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Exploring Nominalization in Academic Writing: A Comparative Study of Shipbuilding and Oceanography Engineering and Linguistics

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Nominalization, as a universal linguistic phenomenon, is widely used in academic discourse in various fields. In recent years, corpus-based approaches to nominalization have become increasingly prevalent, but nominalization involving academic discourse of Marine-related majors receives little attention. Therefore, this paper selects 108 academic discourse abstracts of Shipbuilding and Oceanography Engineering and 50 abstracts of Linguistics academic discourses, based on the definition of nominalization, the common form of ideational grammatical metaphor from Halliday and Zhu Yongsheng's classification to achieve the analysis of nominalization. It explores the cross-disciplinary differences and frequency of different types of nominalizations and their functions in the selected abstracts. The results show that the common use of nominalizations and the most frequent type is "take process as thing" which shows a significant difference across the two disciplines, signifying disciplinary differences in academic writing. Besides, this paper finds the three most commonly used nominal patterns of each corpus. It provides a couple of possible reasons and elaborate explanations for the particular consequence, expecting that it can contribute to future research in this field and abstract writing in academic discourse.

Keywords: *nominalization, grammatical metaphor, academic writing, disciplinary differences and similarities*

Introduction

Under the framework of Systemic Functional Linguistics (SFL), nominalization is emphasized as the single most powerful resource for creating a grammatical metaphor (Halliday 2004), which has made a great contribution to the development

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of nominalization studies. Nominalization is one of the most prevalent, special, and recognizable linguistic features which is widely used in the scientific and technical registers (Halliday and Matthiessen 1999, Biber and Grey 2013), and it is an efficient means for information packaging and a typical technique to increase information density (Halliday and Matthiessen 2004). It has been purposefully employed in formal and scientific languages. Academic writing, which serves as a prototypical example of scientific language, possesses a high degree of formality and objectivity. Lexical density, nominal structure, and impersonal style are preferable ways to communicate these features (Hyland 2006). As a special case of scientific writing, Halliday and Matin (1993, p. 124) noted that "it seems there are certain features of the way meaning are organized and the way they are worded". The development of academic writing studies concerning language use has been promoted by the high degree of nominalization and formal discourse.

It has garnered a great amount of attention and interest for decades, which has encouraged researchers to explore nominalization in different genres. Numerous studies, comparing literary and editorial language with scientific language, have been conducted, demonstrating that nominalization is used in scientific language more frequently than in literary language. It plays a crucial role in constituting technicality in the latter (Ahmad 2012, Prasithrathsint 2020, Wang 2003, Wang and Yang 2016). These comparative studies aim to reflect the traits and purposes of nominalization used in the scientific language.

Although academic writing in different disciplines generally has the same structure and purpose, there is the important distinction in lexis and morphology in terms of vocabulary use and phrase collocation. It varies in disciplines in response to the disciplinary conventions and communities (Hyland 2009). Discipline construction in academic writing is largely influenced by personal ideas and experiences, institutional features, and social culture, which results in disciplinary distinctions (Hyland 2006). Previous studies of nominalization on the disciplinary differences of academic discourse have primarily focused on Linguistics (Zhou and Liu 2017), Physics (Liu and Cheng 2019), textbooks of Biology (Hao and Humphrey 2019), Pain English and Legal Writing (Hartig and Lu 2013). All of them either study the typical features in language use between English as a first language and English as a second or foreign language or explore the function of nominalization in academic texts of a certain discipline.

Besides, a large number of comparative researches keep appearing on the use of nominalizations to expose disciplinary differences and variations in academic discourses, for example, Jalilifar et al. (2014, 2017), Gonzalez and Valeska (2019), Marr and Mahmood (2021), Ahmad (2012), He and Yang (2018), etc. There is a demonstration that nominalizations in academic discourses are not sensitive across disciplines, and some of the above studies indeed verified that there is no significant variation across disciplines on nominalization in scientific language

(Jalilifar et al. 2014, 2017, He and Yang 2018), and other studies revealed nominalization was designed with the universality and technicality without mentioning any disciplinary differences nominalization used (Ahmad 2012).

Above all, as for exploring nominalization in academic writing, there is still some room for research on Shipbuilding and Oceanography Engineering and Linguistics to discover the inherent linguistic features of each discipline. This is especially important for Shipbuilding and Oceanography Engineering, which has received less attention. Therefore, it is worth exploring the frequency and distribution of nominalization in the different two disciplines to find the similarities and differences. The comparative analysis of Shipbuilding and Oceanography Engineering and Linguistics has not been undertaken in the Linguistics field. The majority of the studies on nominalization that were cited above compare Linguistics with many other fields. This paper selected the two, one that is commonly studied, and the other is rarely studied, which can provide a new direction for studies on nominalization as well as proceed a thorough exploration of linguistic characteristics of the two disciplines. A need for research on nominalization inspires scholars to pay closer attention to it in academic writing across disciplines to present more inherent cross-disciplinary features through the usage of nominalizations.

Nominalization in SFL

Nominalization is studied from a variety of linguistic schools, including structural linguistics represented by Jespersen, transformational generative linguistics, and systemic functional linguistics (Fan and Wang 2003, Liu and Lu 2004). However, Halliday's investigation into nominalization is the most thorough and systematic of these three schools.

Nominalization in SFL is a fundamental element of grammatical metaphor and was initially discussed in the book *An Introduction to Functional Grammar* (Halliday 1985). In an elaboration on metaphor (Ravelli 2003), Halliday argued that metaphor is not only simply a variation in the use of words that refer to cognitive metaphor but also their uses and meanings (Taverniers 2003). According to Halliday (1985, cited in Taverniers 2003, p. 7), metaphor is a variation of a given meaning instead of a variation in the meaning of a given expression. This claim is regarded as the origin of grammatical metaphor.

Lexis, uses, and meaning are all metaphorical terms that relate to the two separate forms. Both of them have parallel two domains, but different names and meanings. According to Halliday (1994 p. 342), grammatical metaphor refers to "for any given semantic configuration there will be some realization in the lexicogrammar—some wording—that can be considered CONGRUENT; there may also be various other that are in some respect 'transferred', or METAPHORICAL".

Although there are various techniques to transform metaphorical construction from congruent construction, the fundamental step is to rewrite and reconstruct the clausal patterns into nominal groups (Halliday and Matthiessen 2004). Ascribing to this, nominalization is acknowledged as one of the most indispensable components of grammatical metaphor.

The significance of nominalization in constructing academic writing has always been a topic of discussion among researches. Baratta (2010) addressed that it is unnecessary to use nominalization instead of a personal subject within an academic program. However, further evidence supports the notion that nominalization is crucial for obtaining lexical density, cohesiveness, formality, and conciseness (e.g., Halliday 1998, Schleppegrell 2001, Liardet 2016, Liardet and Black 2020, Liardet 2019). For instance, Liardet (2016) examined the function of grammatical metaphor and found that it is important for a learner's performance in an academic setting. All of them illustrated that nominalization under the SFL framework is more in line with the linguistic characteristics of academic writing.

The authors here share the latter view and support it with examples by highlighting how crucial nominalization is when constructing academic discourse. Besides, as only a few numbers of researches have indicated that nominalization is discipline-sensitive, this paper desires to explore nominalization under the framework of SFL across disciplines and seeks to identify disciplinary variances and similarities in it. In light of the foregoing research and inquiry, the study is intended to address the following two concerns.

1. Is there a difference in the distribution of nominalization across disciplines? And to what degree do the two corpora differ from each other in the distribution of nominalization?
2. How does nominalization reflect the differences in academic writings across disciplines?
3. Are there any similarities of the nominalization which distribute differently across corpora? And what are the similarities?

Methodology

Both quantitative and qualitative research methods were adopted in this corpus-based investigation. Typical examples and precise data are extended to study the linguistic properties of the two self-built corpora, Shipbuilding and Oceanography Engineering Academic English Corpus (SOEAE Corpus) and Linguistics Academic English Corpus (LAE Corpus). The following section aims to provide a thorough overview of corpora, research methods, and the research process.

Corpus

This study is proceeded by two corpora, one is SOEAE Corpus, and another is LAE Corpus. The former contains 108 journal paper abstracts written in English referring to Shipbuilding and Oceanography Engineering, all of which were published within the last five years (from 2016 to 2020). After text cleaning and sorting, a small corpus was built with a total number of 21,451 words and an average word count of 199 for each abstract.

The authors built another corpus used as the comparable one. It is composed of Linguistics abstracts of 50 pieces of journal papers written in English. Additionally, the fundamental ideas of the selected journal papers are essentially the same as those of SOEAE Corpus, for example, in the same time range (from 2016 to 2020). The download abstracts are used to build LAE Corpus. It is capable of 8470 words in total number and an average of 169 words per abstract.

Procedure

To determine the various properties of nominalization using, nominalization collocation, and nominalization function in corpora of the two distinct fields, identifying, classifying, and quantifying are implemented after the corpora's construction.

Identifying and Quantifying

Nominalization defining is always a challenging issue, and academics continue to hold differing views on the subject. Derewianka (2003) argued that the principles of grammatical metaphor identification follow derivational morphology, agnition, and rank shifting. This paper retrieved nominalizations depending on the above principles. Halliday and Matthiessen (1999), as well as Matthiessen (1995), made a clear distinction between transcategorization and grammatical metaphor as well as rankshifted embeddings and grammatical metaphor. The author retrieved all the nouns first, and manually labeled the nominalizations among these nouns because not all the nouns are nominalizations. For example, some verbs are converted into nouns rather than nominalization (e.g., writer, container), the gerund form (e.g., writing, operating), and proper nouns (e.g., International Regulations for Preventing Collisions at Sea).

Classifying

Thirteen different types of grammatical metaphors, including those relating to ideational and interpersonal grammatical metaphors, are described in detail by Halliday and Matthiessen (1999). They thought that nominalization is one part of the ideational grammatical metaphor that can be outlined into five types. This

viewpoint is a little abstract to comprehend.

As studies on the topic proliferate, on the backs of Halliday and Matthiessen, Zhu (2006) put forward a new classification of nominalization, classifying nominalization as three types, "take process as thing", "take quality as thing" and "take assessment as thing". In comparison to the taxonomy of Halliday and Matthiessen (1999), it is more specific and precise and has the potential to operate flexibly with distinct classifying criteria. Zhu's (2006) classification of nominalization is detailed in Table 1.

Table 1. *Zhu (2006) Taxonomy of Nominalization*

Type	**Conversion**		**Example**	
Take process as thing	verb	thing	investigate	investigation
Take Quality as thing	adjective	thing	hungry	hunger
Take assessment as thing	modal verb/ modal adverb	thing	could	potential

Several words in the classification process fell into ambiguous nominalization categories, such as VARIABLE, DIFFERENCE. They were concluded as two outcomes: first, the boundary ambiguous words can be traced directly to the verb or adjective forms, for example, VARIABLE, which was placed in the classification of "take process as thing". Secondly, and the other is that they can be traced to both adjective and verb forms, such as DIFFERENCE, for which the authors use the word root as the principle of division, DIFFERENCE classified into "take process as thing".

Results and Discussion

Comparison Results of Nominalization Distribution

The authors counted all the nominalizations in the two corpora to answer the first question: Is there a difference in the distribution of nominalization across disciplines? And to what degree do the two corpora differ from each other in the distribution of nominalization?

Table 2. *Frequency of Nominalization in Two Corpora*

Corpora	Word number/ (word)	Nominalization/ (word)	Frequency/ (thousand words)
LAE Corpus	8470	539	63.6
SOEAE Corpus	21307	1922	90.2

Table 2 shows that the SOEAE Corpus and LAE Corpus both have nominalization frequencies of roughly 90.2 and 63.6, respectively.

Further, the retrieved nominalizations are divided into three categories based on Zhu's (2006) taxonomy of nominalization: "take process as thing" (Type 1), "take quality as thing" (Type 2), and "take assessment as thing" (Type 3). Table 3 presents the frequency of nominalization types used and the difference in the particular type in the two corpora.

Table 3. *Frequency of Types of Nominalizations*

corpora / nominalization types	LAE Corpus		SOEAE Corpus		
	Raw frequency	Frequency/ Percent	Raw frequency	Frequency/ Percent	Significance (p-value)
Type 1	409	75.9	1527	79.4	0.0266
Type 2	128	23.7	389	20.2	0.4091
Type 3	2	0.4	6	0.4	0.5579
total	539	100	1922	100	0.5672

In terms of the total amount of nominalization, no differences in the number of nominalizations are reflected in the two corpora.

Table 3 provides the raw number, standard frequency of each type and the significance of the differences between the individual types in the two corpora, the frequencies of the three types in LAE Corpus are 75.9%, 23.7%, and 0.4%, while in SOEAE Corpus are 79.4%, 20.2%, and 0.4% respectively. Longitudinally, both disciplines prefer to use Type 1 nominalization in academic discourse. In terms of the significance of difference, the p-values for the three types are, respectively, 0.0266 ($p<0.05$), 0.4091 ($p>0.05$), 0.5579 ($p>0.05$), and 0.5672 ($P>0.05$). There is a significant difference in the frequency of Type 1(take process as thing), meaning that it occurs more frequently in Shipbuilding and Oceanography Engineering than it does in Linguistics. However, there is no discernible difference in the frequency of Type 2 and Type 3 between the two disciplines.

Nominalizations and Nominal Groups

This section is created for the second research question: How does nominalization reflect the differences in academic writings across disciplines? Nominalizations were set into nominal groups to ascertain the difference.

A nominal group refers to a variety of other items that precede and follow a noun and all of which characterize the noun in some ways (Halliday 2004). Halliday (2004) proposed the experiential structure of nominal groups and explained in detail the specific meaning of each component. Take *those two*

splendid old electric trains with pantographs as an example (example from Halliday 2004, p.312), the nominal group consists of *deictic*, *numerative*, *epithet*, *classifier*, *thing*, and *qualifier*. Nominalization as the subclass of nouns can be in line with what has been described above about nominal group. Therefore, we apply Halliday's definition of components to the testification of disciplinary differences identified by nominalization. Besides, deictic words cannot affect results of the paper, such as a, an, the, this, that, etc. nominal groups described here without much emphasis. Table 4 specifies the components of the nominal group by giving concrete examples.

Table 4. *Explanation for Components of Nominal Groups*

Example: *Those two splendid old electric trains with pantographs* (Halliday 2004, p. 312).						
those	two	splendid	old	electric	trains	With pantographs
deictic	Numerative	epithet	epithet	Classifier	Thing	qualifier

In light of the definition and components mentioned above, the authors concluded 11 common patterns of two corpora and 1 pattern, especially for Linguistics. Patterns and examples are listed in Table 5.

Table 5. *Nominal Patterns and Examples of Type 1*

Pattern number	Patterns and Examples	Raw Frequency/%	
		SOEAE Corpus	LAE Corpus
#1	**Thing+ Qualifier** The investigation of language acquisition in related languages reveals how children's attention to the adult language limits the operation of both universal and individual processes (LAE Corpus, Pye et al. 2017).	236 15.46	99 24.24
#2	**Epithet…+ Thing** Expansion of real-time operating data from limited measurements to obtain full-field displacement data has been performed for structures in air. This approach has shown great success, … (SOEAE Corpus, Chen et al. 2018)	36 2.36	20 4.89
#3	**Epithet…+ Thing…+ Qualifier** …, constraining the possible lexicalization of object concepts. (LAE Corpus, Ursini and Acquaviva 2019)	21 1.38	29 7.09
#4	**Epithet…+ Classifier…+ Thing** The goal of this research is to discover the potentials to design multi-objective optimal elastic structures for better acoustic performance. (SOEAE Corpus, He and Sun. 2018)	51 3.34	13 3.18
#5	**Epithet…+ Classifier…+ Thing+ Qualifier**	52	6

	The analysis provides a comprehensive functional description of the N1 of N2 pattern in the context of disciplinary academic writing. (LAE Corpus, Liu and Lu 2020)	3.41	1.47
#6	**Classifier…+ Thing** We have found that geometrical and dynamic constraints can substantially reduce the volume fraction of feasible solutions in the design space, … (SOEAE Corpus, He and Sun 2018)	626 40.86	118 28.85
#7	**Classifier…+ Thing+ Qualifier** We have found that geometrical and dynamic constraints can substantially reduce the volume fraction of feasible solutions in the design space, … (SOEAE Corpus, He and Sun 2018)	339 22.20	50 12.22
#8	**Thing** On the other hand, constructional prior knowledge regulates the innovations. (LAE Corpus, Peng 2016)	128 8.38	59 14.43
#9	**Numerative+ Thing+ Qualifier** … pressure integration method that integrated the second-order pressure on a body surface. (SOEAE Corpus, Park and Kim 2019)	3 0.20	3 0.73
#10	**Numerative+ Thing** Neither of the two observations has been convincingly addressed in previous studies, … (LAE Corpus, Peng 2016)	0 0	5 1.22
#11	**Numerative+ Classifier…+ Thing** … double layer pressure measurements are used to replace the measurements of the pressure and normal velocity which uses costly p-u probes. (SOEAE, He et al. 2017)	9 0.59	3 0.73
#12	**Numerative+ Classifier…+ Thing+ Qualifier** We identify three institutional motivations working to over-ride the normal communicative contract… (LAE Corpus, Antaki and Stokoe 2017)	28 1.83	4 0.98

Two decimal places are retained here as the frequency of nominal groups cannot be rounded off, which does not influence the result of the study. In addition, ellipses in pattern #2, pattern #3, pattern #4, pattern #5, pattern #7, pattern #8, pattern #12, and pattern #13 denote the presence of several classifiers or epithets in those patterns. An explanation is given in Table 6.

Table 6. *Explanation for Ellipse*

Example: … double layer pressure measurements are used to replace the measurements of the pressure and normal velocity which uses costly p-u probes. (SOEAE Corpus, He and Sun 2018)			
double	layer	pressure	measurement
Numerative	Classifier 1	Classifier 2	Thing

Nominalizations operate at distinct frequencies in the different corpora. What causes this to occur? According to Table 5, pattern #7, pattern #8, and pattern #1 are the three which are most prevalent used in Shipbuilding and Oceanography Engineering, and pattern #7, pattern #1, and #9 are most frequently used in Linguistics. There are similarities, indicating that pattern #7 is present in both corpora in significant numbers, however, focusing on the variations in patterns usage demand greater consideration. To examine the differences, pattern #4, Pattern #5, pattern #6, and pattern #7 are placed in Group 1, and pattern #1, pattern #2, pattern #3, and pattern #8 are in Group 2. By the way, this study does not take patterns #9, #10, #11, and #12 into account due to their extremely low frequency and insignificant influence on the result.

Nominal Patterns with Classifier

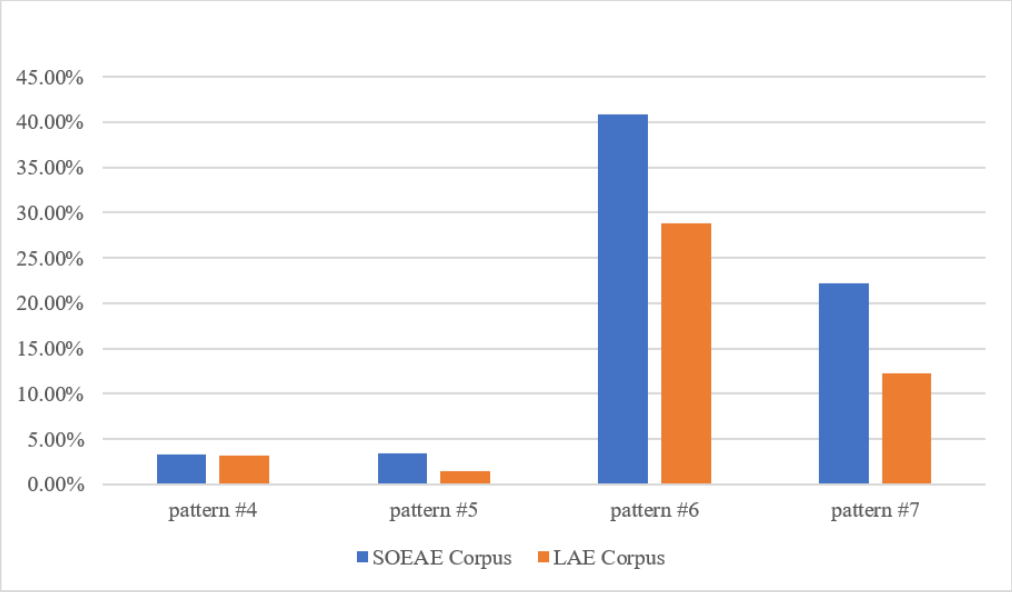
Here pattern #4, pattern #5, pattern #6, and pattern #7 are grouped as Group 1 for analysis, for one reason that they all contain a classifier, for another is that it is more straightforward to make a comparison between two different types of a classifier.

In light of Halliday (1994, 2004), a classifier can be expressed using an adjective or a noun as demonstrated by the examples in pattern #5 [Epithet…+ Classifier…+ Thing+ Qualifier] and pattern #6 [Classifier+ Thing]. It always refers to a subclass of *thing*. The following language traits are present in both disciplines.

Patterns #4, #5, #6, and #7 are examples of patterns with classifiers that appear more frequently in the SOEAE Corpus than in the LAE Corpus, whereas patterns #1, #2, #3, and #8 are examples of patterns without classifiers that appear more frequently in the LAE Corpus than in the SOEAE Corpus. In the next two figures, the specifics are displayed (Figures 1-2).

The number of patterns is clearly illustrated in Figure 1. Pattern #4[Epithet…+ Classifier…+ Thing] is 3.34% in SOEAE Corpus and 3.18% in LAE Corpus. Pattern #5[Epithet…+ Classifier…+ Thing+ Qualifier] is 3.41% in SOEAE Corpus and 1.41% in LAE Corpus. Pattern 6[Classifier…+ Thing] is 40.86% in SOEAE Corpus, and 28.85% in LAE Corpus. Pattern #7[Classifier…+ Thing+ Qualifier] is 20.2% in SOEAE Corpus and 12.22% in LAE Corpus. Comparing the two columns in Figure 1 which shows that in the SOEAE Corpus, patterns including classifiers occur more frequently.

Figure 1. *Patterns with Classifier in Two Corpora*



Additionally, Shipbuilding and Oceanography Engineering outperforms Linguistics in terms of the four nominalization patterns in Group 1 with a percentage of 45.72% compared to Linguistics' overall percentage of 69.81%. Pattern #6 [Classifier+ Thing] dominates these two corpora, occurring 118 (28.85%) times in linguistics, 626 (40.86%) times in shipbuilding and oceanography engineering, and over half of all nominalization patterns. It means that more nouns, including nominalizations, are used as classifiers in the SOEAE Corpus. Table 7 provides classifier incidence information.

Table 7. *Frequency of Type 1 Nominalization as a Classifier*

Corpus Name	Raw Frequency	Frequency/%
SOEAE Corpus	467	30.58
LAE Corpus	47	11.49

Table 7 displays the number of Type 1 nominalizations used as a classifier in the two corpora. They are manually located and selected from each corpus's nominal patterns as classifiers to ascertain whether or not the number of nominalizations used is significantly influenced by classifiers. The nominal patterns of the SOEAE Corpus can be recognized to use 467 nominalizations as classifiers, and roughly 30 out of every 100 nominalizations are used as classifiers to modify the head of a nominal group. The nominal groups in the LAE corpus contain 47 instances of nominalization as a classifier. Roughly 11 nouns out of every 100 words serve as classifiers. Because of this, more nominalizations are used as classifiers in the SOEAE corpus, suggesting that this may be one of the

reasons why nominalizations are used more frequently in the SOEAE corpus than the LAE corpus.

A great number of patterns, like classifier (nominalization) + thing (nominalization) in Shipbuilding and Oceanography Engineering tends to express the semantic meaning involving model (e.g., propagation model, equal weight stochastic model) method (e.g., parameter estimation method, identification method), structure (bow appendage), etc. These modes of expression highlight the particularities of a given discipline and differences between disciplines.

Table 8. *Patterns and Examples*

Example of pattern #4 [Epithet…+ Classifier…+ Thing] in SOEAE Corpus
From the experimental investigation, it emerged that increase in backpressure, along with greater injection pressure, minimizes the spray non-uniformity (Shipbuilding and Oceanography Engineering, Coratella et al. 2020).
Example of pattern #5 [Epithet…+ Classifier…+ Thing+ Qualifier] in LAE Corpus
Metaphorical construction: The analysis provides a comprehensive functional description of the N1 of N2 pattern in the context of disciplinary academic writing. (Linguistics, Liu and Lu 2020) **Congruent construction:** The analysis describes the N1 of N2 pattern in the context of disciplinary academic writing in function, which is comprehensive.
Example of pattern #6 [Classifier+ Thing] in SOEAE Corpus
We have found that geometrical and dynamic constraints can substantially reduce the volume fraction of feasible solutions in the design space, … (Shipbuilding and Oceanography Engineering, He and Sun 2018)
Example of pattern #7 [Classifier…+ Thing+ Qualifier] in SOEAE Corpus
This may be attributed to the boosting action exerted by cylinder backpressure on the needle, … (Shipbuilding and Oceanography Engineering, Coratella et al. 2020)

*The examples not noted specially are metaphorical form.

Besides, nouns and adjectives behave very differently when it comes to the transformations of congruent and metaphorical construction. Table 8 shows the congruent and metaphorical construction, specifically for pattern 5, as well as the metaphorical construction, which is shown just for patterns #4, #6, and #7. Comparing examples from patterns #4 [Epithet...+ Classifier...+ Thing], #6 [Classifier...+ Thing], and #7 [Classifier...+ Thing+ Qualifier] with pattern #5 [Epithet...+ Classifier...+ Thing+ Qualifier] reveals that adjectives used as classifiers can be transformed from metaphorical constructions into congruent constructions, such as the conversion from a brief and formal declaration to a more complex one in pattern #5 [Epithet...+ Classifier...+ Thing+ Qualifier]. However, nouns cannot be transformed into congruent construction when they are used as classifiers. The noun is often co-selected with the *head* when employed as a

classifier to indicate a particular meaning in the specific language context. For instance, terms often used in Shipbuilding and Oceanography Engineering, such as injection pressure, fuel consumption, cylinder backpressure, etc. cannot be traced back to their congruent construction. It is consistent with Halliday's assertion that a nominalization can be traced back to a congruent construction because a nominalization without context can be linked to a congruent construction. However, in a specific context, usage restrictions limit the metaphorical construction in a collocation, making it impossible to change without altering the meaning.

Nominal Patterns without Classifier

Group 2 is made up of the remaining four nominal patterns, which are patterns #1, #2, #3, and #8. They include adjectives, things, and qualifiers, all of which are frequently devoid of classifiers. Between the SOEAE Corpus and the LAE Corpus, the frequency of nominal patterns without a classifier is compared in Figure 2.

Figure 2. *Patterns without Classifier in Two Corpora*

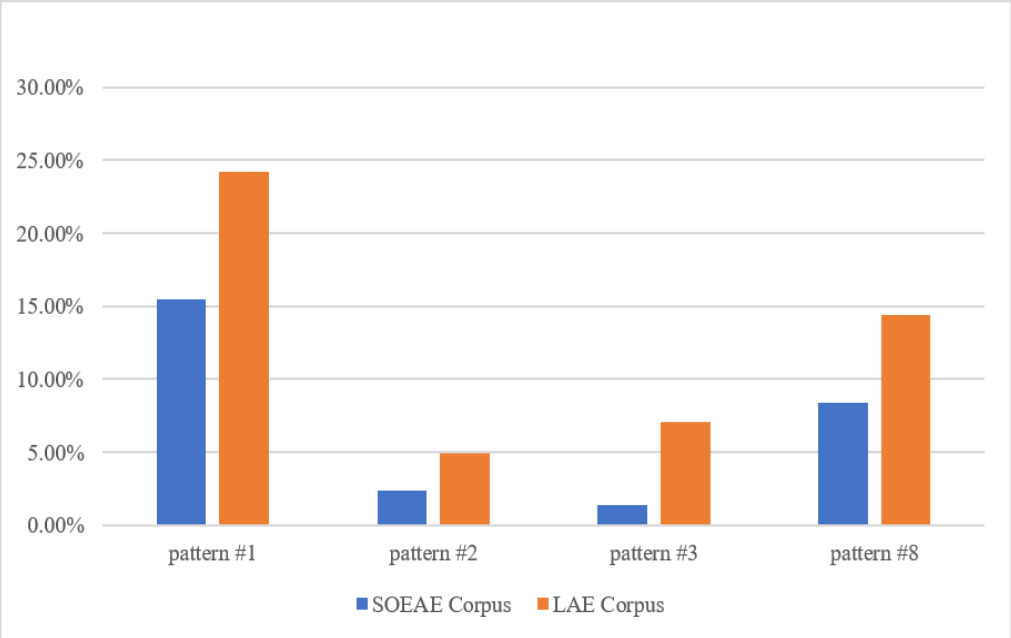


Figure 2 compares the frequencies of the four nominal patterns in the two corpora with regard to Group 2, clearly signifying that more patterns without classifiers are used in LAE Corpus than those in SOEAE Corpus. Pattern #1[Thing+ Qualifier] is 24.24% in LAE Corpus and 15.46% in SOEAE Corpus. Pattern #2 [epithet+ Thing] is 4.89% in LAE Corpus and 2.36% in SOEAE Corpus. Pattern #3 [epithet…t+ Thing+ Qualifier] is 7.09% in LAE Corpus and 1.38% in SOEAE Corpus. Pattern #8[Thing] is 14.43% in LAE Corpus and 8.38% in SOEAE Corpus. It implies that all four patterns in Group 1 share that the

frequency of occurrence of any one of the patterns in the LAE Corpus is more than that in the SOEAE Corpus.

Patterns #1 and #8, which lack any modifiers, are the two simplest nominal groups. As seen in Figure 2, linguistics, as opposed to Shipbuilding and Oceanography Engineering, prefers to utilize nominalization alone or when it is modified by postpositions. Thus, the authors speculate that it may be one of the reasons that there are fewer nominalizations in the LAE corpus than in the SOEAE corpus.

Additionally, epithets are used as modifiers in patterns #2 and #3. It highlights how adjectives are frequently used in Linguistics to modify nouns in a nominal group. According to Halliday (1994, 2004), adjectives are always employed as epithets in the experiential structure. That is to say, compared to the other, adjectives are used as adjective nominal modifiers more frequently in academic English.

Similarities Reflected Through Nominalization

Although the corpora of the two disciplines reflect differences in the number of uses of Type 1 nominalization, they are similar in function. In this section, in order to answer the third question, the authors conducted a thorough investigation of the functions of nominalization using concrete examples to address the third question.

Table 9. *Nominalization Function of Objectiveness*

Example 1 **Metaphorical construction:** The investigation of language acquisition in related languages reveals how children's attention to the adult language limits the operation of both universal and individual processes (Linguistics, Pye et al. 2017). **Congruent construction:** We/ I/It investigate (s) language acquisition in related languages reveals how children's attention to the adult language limits the operation of both universal and individual processes.
Example 2 **Metaphorical construction:** Predictions of independent operation were also promising (Shipbuilding and Oceanography Engineering, Kuuliala et al. 2017). **Congruent construction:** we predicted independent operation, which is also promising.

The two examples from each corpus presented in table 9 involve an expression of metaphorical and congruent construction. In example 1 the writers of this passage used THE INVESTIGATION OF instead of SUBJECT+ INVESTIGATE. PREDICTION instead of PREDICT in example 2 achieves the same function.

Both of them have the same function, which makes the explanation and results expressed more objective and convincing by omitting the subject using. Hyland and Jiang (2017) claimed that objectiveness can be achieved by omitting the subject.

Table 10. *Nominalization Function of Integrity*

Example 1 **Metaphorical construction:** The analysis provides a comprehensive functional description of the N1 of N2 pattern in the context of disciplinary academic writing. (Linguistics, Liu and Lu 2020). **Congruent construction:** The analysis describes the N1 of N2 pattern in the context of disciplinary academic writing in function, which is comprehensive.
Example 2 **Metaphorical construction:** It enables decision makers to choose optimal repair option with respect to different service life extension needs (Shipbuilding and Oceanography Engineering, Liu et al. 2019). **Congruent construction:** It enables decision makers to choose for optimal repair with respect to different service life extension needs.

In the metaphorical construction of example 1, the word "DESCRIPTION" is modified by three premodifiers. While in the congruent form, the modifiers of the word are broken up and scattered throughout the sentence. Compared to the metaphorical construction, the sentence structure of the congruent construction is not sufficiently integrated. By enclosing the head word in a number of modifiers in these examples, nominalization serves the purpose of maintaining the integrity of the language. The majority of nouns are modified by other words, which can be realized in the patterns of Table 5, such as pattern #2, pattern #3, pattern #4, pattern #5, pattern #6, pattern #7, pattern #11 and pattern #12, which all frequently include an epithet or a classifier to modify *thing*.

It is well known that nominalization is more effective at expressing the function of increasing the information in a sentence by superimposing modifiers to increase sentence density (Halliday 1994, Zhu 2006), which is best shown in the above examples. No significant differences in the function of nominalization used are reflected in the two corpora, which may be due to the consistent genre of the selected texts. Academic discourse has its own writing rules, language norms, and target audience.

Discussion

In terms of function, Hasan (1977) claimed that genre is related to the field which largely determines the choice of language in communication and the grammatical features of the lexis. Although the two corpora cover different disciplines, they are of the same genre, therefore it may be the reason that no discrepancies were identified when the nominalization functions in the two corpora were analyzed with particular instances in this article. Although no functional differences were found, nominalization occurs heavily in both corpora, and the authors believe that there are several main reasons for this. Nominalization transforms processes into things, and as objects are static and objective rather than subjective, they cannot be simply refuted (Song 2008). In addition, the degree of formality of the discourse is correlated with the frequency of nominalization (Wang 2003). Academic discourse is more formal when compared to other genres. Besides, the target group for academic discourses has a high requirement of language proficiency which can be achieved by nominalizations. Regarding the frequency of nominalization and nominal groups, it discovered that patterns #6, #7, and pattern #1 in the SOEAE Corpus, and patterns #6, pattern #1, and pattern #9 in the LAE Corpus, were the three most commonly used nominal patterns of each corpus. The common two patterns, pattern #6, pattern #1 as well as pattern#7 in SOEAE Corpus can be concluded as a noun phrase. Lan et al. (2022) mentioned that academic writing is full of compressed noun phrases whose heads are usually modified. In recent centuries, studies have shown that compressed noun phrases are increasingly employed in academic writing (Biber and Gray 2011). Therefore, this paper also convincingly demonstrates the widely used noun phrases taking over 78.52% of SOEAE Corpus and 52.5% of LAE Corpus.

Although pattern #6 is the most frequently used of the two corpora, the significant distinction in the frequency can be explained by the divided two groups. Any patterns in Group 2, particularly, pattern #2 and pattern #3 with epithets as the only modifier in SOEAE Corpus occur less than in LAE Corpus, while the frequency of any of the four nominal patterns in Group 1 in SOEAE Corpus occurs more than those in LAE Corpus. That is to say, the discipline of Shipbuilding and Oceanography Engineering is more inclined to deploy classifiers (including more nominalizations) as modifiers, while Linguistics tends to regard epithets (adjectives) as modifiers or without any modifiers. Classifiers used as modifiers as mentioned by Halliday (1994, 2004) are often expressed as a subclass of something. A majority of Classifier (nominalization) + Thing used in SOEAE Corpus to realize sets of generally perceived concepts (e.g., ice resistance test, energy storage device, simulation model, combustion chamber, etc.), methods (e.g., simulation method, resistance method, energy management strategy, etc.) or procedures in certain experiments (e.g., optimization procedure, emission

constraints, echolocation click, etc.). These kinds of expressions can be summarized as [Nominalization+ Noun/ Nominalization] which signifies a very high density of nominalization widely existing in SOEAE Corpus, being directly responsible for the more nominalization used in the discipline of Shipbuilding and Oceanography Engineering.

Regarding the claim that there are more adjectives used as modifiers in the LAE Corpus, on the one hand, some adjectives are used as classifiers expressed as concepts or procedures (e.g., bilingual education, multilingual education, pragmatic modulation, etc.), while others are chosen as epithets to modify nouns or nominalizations, such as "high occurrence of", "better performance", "significant professional realignment", etc., such expressions always appearing in the LAE Corpus. The modifiers in the nominal groups serve to evaluate the noun as well as just supply a piece of information. Biber (2006) claimed that adjectives are used as attributives to express evaluations of head nouns, for example, good, bad, great, terrible, and so on, such adjectives are used to express a positive or negative effect. There are great differences in the expression and quantity of evaluation among different disciplines. Compared with hard science, soft science has more engagement with readers (Zou and Hyland 2020). Thus, fewer nominalizations are employed in LAE Corpus.

Since the LAE Corpus increasingly aims to use adjectives as modifiers rather than nouns, whereas the SOEAE Corpus is more likely to use nouns (including nominalization) as modifiers (including nominalization). This influences how differently Type 1 nominalizations are utilized in the corpora of the two disciplines; in other words, Shipbuilding and Oceanography Engineering uses more Type 1 than Linguistics.

Conclusion

The current study explores disparities in the frequency of nominalization and compares the functions of nominalization in abstracts of academic discourses from two distinct fields, Shipbuilding and Oceanography Engineering and Linguistics. Results show that in neither of the two corpora did the nominalization function accounts for the distinction. Nominal groups are the most appropriate explanation for the significant difference in Type 1 nominalization, which relates to the fact that Type 1 nominalization is more prevalent in the former than in the latter. Additionally, this paper identifies patterns that are often employed in these two disciplines, with patterns #7, #8, and #1 in the SOEAE Corpus and patterns #7, #9, and #1 in the LAE Corpus accounting for more than half of each corpus. In the research of nominalization, the discipline of shipbuilding and oceanography engineering has not been well examined. Thus, this paper serves as a reference for

its future growth and advancement. Besides, Type 1 nominalization (take process as thing) signifies a substantial variation between the two fields, which can point to additional investigations on nominalization among disciplines. The appropriate use of nominalization can also assist academic writers in structuring language more coherently and in keeping with the characteristics of academic writing.

Clearly, this paper is limited to the inconsistent number of texts in two corpora, which may slightly have an impact on the result. Besides, it was limited to the already-existing functions, and no functional distinction between the two corpora was discovered. Therefore, further research is needed to investigate the across-disciplinary differences concerning the nominalization involving Shipbuilding and Oceanography Engineering.

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