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Keyword analyses of English charter parties*

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Xu, Lin and Se-Eun Jhang. 2020. Keyword analyses of English charter parties. *Linguistic Research* 37(2), 267-288. In the present study, based on a self-built corpus of English charter parties, keyword analyses are conducted using two methods: a traditional corpus frequency keyword analysis and a text dispersion keyword analysis recently proposed by Egbert and Biber (2019). The results show that both keyword analyses could reveal some aspects of the textual features of English charter party documents. Keyword lists generated by the two methods contain different keywords as well as shared ones. Despite the differences between the two lists, a majority of the keywords are strongly associated with the target domain of maritime documents. Each of the two keyword lists carries its own merits. We recommend a combination of the frequency-based method and the dispersion-based method for analyzing a specialized corpus to develop a consolidated keyword list. (Dalian Maritime University · Korea Maritime and Ocean University)

Keywords English charter parties, keyword analysis, frequency, dispersion, legal documents, textual features, English for Specific Purposes

1. Introduction

Chartering is a necessary activity in the shipping industry. Due to the contractual nature of chartering, there is a close relationship with maritime law and marine transportation. A charter party, or contracting a ship, is an agreement between a shipowner and a charterer for the use of a vessel. It covers a variety of issues such as freight rate, general average, marine insurance, and maritime lien. There are many legal clauses concerned with such chartering, such as *Hague Rules, Hamburg Rules*, and *Rotterdam Rules*. All terms, conditions, and exceptions mutually agreed to by the charters and vessel owners/operators in the process of hiring a ship would be stated in the charter party contract. A

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charter party document is made up of two parts. The first part contains blank areas to specify the property elements and personal elements of the ship and goods, while the second part contains standard and non-standard clauses that define the conditions of carriage.

Research on charter parties has been concerned with issues of maritime law (e.g., Gauci 1997; Bulow 2006; Wagener 2009; Kim 2012; Lee 2013). Non-legal research has focused on the translation of charter parties (e.g., Del Pozo Triviño 2014) since charter parties, written in English, carry a multicultural and multilingual nature, which leads to a research orientation in translation. Most maritime documents, due to the global nature of shipping, contain terminology and textual features of an international scope. This is also the case with charter parties. It is surprisingly difficult to find any research exploring the specialized textual features of charter parties.

Corpus linguists have access to a range of procedures (e.g., collocations, frequency lists, dispersion plots, concordances) that can be utilized in the analysis of textual features in various domains (Baker 2004). Keyword analysis has been proven to be a popular statistical procedure in corpus-based studies. Scott (1997: 236) defined keywords as words that occur "with unusual frequency" in a target corpus when compared with a reference corpus, leading to the use of the frequency-based method of calculating keyness by corpus scholars. However, frequency-based computation of keyness treats the corpus as a whole, while the individual texts in the corpus are not considered.

We can be sure that keywords identified by the frequency-based method, frequently appeared in a corpus, but we cannot be sure whether they are widely dispersed across the texts of that corpus. As a result, such keywords (with high frequency but not widely dispersed) are not truly typical of the discourse domain represented by the corpus. Addressing this problem, Egbert and Biber (2019) recently proposed a new method of identifying keywords: text dispersion keyword analysis. In their study, they found that text dispersion keyword analysis was more effective in revealing textual features in a target discourse domain, yet more empirical studies are needed to support this finding.

The present study aims to explore the textual features of English charter parties using the two different keyword extraction methods to gain a deeper insight into this specific discourse domain as well as the effectiveness of the two keyword extraction methods. The following research questions guide this study:

- 1. What textual features of English charter parties can be found in the keyword analyses?
- 2. Are there any differences between the lists of keywords identified by the frequency-based method and dispersion-based method?

2. Literature review

Researchers use keyword analysis to identify words carrying the features of a target discourse domain. In recent decades, researchers devoted themselves to extracting keywords based on frequency to identify the main content of texts in specific domains (e.g., Gabrielatos and Baker 2008; Römer and Wulff 2008; Paquot and Bestgen 2009; Kilgarriff 2012).

Scott and Tribble (2006) stated that keywords are often considered as the markers of the "aboutness" and the features of a text. There are two main points in the definition of keywords proposed by Scott (1997). One is "unusual frequency", and the other is "compared with a reference corpus". "Unusual frequency", not high frequency, indicates that there are two kinds of keywords: unusually high and unusually low. They are referred to as positive keywords and negative keywords, respectively. "Compared with a reference corpus" indicates that whether a word is a keyword or not depends highly on the reference corpus since keywords are merely words that are outstandingly frequent or infrequent based on comparison with their frequency within the reference corpus. If there is a change in the reference corpus, there may be a change in the keyword list. Scott's definition of keywords is therefore not based on concepts that are subjectively viewed as important to culture but allows for any word potentially to be key if it occurs frequently enough when compared to the selected reference corpus (Baker 2004: 347).

Within Scott's WordSmith Tools (see Scott 1997), the keyword list is generated using statistical measures such as chi-square or log-likelihood. There are also other statistical measures; they are all frequency-based methods in that they compare the frequency of a word between two corpora, without regard to the word's dispersion across texts. 270 Lin Xu · Se-Eun Jhang

The effectiveness of a keyword analysis can be evaluated by means of two criteria: content-distinctiveness and content-generalisability (Egbert and Biber 2019: 79). Content-distinctiveness requires keywords that are truly typical in a specific domain and carry textual features which are distinguished from the other domains. On the other hand, content-generalisability needs keywords that have the quality to be generalized to other texts in a similar domain and "offer insight into the actual content-'aboutness' of those texts" (Egbert and Biber 2019). The corpus frequency approach is often criticized in that discourse analysts typically select words from the keyword list that are deemed meaningful or interesting to investigate further, while simply disregarding words that are non-distinctive and/or non-generalizable (Egbert and Biber 2019). In response to the limitation of frequency-based keyword analysis, Egbert and Biber (2019) proposed a new method for keyword analysis – text dispersion keyness – that is based on text dispersion, rather than corpus frequency.

This hypothesis behind the text dispersion keyness method was that a widely dispersed keyword has a minimum moderate frequency. But the calculation of keyness in text-dispersion keyword analysis is independent from frequency calculation. By examining keyword lists of online travel blogs, Egbert and Biber (2019) compared different keyword extraction methods and proved that dispersion keyword analysis was more effective in identifying truly representative keywords, based on the criteria of content-distinctiveness and content-generalisability. However, to date, there is a dearth of empirical studies on the comparison of different keyword analyses in other discourse domains.

Data and methods

3.1 Corpora

We compiled a Corpus of English Charter parties (CEC) to be used in comparing frequency-based keyword analysis and text dispersion keyword analysis. The CEC was the target corpus containing 845,139 running words in total from 156 files of sample contracts. The main data of CEC come from the official website of the Baltic and International Maritime Conference (BIMCO).

The sample contracts on the official website of BIMCO are pro-forma English-language charter parties commonly used or referred to in the maritime transportation, representing in a sample of English-language charter parties.

BNC Baby was chosen as a reference corpus, which contains four one-million-word genre-based subsets (academic, fiction, newspaper, and conversation), extracted from the British National Corpus (BNC). It includes many different styles and varieties, and is not limited to any particular subject field, genre, or register. The conversation data in BNC Baby were excluded to better serve as a reference corpus in this study since charter parties are typically written documents. The resulting refined BNC Baby used in this study contained 3,011,321 running words in total.

WordSmith 6.0 was used to process the data in order to get the descriptive statistical data of the two corpora, such as size, type/token ratio (TTR), standardized type/token ratio (STTR), and concordance lines, as is shown in Table 1.

	CEC	Refined BNC Baby				
tokens	797,651	2,972,998				
types	7,489	76,804				
type/token ratio (TTR)	0.94	2.58				
standardized TTR	29.82	44.74				
STTR std.dev.	69.87	57.43				

Table 1. TTR and STTR of CEC and refined BNC Baby

Table 1 shows that the TTR of CEC and the refined BNC Baby is 0.94 and 2.58 respectively, while the STTR value of them is 29.82 and 44.74, respectively. It is obvious that the TTR of CEC is lower than that of the refined BNC Baby. Taking the length of texts into consideration, the TTR is of statistical significance in this case. However, to some extent, the TTR can still reflect that the refined BNC Baby has a higher proportion of different words than that of CEC. The STTR also indicates that the words in the refined BNC Baby are more diverse than those in CEC and the proportion of duplicated words in the refined BNC Baby is less than that of CEC.

That is due principally because a charter party is a type of "formula" legal documents, which have a certain standardized format: several boxes for specifying information and legal clauses, as shown in Figure 1 below.

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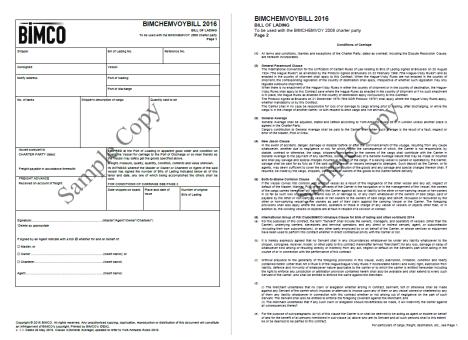


Figure 1. A snapshot of a sample English charter party document

The boxes used for collecting basic information share the same titles and names across documents, even while the design of the page may differ. The specifications clauses are different in each charter party according to the requirements of the parties involved, but there are considerable overlaps across charter parties due to the global set of rules and clauses. These overlaps may lead to a high proportion of duplicated words appearing in the CEC. However, these lexical statistics should not lead one to conclude that the texts in the CEC are easier to be understood than those in the refined BNC Baby, as many factors such as sentence structure, a number of specific terms, and special expressions can influence the readability of a text.

3.2 Methods

Keyword lists were generated by the frequency-based method and the dispersion-based method. Wordsmith Tools 6.0 was used to extract keywords

based on frequency. Loglikelihood, a statistical measurement, was chosen to make a significant judgment of the keyness of words between the target corpus and the reference corpus.¹ The decision to use loglikelihood, rather than chi-square, was based on the use of loglikelihood for the statistical measurement in the text dispersion-based method. Thus, the two methods are more comparable.

Text dispersion keyness was calculated by the method adopted from Egbert and Biber (2019), using a program written in Python to generate the keyword list. In this method, instead of comparing the total frequency of a word in the target and reference corpora, the total number of texts where a word occurs was compared between the target and reference corpus. Log-likelihood (C_2) was chosen as the statistical measurement. In this study, each word in the target corpus was assigned a log-likelihood value. The greater the difference between the total number of texts a word occurs in target corpus and reference corpus, the larger the loglikelihood value becomes. The log-likelihood values were calculated through the following formula.

$$G^2 = 2\sum_i O_i \ln\left(\frac{O_i}{E_i}\right)$$

In this formula, A is the observed number of texts where the word occurs in the target and reference corpus and E is the expected number of texts where the word occurs in the target and reference corpus. The expected values (E) are calculated using the following formula, where N is the total number of texts in the target and reference corpora:

$$E_i = \frac{N_i \sum_i O_i}{\sum_i N_i}$$

Table 2 below describes the main difference between the frequency-based keyword extraction method and the dispersion-based keyword extraction method.

¹ The same loglikelihood test was used to extract keywords in specialized corpora such as the Maritime Legal English Corpus (Lu, Lee, and Jhang 2017) and Marine Accident Reports Corpora (Jhang, Kim, and Qi 2018; Lu and Jhang 2019).

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analysis (Egbert and Biber 2019)						
	Corpus frequency keyness	Text dispersion keyness				
	Words that are statistically more	Words that occur in statistically				
Definition	frequent in a target corpus when	more texts in a target corpus				
	compared with a reference corpus	when compared with a reference				
		corpus				
Variable	Frequency in corpora	Dispersion across texts				
	Log-likelihood	Log-likelihood				
Formula	O = observed word frequency	O = observed word dispersion				
	E = expected word frequency	(number of texts)				
		E = expected word dispersion				
		(number of texts)				
	-At least one text in target and	-Many texts in target and				
Requirements	reference corpora	reference corpora				
	-Software (e.g., AntConc,	-Specialised program				
	WordSmith) or specialised program					

Table 2. Comparison of corpus frequency keyword analysis and text dispersion keyword analysis (Egbert and Biber 2019)

After the calculation, all the words (occurring at least once in the target corpus) were ranked from highest to lowest according to their log-likelihood value. As this study was concerned with the widely dispersed keywords in the target corpus, negative keywords (which refer to the words widely dispersed only in the reference) were filtered out in this step. The top 100 text dispersion keywords were selected to compare with the top 100 frequency keywords.

4. Results and discussion

4.1 Two keyword analyses

4.1.1 Corpus frequency keywords

The frequency-based keyword list was generated through Wordsmith Tools 6.0. The top 100 keywords are shown in Appendix A. There are 16 function words (*shall, or, any, the such be, other, of, whatsoever, under, if, may, unless, by, this,*

within) in a list of the top 100 keywords identified under the corpus frequency method. Function words are considered to be not content-distinctive, which means that these function words are typically difficult to associate with the target corpus since they tend to be highly frequent and widely dispersed in all discourse domains (Egbert and Biber 2019).

Among these function words, a top ranked word on the keyword list, *shall*, caught our attention, as shown in top 100 corpus frequency keywords listed in Appendix A.

N	File	Words	Hits	per 1,000	Dispersion	Plot
1 SHALL	(Overall)	830,994	16,279	19.59	0.941	
² SHALL Sam	ole copy	21,779	401	18.41	0.866	
3 SHALL Sam	ole copy	15,736	383	24.34	0.879	
4 SHALL Sam	ole copy	17,919	373	20.82	0.937	
5 SHALL Sam	ole copy	16,711	370	22.14	0.908	
6 SHALL Sam	ole copy	15,038	332	22.08	0.891	
7 SHALL Sam	ole copy	15,129	300	19.83	0.929	
8 SHALL Sam	ole copy	11,678	295	25.26	0.917	
9 SHALL Sam	ole copy	14,070	286	20.33	0.925	
10 SHALL Sam	ole copy	11,810	282	23.88	0.899	
11 SHALL Sam	ole copy	11,727	282	24.05	0.876	
12 SHALL Sam	ole copy	13,133	277	21.09	0.911	
13 SHALL Sam	ole copy	13,069	269	20.58	0.831	
14 SHALL Sam			265	22.41	0.946	
15 SHALL Sam			264	22.27	0.927	
16 SHALL Sam			244	20.90	0.899	
17 SHALL Sam			243	18.12	0.912	
18 SHALL Sam			242	21.93	0.892	
19 SHALL Sam			237	19.33	0.875	

Figure 2. Description of shall

As illustrated in the left snapshot of the description of *shall* in Figure 2, the word *shall* appears 16,279 times among 830,994 total words, or 19.59 times per 1,000 words in the CEC. As illustrated in the right snapshot of the plot in Figure 3, we see that *shall* appears "globally" in each individual text among the 156 texts. It seems that *shall* is "typical" in the CEC. As a function word, *shall*, appears repeatedly with words strongly related to law.

In order to observe the relationship between *shall* and other legal terms, the collocation of *shall* was examined, as shown in Figure 3 below.

L5	L4	L3	L2	L1	Centre	R1	R2	R3	R4	R5
THE	THE	THE	THE	CHARTERERS	SHALL	BE	THE	THE	THE	THE
OF	= OF	AND	THIS	OWNERS		NOT	BE	TO	то	OF
11	AND	OF	OF	AND		APPLY	FOR	BY	AND	IN
AND	D THIS	THIS	SUCH	VESSEL		HAVE	то	IN	OF	AND
OF	R OR	OR	CHARTER	PARTY		PAY	PAID	FOR	FOR	TO
TC	D IN	THAT	AND	AGREEMENT		PROVIDE	ENTITLED	AND	BE	WITH
THIS	6 OWNERS	IN	OR	WHICH		ALSO	CONDUCTED	OWNERS	ACCORDANCE	ANY
CLAUSE	TO	CLAUSE	OWNERS	ARBITRATION		INDEMNIFY	DEEMED	AS	CHARTERERS	OWNERS
B١	CHARTER	PARTY	APPROVED	CLAUSE		IN	IN	RIGHT	ANY	ACCOUNT
BE	SUCH	TO	GENERAL	CARRIER		COUNT	AND	OF	OWNERS	OR
PARTIES	BY BY	AGREE	TO	CONTRACT		INCLUDE	REFERRED	OPTION	IN	CHARTERERS
ANY	BOX	UNDER	POOL	CARGO		REMAIN	LIABLE	ON	AS	ALL
SHALL	ANY	BY	OTHER	MANAGERS		GIVE	ANY	AT	OR	FOR
FOF	R PARTY	VESSEL	CLAUSE	PARTIES		APPOINT	GOVERNED	CHARTERERS	ALL	BE
OWNERS	CLAUSE	BIMCO	CREW	HIRE		MEAN	ALL	ALL	ON	CONSTRUED
BO)	MAY	WITH	CHARTERERS	DOCUMENT		AT	AT	BE	BY	SHALL
AS	6 AS	CHARTERERS	EACH	CONTRACTOR		CONTINUE	AS	THIS	WITH	BY
CHARTER	VESSEL	SUCH	NO	MASTER		PREVAIL	WITH	UNREASONABLY	PARTY	AS
WITH	MEDIATION	CASE	IN	THEY		NOTIFY	RESPONSIBLE	WITH	SUCH	RESPONSIBILITY
SUCH	CHARTERERS	ALL	ARBITRATOR	IT		COMPLY	APPLY	DEEMED	NO	SUCH

Figure 3. Top 20 collocation patterns of shall

Figure 3 shows the top 20 collocation patterns of *shall* from L5 to R5. Words related to law (e.g., *clause, charter, party, arbitrator, approved, contract, indemnify, liable*) appear with high ranking.

In order to see how *shall* is used in authentic text, let us take a look at the concordance lines of *shall* and these words, as shown in Figure 4.

States waters, the Owners 1032 shall also comply with the requirements as mentioned under Clause 18(a) 1032 shall nevertheless be made against the load, stipulated for in Clause 11, 104 shall not be obligatory, and in no case registration under the Buyers' flag 105 shall be for the Buyers' account, gear is to be used, the Owners 107 shall have the option to provide of loading and port of discharge 107 shall count as laytime. 108 9. Laytime the said 72 hours the Owners 108 shall have the option (exercisable up to by mutually acceptable surveyors 108 shall have the option of cancelling this delivery. "Inspection" in this Clause 11, shall mean the Buyers' inspection build-down period 246 As per Box 11 shall commence, during which time all delivery. "Inspection" in this Clause 11, shall mean the Buyers' inspection are commenced. The reference 1110 shall be to three arbitrators. A party

Figure 4. Examples of concordance lines of shall

Figure 4 above may provide evidence of the fact that *shall* as a function word reveals one of the textual features in English charter parties as a type of legal documents. Such an indication suggests that we cannot simply say that function words are weak indicators for revealing textual features. Rather, in a specialized corpus, function words may retain certain textual features. The difference is that content words tend to show "what it is" of the target corpus, whereas function

words may reveal "how it is" of the corpus.

The content words identified by the corpus frequency method are strongly related to the content of charter parties. Content words such as *vessel, cargo, port, loading, carrier, delivery, crew, freight, discharge, lading, laytime* and *carriage* share navigation and marine transportation features. Let us take *part* as an example that could only be found in the CEC frequency-based keyword list. Some examples of collocates of *part* are shown in Figure 5.

Ν	Word	Total	Total Left	Total Right	L5	L4	L3	L2	L1	Centre	R1	R2	R3	R4	R5
1	PORT	3,373	158	158	53	45	54	6		3,057		6	54	45	53
2	THE	2,635	1,657	978	292	179	130	473	583		126	133	242	232	245
3	OR	1,549	408	1,141	93	93	141	70	11		580	149	219	64	129
4	OF	1,484	473	1,011	147	91	66	140	29		546	60	151	151	103
5	AT	1,136	1,023	113	60	118	412	397	36		25	26	28	17	17
6	TO	905	619	286	181	121	187	117	13		103	31	38	65	49
7	LOADING	823	521	302	17	29	52	31	392			196	30	52	24
8	AND	799	368	431	41	57	120	124	26		141	72	78	65	75
9	ANY	708	546	162	24	36	50	235	201		33	14	60	45	10
10	DISCHARGE	463	94	369	31	41	1		21			205	63	36	65
11	PLACE	443	66	377	23	9	32		2		48	269	47	7	6
12	S	432	40	392	15	14	6	3	2		294		22	59	17
13	DISCHARGING	427	356	71	10	2	2	12	330		2	12	21	11	25
14	IN	424	159	265	34	44	24	16	41		22	37	73	96	37
15	A	312	255	57	68	9	15	70	93		2	7	26	11	11
16	VESSEL	306	230	76	71	100	37	11	11		4	24	13	18	17
17	SAFE	294	276	18	10	57	31	5	173		1	3	6		8
18	SHALL	272	48	224	22	10	16				44	44	59	33	44
19	OTHER	269	195	74	11	52	2	24	106		18	16	17	11	12
20	BY	256	106	150	18	5	3	52	28		9	10	75	38	18
21	CARGO	255	179	76	49	77	48	3	2			39	9	6	22

Figure 5. Examples of collocates of port

As seen in Figure 5, the most frequent collocates of *part* are function words, including *the*, *a*, *of*, *at*, and *to* Such a situation is within our expectation. At the same time, we found that the word *part* collocates frequently with words such as *loading*, *discharge* (*discharging*), *vessel*, *safe*, and *cargo*. Those words are definitely associated with marine transportation.

Other words such as *charterers, party, clause, accordance, agreement, arbitration, contract, provisions, contractor, liability, mediation, applicable, clenutrage, infringement* and *unauthorized* are typically representative words in legal documents. For example, *clause* is frequently used in clusters such as *in accordance with clause..., the provisions* of *clause..., in sub-clause, the clause shall apply..., to blame collision clause, dispute resolution clause,* etc.

Worth noticing are the high-frequency words common to both the BNC Baby and the CEC. Let us take *cost* as an example. As mentioned earlier, the reference corpus is the refined BNC Baby in which the conversation subset was excluded. In this reference corpus, the high frequency collocations of *cost* are *the cost of, at a cost, towards the cost, total cost of, low cost housing cost of borrowing* etc., whereas in the CEC corpus, the high frequent collocations of *cost are costs and expense, costs incurred in, allocating the cost, party shall bear its own cost, the arbitration cost, share equally the cost, all claims costs,* etc. It is obvious that these collocations in the CEC are markedly different from those in the reference corpus. It seems that these collocations of *cost* in the CEC might also demonstrate the genre feature of CEC as a legal document.

4.1.2 Text dispersion keywords

The dispersion-based keyword extraction method was also used to identify keywords, aiming at making comparisons with and providing supplements to the keyword list identified by the corpus frequency method. The basic criterion for keyness calculation in the text dispersion keyword analysis is the "unusually wide" dispersion of one word compared with the dispersion of the same word in the reference corpus. It must be made clear that if a word is widely dispersed across a corpus, then the frequency of this word must be at least moderately high in the target corpus. In essence, there can be no occasion in which a word is widely dispersed across the texts in the target corpus but appeared only a few times.

Using a specially designed Python program, the text dispersion keyword list was constructed. The top 100 keywords produced by the text dispersion-based method are shown in Appendix B. Comparing them with the keywords identified by the corpus frequency method, we can see that function words such as *a*, *the*, *shall*, *may*, *be*, *any*, and *such* do not appear in the text dispersion keyword list. From this point of view, it seems that the text dispersion keyword list could better meet the requirements of content-distinctiveness.

Although these function words were filtered out, we found two new types of problematic cases in the text dispersion keyword list. The first case was the appearance of several proper names and acronyms (*Hague, LMAA, RATA, IMO, Himalaya*) in the list. Proper names and acronyms are considered questionable in their content-generalizability (Egbert and Biber 2019). It does not mean these words are not associated with the target domain, but they are questionable in their dispersion in enough texts. However, in the present study, it shows that these proper names and acronyms have content-generalizability in the domain of English charter parties. This can be illustrated by the example of *Hague* with the concordance lines in Figure 6.

Protocol 1979") shall apply where the Hague-Visby Rules apply whether or if no such enactment is in place the Hague Rules as enacted in the country apply to this Contract, save where the Hague Rules as enacted in the country or in the country of destination, the Hague-Visby Rules shall apply to this . When there is no enactment of the Hague-Visby Rules in either the country shall apply to this Contract. When the Hague-Visby Rules are not enacted in at Brussels on 23 February 1968 ("the Hague-Visby Rules") and as enacted at Brussels on 24 August 1924 ("the Hague Rules") as amended by the a bill of lading incorporating 1128 the Hague-Visby Rules. 1129 (c) Personal 'aramount" applying the Hague or 998 Hague-Visby Rules or a carriage of 1) A "Clause Paramount" applying the Hague or 998 Hague-Visby Rules or a

Figure 6. Examples of concordance lines of Hague

Hague appears in 78 of the 156 texts in the CEC, and it appears at most 11 times and at least once in the 78 texts. Compared with its frequency of 458 times, which is insufficient to be "key" in the corpus frequency method, its relatively wide dispersion is significant. The most frequent collocations are *the Hague-Visby Rules* and *the Hague Rules*, as shown in the concordance examples in Figure 6. This may be due to the fact that most charter parties adopt the provisions of the internationally accepted legal provisions of the uniform bill of lading (e.g., *Hague Rules*). Similarly, a dispute resolution mechanism such as *LMAA* (*London Maritime Arbitrators Association*) is often mentioned in legal documents.

In the second type of problematic case, we found another special group of words appeared in the text dispersion keyword list only: a group of words such as *hereunder, herein, thereto, hereby, thereon, hereto, hereinafter, hereof,* and *aforesaid* Let us take *hereunder* and *hereof* as an example, as shown in Figure 7.

not sub-contract any of their obligations hereunder without the prior written the purposes of the Parties' obligations hereunder, then the injured party is to not subcontract any of their obligations hereunder without the prior written with the 358 any of their obligations hereunder by reason of any cause 295 or to which the Contractors are entitled hereunder shall also be available and or to which the Managers are entitled hereunder shall also be available and or to which the Carrier is entitled hereunder including the right to enforce or to which the carrier is entitled hereunder including the right to enforce Cargo 363 Bills of Lading issued hereunder provided that when no such in the Bills of Lading issued hereunder. 448 freight, advances, is the greater to cover its liabilities hereunder. Reasonable deductibles are insurance to cover its liabilities hereunder. Reasonable deductibles are pursuant to any of the provisions hereof, always provided, however, that pursuant to any of the provisions hereof, always provided, however, that of the remaining provisions hereof 494 shall not in any way be and shall not be deemed to be part hereof 791 or be taken into date all other terms and conditions hereof including those contained in Date all other terms and conditions hereof including those contained in Date, all other terms and conditions hereof shall 205 delivery, is free from and be tele-242 the Charterers hereof and state a new cancelling date change of 113 work under Clause 4 hereof, utilising the Personnel, Craft for freight is payable under Clause 5 hereof. 347 (c) Should it appear to the extent provided in paragraph (a) 582 hereof. 583 (iii) Without prejudice to to the extent provided in paragraph (a) hereof. 592 (c) Charterers warrant that Figure 7. Examples of concordance lines of hereunder and hereof

In Figure 7, we find that a group of these words has a limited set of collocates (e.g., *obligations, entitled, liabilities, provisions, conditions, clause*) which share close relationships with terms used in legal documents. However, many of these "textual feature carrier" words were neglected in the corpus frequency keyword list.²

Let us consider dispersion and frequency of a group of these words in the study corpus and the reference corpus, as shown in Table 3.

	nerenna	iner, nerec	<i>),</i> and <i>,</i>	aloresalo II			neu binc	Бару	
Words		CEC		CEC	Ref	ined BNC	Baby Ref	ined BNC	Baby
	Т	exts (%)	Freq	uency (%)		Texts (%) I	Frequency	(%)
hereunder	116	(74.36)	307	(0.04)	0	(0)	0	(0)	
herein	112	(71.79)	363	(0.04)	0	(0)	0	(0)	
thereto	89	(57.05)	183	(0.02)	1	(0)	1	(0.66)	

Table 3. Dispersion and frequency of *hereunder, herein, thereto, hereby, thereon, hereto, hereinafter, hereof,* and *aforesaid* in CEC and refined BNC Baby

2 Interestingly, *thereof* is the only one word found on the corpus frequency keyword list. This word was also found on the text dispersion keyword list.

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hereby	85	(54.49)	180	(0.02)	0	(0)	0	(0)	
thereon	85	(54.49)	95	(0.01)	1	(0)	1	(0.66)	
hereinafter	76	(48.72)	139	(0.02)	0	(0)	0	(0)	
hereof	57	(36.54)	118	(0.01)	0	(0)	0	(0)	
aforesaid	57	(36.54)	153	(0.02)	1	(0)	1	(0.66)	

In Table 3, it is clear that the above words rarely occurred in the reference corpus, while in the CEC, these words have a relatively high frequency and wide dispersion. Examining frequency, although they have relatively high frequency compared with once and no instance, they are far from "being key" since their frequency is absolutely low, compared with other words that appear "really frequently". From the perspective of dispersion, similarly compared with once and no instance in the reference corpus, these words appearing in 36.54% texts are enough to be prominent as keywords. For these words in the CEC, we could find that the dispersion of one word could not accurately predict their frequency. For example, hereby and thereon both appeared in 85 texts, but their frequency is 180 and 95, respectively. Using a text dispersion method, the frequency of one word within a text does not account for the calculation of keyness. On the contrary, the calculation of keyness focuses on the total number of texts one word appears in. Again, "the width across the corpus" should be taken into consideration rather than "the density within a text" when deciding whether or not a word is key in text dispersion keyword analysis.

4.2 Comparison between the two approaches

In this section, the two keyword lists are further examined by comparing them in Table 4 below. The middle column shows the keywords shared by the two lists. The left column contains the keywords only identified by the corpus frequency method while the keywords in the right column are only identified by the text dispersion method.

Table 4. Comparison between keyword lists of top 100 corpus frequency keywords and top 100 text dispersion keywords

CF only		BOTH	TD only		
SHALL	EQUIPMENT	BIMCO	INDEMNIFY	CONSIGNEES	

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OR	EVENT	THEREOF	HEREUNDER	DEEMED
OWNERS	MAY	PAYABLE	HEREIN	SALVING
ANY	MEDIATION	ARBITRATION	ENACTMENT	JURISDICTION
PARTY	EXPENSE	CLAUSE	COMMENCEMENT	COUNTERCLAIM
CHARTER	RESPECT	WHATSOEVER	THERETO	NAVIGATION
PORT	DUE	LADING	HOWSOEVER	SALVAGE
BOX	ACCOUNT	VESSEL	HEREBY	DUES
THE	UNLESS	INCURRED	THEREON	CONSTRUED
SUCH	PLACE	LIABILITY	DEFAULT	HAGUE
STATED	BY	CARGO	NEGLIGENCE	DEEM
BE	INCLUDING	ACCORDANCE	PURSUANT	NOTWITHSTANDING
CARRIER	PART	FREIGHT	RECEIPT	HEREOF
NOTICE	COSTS	CHARTERERS	ANTWERP	INDEMNITY
AGREEMENT	DISPUTE	DISCHARGING	CLAUSES	LMAA
CREW	THIS	ARBITRATOR	FOREGOING	PREVAIL
CONTRACT	LAYTIME	PROVISIONS	NOTIFY	RATA
DATE	PROVIDED	DISCHARGE	LIEN	SPECIFIED
LOSS	DELAY	LOADING	VISBY	SHIPPER
DOCUMENT	PRIOR	APPLICABLE	HERETO	MODIFICATION
OTHER	CONTRACTORS	VOYAGE	MARITIME	LIABILITIES
HIRE	PAID	DEMURRAGE	COMMENCED	STATUTE
PARTIES	TIME	VESSELS	SHIPPERS	PROTOCOL
APPLY	WITHIN	EXPENSES	PARTICULARS	COMPULSORILY
OF	OTHERWISE	COMPLY	HEREINAFTER	STEVEDORES
AGREED	PORTS	ARISING	AMENDED	HIMALAYA
MASTER	RESERVED	VESSEL'S	SIGNATURE	DELETION
SUB	UNAUTHORISED	COPYRIGHT	ARBITRATORS	COLLIDING
DAMAGE	COPYING	CARRIAGE	EXPRESSLY	RECOUPED
UNDER	REDELIVERY	DUPLICATION	PREJUDICE	AFORESAID
IF	SMARTCON	PAYMENT	DISCLOSABLE	CONSIGNEE
CONTRACTOR	PERIOD	DELIVERY	MARINER	COLLISION
MANAGERS	RIGHTS	INFRINGEMENT	WARLIKE	IMO
GOODS				SHIPMENT

Table 4 shows that there are some differences between the two keyword lists generated by the frequency-based method and the dispersion-based method. The vast majority of the words appear to be strongly associated with English charter parties. There are 33 shared keywords including an acronym (*BIMCO*), and one function word (*whatsœvær*). These shared keywords have both high frequency and wide dispersion, revealing they are the best representative words of the target domain.

Compared with the corpus frequency method, the text dispersion keyword method filtered out more frequent function words such as shall, or, a, the, any, may, if, of, this, and by. These function words are believed to not involve content-distinctiveness (Egbert and Biber 2019), since they appear frequently in all discourse domains. However, as mentioned earlier, some function words (e.g., shall) have their uniqueness in revealing textual features in the target domain. This filter may lead to negligence in identifying some words that are really "key" in the target domain. We know that shall is frequently used in charter parties. How about in other legal contracts, for example, in business contracts? Do all of the contracts share the same feature of using *shall* frequently? Or even further, can we say that *shall* is frequently used in all formal writings? Of course, we could not infer that shall will be a keyword in all formal written domains from the present study, but the lack of this kind of information caused by the filter of text dispersion keyword analysis could make us miss important clues of uncovering the real textual features of the target domain and divert the orientation in the further in-depth research. Nation (2001) stated that owing to different frequencies in a text or corpus, some words are much more useful and momentous than other words. After all, it is difficult to deny that frequency is an important parameter to measure the usefulness of a word. From this point of view, frequency-based keyword analysis has its strengths.

On the other hand, the text dispersion method has its own merits as well. Although some keywords are not high-frequency words, they are dispersed in more texts, for example, these proper names in Table 3. They proved to be strongly associated with the target domain but were not identified by the corpus frequency method. This method also revealed that, compared with the corpus frequency keyword list, the text dispersion keyword list contains more specialized vocabulary related to law (*eg., indemnity, consignee, jurisdiction, lien, liabilities, protocol, arbitrator*) and to marine transportation (*eg., salving salvage, maritime, mariner, stevedores*). This does not mean that keywords in the corpus frequency keyword list are not content-distinctive. Actually, words such as *charter, agreement, contract, mediation, dispute, etc.* are strongly associated with the law and words such as *carrier, laytime, crew, redelivery, parts, etc.* associated with marine transportation are all included in the corpus frequency keyword list.

the text dispersion keywords. Furthermore, the text dispersion keywords represent the written textual features better than keywords produced by frequency, since legal terms (*eg., foregoing, aforesaid, pursuant, construed, herein, hereto, hereor, hereby, thereon, thereto*) can be identified by the dispersion-based method.

From the present study, it is too early to say the dispersion-based method is more effective than the frequency-based method, or vice versa. In the CEC, a specialized corpus, both methods identified keywords that carry textual features in the target domain. It seems that both deserve a place in keyword analysis although the two parameters focus on different aspects in keyness measurement.

5. Conclusion

English charter parties, as a type of legal documents, have a less diverse vocabulary because of their fixed format. Two keyword lists generated by the corpus frequency and text dispersion methods contain different keywords as well as shared ones. Approximately one-fifth of the keywords are shared between the lists. Those shared keywords are believed to be the best representatives of the target domain.

Despite the differences, most of the keywords are strongly associated with the target domain as legal documents. Each of the two keyword lists has its own merits. Thus we recommend a combination of the frequency-based method and the dispersion-based method, taking the text dispersion as an influential factor into consideration when making keyword lists.

Keywords may have great significance in pedagogy in English for Specific Purposes (ESP) since acquiring vocabulary in a foreign language is arduous for most language learners, especially when they intend to achieve high literacy (Cobb and Horst 2002). A specialized vocabulary list based on keyness is needed for students to help them acquire the specific vocabulary used in English charter parties, which is especially helpful in reading and writing. On the one hand, terminologies in maritime law are required in understanding English charter parties. On the other hand, general words with special meanings and usage in English charter parties also need to be learned. Collocations of the keywords may help facilitate the vocabulary learning for users of English charter parties. This study, while developing a new corpus to experiment with a new form of lexical analysis, still has some limitations. Because general English was chosen as the reference corpus, the textual features of legal documents were found to be significant. The specific features of charter parties, however, as one type of legal documents, were not compared and investigated with other types of legal documents. Furthermore, the size of the CEC was relatively small compared with other ESP corpora. Additional English charter parties and related materials should be added into larger corpus to add greater authority to the results. Only frequency and dispersion were considered when extracting keywords in this study. Future studies should explore additional parameters and hybrid methods in keyword analysis.

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Appendix A

Top 100 corpus frequency keywords

1. SHALL	21. NOTICE	41. DISCHARGE	61. APPLICABLE	81. DELAY
2. OR	22. AGREEMENT	42. EXPENSES	62. EXPENSE	82. PRIOR
3. VESSEL	23. DELIVERY	43. SUB	63. RESPECT	83. CONTRACTORS
4. OWNERS	24. ARBITRATION	44. DAMAGE	64. DEMURRAGE	84. PAID
5. ANY	25. CREW	45. LADING	65. VOYAGE	85. INFRINGEMENT
6. CHARTERERS	26. CONTRACT	46. WHATSOEVER	66. VESSELS	86. TIME
7. PARTY	27. DATE	47. ARBITRATOR	67. DUE	87. DUPLICATION
8. BIMCO	28. DISCHARGING	48. ARISING	68. INCURRED	88. WITHIN
9. CARGO	29. LOSS	49. UNDER	69. ACCOUNT	89. CARRIAGE
10. CLAUSE	30. DOCUMENT	50. IF	70. UNLESS	90. OTHERWISE
11. CHARTER	31. COPYRIGHT	51. CONTRACTOR	71. PLACE	91. PORTS
12. PORT	32. OTHER	52. PAYMENT	72. BY	92. COMPLY
13. BOX	33. HIRE	53. MANAGERS	73. INCLUDING	93. RESERVED
14. THE	34. PARTIES	54. LIABILITY	74. PAYABLE	94. UNAUTHORISED
15. LOADING	35. APPLY	55. GOODS	75. PART	95. COPYING
16. SUCH	36. OF	56. EQUIPMENT	76. COSTS	96. REDELIVERY
17. STATED	37. FREIGHT	57. THEREOF	77. DISPUTE	97. SMARTCON
18. ACCORDANCE	38. AGREED	58. EVENT	78. THIS	98. VESSEL'S
19. BE	39. MASTER	59. MAY	79. LAYTIME	99. PERIOD
20. CARRIER	40. PROVISIONS	60. MEDIATION	80. PROVIDED	100. RIGHTS

Appendix B

Top 100 text dispersion keywords

1. BIMCO	21. LIABILITY	41. DISCHARGING	61. EXPENSES	81. DUPLICATION
2. INDEMNIFY	22. PURSUANT	42. ARBITRATOR	62. DUES	82. STATUTE
3. HEREUNDER	23. RECEIPT	43. SIGNATURE	63. COMPLY	83. PROTOCOL
4. HEREIN	24. CARGO	44. ARBITRATORS	64. CONSTRUED	84. COMPULSORILY
5. THEREOF	25. ANTWERP	45. EXPRESSLY	65. HAGUE	85. STEVEDORES
6. PAYABLE	26. CLAUSES	46. PROVISIONS	66. DEEM	86. HIMALAYA
7. ENACTMENT	27. FOREGOING	47. DISCHARGE	67. NOTWITHSTANDIN	G 87. DELETION
8. ARBITRATION	28. NOTIFY	48. LOADING	68. ARISING	88. COLLIDING
9. CLAUSE	29. LIEN	49. APPLICABLE	69. VESSEL'S	89. RECOUPED

10. COMMENCEMENT	[30. VISBY	50. PREJUDICE	70. HEREOF	90. AFORESAID
11. WHATSOEVER	31. HERETO	51. VOYAGE	71. INDEMNITY	91. PAYMENT
12. LADING	32. ACCORDANCE	52. DEMURRAGE	72. LMAA	92. CONSIGNEE
13. VESSEL	33. FREIGHT	53. CONSIGNEES	73. COPYRIGHT	93. DELIVERY
14. THERETO	34. MARITIME	54. DEEMED	74. CARRIAGE	94. COLLISION
15. INCURRED	35. COMMENCED	55. VESSELS	75. PREVAIL	95. IMO
16. HOWSOEVER	36. SHIPPERS	56. SALVING	76. RATA	96. DISCLOSABLE
17. HEREBY	37. PARTICULARS	57. JURISDICTION	77. SPECIFIED	97. MARINER
18. THEREON	38. HEREINAFTER	58. COUNTERCLAIM	78. SHIPPER	98. WARLIKE
19. DEFAULT	39. CHARTERERS	59. NAVIGATION	79. MODIFICATION	99. SHIPMENT
20. NEGLIGENCE	40. AMENDED	60. SALVAGE	80. LIABILITIES	100. INFRINGEMENT

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