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

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 the future research in this field and abstract writing in academic discourse.

Keywords: Nominalization, grammatical metaphor, academic writing, disciplinary differences

Introduction

Under the framework of Systemic Functional Linguistics (SFL), nominalization is emphasized as the single most powerful resource for creating grammatical metaphor (Halliday, 2004), which has made a great contribution to the development of nominalization studies. Nominalization is a common but most special and distinctive linguistic characteristics which are widely used in the scientific and technical registers (Halliday 1999, Biber and Grey 2013), and it is an efficient means to achieve information density through information packaging (Halliday 2004) that has been purposefully employed in the formal
and scientific languages. Academic writing as a prototypical example of
scientific language, possesses a high degree of formality and objectivity which
can be better presented through lexical density, nominalized structure and
impersonal style (Hyland 2006). As a special case of scientific writing,
Halliday and Matin (1993, p.124) regarded that “it seems there are certain
features of the way meaning are organized and the way they are worded”. The
high agreement between nominalization and academic discourse has promoted
the development of this field.

It has attracted a great amount of attention and interest for decades,
encouraging researchers to explore it in different discourse genres involving
the comparison of nominalization between literary language and scientific
language, as well as editorial language and scientific language, showing that
nominalization used in scientific language is more frequently than that in the
literary language, which is as a key role to constitute technicality in the
2016). What the mentioned above presents the comparative studies on
nominalization, all of which essentially reflect the characteristics and functions
of nominalization in scientific language.

To some extent, academic writings of different disciplines are consistent in
discourse structure and purpose, but there is a great distinction between lexis
and morphology in terms of vocabulary use and phrase collocation. Academic
writings varying in disciplines are in response to the disciplinary conventions
and communities (Hyland 2009), personal ideas and experience, as well as the
institutional features and social culture play a nonnegligible part in disciplinary
construction (Hyland 2006), which directly leads to disciplinary differences.
Previous studies on the disciplinary differences of academic discourse from
nominalization mainly focus on the following, such as Linguistics (Zhou and
Liu 2017), Physics (Liu and Chen 2019), textbooks of Biology (Hao and
Humphrey 2019), Pain English and legal writing (Hartig and Lu 2013), all of
which either study the typical features in language use between English as a
first language and English as a second or foreign language through
nominalization or study the function of nominalization in academic texts of a
certain discipline.

Besides, a large number of researches keep appearing on using
nominalizations revealing disciplines differences and variations in academic
discourses, mainly involving comparisons between disciplines in academic
discourses (for example, see Jalilifar et al. 2014, 2017, Gonzalez 2019, Marr
and Mahmood 2021, Ahmad 2012, He and Yang 2018), which means that
nominalizations in academic discourses are not sensitive across disciplines.
However, some of them examine that there is no great variation actually across
disciplines on nominalization used in scientific language (Jalilifar et al. 2014,
2017, He and Yang 2018), and some others did not note or mention any disciplinary differences in nominalization used in academic discourses, nominalization signifying universality and technicality (Ahmad 2012).

Above all, as for exploring nominalization in academic writing, there is still some room for researching on Shipbuilding and Oceanography Engineering and Linguistics to discover the inherent linguistic features of each discipline, particularly, the discipline of Shipbuilding and Oceanography Engineering which has been less involves. Therefore, it is worth exploring the frequency and distribution of nominalization in the different two disciplines, Shipbuilding and Oceanography Engineering and Linguistics, which has not been undertaken in the Linguistics field, helping and enhancing the academic writers more skillfully operate the system of research articles. Most of the researches mentioned above on nominalization involves comparison of Linguistics and other certain disciplines. This paper selected the two, one commonly studied, and one rarely studied, which manifests the generality but unfamiliarity and provides a new direction as well as a deep exploration of Shipbuilding and Oceanography Engineering to examine more exact linguistic characteristics about it. A need for research on nominalization inspires scholars to pay more attention to it in academic writing across disciplines to present more inherent features of different disciplines through the usage of nominalizations.

Nominalization in SFL

Nominalization is studied from different linguistic schools, such as structural linguistics represented by Jespersen, transformational generative linguistics and systemic functional linguistics (Fan and Wang 2003, Liu and Lu 2004), but nominalization of SFL represented by Halliday is the most systematic and in-depth study on nominalization among these three schools.

An important part of grammatical metaphor, nominalization in SFL was first proposed in the book An Introduction to Functional Grammar (Halliday 1985). Halliday made an expansion on metaphor (Ravelli 2003), thinking that metaphor is not only simply a variation in the use of words which refers to cognitive metaphor, but also the uses and meanings (Taverniers 2003). It was claimed that metaphor is the variation of a given meaning instead of a variation in the meaning of a given expression (Halliday 1985, cited from Taverniers 2003, p.7), which is thought as a basis for the birth of grammatical metaphor.

Metaphor concerning lexis, as well as uses and meaning, the two distinctive forms having the similar parts. Both of Them have the parallel two domains, but different names and meanings. Halliday (1994 p.342) claimed
that 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 would be other
ways to achieve congruent constructions to metaphorical ones, what the mainly
involved is turning the clausal patterns into nominal patterns through
rewording and reconstruction (Halliday and Matthiessen 2004). Ascribing to
this, nominalization is recognized as one of the most indispensable parts of
grammatical metaphor.

There has been debate among scholars as to whether nominalization is a
key element in constituting academic discourse. Few of researches argue that
nominalization is not crucial in academic discourse. Baratta (2010) addresses
that it is not necessary to use nominalization instead of personal subject within
an academic program. In contrast, more research confirms that nominalization
plays a very important role for achieving lexical density, cohesion, formality
and conciseness in academic writing (e. g. Halliday 1998, Schleppegrell 2001,
Liardet 2016, Liardet and Black 2020, Liardet et al. 2019), for example,
Liardet (2016) explored the role of grammatical metaphor and it is important
for the success of a learner. All of these show that nominalization in the
framework of SFL is more in line with the linguistic characteristics of
academic writing.

The authors here share the latter view and use examples to confirm that
nominalization is of great importance for constructing academic writing.
Besides, due to few researches signify that nominalization is discipline
sensitive, this paper desires to make an exploration of nominalization under the
framework of SFL across disciplines and tend to find disciplinary variations in
it. Based on the researches and explanation of nominalization above, this
research is prepared to answer the following two questions:

1. 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?

**Methodology**

It is a corpus-based study in which quantitative research method and
qualitative research method are adopted. According to the self-built
Shipbuilding and Oceanography Engineering Academic English Corpus
(SOEAE Corpus) and Linguistics Academic English Corpus (LAE Corpus),
typical examples and accurate data are elaborated to explore the linguistic
characteristics of the two corpora. The following part promotes an exhaustive introduction to corpora, research methods and the research process.

**Corpus**

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

For the sake of finding disciplinary differences in academic writing, we have built another corpus using as the comparative one. It is made up of abstracts from 50 journal papers involving the Linguistics discipline. Equally, the principles of the selected journal papers are basically 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 which is capable of 8470 words in a total number and an average of 169 words per abstract.

**Procedure**

After finishing building the corpus, identifying, classifying and quantifying nominalization wait to be implemented to identify the different features of nominalization using, nominalization collocation and nominalization function in corpora of the two different disciplines.

**Identifying and quantifying:** To identify nominalization is always a hard job, scholars maintain their personal opinions on it. This paper retrieved nominalizations according to Derewianka (2003) who recognized grammatical metaphor as derivational morphology, agnition and rank shifting. It makes a clear distinction between transcategorization and grammatical metaphor as well as rankshifted embeddings and grammatical metaphor based on Halliday and Matthiessen (1999), as well as Matthiessen (1995). In order to retrieve nominalizations, all the nouns in the corpus were retrieved, then the authors extracted nominalizations through manual labeling for that not all the nouns are nominalizations, especially, some verbs 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:** Halliday and Matthiessen (1999) gave an elaborate description of types of grammatical metaphor which involves 13 types that concerning ideational grammatical metaphor and interpersonal grammatical
metaphor. They (1999) thought that nominalization is one part of ideational grammatical metaphor that can be outlined into five types which is a little abstract to understand.

As a large number of studies on nominalization flood into the linguistic field, Zhu (2006) puts forward a new classification of nominalization on the shoulder of Halliday and Matthiessen, classifying nominalization as three types, “take process as thing”, “take quality as thing” and “take assessment as thing”. Compared with the taxonomy of Halliday and Matthiessen (1999), this one is more specific and has the potential to operate flexibly with clear classifying criteria. Table 1 shows the detail of Zhu Yongsheng’s classification of nominalization.

Table 1. Yongsheng Zhu (2006) Taxonomy of Nominalizations

<table>
<thead>
<tr>
<th>type</th>
<th>conversion</th>
<th>example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take process as thing</td>
<td>verb</td>
<td>thing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>investigate</td>
</tr>
<tr>
<td>Take quality as thing</td>
<td>adjective</td>
<td>thing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hungry</td>
</tr>
<tr>
<td>Take assessment as</td>
<td>Modal verb</td>
<td>thing</td>
</tr>
<tr>
<td>thing</td>
<td>modal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>adverb</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the process of classification, the authors were unsure of which category some words should be placed in, for example, variable, difference, etc. After searching for information, it was found that variable is derived from the verb vary, so it was placed in the classification of “take process as thing”. Although the words related to difference can be both different and differ, the root of different is also differ, so that difference is planned into the classification of “take process as thing”.

Results and Discussion

In order to answer the first question: To what degree do the two corpora differ from each other in the distribution of nominalization? The authors counted all the nominalizations in the two corpora. The asymptotic value for all nominalizations occurs in the two corpora is 0.567120433 (p>0.05), reflecting that there is no great difference between nominalizations applied in the Shipbuilding and Oceanography Engineering and Linguistics. The detailed information is shown in Table 2.
Table 2. Frequency of nominalization in two corpora

<table>
<thead>
<tr>
<th>Corpora</th>
<th>Word number /word</th>
<th>Nominalization /word</th>
<th>Frequency /thousand words</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAE Corpus</td>
<td>8470</td>
<td>539</td>
<td>63.6</td>
</tr>
<tr>
<td>SOEAE Corpus</td>
<td>21307</td>
<td>1922</td>
<td>90.2</td>
</tr>
</tbody>
</table>

*P-value = 0.567212

In light of Zhu’s (2006) taxonomy of nominalization, all of them are sorted into three types, “take process as thing” (type 1), “take quality as thing” (type 2) and “take assessment as thing” (type 3). The number and frequency of nominalizations used in the two disciplines are shown in Table 3 and the asymptotic values for each type of nominalization across disciplines are presented in Table 4.

Table 3. Frequency of Types of Nominalizations

<table>
<thead>
<tr>
<th>Nominalization types</th>
<th>LAE Corpus</th>
<th>SOEAE Corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number/word</td>
<td>Frequency/Percent</td>
<td>Number/Word</td>
</tr>
<tr>
<td>Type 1</td>
<td>409</td>
<td>75.9</td>
</tr>
<tr>
<td>Type 2</td>
<td>128</td>
<td>23.7</td>
</tr>
<tr>
<td>Type 3</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>total</td>
<td>539</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4. P value of three types of nominalizations

<table>
<thead>
<tr>
<th>Nominalization types</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1: LAE Corpus &amp; SOEAE Corpus</td>
<td>0.0266</td>
</tr>
<tr>
<td>Type 2: LAE Corpus &amp; SOEAE Corpus</td>
<td>0.4091</td>
</tr>
<tr>
<td>Type 3: LAE Corpus &amp; SOEAE Corpus</td>
<td>0.5579</td>
</tr>
</tbody>
</table>

Although in general, there is no significant difference in the total number of nominalizations occurring in the two disciplines, it is surprising to find that one type of nominalization exhibits a great difference in its frequency.

As it shown in Table 4, the p-value of three types respectively is 0.0266 (p<0.05), 0.4091 (p>0.05) and 0.5579 (p>0.05). Thus, the frequency of type 2 and type 3 do not show any significant differences between Shipbuilding and
Oceanography Engineering and Linguistics, but there is a great distinction in the frequency of type 1 (take process as thing), that is to say, type 1 in Shipbuilding and Oceanography Engineering occurs more frequently than that in Linguistics, therefore, the following part mainly has a discussion on type 1 of nominalization and prepares to answer the second research question: How does nominalization reflect the differences in academic writings across disciplines?

A nominal group refers to a noun that is proceeded and followed by a variety of other items, all of which characterize the noun in some ways (2004). Take “Those two splendid old electric trains with pantographs” (Halliday 2004, p.312) as an example.

Halliday (2004) proposed the experiential structure of nominal groups and made a detailed introduction and explanation of the various components of it, such as numerative, epithet, qualifier classifier, etc. As a part of nouns, nominalizations can be expressed through this description as well. In light of it, the authors concluded 11 common patterns of two corpora, and 2 patterns especially for Linguistics, all of which are described and categorized in terms of a nominal group, there being a nominalization in it. 13 nominal patterns are listed in Table 5.

Table 5. Type 1 Nominal patterns and examples

<table>
<thead>
<tr>
<th>Pattern number</th>
<th>Patterns and Examples</th>
<th>Frequency SOEAE Corpus</th>
<th>Frequency LAE Corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Thing+ Qualifier</td>
<td>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).</td>
<td>236</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15.46%</td>
</tr>
<tr>
<td>#2</td>
<td>Epithet…+ Thing</td>
<td>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)</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.36%</td>
</tr>
<tr>
<td>#3</td>
<td>Epithet…+ Thing…+ Qualifier</td>
<td>…, constraining the possible lexicalization of object concepts. (LAE Corpus, Ursini &amp; Acquaviva, 2019)</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.38%</td>
</tr>
<tr>
<td>#4</td>
<td>Epithet…+ Classifier…+ Thing</td>
<td>The goal of this research is to discover the potentials to</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.34%</td>
</tr>
<tr>
<td>#</td>
<td>String</td>
<td>Epithet+ Classifier+ Thing+ Qualifier</td>
<td>Classifier+ Thing</td>
</tr>
<tr>
<td>----</td>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>#5</td>
<td>design multi-objective optimal elastic structures for better acoustic performance. (SOEAE Corpus, He et al., 2017)</td>
<td>Epithet…+ Classifier…+ Thing+ Qualifier The analysis provides a comprehensive functional description of the N1 of N2 pattern in the context of disciplinary academic writing. (LAE Corpus, Liu &amp; Lu, 2020)</td>
<td>52</td>
</tr>
<tr>
<td>#6</td>
<td>The analysis provides a comprehensive functional description of the N1 of N2 pattern in the context of disciplinary academic writing. (LAE Corpus, Liu &amp; Lu, 2020)</td>
<td>…, that these statements employed. (LAE, Bruce, 2016)</td>
<td>0</td>
</tr>
<tr>
<td>#7</td>
<td>We have found that geometrical and dynamic constraints can substantially reduce the volume fraction of feasible solutions in the design space, … (SOEAE Corpus, He et al., 2017)</td>
<td>We have found that geometrical and dynamic constraints can substantially reduce the volume fraction of feasible solutions in the design space, … (SOEAE Corpus, He et al., 2017)</td>
<td>626</td>
</tr>
<tr>
<td>#8</td>
<td>We have found that geometrical and dynamic constraints can substantially reduce the volume fraction of feasible solutions in the design space, … (SOEAE Corpus, He et al., 2017)</td>
<td>We have found that geometrical and dynamic constraints can substantially reduce the volume fraction of feasible solutions in the design space, … (SOEAE Corpus, He et al., 2017)</td>
<td>339</td>
</tr>
<tr>
<td>#9</td>
<td>On the other hand, constructional prior knowledge regulates the innovations. (LAE Corpus, Peng, 2016)</td>
<td>On the other hand, constructional prior knowledge regulates the innovations. (LAE Corpus, Peng, 2016)</td>
<td>128</td>
</tr>
<tr>
<td>#10</td>
<td>… pressure integration method that integrated the second-order pressure on a body surface. (SOEAE Corpus, Dong-Min and Yonghwan, 2019)</td>
<td>… pressure integration method that integrated the second-order pressure on a body surface. (SOEAE Corpus, Dong-Min and Yonghwan, 2019)</td>
<td>3</td>
</tr>
<tr>
<td>#11</td>
<td>Neither of the two observations has been convincingly addressed in previous studies, … (LAE Corpus, Peng, 2016)</td>
<td>Neither of the two observations has been convincingly addressed in previous studies, … (LAE Corpus, Peng, 2016)</td>
<td>0</td>
</tr>
<tr>
<td>#12</td>
<td>… 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)</td>
<td>… 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)</td>
<td>9</td>
</tr>
<tr>
<td>#13</td>
<td>We identify three institutional motivations working to over-ride the normal communicative contract… (LAE Corpus, Antaki and Stokoe, 2017)</td>
<td>We identify three institutional motivations working to over-ride the normal communicative contract… (LAE Corpus, Antaki and Stokoe, 2017)</td>
<td>28</td>
</tr>
</tbody>
</table>
In order to find out the characteristics of nominalizations in the two disciplines and further discover the peculiarity of disciplinary differences, 13 patterns are summarized in this paper ignoring deictic such as a, the, this, my, etc. When calculating the frequency of these patterns, because the data cannot be divisible, a reasonable error of the results for keeping them after two decimal points. Besides, in pattern #2, pattern #3, pattern #4, pattern #5, pattern #7, pattern #8, pattern #12 and pattern #13, ellipses in these patterns indicate that there is more than one epithet or classifier present in these patterns. Table 6 provides an explanation about it.

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 et al., 2017) |
|---|---|---|---|
| double | layer | pressure | measurement |
| Numerative | Classifier 1 | Classifier 2 | Thing |

It is well-known that nominalization better explains the function of increasing the information content of a sentence as much as possible without changing the essence of the sentence by the superposed modifier to strengthen the lexical density (Halliday 1994, Zhu 2006). This is well presented through patterns in Table 5, especially, pattern #2, pattern #3, pattern #4, pattern #5, pattern #6, pattern #7, pattern #8, pattern #12 and pattern #13, all of which commonly comprise at least an epithet or a classifier to modify the core part, thing, of nominal groups. Although the same function they carry, different frequencies they present. Why does this happen?

According to Table 5, it reported that pattern #7, pattern #8 and pattern #1 in Shipbuilding and Oceanography Engineering and pattern #1, pattern #7 and #9 in Linguistics are the most prevalent forms respectively, and the frequency of using pattern #7 shows a great difference between two disciplines. Besides, in line with forms and functions, pattern #1, pattern #2, pattern #3, pattern #6 and pattern #9 share the same characteristics that they contain classifiers in them, but pattern #6 occurs so infrequently in both disciplines that it is negligible, while pattern #4, pattern #5, pattern #7 and pattern #8 can be concluded into another group. It suggests that patterns with classifiers occur more frequently in Shipbuilding and Oceanography Engineering than those in Linguistics. The last four patterns have a relatively small proportion in the corpus of the two disciplines, which are not considered in this paper. The authors divided the 8 patterns into two categories according to whether there
are classifiers or not. One group is pattern #1, pattern #2, pattern #3, pattern #9 without classifier named Group 1, the other one is pattern #4, pattern #5, pattern #7 and pattern #8 with classifier named group 2. Therefore, the following explains nominalization in academic writing by enumerating concrete examples through reducing the metaphorical construction to congruent construction. Besides, considering the functions of nominalization presented by the examples, the authors make a discussion on the linguistic characteristics across disciplines.

Epithet as premodifier

The frequency of pattern #1 \[\text{Thing} + \text{Qualifier}\] is 236 (15.46%) in Shipbuilding and Oceanography Engineering and 98 (24.00%) in Linguistics. In this pattern, there is not any premodifier or post modifier, regarded as the most general pattern. The function of this pattern in the academic discourse is mainly to obscure the implementer and the subject. Table 7 provides an instance of pattern #1.

Table 7. Examples of pattern #1 \[\text{Thing} + \text{Qualifier}\] in LAE Corpus

<table>
<thead>
<tr>
<th>Metaphorical construction</th>
<th>Congruent construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>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).</td>
<td>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.</td>
</tr>
</tbody>
</table>

As is shown in table 7, the authors of this passage used THE INVESTIGATION OF instead of SUBJECT+ INVESTIGATE to make the explanation and results expressed more objective and convincing to achieve objectiveness through omitting the subject (Hyland and Jiang 2017).

Pattern #2 [Epithet…+ Thing] appears with a frequency of 36 (2.36%) in Shipbuilding and Oceanography Engineering and 20 (4.89%) in Linguistics. Although there is no significant difference in frequency between the two disciplines on this pattern, it is obvious that the latter is more frequent than the former. The example presented in table 8 involves an expression of metaphorical and congruent construction.
Table 8. Examples of pattern #2 [Epithet...+ Thing] in SOEAE Corpus

<table>
<thead>
<tr>
<th>Metaphorical construction</th>
<th>Congruent construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>The results indicate that the proposed method can achieve <strong>excellent performance</strong> and is easily applied. (Shipbuilding and Oceanography Engineering, Chen Hui et al., 2020)</td>
<td>The results indicate that the proposed method can <strong>perform excellently</strong> and be easily applied.</td>
</tr>
</tbody>
</table>

Here in this example PERFORMANCE is converted into PERFORM which unpackages the information signified in the sentence. Formality refers to that expressions are “so general that it not very useful as an analytic tool” (Irvine 1979, p.786, as cited in Liardet et al. 2019, p.147). Although it seems more concise in the congruent construction, it is not widely recognized in formal discourses. PERFORM excellently which is often used in an informal situations such as colloquial expressions.

Pattern #3 [Epithet…+ Thing+ Qualifier] occurs 21 (1.38%) times in the former, and occurs 29 (7.09%) times in Linguistics, signifying that it is more commonly used in the LAE Corpus rather than the SOEAE Corpus. Table 9 shows an example of pattern #8 in two different constructions.

Table 9. Examples of pattern #3[Epithet... + Thing+ Qualifier] in LAE Corpus

<table>
<thead>
<tr>
<th>Metaphorical construction</th>
<th>Congruent construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifically, the study identified the particular statements in essays that overtly expressed a critical evaluation, and explored the textual resources that these statements employed (Linguistics, Bruce; 2016).</td>
<td>Specifically, the study identified the critical evaluation overtly which is particularly stated in essays, and explored the textual…</td>
</tr>
</tbody>
</table>

As is shown in Table 9, the phrase “the particular statement in essays” is reconstructed into a relative clause following evaluation in the congruent constructions which inevitably makes the expression more verbose.

Pattern #9 [Thing] is the simplest one among the 13 patterns without any pre/postmodifiers or qualifiers in it. It occurs less in the SOEAE Corpus with a frequency of 128 (8.38%) and 59 (14.43) times in the LAE Corpus.
Table 10. Examples of pattern #9 [Thing] in SOEAE Corpus

<table>
<thead>
<tr>
<th>Metaphorical construction</th>
<th>Congruent construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulations were performed including numerical uncertainty verification and compared to experimental data for an external cavity (Shipbuilding and Oceanography Engineering, Gem et al., 2020).</td>
<td>We gain the result through simulating including numerical uncertainty verification and compared to experimental data for an external cavity.</td>
</tr>
</tbody>
</table>

In this example, it suggests that the transfer from metaphorical construction to congruent construction by adding a subject, and the expression in the congruent construction is not recommended to use in academic discourse compared with metaphorical one which clarifies the concept concisely.

To sum up, it can be demonstrated in Table 5 that all the four patterns in Group 1 exhibit a common feature, that is, the frequency of occurrence of any one of the patterns in the SOEAE Corpus is less than that in the LAE Corpus. As the dividing principle mentioned before, which refers to if there is a classifier existing in the pattern or not, it as a reason contributing to the finding above. What’s more, among the patterns except pattern #9, all of the three contain as least an epithet in it. As mentioned by Halliday (1994, 2004) adjectives are always used as epithets. That’s to say, adjectives as adnominal modifier is more frequently deployed in Linguistics academic English when comparing with Shipbuilding and Oceanography Engineering academic English.

Classifier as premodifier

Here pattern #4, pattern #5, pattern #7 and pattern #8 as group 2 are put together to analyze, for one reason that all of them include a classifier, for another is to make a comparative analysis between two different forms of classifier.

In light of Halliday (1994, 2004), a classifier can be expressed through an adjective or a noun which can be clearly identified as the example in pattern #5 [Epithet…+ Classifier…+ Thing+ Qualifier] and example in pattern #7 [Classifier+ Thing]. It always refers to a subclass of things, expressing features as followings happening across two disciplines.
First and foremost, in accordance with Table 5, pattern #7 is the most popular nominal pattern in both two corpora, especially, in the SOEAE Corpus it occurs nearly half of the number of all patterns.

Besides, according to Table 5, comparing examples in pattern #4 [Epithet…+ Classifier…+ Thing], pattern #7 [Classifier…+ Thing] and pattern #8 [Classifier…+ Thing+ Qualifier] with pattern #5 [Epithet…+ Classifier…+ Thing+ Qualifier] which are shown in Table 11, finding that adjective is used as classifier can be converted into congruent constructions from metaphorical constructions. Such as the example of pattern #5 [Epithet…+ Classifier…+ Thing+ Qualifier] which is similar to the example of pattern #3, both of which make a conversion from a concise and professional expression to a more complex one. However, nouns, as classifiers cannot be transformed, for that Noun+ Nominalization is more inclined to use as a fixed collocation which is formed for a long time, the widely using of it leading it to a common linguistic phenomenon. For example, injection pressure, fuel consumption, cylinder backpressure and so on which often are repeated in these academic discourses.

In addition, the total number of the four nominalization patterns of Group 2 occurring in Shipbuilding and Oceanography Engineering is 69.81% which is more than that in linguistics with a number of 45.72%, especially, pattern #7 [Classifier+ Thing] which occurs most frequently in these two corpora with a
frequency of 626 (40.86%), which accounts for almost half of all
nominalization patterns of Shipbuilding and Oceanography Engineering and
118 (28.85%) times in Linguistics. It suggests that there are more nouns
including nominalizations employed as classifiers in SOEAE Corpus. Table 12
provides identification for the opinion.

Table 12. Frequency of nominalization as a classifier

<table>
<thead>
<tr>
<th>Corpus Name</th>
<th>Frequency /word</th>
<th>Frequency/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOEAE Corpus</td>
<td>467</td>
<td>30.58</td>
</tr>
<tr>
<td>LAE Corpus</td>
<td>47</td>
<td>11.49</td>
</tr>
</tbody>
</table>

Nominalizations as classifiers are manually identified and selected from
all the nominal patterns of each corpus to verify if the number of
nominalizations is related to classifiers. It can be recognized that 467
nominalizations are used as classifiers in the SOEAE corpus and about out of
every hundred nominalization patterns are classifiers, which in the LAE
Corpus The nominalization transformation to classifier occurs 47 times, and
approximately 12 nouns in every 100 words are selected as a classifier.
Therefore, more nominalizations are used as classifiers in SOEAE Corpus
demonstrating disciplinary considerations and conventions. Amount of
Classifier (nominalization) + noun in this discipline tends to express a kind of
model (e. g. propagation model, equal weight stochastic model) method (e. g.
parameter estimation method, identification method), etc. These kinds of
expression promote the specificity of a particular discipline and variations
across disciplines.

Discussion

In this section, the most important is to ascertain why a significant
difference exists between the two cross-disciplinary corpora.
The three most frequently used nominal patterns of each corpus, patterns
#7, #8 and pattern #1 in SOEAE Corpus and patterns #7, pattern #1 and pattern
#9 in LAE Corpus, the common two patterns of both two corpora, pattern #7,
pattern #1 as well as pattern#8 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 by modifiers or complements.
In recent centuries, researches have shown that compressed noun phrases are
increasingly employed in academic writings (Biber and Gray 2011). Therefore,
this paper also convincingly demonstrates the widely used of noun phrases
taking over 78.52% in SOEAE Corpus and 52.5% in LAE Corpus.

Although pattern #7 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 1, 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 2 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.

Classifiers used as modifiers as mentioned by Halliday (1994, 2004) is 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 is widely existing in SOEAE Corpus, being directly
responsible for the more nominalization used in the discipline of Shipbuilding and
Oceanography Engineering.

As for more adjectives used as modifiers in LAE Corpus, on the one hand, is
that some of the adjectives are used as classifiers (e. g. bilingual education,
multilingual education, pragmatic modulation, etc.) expressed as concept or
procedure, while others of adjectives are listed as epithets to modify nouns or
nominalizations, for example, high occurrence of, better performance, significant
professional realignment, etc., such expression always occurring in LAE Corpus.
the modifiers here not only simply provide a piece of given information, but also
achieve evaluation of the noun (nominalization). Biber (2006) claimed that
adjectives are used as attributives express evaluations of head nouns, for example,
good, bad, great, terrible and so on, such adjectives are used to express a positive
or negative affect. 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.

It is because SOEAE Corpus is more inclined to used nouns (including
nominalization) as modifier instead of adjectives, while LAE Corpus increasingly
intends to use adjectives as modifiers rather than nouns (including nominalization).
This contributes to the differences in Type 1 nominalizations used in the corpus of
two disciplines, in other words, more Type 1 is used in the discipline of
Shipbuilding and Oceanography Engineering instead of Linguistics.
Conclusion

The current study examines the differences in the frequency of nominalization in abstracts of academic discourses in two different disciplines: Shipbuilding and Oceanography Engineering and Linguistics. Results show that there is a significant difference in type 1, which refers to there being more type 1 in the former than in the latter, nominal patterns can best account for it. Besides, this article finds patterns widely used in these two disciplines referring to patterns #7, pattern#8 and pattern#1 in SOEAE Corpus and pattern #7, pattern#9 and pattern #1 in LAE Corpus, accounting for more than half of each corpus.

Contributions are made for the academic discourse abstract researchers, the discipline of Shipbuilding and Oceanography Engineering is barely touched among researches on nominalization, so it provides some reference for its development and progress in the future. What’s more, previous researches on nominalization hold that there is no significant difference across disciplines, and this paper appears to obtain the same result on the surface, but after a deeper exploration, finding that the type of nominalizations converted from verbs shows a great difference across the two disciplines, which can direct to further studies on nominalization. Finally, it can help academic writers to organize discourse more logically and be in line with the features of academic writings.

There are limitations in this paper, for one thing, is that the number of abstracts contained in the two corpora is different, which may slightly have an impact on the result. Although it illustrates the functions of nominalization through different nominalization patterns, due to the limited ability, the authors do not discover the new functions of nominalization.

This study provides a new perspective to nominalizations for future study. It is worth investigating deeply the disciplinary differences concerning the nominalization of Shipbuilding and Oceanography Engineering with other disciplines. Besides, researches can try to use and find new theories accounting for the distinction of nominalization using cross-disciplines.

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