is in agreement with her finding and the concrete value is similar. The longer distance between the words means morememory decay or interference (Liu et al., 2017), therefore, we infer that the sentence in ChiE is more complex than in AmE and ChiE bears more work memory load in processing the sentence. However, Liu and Zhang (2019) found the MDD value of ChiE and AmE in academic English texts is 2.73, which is slightly higher than our result. We speculate that the genre of the text may influence the MDD value.

Table 6 presents the MDD of these five kinds of dependents of nouns in the two variants. Table 7 and Table 8 calculate the MDD value when the dependents act as pre-modifiers and post-modifiers respectively. Since the determiners are mostly used as the pre-modifiers, therefore, in the calculation of MDD in HI construction, determiners are not included.

Table 6. MDD of five dependents of nouns in ChiE and AmE

Dependents	ChiE (MDD)	AmE (MDD)
DET	1.70	1.70
ADJ	1.42	1.41
NOUN	2.02	2.21
ADP	1.42	1.85
VERB	2.83	3.19

In Table 6, on the whole, the MDD value of these dependents in ChiE and AmE vary in a small range, while when the prepositions and verbs serve as the dependents, the value of MDD in AmE is higher than that in ChiE. In these five dependent categories, when adjectives collocate with nouns, the value of MDD is the smallest, followed by determiners, and when the dependent is a verb, the MDD value in both variants is the biggest. Because the MDD value here is the absolute value of the sum of positive and negative values, and some adjectives may be pre-modifiers or post-modifiers that modify the nouns in the adjacent place, therefore, the sum of their value will be less than the original value. Besides, the determiners in the dependency treebanks include various words such as “either”, “neither”, “whose”, “which” and so on, which are often preceded by the comma. Since punctuations are also regarded as one token, therefore, the dependency distance between the determiners and nouns is larger than that in adjectives and nouns. In English, compared with Chinese, in order to keep the balance of a sentence and the integrity of the subject-predicate structure, it tends to use the grammatical subject “it” and the logic subject “there” to connect the elements in a sentence. Hence, the dependency distance between verbs and nouns in English is accordingly larger than in Chinese.

Table 7. MDD of five dependents of nouns in HF construction in ChiE and AmE

Dependents	ChiE	AmE
DET	1.81	1.70
ADJ	1.41	1.38
NOUN	1.36	1.42
ADP	3.79	3.94
VERB	1.67	1.63

Table 8. MDD of five dependents of nouns in HI construction in ChiE and AmE

Dependents	ChiE	AmE
ADJ	2.61	2.51
NOUN	3.69	3.95
ADP	1.40	1.83
VERB	3.29	3.61

Table 7 shows the value of MDD when the dependents act as the pre-modifiers. It can be found that the MDD value also varies in a small range and the value of determiners, adjectives and verbs in ChiE is slightly bigger than that in AmE, which is in accordance with the result that the frequent occurrence of these word classes in China English.

Table 8 presents four dependent categories. This study finds that in the HI structure, the MDD value of nouns, prepositions and verbs in ChiE are smaller than those in AmE, which is consistent with the result of MDD in Table 6. In addition, by comparing the value of MDD of HF construction with HI construction, it can be noticed that on the whole, the dependency distance of pre-modifiers tends to be much shorter than that of post-modifiers (Quirk et al., 1985; Gibson, 1998; Temperley, 2007). Because as a head-initial language, English prefers an ‘end-weight’ syntax. The value of dependency distance can reflect the cognitive difficulty in processing a sentence. The human brains tend to process the information according to the linear position of the modifiers. The longer the modifiers are, the more difficult it is to

understand.

5. Conclusion

In the process of globalization, English is inevitably influenced by various factors, such as politics, economy and local culture, and has gradually formed different variants with native features. With the framework of dependency grammar, this paper analyzes the syntactic features of nouns when serving as the governor. A comparison of dependent categories, dependency direction and dependency distance in China English and American English in the News domain is made in this paper. It is found that on the whole, the categories of different dependents in two variants are similar while the difference in the use of concrete word types also exists. More specifically, in the News domain, China English tends to use more adjectives and nouns, while determiners especially articles and pronouns are rarely used.

As for the dependency direction, this paper reveals the use of different word classes when they modify the nouns. Determiners, adjectives, nouns, numbers, proper nouns and pronouns tend to be pre-modifiers; prepositions, verbs, conjunctions and participles are post-modifiers; nouns, verbs, and proper nouns can be pre-modifiers or post-modifiers. The difference between these word types can provide an idea for future research and may be helpful in publicity. Besides, the method this paper used in distinguishing dependency direction can differentiate whether a language is head-final or not. This paper also finds that native languages have little impact on the syntactic dependency of English variants, indicating the great similarity in English variants of the News genre. Within the same annotating scheme and the same genre frame, it is the similar human cognitive mechanism and the same grammatical system of English that make China English presents a consistent tendency with the native English in the syntactic dependency. Hence, it is also conducive to the exploration of human language commonalities and specialties.

Previous studies found that no matter the language itself or in terms of the concrete dependency relations, Chinese bears more cognitive cost and working memory load. However, in this paper, the value of MDD in ChiE is lower than in AmE, which is not in agreement with the previous findings. This paper analyzes and discusses the reason that caused the difference by using linguistic theories. And cultural difference has also been taken into consideration. Besides, as a measurement of difficulty in understanding a sentence, dependency distance will be constrained by working memory capacity, grammar, or other factors. Many scholars have found that human language has a tendency to minimalization. This paper explores the distribution of dependency distance and finds that not only in a language but also in concrete collocations, such as noun as the governor and determiner as the dependent. Therefore, this finding is of significance in linguistic research.

The findings of the current research have indicated the great similarity in the syntactic features of China English and American English in the News domain, through which it is easier to infer that although China English is one of the English variants, it still shares certain inner homogeneity which is caused by the same grammar and similar cognitive mechanism (Liu & Zhang, 2019). However, this paper has not yet found obvious cultural differences and still exists some mistakes such as the annotation of part-of-speech in generating the treebanks which may be caused by the limitation of the software. In future research, more English varieties can be investigated and other word types as the governor can also be explored in the future study.

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