



A Corpus-based Comparative Study of Ideational Grammatical Metaphor in Marine Engineering and Maritime Legal Regulation English

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Abstract

Grammatical metaphor is one of the language phenomena introduced by Halliday (2004) in the framework of functional grammar. This paper used Halliday's metafunctional framework in marine engineering and maritime legal regulation English discourses under Prichard's category (2003) of English for occupational purposes and English for academic purposes respectively. The analysis of data was conducted through a description of English occupational and academic texts, based on grammatical metaphor. The researcher conducted some statistical analysis, including frequency and percentage of ideational grammatical metaphor and its different processes of transitivity in both genres. Finally, two genres of English texts were compared statistically to show in what aspect they are significantly different or similar. The results obtained indicate that the two genres bear more similarities than differences in terms of using the nominalization of ideational grammatical metaphor. In other words, while indicating genre differences, the study proves their functional similarities in using the material process types more than other process types to convey meaning, however marine engineering English applies a little less frequency of material and relational process. Some behavior process types were found in marine engineering English texts but no behavior processes were found in marine legal English. Maritime legal English applies small amount of existential process and mental process while in marine engineering English these two types of process were not found. Both genres apply ideational metaphor to condense the information and increase the complexity of sentence structure.

Keywords: ideational grammatical metaphor, nominalization, process, marine engineering English, maritime legal regulation English

1 Introduction

In many instances, metaphorical expression has become the norm and the characteristics of written English. For English as a foreign language (EFL) learners, getting to know the target language features helps them better understand the structure, style, and meaning. Marine engineering English and maritime legal regulation English texts (the two genres contained in our compulsory course book) have the features of long and complicated sentence structure, condensed information, subject terms or technique words, and specific knowledge (as shown in the following example). These bring about the difficulties for readers to understand.

The bedplate, which in most cases is of the welded design, is bolted to the seating which forms a part of the double bottom of the ship. It is secured in the transverse direction by means of bolts known as side-chock bolts and in longitudinal direction by means of end-chock bolts (China Maritime Organization, 2012: 3).

In the above sentence, there are altogether 51 words in two sentences. It contains some technical words, like bedplate, seating, transverse, side-chock bolts, longitudinal, end-chock bolts. Also, it contains two attributive clauses, which makes the sentence structure complicated and difficult to comprehend.

Students in Chinese maritime institutes and colleges, and trainees who have already worked on board for years seeking for higher positions, after taking the compulsory course -maritime engineering English, will attend the competency test of English and other subjects like marine diesel engine, auxiliary machinery, ship management, electrical equipment and automation. If they fail in the exams, they will not get the Certificate of Competency issued by China Maritime Safety Administration (MSA). According to many years' statistics, the passing rate of maritime engineering English test is the lowest among all the subjects. Students come across tremendous difficulties in analyzing the complicated sentence structure, and acquiring new technical words and subject knowledge. The competency test comprises two

sections, mainly testing the reading ability and understanding of the knowledge. Section I includes seventy-six multiple choice, $76 \times 1\% = 76\%$. Section II includes four reading comprehension passages with four multiple choices following each passage, $4 \times 4 \times 1.5\% = 24\%$. The researcher randomly chose one reading passage of 285 words about the watchkeeping duties of an engineer.

At appropriate intervals inspection should be made of the main propulsion plant, auxiliary machinery and steering gear spaces. Any routine adjustments may then be made and malfunctions or breakdowns can be noted, reported and corrected. During these tours of inspection bilge level should be noted, piping and systems observed for leaks, and local indication instruments also be observed.....Bridge orders must be promptly carried Certain watchkeeping duties will be necessary for the continuous operation of equipment or plant-the transferring of fuel for instance.....(China MSA Maritime Engineering English Test, January, 2012).

From the above example, it is noticed that sentences are complicated and informative, metaphors are used frequently (10 instances of metaphor altogether in this passage), which necessitates much effort to comprehend the passage.

For this reason, the researcher hopes the present study can help to find out the linguistic similarities and differences of ideational grammatical metaphor usages and realization in marine engineering and maritime legal regulation English texts, which help students, teachers and readers unpack the complicated sentence structure in order to better understand the English for Vocational Purpose and the English for Legal Purpose more effectively and with less difficulty.

In this paper, the researcher exclusively focused on the analysis of ideational grammatical metaphor in marine engineering English and maritime legal regulation English. This paper tried to answer the following questions:

- 1) What is the frequency and percentage of ideational metaphor in the two types of genres?
- 2) How are the ideational metaphor realized in terms of process?
- 3) Are there any similarities and differences between the two genres from the aspect of ideational grammatical metaphor realization?

2 Literature review

2.1 Lexical metaphor and grammatical metaphor

Since the publication of Lakoff and Johnson's (1980) *Metaphors we live by*, metaphor has raised much research interest. Metaphor is a very common phenomenon in literature, everyday English, academic, and scientific English. For example, there are a lot of metaphoric words in computer science: mouse, menu, search, cancel, program, high speed and so on. The term of metaphor is traditionally applied to the lexical transformation which can be described as "variation in the use of words" (Halliday, 1985, p. 320), which is called lexical metaphor, transferring a dominant quality/attribute of one thing onto another—that is, from the "source domain" to the "target domain" as in *Love is a journey* (Lakoff, 1993). In marine engineering English, using a more concrete, familiar, easy-to-grasp concept helps listeners and readers grasp an abstract, unfamiliar or difficult-to-grasp concept. Some compared the similarity of source and target, for example, in the construction of a diesel engine, a lower part of piston as piston skirt, an upper part as piston crown, the blocks on the crosshead moving up and down on the guide as crosshead shoes like skating shoes.

However, metaphor also brings variation in the expression of meaning if it is described from the point of view of how meaning is expressed (Halliday, 1985), suggesting that metaphor can be also approached from the point of view of grammar. Grammatical metaphor (GM) transfers meaning from one grammatical status/class to another, for instance, from verb (process) to noun (participant). GM is one of the most important language features since it enables readers to enhance the understanding of nature of language, the semogenic process of language and the relationship between language and context. GM is used extensively in various written texts and becomes an important concept of systemic-functional grammar.

GM is "the phenomenon whereby a set of agnate forms is present in the language having different mappings between the semantic and the grammatical categories" (Halliday & Matthiessen, 1999, p. 7). According to Ravelli (2003), there are many reasons for being interested in processes of GM, one central reason is in terms of its relation to an understanding of written texts, and thus to processes of literacy. GM is very much at the heart of written language, particularly the scientific and academic reasoning. There are two prominent types of GM: ideational and interpersonal, although Jamshid (2005) gave some exemplifications of textual metaphor.

Some studies analyzed grammatical metaphor qualitatively. Liu (2014) conducted a systemic functional study of the English nominal group as grammatical metaphor, aiming at studying how English nominal group was related to GM. The findings showed that the English nominal group as GM could be investigated from the experiential perspective. Skorcynska (2003) analyzed the metaphor in scientific business journals and business periodicals at the conceptual level, linguistic level, and communicative level, concluding that the popularization of the scientific business discourse at the level of metaphor variation consists in a number of transformations. V. To, G. Lê and T. Lê (2015) declaimed that four linguistic features namely, nominalisation, grammatical metaphor, thematic structure and lexical density were useful in examining qualitative data and discussed three social metafunctions of language known as the ideational, the

interpersonal and the textual metafunctions which are significant for understanding and interpreting texts. Other studies analyzed quantitatively. Tabrizi and Nabifar (2013) conducted a comparative study of ideational grammatical metaphor in health and political newspapers, and found that “both genres include all types of process, but the frequency and percentage of nominalization of ideational grammatical metaphor used in political texts are more than health texts in English newspapers” (p.49). Dong (2013) presented a modality analysis of the utterances between the lawyer and the witness within the interpersonal meta-function of Systemic Functional Linguistics framework. To present, no studies only a few researches touched the qualitative and quantitative analysis of grammatical metaphor in the fields of engineering English and legal regulation English (elicit the examples or studies conducted).

2.2 Ideational metaphor

Halliday and Matthiessen's (2004) defined ideational metaphor as follows:

..... the general tendency of ideational metaphor is to “downgrade” the domain of grammatical realization of a semantic sequence, figure or element—from clause nexus to clause, from clause to group/phrase, and even from group or phrase to word . . . Such downgrading affects both the unit whose domain of realization is downgraded, and the units of which it is composed: the downgrading proceeds down the rank scale by a kind of “domino effect.” The downgrading may start with (i) a whole sequence of figures (ii) with a single figure, or (iii) with a single element within a figure. (p.646)

Tabrizi and Nabifar (2013) put forward that “In Ideational metaphor lexicogrammatical metaphor features are rearranged to put forth a certain view of reality. They constitute an alternative way of constructing a picture of reality” (p.35). Ideational metaphor is expressed through transitivity system (material, behavior, mental, verbal, relational, and existential).

The ideational metafunction of language deals with language as representation: it focuses on the role of language in representing and shaping reality. As Halliday and Matthiessen note (1997, p.14), “the ideational metafunction is concerned with ‘ideation’ that is grammatical resources for construing our experience of the world around us and inside us”.

2.3 Congruent and metaphorical form

According to Thompson (2004, p. 222), the term congruent employed here is defined as “closer to the state of affairs in the external world” while metaphorical form is “the expression of a meaning through a lexico-grammatical form that originally evolved to express a different kind of meaning” (p. 223).

Steiner (2002) distinguished the “Criteria variously suggested for distinguishing between them include intonational, lexical, paralinguistic, contextual or cultural features. In addition, one could stipulate that ‘congruent’ goes with ‘unmarked’ and ‘metaphorical’ with ‘marked.’”

Halliday (1994) used congruent forms to refer to the less metaphorical variant. In the congruent form, verbs are used to express action / process, noun is used to describe participant, adjectives to characteristic, adverbs to circumstance, time, place and logic. When changes take place, for example, verbs or adjectives change to noun, clause changes to noun phrase, nominalization turns the process and quality to participant in the metaphorization. Such kind of metaphorical expressions are realized as ideational grammatical metaphors or metaphors of transitivity (Halliday 1985a, 1994).

1a: When fuel burns, it gives a lot of heat to the air charge. (congruent, verb phrase, burn)

1b: The burning of fuel adds more heat to the air charge. (non-congruent, metaphorical, the hypotactic clause is downgraded to nominal group, verb (burn) → noun phrase, the burning of fuel)

2a: It is necessary to keep a supply of lubricating oil and cooling oil to well maintain the machines. (congruent, adjective phrase, necessary)

2b: The necessity of lubricating and cooling oil supply is good for maintenance of the machines. (non-congruent, metaphorical, adjective phrase (necessary) → nominal group, the necessity of, an entity or thing; maintain, a process-verb → maintenance, a participant- noun)

Examples in 1a and 2a are more congruent variants, in which a semantic meaning is congruently mapped onto a grammatical expression. Congruent forms, also referred to as the “unmarked clause structure,” reflect the typical ways we construe experience using the resources of the lexicogrammar. For example, nouns construe things/ participants, verbs construe events/processes, adjectives construe qualities or properties.

Examples in 1b and 2b are the metaphorical variants, in which the mapping between semantic meanings and grammatical realizations was realigned. Metaphorical mode of realization are referred to as “the marked clause structure,” for example, a process realized by a verb maybe coded as a participant – a noun /nominal group, an attribute/property realized by an adjective may be coded as a participant, a sequence realized by a clause nexus may be coded as a single clause with all the lexical items packed in the nominal groups serving as subject or complement. The transference from the verbal group into the nominal group is a linguistic movement across functions and at the same time a downward rank shift occurs.

2.4 Nominalization

Nominalization is the process of deriving nouns from other classes. Nominalization transfers the verb which expresses the process or the adjective which expresses the characteristics into the form of noun. During the process, a verb or adjective can be transferred into a noun and become a participant or thing in another process (Bloor & Bloor, 1995). Nominalization refers to the use of noun or noun phrase with or without the morphological transformation. When the verb is nominalized, it becomes the concept rather than an action (Taverniers, 2003). Not all nouns deriving from verbs or adjectives are nominalizations. Hartnett (2004) defined the nouns denoting to process (corrosion, burning, pollution) and products (information, failure) as nominalizations. In addition to verbal and adjectival nominalizations, the third type of nominalization can be formed by nominalizing a conjunction, joining two dependent clauses into one main clause. The action of “can not solve” is nominalized to “inability”.

3(a) Because they can not solve it themselves, they behave in ways that are totally foreign to them (Jones et al., 1989, p. 268)

3(b) Their inability to solve these problems may lead to kinds of behavior that are totally foreign to them (Jones et al., 1989, p. 269)

In the process of nominalization, a single sentence is packed in several complex abstract ideas, and a long sentence is turned into a lexically dense style. Nominalization reduces the number of clauses and increases the information density, enabling the writer to concisely refer to abstract ideas.

In the previous example 1(b), the nominalized group (the burning of fuel) has the dual function of participant and expressing the process (burn).

Marine engineering English and maritime legal regulation English belong to the category of writing characteristics of high literacy in science, technology, legislation and other specialized disciplines. They are more abstract, depersonalized, and ideational. One of the systemic strategies for achieving word economy and information density in academic writing has been suggested: grammatical metaphor of the ideational type (Halliday, 1985, 2004; Halliday & Matthiessen, 2004).

3 Methodology

3.1 Corpus

The analysis was conducted on written texts for two subfields within the maritime engineering English, i.e. marine engineering and maritime regulation. The corpora were chosen from the textbook of Maritime Engineering English (Chinese Maritime Service Center, 2012), which consists of instruction books for various machines on board and maritime laws to be observed by maritime engineers when working on board the ship. This textbook is the most commonly used one in Chinese maritime colleges and institutes. The texts are extracted from original instruction books and international conventions written in English, not from the Chinese translation version. Marine engineering English requires careful choosing of words to describe structures, functions, techniques of machines and ideational grammatical metaphors are used often to make sentences complex. Legal English are more abstract and formal.

Each of the genres contains a total of 14,865 words on its own. Marine engineering English contains 12 texts and maritime legal English contains 11 texts. The first one contains texts about various machines and their systems. The second one mainly consists of texts concerning the pollution prevention, safety of life, standards of training, certification and watchkeeping, ship and port facility security code and port state control.

The data considered as representative in the features observed are generalizable to the whole domain of maritime English. In this study, the researcher did not analyze the data of written or spoken conversations. The table and figures in the original texts were excluded from the sample because they were not the appropriate material to be analyzed.

The corpora were analyzed to investigate the frequency and percentage of process types, role and function of ideational grammatical metaphor, to find congruent domain for all the extracted grammatical metaphors, and also find similarities and differences between two genres in terms of ideational grammatical metaphor.

3.2 Design

This study was designed within the framework of qualitative and quantitative research methodology. The text analysis was done in terms of grammatical metaphors particularly by its view of semantic and lexicogrammatical realizations of functions employed in texts of marine engineering and maritime legal English, to analyze how we represent reality in language. Clause was used as the unit of analysis, and Halliday's Systemic Functional Linguistics model of text analysis was applied to analyze these clauses.

3.3 Procedure

The study was carried out in the following steps. First, the researcher chose engineering English and maritime legal English texts from the text book *Maritime engineering English*. The first part mainly concerns the working principle, construction, operating instruction and troubleshooting for various kinds of machines, such as diesel engine and its fuel oil system, starting system, lubricating system, cooling water system, and various auxiliary machinery (i.e. boilers, pumps, steering gear, fresh water generator). The second part contains some maritime regulations: The International Convention for the Prevention Pollution from Ships (MARPOL), International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), The International Convention for Safety of Life at Sea (SOLAS), The International Convention for the Control of Ballast Water and Sediments (BWS), International Safety Management

(ISM), International Ship and Port Facility Security (ISPS), Basic principles to be observed in keeping an engineering watch, and the port state control (PSC). Then the researcher read the texts thoroughly and very carefully, finding that the texts contain some lexical metaphors and a lot of grammatical metaphors and determined to choose ideational grammatical metaphor as the focus of this study. Later, the researcher became interested in the types of process in the realization of ideational grammatical metaphors. The researcher searched for the ideational grammatical metaphor and identified them according to Halliday's definition above mentioned and the process type described below in a consistent way, and coded them accordingly. Afterwards, in order to ensure correctness, the researcher asked another language teacher to code the metaphors according to definitions. When some different opinions occurred, an agreement was reached for the purpose of correct identification.

Table 1. Six Types of Process (adapted from Halliday, 2004)

<i>Types of process</i>	<i>Examples</i>
<i>Material (doing, happening)</i>	<u>Regular testing of</u> boiler protective devices should be carried at every watch interval.describe the use of the part flow system <u>in conjunction with</u> the ballast discharge and the slop tank decanting procedures.
<i>Mental (sensing, seeing, thinking)</i>	<i>The fifth day saw</i> the submission of the paper. They include the following principles: <u>detection of any fire</u> in the zone of origin.
<i>Relational (being, attributing, identifying)</i>	<u>The sophistication of modern control systems and the reliability of the equipment used</u> have resulted in machinery spaces remaining unattended for long periods. In the <u>absence of a contract</u> , the construction work of which is begun after 30 June 1976
<i>Verbal (saying)</i>	In reality, the computer recognition system must have <u>a set of valid utterances from which to choose to match the user utterance.</u>
<i>Behavioral (behaving)</i>	Carbon brushes <u>rest on these rings</u> as they rotate and collect the current for use in an external circuit.
<i>Existential (existing)</i>	Subject to the provisions of paragraphs (8) and (9) regulation <u>every existing crude oil tanker</u> of 40,000 tons deadweight and above shall be provided with segregated ballast tanks and shall comply with the requirements of paragraphs (2) and (3) regulation from the date of entry into force of the present Convention.

In order to accurately identify and analyze the ideational grammatical metaphor, the researcher tried to find a congruent domain and metaphorical domain for all the extracted grammatical metaphors, which helps better understand the concept of transitivity and ideational grammatical metaphor.

For example,

3(a) Congruent form: *The connecting pipe between the 1st and the 2nd chamber allows that bilge water can pass from 1st chamber to 2nd chamber.*

3(b) Metaphorical form: *The connecting pipe between 1st and 2nd chamber allows the passage of bilge water from 1st chamber to 2nd chamber. (pass → passage)*

4(a) Congruent form: *Modern control system becomes more and more sophisticated and the equipment are more reliable, which resulted in the machinery spaces being remained unattended for long periods.*

4(b) Metaphorical form: *The sophistication of modern control systems and the reliability of the equipment used have resulted in machinery spaces remaining unattended for long periods. (sophisticate → sophistication; reliable → reliability)*

5(a) Congruent form: *When a contract is absent, the construction work of which is begun after 30 June 1976.....*

5(b) Metaphorical form: *In the absence of a contract, the construction work of which is begun after 30 June 1976..... (absent → absence)*

Ideational grammatical metaphor is closely related to transitivity system, which enables us to construe the world of our experience into a limited set of process types (material, mental, relational, existential, verbal and behavior). From the above examples, it is also noticed that nominalization is the most important feature of both genres that leads to ideational grammatical metaphor. Nominalization makes the verbs which express the process and the adjectives which express the characteristics metaphorical lose their own functions. "The principal way of creation of GM is nominalization which is the application of a noun form to present a process meaning" (Tabrizi & Nabifar, 2013, p. 35). Nominalization features the lexical complexity of written language to attain a high lexical density. And at the same time, ideational metaphorical expression is more interesting and more economic.

4. Results and analysis

Twelve texts of marine engineering English and eleven maritime law texts are analyzed on the basis of definitions of ideational grammatical metaphor presented by Halliday (2004) to find out the instances of ideational grammatical metaphors used in both genres and the percentages and frequencies of process types of ideational grammatical metaphors in each genre. Furthermore, the data were analyzed to find out the role and function of ideational grammatical metaphor in these texts.

4.1 Ideational grammatical metaphor in marine engineering English

The application of ideational grammatical metaphor is one of the important stylistic features of marine engineering English texts.

6 Pressure of the fresh water must exceed that of the sea water to prevent any possibility of sea water leakage into the system.

7 They must be capable of removing heat from oil cooled pistons and in doing so must have the highest possible degree of resistance to oxidation and other effects of heat. The use of poor quality oil can lead to rapid deterioration of its properties with the resultant formation of deposits in the piston crown which in turn results in a considerable reduction in heat transfer with subsequent overheating and thermal cracking.

8 Provision has to be made for the expansion of the water due to the increase in temperature and due to small amounts of air which may enter the system and become entrained and for water make-up due to leakages.

Ideational grammatical metaphors occur more than twice in the above sentences. The nominalized grammatical metaphor (provision) enables it to become entity/thing from the process (to provide), also in the case of nominalized metaphor (possibility) from quality (possible) to entity (possibility). The process is realized by a typical grammatical class such as a noun, instead of a verb or adjective. These examples show the shift in semantic type and in grammatical class.

Table 2. Frequency and Percentage of Process Type in 12 Marine Engineering English Texts

Process	Frequency	Percentage
material	118	87.4
relational	15	11.11
mental	0	0
Existential	0	0
behaviour	2	1.48
Total	135	100%

The percentage of process type is presented in Figure 1. below.

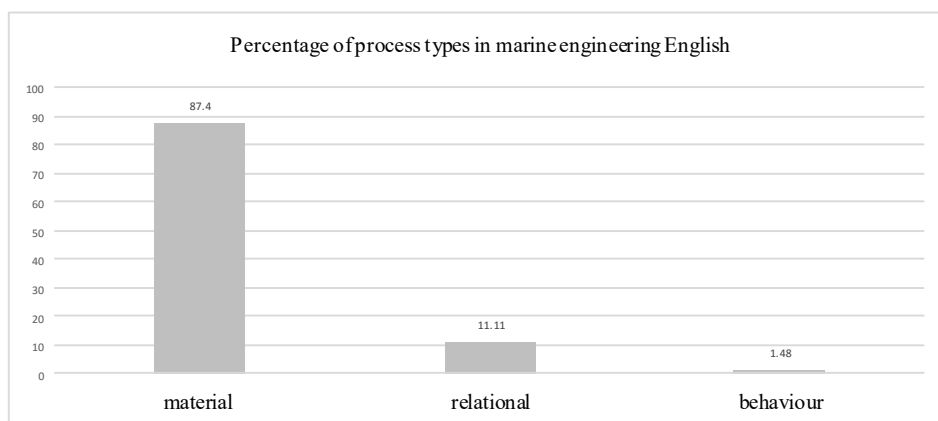


Figure 1. Percentage of Process Types of Ideational Grammatical Metaphor in Marine Engineering English

From Table 2 and Figure 1, it can be found that 135 instances of ideational grammatical metaphor were extracted from marine engineering English texts, 118 material, 2 behavior, 15 relational, 0 existential and 0 mental. The percentage of the material process type is 87.40% which represents the most dominant proportion of the ideational grammatical metaphor, followed by 11.11% relational process type. This shows that material process type occurs more frequently than other processes and applies frequently the nominalization of ideational metaphor.

4.2 Ideational grammatical metaphor in maritime legal English

Similarly, in maritime legal English, ideational grammatical metaphor dominates the linguistic feature. Some sentences in the under- listed examples represent the application of ideational grammatical metaphor twice or more in a simple sentence. One of the main benefits of

nominalization of ideational grammatical metaphor is the production of high adult wordings (Halliday, 1985). Nominalized group not only condenses the information, but also facilitates the cognition of some conceptual and legislative regulations, making legal English more logical, concise and rigorous.

9 Regulations 9 and 10 of this Annex shall not apply to:

- (a). the discharge into the sea of oil or oily mixture necessary for the purpose of securing the safety of a ship or saving life at sea; or
- (b). the discharge into the sea of oil or oily mixture resulting from damage to a ship or its equipment:

(c). provided that all reasonable precautions have been taken after the occurrence of the damage or discovery of the discharge for the purpose of preventing or minimizing the discharge; and.....

Table 3. Frequency and Percentage of Process Type in Maritime 11 Legal English Texts

Process	Frequency	Percentage
material	142	86.58
relational	16	9.75
existential	5	3.3
behaviour	0	0
mental	1	0.61
Total	164	100%

As Table 3 shows, out of 164 instances of metaphor, 142 instances of material process account for 86.58%. Relational and existential process type account for 9.75% and 3.3% respectively. The percentage of mental process type is 0.61%. No behavior process was found. Like marine engineering English, maritime legal English represents the dominant textual force of material process type and then the relational type of process. The percentage of process type is presented in Figure 2 below.

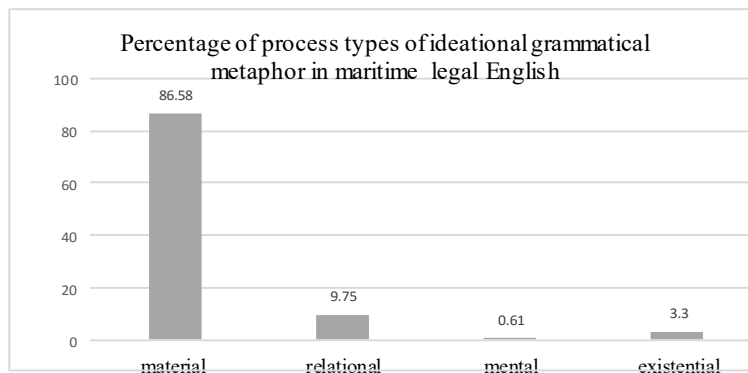


Figure 2. Percentage of Process Types of Ideational Grammatical Metaphor in Maritime Legal English

4.3 Similarities and differences of two genres in ideational grammatical metaphor usages

A whole picture of all the data was shown in the following Table 4.

Table 4. A Summary of the Usages of Metaphor in Two Genres

Process type	Marine engineering English	Maritime legal English	Overall
material	118(87.40%)	142(86.58%)	240 (80.26%)
relational	15(9.75%)	16(11.11%)	31(10.36 %)
behaviour	2(1.48%)	0(0%)	2 (0.67%)
existential	0(0%)	5(1.22%)	5 (1.67%)
mental	0(0%)	1(0.61%)	1 (0.33 %)
Total ideational grammatical metaphors	135(100%)	164(100%)	299 (100%)

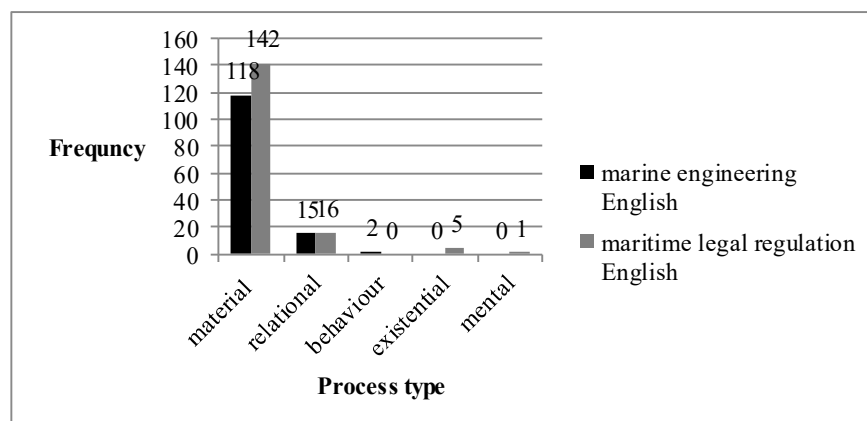


Figure 3. Comparison of Frequency of Process Type of Ideational Grammatical Metaphors in Two Genres

Figure 3 shows the frequency of different process types for realizing ideational grammatical metaphor in marine engineering and maritime legal regulation English.

From the marine engineering English texts totaling 14,865 words, 135 instances of ideational grammatical metaphor were extracted, and 164 instances of ideational grammatical metaphor from maritime legal English corpus totaling 14,865 words. As the figure shows, marine engineering English applies a little less material process (118 vs 142) and relational process (15 vs 16). Behavior process types were found in marine engineering English texts (2), but no behavior processes were found in maritime legal English. Maritime legal English applied existential process (5) and mental process (1), while in the marine engineering English these two types of process were not found. No verbal process types were found in both genres.

4.4 Discussion

Based on the above findings, we can conclude that there are some similarities and differences in the usage of ideational grammatical metaphor in both genres. Liu (2001) has presented that nominalization is one of the essential characteristics of grammatical metaphor in systemic-functional linguistics. A statistical analysis of the distribution and features of six types of nominalization in twelve texts and eleven maritime legal texts was conducted in this study. The statistical analysis revealed that nominalization of verbs occurred the most frequently to perform the function of conciseness, objectivity, formality and semantic expansion; the nominalization of verbs took place more frequently than adjectives to perform the function of conciseness and objectivity.

There are more similarities than differences in both genres. As to the similarities, both genres apply the ideational grammatical metaphor to perform the function of condensation, conciseness, objectivity, and logicity. Both of them apply a big proportion of nominalization and dominant textual force of material process to realize the transitivity and low proportion of other types of process.

This research supports the findings in Tabrizi and Nabifar's study (2013) and Halliday (2004) that the ideational grammatical or transitivity analysis should show material type process.

Regarding the differences of metaphor use in both genres, marine engineering English applies a little less instances of material and relational process than maritime legal English and applies no existential and mental process, and a little percentage of behavior process, while in the maritime legal English no behavior process is found.

A tendency towards conciseness has been observed in two sampled genres. The use of compact construction is possible through process of metaphorization and nominalization. Ideational grammatical metaphor instances in both genres perform the similar functions, such as condensing, objectivity and logicity. Marine engineering English belongs to scientific English with concrete and objective phenomena and the nominalization used makes easy for processes to be objectified. The use of nominalization can condense some technical, professional and subject matter terms and several lexical meanings into one or two nominal groups, making the text difficult to understand without the background knowledge of subject matter.

Maritime legal English applies more nominalization and material process and relational process in order to convey meaning in a more abstract, logical, and formal way. It also makes the text difficult to understand.

5. Conclusion

Based on the theory of Systematic Function Grammar, the analysis was carried out trying to find out the functions and several process types of ideational grammatical metaphor and differences and similarities of ideational grammatical metaphors in marine engineering English and maritime legal regulation English.

Marine engineering English applies less instances of ideational grammatical metaphor than maritime legal English. Both genres apply three or four types of processes of the six types of process, but marine engineering English uses less instances of material and relational process than maritime legal English. No mental process and existential process are used in marine engineering English. While in maritime legal English, no behavior process is used. Nominalization, turning a process (verb) or quality (adjective) to concept or entity (noun), is found most frequently in the realization of ideational grammatical metaphor, which is characteristic writing style in engineering English and legal English.

Nominalization makes the writing of these two genres more formal, informative, objective, and concise. This feature meets the needs of engineering and legal texts' requirement of conciseness, economy and formality, on the other hand, increases the difficulty of understanding.

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