



## A Corpus-based Study of Metaphor and Metonymy in Maritime English

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### ABSTRACT

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Metaphor and metonymy are essential linguistic devices in Maritime English, enabling the communication of complex ideas and evoking cultural associations. Despite their importance, few studies have investigated the role of these devices in maritime contexts. This study used a method that combines Python coding with manual identification to explore metaphorical and metonymic expressions in a self-constructed corpus of Maritime English. Specifically, we developed Python codes based on previous research to initially identify metaphors and metonymies for efficiency. To ensure the accuracy of the results, we manually identified metaphorical and metonymic expressions using a metaphor identification procedure and the metonymy identification steps proposed by Biernacka (2013). Finally, we categorized the research results according to a standardized classification framework. The study reveals the widespread presence of conceptual metaphor and metonymy in Maritime English; however, conceptual metonyms are mainly concentrated in specific categories. This research contributes to a better understanding of Maritime English and lays the foundation for future studies on metaphor and metonymy in Maritime English.

### KEYWORDS

Maritime English, conceptual metaphor, conceptual metonymy, Python codes, Biernacka's metonymy recognition steps

## 1. Introduction

The topic of metaphor and metonymy has been a concern for linguistic researchers, leading to the formation of different views of metaphor and metonymy. In particular, cognitive linguistics asserts that metaphor and metonymy are integral to our daily lives and represent essential modes of thinking. According to Lakoff and Johnson (1980) in their book *Metaphor We Live By*, the essence of metaphor lies in our ability to understand and experience one thing in terms of another. They further propose that metonymy is a figure of speech that uses one entity to refer to the related entity. Metonymy, like metaphor, is considered part of our everyday thinking, grounded in our experience, subject to general and systematic principles, and influential in structuring our thoughts and actions.

From the above description, we can see that metonymy, like metaphor, is no longer a mere rhetorical tool, but has become an essential cognitive mechanism for human beings. Ullmann (1962), Jakobson (2002) and Geeraerts (2010) have pointed out the differences between metaphor and metonymy. Metonymy is based on the semantic relationship of co-occurrence and association, namely contiguity, while metaphor is based on similarity. The concept of metaphor and metonymy can be better understood by analyzing the following two sentences: (1) and (2).

(1) He shot down all of my arguments. (Lakoff and Johnson 1980)

The above sentence (1) contains a metaphorical expression. People will treat others as rivals on the battlefield in their arguments to attack others' positions and defend their viewpoints. The phrase "shot down" in (1) belongs to the field of war. From this, we can conclude that although "argument" and "shot down" belong to different linguistic domains, they share similarities. Therefore, sentence (1) is considered to contain a metaphorical expression.

The below sentence (2) contains a metonymic expression.

(2) He is such a stupid head. (Zhang 2020)

In (2), the word "head" and the subject "he" belong to the same cognitive domain, namely the cognitive domain "human". In addition, "head" and "he" belong to the partial-whole relation on the spatial level, so this sentence contains a metonymy.

Both metaphor and metonymy can be divided into three levels: linguistic metaphor and metonymy, nominal metaphor and metonymy, and conceptual metaphor and metonymy. Linguistic metaphor and metonymy are figurative language devices that use one word or phrase to represent another related word or concept in the language. Nominal metaphor and metonymy, on the other hand, involve metaphor and metonymy in terms of vocabulary. They occur when one thing or concept is described as another thing or concept. Conceptual metaphor and metonymy operate at the level of thought, mapping one concept onto another to help people understand the content of texts. Linguistic metaphor and metonymy, like nominal metaphor and metonymy, are based on vocabulary and grammatical structures. The former is manifested in phrases or sentences, while the latter involves figurative descriptions of nouns. In contrast, conceptual metaphor and metonymy are more abstract and universal, existing in language expressions and reflecting the inner thoughts of the text. From the above description, we can see that the recognized expressions are linguistic metaphors and metonymies in a given text, and linguistic metaphor and metonymy serve as the basis for other metaphors and metonymies.

Two main methods for identifying English metaphorical and metonymic expressions in English corpora are

manual annotation and natural language processing technology. Stefanowitsch (2006) summarized five manual extraction methods of metaphor and metonymy: (a) manual extraction, (b) searching for source domain words, (c) searching for target domain words, (d) seeking sentences containing source and target domain words, (e) relying on “markers” for detection. This method yields high-quality annotation data, but demands significant human resources and time. In addition, various natural language processing technologies can be employed for metaphor and metonym identification, such as supervised learning (Shutova et al. 2013, Tsvetkov et al. 2014) and language model-based approaches (Choi et al. 2021, Rai et al. 2019). However, these natural language processing methods require extensive labelled corpora as training data, the metaphor and metonymy dataset must be comprehensive to ensure accurate identification. Furthermore, metaphors and metonymies are subjective linguistic phenomena, often influenced by factors such as context, culture, and background. Consequently, even with the advanced natural language processing techniques, achieving complete accuracy in metaphor and metonymy identification remains a challenge.

The Metaphor Identification Procedure (MIP), introduced by the Pragglejaz Group<sup>1</sup> in 2007, offers a standardized approach to metaphor identification that helps minimize the impact of researcher subjectivity on labelling results. In addition, Biernacka (2013) proposed a comprehensive set of steps for recognizing metonymy expressions. These steps systematically identify metonymies by integrating the MIP and Metaphor Recognition Steps within the dynamic context framework.

Maritime English, encompassing navigation, shipbuilding, and port-related terminology, holds a significant place in the maritime industry. Its importance extends to international trade and shipping, where it plays an increasingly vital role. The use of metaphorical and metonymic expressions within Maritime English is particularly noteworthy due to their involvement in various aspects of technical terminology, grammatical structures, and communication styles in the maritime field. A comprehensive study of these metaphorical and metonymic expressions in Maritime English offers deeper insights into their linguistic characteristics and cultural connotations, ultimately enhancing the language and intercultural communication skills of Maritime English learners.

Metaphor and metonymy serve as fundamental linguistic devices in Maritime English, facilitating the communication of intricate concepts and evoking cultural associations. Despite their significance, only a limited number of studies have delved into the role of these devices in the maritime context. Isserlis (2014) conducted an analysis of the linguistic legacy of Britain’s maritime history in the Maritime Text Corpus, identifying various conceptual metaphors and discussing their cultural significance. Wu and Cai (2016) employed manual screening and expert review to identify metaphorical expressions in marine engineering and maritime legal regulation English, comparing the similarities and differences between the two genres. In addition, Molina-Plaza (2016) conducted an analysis on a corpus of 250,000 words to identify metaphorical and metonymic expressions used in naval units, examining their sociocultural context. Most recently, Xu et al. (2023) concentrated on the use of WAR metaphors in maritime English news and investigated the relationship between metaphorical expressions and their collocates. These studies primarily relied on manual judgments for the identification of metaphor and metonymy, a process that ensures result accuracy but also requires significant time and effort.

In this paper, Python codes were employed to initially detect metaphorical and metonymic expressions from a self-constructed corpus of Maritime English. Subsequently, the study applies the MIP and incorporates Biernacka’s general metonymy recognition steps to validate the accuracy of the identified metaphors and metonymies. Finally,

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<sup>1</sup> The original members of Pragglejaz were Peter Crisp (Chinese University of Hong Kong), Raymond Gibbs (University of California, Santa Cruz), Alice Deignan (University of Leeds), Graham Low (University of York), Gerard Steen (Vrije University of Amsterdam), Lynne Cameron (University of Leeds/The Open University), Elena Semino (Lancaster University), Joe Grady (Cultural Logics), Alan Cienki (Emory University), and Zoltan Kövecses (Eötvös Loránd University).

it summarizes the conceptual metaphors and metonymies based on related classification criteria. In light of the preceding discussion, this research seeks to address the following two questions:

- (i) Do conceptual metaphorical and metonymic expressions exist in the English-language maritime journal corpus?
- (ii) To what extent do metaphor and metonymy in English reflect the underlying content of the text?

## 2. Previous Studies

### 2.1 Algorithm for Identifying Metaphors

The first two sections of this chapter present automated algorithms for metaphor and metonymy that have been utilized in previous research. These algorithms form the theoretical foundation for the Python codes developed in this paper. The following two sections discuss the classification criteria for conceptual metaphor and conceptual metonymy proposed by previous scholars, providing the theoretical basis for categorizing metaphorical and metonymic expressions in Maritime English.

In this paper, the Python codes for identifying metaphors were implemented based on the following algorithm. Krishnakumaran and Zhu (2007) proposed three different metaphor types involving nouns. The first type is characterized by a subject-linking verb-predicative structure in which two nouns are connected by a copula verb, represented as  $\langle N1, N2 \rangle$ . For instance, this includes expressions like “Time is money” and “Life is a journey”. The second type of noun metaphor revolves around a verb that signifies the action of a subject noun on an object noun and can be represented as  $\langle N1, V, N2 \rangle$ , as seen in the sentence “The war absorbed his energy”. Lastly, the third type involves an adjective followed by a noun, represented by  $\langle A, N \rangle$ . Neuman et al. (2013) introduced three new algorithms for identifying metaphors involving nouns based on their classification, elaborating on the detailed process from Figure 1 to Figure 3 for identifying these three types of noun metaphors.

**Input:** An adjective-noun pair  $\langle A, N \rangle$ .

1. If the adjective  $A$  has a single dictionary definition then return LITERAL, else
2. If the noun  $N$  does not belong to any WordNet category, then return UNDECIDED, else
3. Let  $\mathbf{N}(A)$  be the  $\theta_{\text{num}}$  nouns most frequently collocated with  $A$ , with mutual information of at least  $\theta_{\text{MI}}$ .
4. Let  $\mathbf{N}^{\mathbf{C}}$  be the  $\kappa$  most concrete nouns in  $\mathbf{N}(A)$ .
5. Let  $\mathbf{Cat}(A)$  be the set of all semantic noun categories containing at least  $\theta_{\text{cat}}$  nouns in  $\mathbf{N}^{\mathbf{C}}$ .
6. If  $N$  belongs to one of the categories in  $\mathbf{Cat}(A)$ , then return LITERAL, else return METAPHORICAL.

**Figure 1. The  $\langle A, N \rangle$  Algorithms Proposed by Neuman et al. (2013)**

**Input:** <N1, V, N2> (the verb V represents the act of the subject N1 on the object N2).

1. Identify the 100 most concrete object nouns associated with the verb V in a corpus.
2. Categorize the 100 nouns by using WordNet.
3. Categorize the object noun N2.
4. If none of the object noun categories overlaps with one of the categories of the 100 nouns associated with the verb, then return METAPHORICAL.
5. Find the main category of the object noun using ConceptNet.
6. If the main category is not included in the categories of the 100 nouns, then return METAPHORICAL; else return LITERAL.

**Figure 2. The <N1, V, N2> Algorithms Proposed by Neuman et al. (2013)**

**Input** <N1, N2> (a subject noun N1 associated with an object noun N2 via a copula verb).

1. Identify the categories of N1 and N2. If they do not overlap then return METAPHORICAL.
2. Find the main category of N1 and N2 using ConceptNet.
3. If the two main categories are different then return METAPHORICAL.
4. Identify the 100 most concrete nouns associated with N1 and N2 separately.
5. Categorize the 100 nouns associated with N1 and N2 separately.
6. If none of the nouns' categories overlap with each other, then return METAPHORICAL; else return LITERAL.

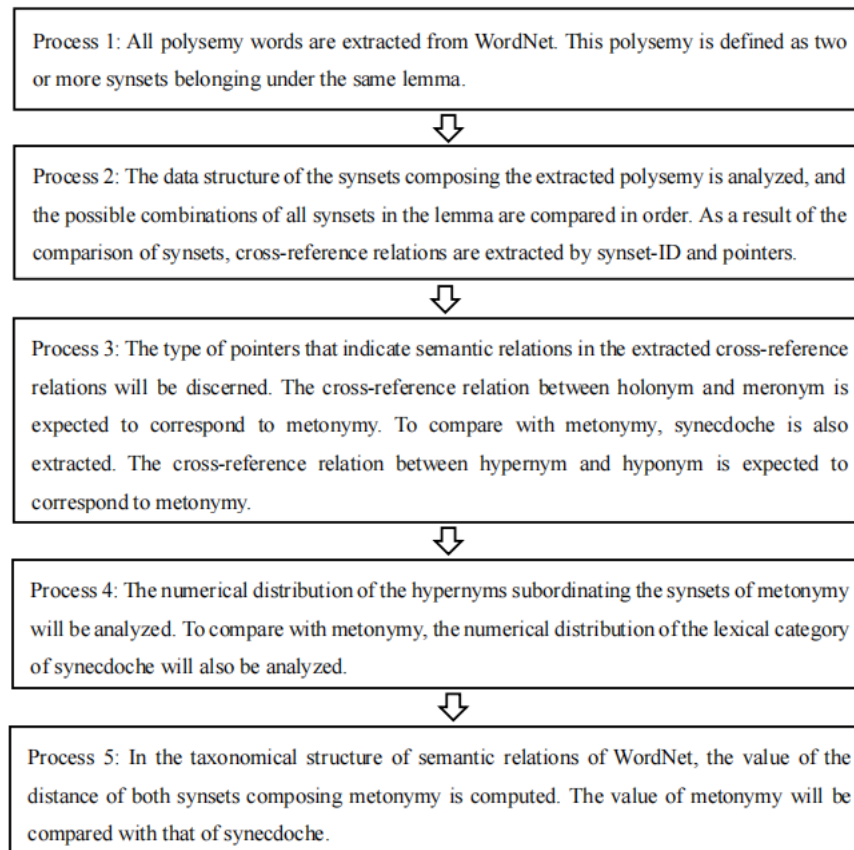
**Figure 3. The <N1, N2> Algorithms Proposed by Neuman et al. (2013)**

Neuman et al. (2013) utilized the Wiktionary Dictionary (<https://en.wiktionary.org>) to determine a word's part of speech and the number of meanings for a particular word. WordStat noun categorization based on WordNet (<http://www.provalisresearch.com/wordstat/WordNet.html>) was employed to classify 69,817 nouns into 25 categories. They also emphasized that the identification of adjective-noun metaphors is the foundation for identifying the other two types of noun metaphors. Therefore, types 1 and 2 algorithms share similarities with type 3 <A, N>. The paper's findings indicate that the accuracy of metaphor recognition reaches up to 71%, which significantly outperforms other algorithms for identifying metaphorical expressions.

## 2.2 Algorithm for Identifying Metonymy

In this paper, the Python codes for identifying metonymies were implemented based on the following algorithm.

Suzuki (2021) developed a WordNet-driven approach to differentiate between metonymy and synecdoche, providing inductive criteria for this distinction, as shown in Figure 4.



**Figure 4. The Algorithm for Numerical Identification of Metonymy through WordNet (Suzuki 2021)**

Suzuki (2021) examines the relationship between hypernyms and hyponyms. In WordNet, hypernyms have more general and abstract meanings, while hyponyms have more specific and concrete meanings. These two are interrelated and form a hypernym-hyponym relationship, which can be described as a "belongs to" relationship. In WordNet, when different senses of the same word form such a hypernym-hyponym relationship, it corresponds to the rhetorical device known as synecdoche. In order to extract the polysemous structure of synecdoche from WordNet, the study achieves this by extracting cross-reference relationships between hypernyms and hyponyms among different senses of the same word. In addition, the study analyzes the numerical distribution of hypernyms and their lexical categories (names) in both metonymy and synecdoche senses. Finally, the study numerically analyzes the taxonomic distance between each sense that constitutes metonymy and synecdoche within the semantic relationship structure of WordNet.

In addition, Suzuki (2021) identified the conceptual distance between metonymic synsets<sup>2</sup> within the WordNet semantic relations structure as a criterion for metonymy. The conclusion drawn from this analysis is that the

<sup>2</sup> In WordNet, a synonym group called a synset (= synonym set) is the unit of meaning (Suzuki 2021).

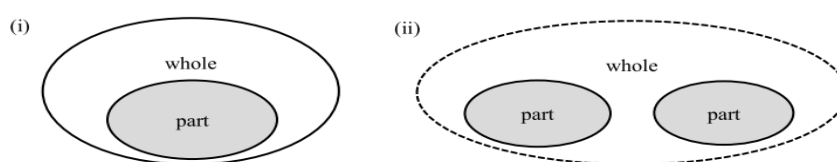
taxonomic distance of synecdoche is relatively close, with a similarity rate of about 0.479, while the taxonomic distance of metonymy appears to be quite distant, averaging about 0.073.

### 2.3 Classification of Conceptual Metaphors

Several researchers (Lakoff and Johnson 1980, Goatly 1997, Goddard 2004, Steen 2008) have worked on classifying conceptual metaphors. In this paper, we adopt the three classifications of conceptual metaphors proposed by Lakoff and Johnson: structural metaphors, orientational metaphors, and ontological metaphors. A structural metaphor involves using a simple, concrete, familiar, and well-structured concept to construct another complex, abstract, unfamiliar, and loosely structured concept. The sentence “Our marriage is on the rocks” (Lakoff and Johnson 1980) can be seen as a structural metaphor in which the concrete phrase “on the rocks” is used to describe the abstract concept of the difficulty of love. Orientational metaphors typically have a source domain related to spatial orientation, such as up-down, inside-out, front-back, center-periphery, etc., and project spatial structures onto non-spatial concepts. “The price of stocks is going up” (Evans and Green 2006) is a typical example of an orientational metaphor. Ontological metaphors conceptualize abstract events, experiences, and emotions as tangible entities and substances. In “He did it out of anger” (Lakoff and Johnson 1980), “out of anger” can be seen as a concrete metaphor in which an abstract emotion is concretized into an entity.

### 2.4 Classification of Conceptual Metonymy

From the perspective of cognitive linguistics, the most comprehensive and influential classification model of metonymy to date is that proposed by Radden and Kövecses in 1999. Radden and Kövecses' categorization of metonymy distinguishes two primary types (Zhang 2020, Suzuki 2021). The first type refers to the relationship between parts and the whole, while the second type refers to the relationship between parts within the whole (Suzuki 2021). Furthermore, within each of these two main metonymic types, various subcategories have been enumerated in Table 1 of Zhang's work (2020).



**Figure 5. Classification of Metonymy by Suzuki (2021)**

**Table 1. Classification of Conceptual Metonymy Based on Zhang (2020)**

Main types	Subcategories	Examples
(i) Part-whole relation	a. WHOLE THING FOR A PART OF THE THING	The United States means America.
	b. PART OF A THING FOR THE WHOLE THING	England means the United Kingdom.
	c. OBJECT FOR MATERIAL CONSTITUTING THE OBJECT	I smell <i>skunk</i> .
	d. MATERIAL CONSTITUTING AN OBJECT FOR THE OBJECT	Wood means forest.
(ii) Relation between the parts in the whole	a. PROFESSOR FOR POSSESSED	<i>That is me</i> . It means "My bus."
	b. POSSESSED FOR PROFESSOR	He married <i>money</i> .
	c. PRODUCER FOR PRODUCT	I have got a <i>Ford</i> .
	d. INSTRUMENT FOR PRODUCT	Did you hear the <i>whistle</i> ?
	e. PRODUCT FOR INSTRUMENT	To turn up the <i>heat</i> .
	f. PLACE FOR PRODUCT MADE THERE	<i>China, Mocha, Camembert</i>

### 3. Data and Methods

#### 3.1 Data

In order to answer the above questions, a self-constructed corpus of Maritime English was compiled. This corpus consists of two maritime magazines: Lloyd's List<sup>3</sup> and Maritime Reporter & Engineering News,<sup>4</sup> which highly representative in Maritime English and easily accessible for download. The titles, authors, footnotes, and other non-textual elements were removed, leaving only the content of the articles. The data in the corpus were organized using WordSmith Tools 8.0. The basic information of the self-constructed study corpus is presented in Table 2 below.

**Table 2. Basic Information of the Study Corpus.**

	Years	Texts	Tokens	Types	TTR	STTR
Lloyd's List	2020-2022	50	240,327	13,893	5.78%	44.51%
Maritime Reporter & Engineering News	2020-2022	50	200,843	13,884	6.91%	43.60%

#### 3.2 Methods

##### 3.2.1 Python codes

In this paper, as mentioned in Sections 2.1 and 2.2, we have developed Python codes<sup>5</sup> to identify metaphorical

<sup>3</sup> Lloyd's List is an internationally renowned maritime and shipping business news and information magazine covering various areas such as shipping, freight forwarding, maritime law and more. It is recognised worldwide as a key source of information for understanding global trends and developments in the shipping industry. Its website is <https://lloydslist.maritimeintelligence.informa.com>.

<sup>4</sup> Maritime Reporter & Engineering News is the world's largest audited circulation magazine dedicated to the maritime industry, with more subscriptions from ship and boat owners, ship and boat builders, naval architects and marine engineers than any other publication in its field. Its website is <https://www.marinelink.com/magazines/maritimereporter>.

<sup>5</sup> The two Python codes for recognizing metaphorical and metonymic expressions are accessible at the following links: <https://github.com/schummLee/python-code-for-identifying-metaphor>; <https://github.com/schummLee/python-code-for-identifying-metonymy>.



and metonymic expressions separately, with the aim of increasing the speed of retrieval of metaphorical and metonymic expressions.

The code for the identification of metaphors imports the necessary Python libraries and modules. Next, it defines two sets of part-of-speech tags to identify adjectives and nouns in the text. These tags are used to analyze words within sentences. Next, the code defines a function called “similarity(w1, w2)” to compute the similarity between two word vectors. It uses a Word2Vec model to compute similarity scores between two input words. The primary functionality is implemented in the “detect\_metaphor” function. This function takes a text as input and optionally takes a similarity threshold parameter.

The code for identifying metonymies also imports the necessary Python libraries and modules, and downloads WordNet data used to find semantic relationships between words. It defines a function called “identify\_metonymy” that takes a word as input and attempts to identify metonymic relationships associated with that word.

### 3.2.2 Metaphor identification procedure

The Metaphor Identification Procedure (MIP) was proposed by the Pragglejaz Group in 2007 as a method for identifying metaphors in text. The MIP process is divided into two main steps: candidate metaphor identification and validation. In the candidate metaphor identification stage, the analyst compares each word in the text to a concept based on the natural world and marks it as a candidate metaphor if there is a difference or similarity. In the validation phase, the analyst analyzes each candidate metaphor in detail to determine whether it is a metaphor. MIP is a systematic approach that allows researchers to follow specific metaphor recognition and analysis steps. Its purpose is to reduce personal bias in identifying metaphors in texts. The specific steps of MIP are as follows:

The MIP is as follows:

1. Read the entire text-discourse to establish a general understanding of the meaning.
2. Determine the lexical units in the text-discourse
3. (a) For each lexical unit in the text, establish its meaning in context, that is, how it applies to an entity, relation, or attribute in the situation evoked by the text (contextual meaning). Take into account what comes before and after the lexical unit.
  - (b) For each lexical unit, determine if it has a more basic contemporary meaning in other contexts than the one in the given context. For our purposes, basic meanings tend to be
    - More concrete; what they evoke is easier to imagine, see, hear, feel, smell, and taste. Related to bodily action.
    - More precise (as opposed to vague)
    - Historically older.
 Basic meanings are not necessarily the most frequent meanings of the lexical unit.
  - (c) If the lexical unit has a more basic current--contemporary meaning in other contexts than the given context, decide whether the contextual meaning contrasts with the basic meaning but can be understood in comparison with it.
4. If yes, mark the lexical unit as metaphorical.

(Pragglejaz Group 2007)

### 3.2.3 Biernacka’s metonymy recognition steps

To systematically identify metonymic expressions, Biernacka (2013) proposed more general metonymy recognition steps by combining MIP and metaphor recognition steps under the context dynamic framework.

The Biernacka's metonymy recognition steps is as follows:

1. Read the entire text to get a general understanding of the overall meaning.
2. Determine the lexical units.
3. Decide on the metonymicity of each lexical unit:
  - a. For each lexical unit, establish its contextual meaning-taking into account how it applies to an entity in the situation evoked by the text, as well as co-text. Take co-text into account.
  - b. For each lexical unit, determine if it has a more basic contemporary meaning in other contexts than the meaning in the given context.
  - c. If the lexical unit has a more basic contemporary meaning in other contexts than the given context, and the contextual and basic meanings are different, determine if they are connected by contiguity, defined as a relation of adjacency and closeness comprising not only spatial contact but also temporal proximity, causal relations and part-whole relations.
4. If a connection is found in step 3c that is one of contiguity: check backwards and forwards to determine if any other lexical unit(s) belong(s) together semantically, thus determining the extent of the metonymy vehicle; and mark the lexical unit (or lexical units which belong together) as metonymy vehicle.

(Biernacka 2013)

In summary, the core of determining whether an expression is a metonymy depends on whether there is contiguity between the contextual meaning of the word and its basic meaning. If there is such contiguity, the expression can be identified as a metonymy; otherwise, if there is no contiguity, it cannot be qualified as a metonymic expression.

After the initial recognition of metaphorical and metonymic expressions using Python codes, we will apply the MIP and Biernacka's metaphor recognition steps to ensure the accurate identification of English metaphors and metonymic expressions.

## 4. Results and Discussion

### 4.1 Metaphor and Metonymy Results Based on the Python codes

Using the metaphor and metonymy codes, we identified 4,721 metaphorical expressions and 6,597 metonymic expressions, as presented in Tables 3 and 4, through Python execution. However, it is important to note that the Python codes do not achieve 100% accuracy in identifying metaphors and metonymy. Therefore, we further evaluate English metaphorical and metonymic expressions in the corpus, based on MIP and Biernacka's Metonymy Recognition Steps, in conjunction with the partial results presented in sections 4.2 and 4.3.

**Table 3. Metaphor Results Based on Python Code**

N	Sentences	Metaphors
1	2020 will be one few will forget in a hurry; a year fraught with disruption and upheaval as the world came to grips with a global pandemic that brought profound change to all our lives.	(‘global’, ‘pandemic’)
2	in this edition, Lloyd’s list publishes our eagerly awaited annual outlook, in which we endeavour to provide both insight and some much-needed clarity on what 2021 has in store for the shipping industry.	(‘much-needed’, ‘clarity’)
3	The single most significant obstacle to offshore wind is public resistance to visual pollution.	(‘visual’, ‘pollution’)
	...	...
4719	while an effective date has yet to be specified, the us policy is expected to increase the financial burden for shipping companies on both sides and threaten Hong Kong’s prospects as a maritime hub.	(‘financial’, ‘burden’)
4720	“it could have an impact on operating costs if there is a great tax that we end up having to pay,” Michael Fitzgerald, deputy chief financial officer of orient overseas container line, told the audience.	(‘financial’, ‘officer’)
4721	“the customer will simply use another ship rather than a Hong Kong ship in the spot market,” he pointed out.	(‘Hong’, ‘Kong’)

**Table 4. Metonymy Results Based on Python Code**

N	Words	Metonymy
1	playpen	enclosure
2	penitentiary	correctional_institution
3	write	create_verbally
...	...	...
6,595	semblance	appearance
6,596	illusion	appearance
6,597	likeness	picture

## 4.2 Conceptual Metaphor

### 4.2.1 Structural metaphors

Based on the classification of conceptual metaphors proposed by Lakoff and Johnson (1980), there are three types of conceptual metaphors in the Maritime English corpus, namely structural metaphors, orientational metaphors, and ontological metaphors. A structural metaphor uses a simple, concrete, familiar, and well-structured concept to help us understand another concept that is more complex, abstract, unfamiliar, and lacks a clear structure. For example, we might use the metaphor “time is money” to convey the importance of time and associate the scarcity of time with the limited nature of money.

Let us consider the following examples.

- (3) Since then, the *darkest of black swans* has descended on container shipping and a *big disease with a little name* has changed the forecasts beyond recognition. (Lloyd’s List)

- (4) This creates a *vicious circle* and adds extra pressure to sectors that operate with *razor-thin margins* and have a risky and volatile operational structure. (Lloyd's List)
- (5) The longer shipowners wait for this *magic elixir*, as I refer to it, this magic change that is going to happen with some other kind of alternative fuel, the longer the problem will continue to exacerbate and just get worse. (Lloyd's List)
- (6) Change of tack Indeed, bringing down costs and operating more efficiently was driven home in the fallout of the global financial crisis of 2008-2009, prompting a *change of tack* among container operators if they too were not to succumb to those that had fallen before them and stay afloat. (Lloyd's List)
- (7) However, this comes with the caveat that lines will refrain from reverting to their old tricks of chasing market share, *sparking a price war* in the process. (Lloyd's List)
- (8) During the maritime conference, the speaker raised a *yellow flag* by emphasizing the need for increased safety measures in the offshore drilling industry. He urged companies to adopt stricter protocols to prevent accidents and protect the environment. (Maritime Report & Engineering News)

In (3), two distinct metaphorical expressions are present. The first metaphor, “darkest of black swans,” refers to a rare and highly impactful event. In the context of (3), it alludes to a devastating setback in the container shipping industry. A “black swan event” is a rare and unexpected event with a significant impact that is typically understood only in hindsight. It can therefore be interpreted as the most damaging black swan event for the container shipping industry. In addition, the phrase “big disease with a little name” can be seen as a metaphorical expression. This phrase comes from the lyrics of the 1985 song “Sign o' the Times” by the American singer Prince, which was used to describe the current situation, in particular the AIDS epidemic. Although AIDS is represented by only a few letters, its destructive impact is considerable. The phrase “big disease with a little name” is therefore metaphorical. The global outbreak of COVID-19 has only a few letters, but its impact on the entire social and economic system is enormous. In (4), “vicious circle” and “razor-thin margins” are metaphors. “Vicious circle” is a metaphor for a situation that goes from bad to worse, getting worse at every turn. “Razor thin margins” describes the narrow profit margins of certain industries. Even a small reduction in sales or increase in costs can be disastrous. In (5), “magic elixir” is a metaphorical expression referring to a solution or remedy that is believed to solve a complex problem or cure an illness. However, it may not exist or may not be as effective as hoped. In the context of the given sentence, it refers to an alternative fuel source that some shipowners are waiting for, which they hope will solve the problem of greenhouse gas emissions, but which may not exist or may not be as effective as hoped. In (6), “change of tack” is a structural metaphor. This phrase is derived from the maneuver of a sailing ship changing course. It is used to signify a shift in strategy or approach within a given situation. In this context, it refers to the strategic adjustments made by container operators following the global financial crisis of 2008-2009. These adjustments were aimed at reducing costs and improving operational efficiency in order to avoid outcomes similar to previous business failures. In (7), this metaphor uses the phrase “spark a war” to imply that companies may engage in fierce competition, similar to two armies fighting each other. The use of “price” explicitly focuses on the dynamics of competitive pricing, as if companies were trying to outdo each other in attracting customers. In (8), “yellow flag” does not literally mean a yellow flag, but serves as a metaphorical representation of a warning or caution. In this context, its color has no literal meaning; rather, it conveys the existence of problems or potential dangers. The context of the sentence implies that by mentioning the “yellow flag,” the speaker is emphasizing the importance of increased safety measures in the offshore drilling industry. This is a symbolic metaphor used to attract attention and advocate for companies to implement stricter protocols to prevent accidents and protect the environment.

#### 4.2.2 Orientational metaphors

The orientation metaphor is a special kind of structural metaphor that uses concepts related to spatial orientation to understand non-spatial concepts. This metaphor applies our perception and understanding of space to other domains to help us understand abstract concepts in those domains. For example, we might use the metaphor “moving forward is good, moving backward is not good” to describe the concept of progress in life, associating forward movement with positivity.

Let us consider the following examples.

- (9) The impact proved too much for some, as each passing year, the *shutters came down* on some of the industry’s most celebrated and illustrious names, eventually culminating with its most high-profile casualty in 2017, South Korean giant Hanjin. (Lloyd’s List)
- (10) *Breaking down the obfuscated walls* of shipping, uncovering complex ownership structures, poor operational records and maintaining port data, may go some way in supporting sea change. (Lloyd’s List)
- (11) Fewer newbuilds and a subdued sale and purchase market is no bad thing, given past mistakes, and anything that can finally *put a nail in the coffin* of speculative boom-and-bust shipping cycles should be welcomed warmly as a sensible step towards a more sustainable future. (Maritime Report & Engineering News)
- (12) While the rest of the world plunged into recession due to the coronavirus pandemic, China has been trying to *dig itself out* of a steep economic slump. (Lloyd’s List)
- (13) We’ve completed the *first leg* of our journey, and now we’re heading into open waters. (Maritime Report and Engineering News)

In (9), “the shutters came down” is metaphorical. “Shutters” refers to the symbol that closes like a window when a company closes or goes bankrupt. So the metaphor is that some container companies closed down or went bankrupt because they could not cope with the changes in the industry. In (10), “breaking down the obfuscated walls” is a metaphorical expression. The term “obfuscated walls”, which alludes to the opacity and secrecy within the shipping industry, similar to an impenetrable barrier, is figuratively “broken down” to signify overcoming these limitations and barriers. Consequently, this expression can be recognized as an English metaphor that uses figurative language to describe the process of overcoming challenges and obstacles in the shipping industry. In (11), “put a nail in the coffin” is a metaphorical expression that figuratively describes the completion or demise of something. It uses the symbolic words “nail” and “coffin” to juxtapose two different concepts, enhancing the vivid conveyance of the intended meaning. In (12), “dig itself out” is a metaphorical expression, suggesting China’s efforts to recover from the economic downturn caused by the effects of COVID-19. In (13), “first leg” does not literally refer to a part of the body, but to the first stage of a journey. When we use “first leg”, we use “first” to indicate the first part of a sequence. So this is an orienting metaphor that uses the concept of sequence to describe different parts of the journey, and to highlight the segmented nature of the journey and the potential need for different strategies or preparations at each stage.

#### 4.2.3 Ontological metaphors

An ontological metaphor is a metaphorical concept that treats abstract events, experiences, and emotions as entities or substances so that we can better understand them. This type of metaphor allows us to concretize abstract concepts by thinking of them as things with tangible attributes. For example, we might say, “Love is a warm

feeling,” representing love as a specific sensation, when in fact it is an emotion.

Let us consider the following examples.

- (14) The distant, alarming, and now forgotten, headlines of COP 26 included mostly *hot-air pledges* of career politicians to address their citizens' production of GHGs. (Maritime Report & Engineering News)
- (15) The single most significant obstacle to offshore wind is public resistance to *visual pollution*. (Maritime Report and Engineering News)
- (16) While the sulphur cap signalled a looming risk of bankruptcies, the coronavirus outbreak will *have sealed the fate* of many companies. (Lloyd's List)
- (17) More importantly, the US-China decoupling *will strike yet another blow* to the virus-battered global economy - and it is bound to further dull *investors' appetite* for new vessels. (Lloyd's List)
- (18) Yet financially, Maersk is in a better place to *weather the storm* than some of its rivals. (Lloyd's List)

In (14), the term “hot air” implies that these promises are empty words without substance. In this context, it suggests that politicians around the world are making promises but not taking meaningful action to address environmental issues. In (15), “visual pollution” in the context of offshore wind is a metaphor representing the negative impact of wind turbines on coastal beauty. It is classified as an ontological metaphor because it links the abstract concept of “pollution” to the visual realm. This connection helps to understand unpleasant aspects of the visual environment. By applying “pollution” to visuals, it clarifies issues related to visual quality. Such metaphors make abstract ideas more tangible for better communication and interpretation of complex problems.

In (16), “sealed the fate” is a metaphor used to indicate a final and unfavorable outcome. It implies that the coronavirus outbreak was the last straw that led to the downfall of many companies. In (17), “will strike yet another blow” is a metaphorical expression meaning that something will inflict another significant setback or impactful blow on an already compromised situation. “Investors' appetite” in the sentence refers to the interest or willingness of investors to buy or invest in new vessels (possibly referring to ships or fleets). In the given context, it implies that the U.S.-China decoupling will further damage the already struggling global economy, which has been severely impacted by the COVID-19 pandemic. In (18), “weather the storm” is a metaphorical expression that does not involve navigating an actual sea storm. Instead, it describes the ability of an entity or organization to withstand and cope with difficulties, challenges, or crises. In this sentence, “weathering the storm” refers to Maersk's greater ability to withstand financial difficulties than some of its competitors.

Based on the above analysis, we found that metaphors play an important role in Maritime English, including structural, orientational, and ontological metaphors. These different types of metaphors enhance the expressiveness and comprehensibility of Maritime English through vivid and illustrative expressions.

First, structural metaphors improve the comprehensibility of Maritime English by transforming abstract, complex concepts into more concrete, simplified, and easily understood forms. They make expressions more vivid and illustrative, which attracts readers' attention and makes information transfer more effective. In addition, structural metaphors help to highlight industry characteristics, enhance industry resonance, and provide readers with a rich and varied cognitive experience. Second, orientational metaphors play an essential role in Maritime English. They illustrate the changes, developments and evolution of the maritime industry by using the concept of spatial orientation. Orientational metaphors help to graphically describe various relationships and interactions in the maritime industry, highlighting critical information and points. In addition, they enhance the charm and attractiveness of expressions, making information dissemination more effective. Finally, ontological metaphors enrich Maritime English expressions by transforming abstract concepts into tangible entities. They effectively

represent industry challenges and convey the status and development trends of the industry. Ontological metaphors also help to reinforce the characteristics and resonance of the industry, for example, the metaphor of “blow” vividly illustrates negative impacts.

**Table 5. Metaphorical Expressions in the Corpus**

Conceptual Metaphors	Metaphorical Expressions	Freq.	Text Meaning
Structural Metaphors	<i>sparking a price war</i>	6	competing on price
	<i>change of tack</i>	4	adjusting strategy
	<i>yellow flag</i>	4	warning
	<i>razor-thin margins</i>	3	cope with difficulties
	<i>darkest of black swan</i>	3	rare and influential event
	<i>vicious circle</i>	3	from bad to worse
	<i>magic elixir</i>	2	strategy for addressing complex issues
	<i>big disease with a little name</i>	2	huge impact
Orientational Metaphors	<i>first leg</i>	7	first stage of a journey
	<i>put a nail in the coffin</i>	4	end or failure
	<i>dig itself out</i>	3	recovering from poor situations
	<i>obfuscated walls</i>	2	limits and barriers
	<i>shutters came down</i>	2	bankrupt
Ontological Metaphors	<i>weather the storm</i>	6	coping with difficulties
	<i>investors' appetite</i>	4	willingness of investors
	<i>have sealed the fate</i>	3	guaranteeing a negative outcome
	<i>visual pollution</i>	3	negative impact
	<i>will strike yet another blow</i>	2	heavy blow
	<i>hot-air pledges</i>	2	hollow words

In this paper, we have identified 19 metaphorical expressions in Maritime English (see Table 5). Among them, “sparking a price war,” “first leg,” and “weather the storm” appear frequently in the corpus, indicating that these three expressions are widely used in Maritime English and widely accepted by readers. This suggests that these expressions have become integral parts of the language of the maritime industry, reflecting their importance and prevalence in maritime communication.

In conclusion, structural, orientational, and ontological metaphors play multiple roles in Maritime English, including enriching expressions, enhancing comprehensibility, emphasizing industry characteristics, and highlighting essential information. Collectively, these metaphors provide readers with richer and more vivid language expressions, making Maritime English more expressive and accurate.

### 4.3 Conceptual Metonymies in the Maritime English Corpus

#### 4.3.1 Part of a thing for the whole thing

As for conceptual metonymies, first let us consider the following examples.

(19) Do *box shipping*'s safety standards stack up? (Lloyd's List)

- (20) One can only imagine what the ship – a one-year-old **14,000 TEU vessel** – and its crew went through for that amount of damage to be caused. (Lloyd's List)
- (21) One catalyst has been the Lloyd's Decile 10 programme, essentially a shakeout of underperformers that saw dozens of **hull insurers pull out of hull**, significantly reducing capacity. (Lloyd's List)
- (22) For the first time ever, the future of tanker shipping in 2021 appears to lie in the hands of **big pharma**. (Lloyd's List)
- (23) Valuations have suffered, equity capital is scarce and expensive, while **banks** are still, generally speaking, in retreat from shipping. (Maritime Report and Engineering News)

Each of these five sentences is an example of metonymy, which Radden and Kovecses (1999) describe as PART OF A THING FOR THE WHOLE THING. In (19), “box shipping” uses the container part to represent the entire container shipping industry. Here, “box” refers to containers, and “box shipping” represents the entire container shipping industry, so the container part represents the entire container shipping industry. The “14,000 TEU” in (20) represents the transportation capacity of the ship, using this part to symbolize the entire ship. Here, the “TEU” (twenty-foot equivalent unit) measures the container capacity, that is, how many standard containers a ship can hold. Therefore, the “14,000 TEU” (the transport capacity of the ship) represents the entire ship. The phrase “hull insurers pulling out of hull” in (21) represents the decline in total hull insurance business due to the withdrawal of hull insurers. In this case, “hull” represents the hull insurance business. Thus, “hull insurers pulling out of hull” actually means that insurers are pulling out of hull insurance. In (22), “big pharma”, representing the pharmaceutical industry as a whole, suggests that its decisions and actions will affect the future of tanker shipping. “Big pharma” represents (in part) the entire pharmaceutical industry (as a whole) whose decisions and actions will affect the future of tanker shipping. The word “banks” in (23) can be seen as a metonymic expression representing financial institutions and the entire financial services sector. This metonymy can be classified as a kind of PART OF A THING FOR THE WHOLE THING. “Banks” (in part) represents the entire financial sector (as a whole), and the attitudes and behaviors of this sector influence the financing of the shipping industry.

#### 4.3.2 Place for product made there

As for conceptual metonymies, second let us consider the following examples.

- (24) As a major maritime power, the country's attitude will have an effect on **Brussels' move**, which may reduce emissions but is expensive for shipping. (Lloyd's List)
- (25) Critics, who are already displeased with the pace of **decisions out of London**, will claim the IMO is displaying typical behaviour that, when applying to climate crisis response, amounts to inertia; they feel others should take the reins. (Lloyd's List)
- (26) **China** was the only country to record growth in 2020 and the lift seen in dry bulk rates in the second half of the year is testament to that, with port calls way above those of 2019, according to Lloyd's List Intelligence data. (Lloyd's List)
- (27) Given China's dominance and importance in dry bulk trades, all eyes will be on **Beijing's next Five-Year Plan**, due to be approved and detailed in early 2021. (Lloyd's List)
- (28) Furthermore, **Russia** is vying with **Saudi Arabia** for leading market share in **China**, which has implications for seaborne volumes. (Maritime Report & Engineering News)

In (24), the phrase “Brussels' move” uses Brussels (place) to represent the policies or decisions of the European



Union (product made there). In (25), the phrase “decisions from London” uses London (place) to represent the decisions of the International Maritime Organization (product made there). In (26), “China” (place) symbolizes the country’s economic growth and related industrial development, indicating economic activity and production originating there (product made there). In (27), “Beijing’s next five-year plan,” Beijing (place) represents the five-year plan developed by the Chinese government (product made there). In (28), “Russia”, “Saudi Arabia”, and “China” each represent the oil they produce and the oil demand markets, using these PLACES to denote the oil produced there (product made there) and the market competition between them.

#### 4.3.3 Instrument for product

Third, let us consider the following example for a conceptual metonymy.

(29) Peering into our *crystal ball*, the initial yet more uncertainty. (Lloyd’s List)

The “crystal ball” in (29) is a figurative tool symbolizing the ability to predict the future. Here, the “crystal ball” (instrument) represents the method or means (product) for predicting future trends.

#### 4.3.4 Whole thing for a part of the thing

As for a conceptual metonymy, finally let us consider the following example.

(30) The admiral ordered *all hands on deck*. (Maritime Report and Engineering News)

In (30), “all hands on deck” is a fixed phrase, meaning that all crew members should be on deck. Here, however, it is used to represent the crew members themselves. Therefore, the whole part (all hands on deck) represents the crew members.

Metonymy plays an important role in Maritime English because its skillful use enhances the vividness and imagery of linguistic expression. In this field, metonymy helps to convey more information, simplify expressions, and increase the attractiveness of the language. However, it is worth noting that of the 10 categories of metonymic expressions, only four subcategories were identified in this study. This suggests that although there are many metonymic expressions in Maritime English, their distribution is not uniform. The frequency of use of four metonymic expressions in Maritime English is particularly striking: PART OF A THING for THE WHOLE THING, PLACE for PRODUCT MADE THERE, INSTRUMENT for PRODUCT, and WHOLE THING for PART OF THE THING.

The PART OF A THING for THE WHOLE THING metonymy allows Maritime English to describe complex phenomena more succinctly. For example, using “box shipping” to represent the entire container shipping industry makes the expression more concise. Similarly, “ship” in “14,000 TEU ship” refers to the entire ship, making the description more concise. Location metonymy helps associate related policies, actions, or phenomena with specific regions. For example, associating “Brussels” with the decision-making body of the European Union helps convey the influence of the EU in the global shipping industry. Similarly, associating “London” with the International Maritime Organization highlights its importance in the global shipping industry. The INSTRUMENT FOR PRODUCT metonymy makes Maritime English more vivid and engaging. For example, the “crystal ball” represents predictions and expectations of future trends, making the expression more engaging. The WHOLE THING FOR A PART OF THE THING metonymy allows Maritime English to be more general. For example, using “the admiral ordered all hands on deck” to indicate the assembly of the entire crew makes the description

more concise.

In conclusion, the use of metonymy in Maritime English helps to achieve more concise, vivid and appealing expressions. By summarizing complex phenomena, places, instruments, and wholes in a simpler way, Maritime English becomes more expressive and accurate.

## 5. Conclusion

In this study, we collected and organized materials from two Maritime English magazines to create a Maritime English corpus for investigating metaphorical and metonymic expressions within the context of Maritime English. We employed a combination of Python coding and manual filtering, guided by the MIP and Biernacka's metonymy recognition steps to screen and identify accurate Maritime English metaphors and metonymies from the corpus. We then classified these expressions according to the principles of conceptual metaphor and metonymy.

Our findings underscore the pivotal role that metaphors and metonymies play in Maritime English. They serve to enrich linguistic expressions and improve their accuracy and comprehensibility. Our extensive analysis of various metaphorical and metonymic types has revealed their significant contribution to conveying information, streamlining expression, and elevating linguistic appeal. Furthermore, our study introduces an effective approach for further research on metaphorical and metonymic expressions in Maritime English. By combining computer technology and manual filtering strategies, we can more proficiently identify and classify metaphors and metonyms in large textual datasets, thereby providing robust support for research and pedagogy in Maritime English.

Nonetheless, this study bears certain limitations. First, the relatively small size of the corpus, consisting of only two magazines, may affect the generalizability of our research findings. In addition, due to space limitations, we were not able to include all metaphorical and metonymic results in this paper, which may hinder an accurate assessment of the codes. These limitations suggest promising avenues for future research.

In summary, this study provides valuable insights into the study of metaphor and metonymy in Maritime English. It lays the groundwork for more comprehensive explorations in this area domain. We anticipate that future researchers will delve deeper into the use of metaphor and metonymy in Maritime English, making substantial contributions to the advancement of this specialized field of Maritime English.

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Examples in: English  
Applicable Languages: English  
Applicable Level: Tertiary