A Dissertation for the Degree of Doctor of Philosophy

A Corpus-based Genre Analysis of Marine Safety Investigation Reports

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by

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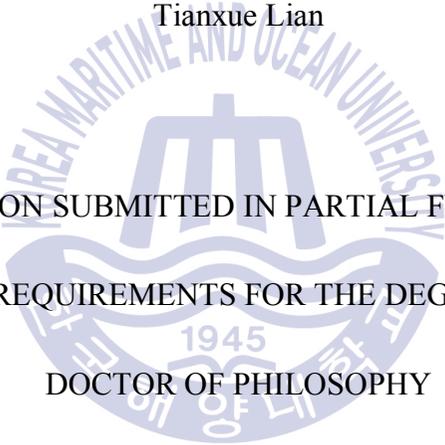
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국문초록

해양사고 후 해양안전심판원에 의해 작성되는 재결서(marine safety investigation reports, 이하 MSI 보고서)는 해양사고의 재발을 막는데 크게 기여해 왔다. 본 연구는 장르이론에 기반하여 MSI 보고서에 나타난 수사학적 무브(moves)와 언어학적 변수들을 일반화하는 것을 목표로 한다. 본 연구를 위해 무작위로 선택된 MSI 보고서로 코퍼스를 구축했는데, 이 코퍼스는 MSI 보고서의 장르를 관통하는 공통된 구조와 언어학적 특징을 결정하는 것이 가능하도록 했다. 무브분석을 통해 본 연구는 MSI 보고서의 필수영역에서 각각의 무브가 전체적 의사소통의 목적에 기여하는 그 자체의 목표를 가지는 14개의 무브타입을 확인했다. 나아가, 다차원적 접근법(multi-dimensional approach)을 사용하여 본 연구는 MSI 보고서의 개별적 무브에서 언어학적 변수에 태그를 달고 구체적인 언어학적 선택을 조사했다. 영어권 나라와 비영어권 나라의 MSI 보고서 간의 차이 또한 관찰되어졌고 분석되었다. 본 연구의 결과는 MSI 보고서 작성 시 규칙성에 대해 조명하여 보고서의 표준화를 촉진시킬 뿐만 아니라 MSI 보고서 작성을 지도하는 지도자를 위한 교육학적 함의를 제공한다.

키워드: 해양안전조사보고서(재결서), 장르, 무브분석, 다차원 분석

A Corpus-based Genre Analysis of Marine Safety Investigation Reports

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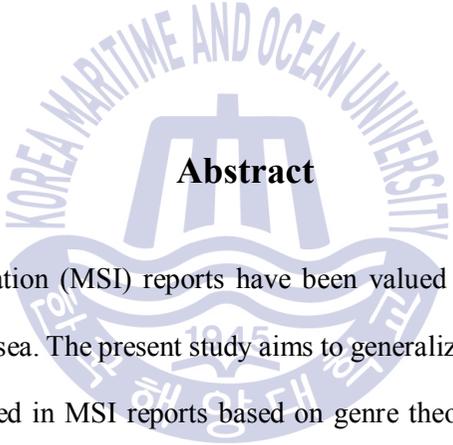
Abstract

Marine safety investigation (MSI) reports have been valued highly for preventing the recurrence of accidents at sea. The present study aims to generalize the rhetorical moves and linguistic variables featured in MSI reports based on genre theories which emphasize the communicative purpose of discourse in a certain community. A corpus compiled with randomly selected MSI reports made it possible to determine a common structure and linguistic features penetrating the genre of MSI reports. Applying a move analysis, 14 move types were coded in the obligatory sections of the MSI reports analyzed, each move possessing its own objective that contributed collaboratively to the overall communicative purpose. Furthermore, a multi-dimensional approach was employed to tag the linguistic variables and explore the specific linguistic selection in individual moves of the studied MSI reports. The differences between MSI reports of English and non-English speaking nations

were also observed and analyzed. The results of this study shed light on the regularities in composing MSI reports which would facilitate the standardization of MSI reports, and provide pedagogical implications for MSI instructors.

Key words: marine safety investigation reports, genre, move analysis, multi-dimensional analysis

Chapter 1   Introduction

1.1 Background of the Study

In the maritime world, even with all the advancement of technology in the industry, accidents are still happening. Experts and seafarers have been struggling to avoid them, if not extinguish. International Maritime Organization (IMO), established after Titanic tragedy, is committed to collaborate member states to improve safe navigation and ocean environment. IMO regulations were principally derived from the lessons learned in the oceans. Seeing the value of the accidents data, dedicated organizations and units have been formed to investigate such unfortunate accidents at sea in order to find real reasons behind their occurrences. These organizations or units have produced marine safety investigation reports (hereafter MSI reports) based on their investigations and posted them on the open access for education and training purposes. Recognized widely as effective and imperative data for implementing safe navigation, the MSI reports are often used as valuable resources in educating maritime professionals and making regulations.

To regulate the investigating behavior and the composition of MSI reports, IMO issued the Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident in 2008. "To fulfill the international responsibilities, the member States of IMO were required to submit the MSI reports to the Global Integrated Shipping Information System (GISIS) through Internet. After analyzing the reports, lessons learnt would be made available in three languages on the IMO webpage" (IMO, 2008, p. 10). In the Code, the content a MSI report should cover was elaborated.

Although the content is specified by the Code, the format of the MSI reports has not been standardized. The authorities of IMO member states stipulated their own templates for the MSI reports though they inevitably overlap or imitate one another.

Linguistic studies on maritime discourse are not scarce. Those studies, however, primarily dealt with the legal documents and textbooks. On the other hand, genre studies on the MSI reports are rare. To analyze the linguistic features of the MSI reports and identify them as a genre, Swales' theoretical postulates (1990) can be adopted. According to Swales (1990), genre is a set of communicative means aiming at reaching a certain communicative goal. Members of a discourse community employ genre to realize their communicative goals. Basic features of genres are their schematic structure in terms of style, content and form. The scope of the MSI reports is within the discourse community whose members are marine safety investigators. These community members are experts in their field and use specific lexis. They create the MSI reports to articulate marine accidents, analyze the probable causes, and provide workable recommendations. They maintain the privity in prescribing the structure of MSI reports. All above established the MSI reports to be analyzed based on the genre theory.

1.2 Rationale for the Study

Genre analysts usually defined genre in terms of the purpose that users seek to achieve. For Swales (1990), a genre is employed by the members of a discourse community who share particular communicative purposes. Biber (1993) recognizes genre as the type of message distinguished with a conventional structure. Bhatia (1993) emphasizes it would be

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more rational if a genre analysis was based on the communicative behavior to reach certain goals. In the case of MSI reports, the communicative purpose is to find out the probable causes of an accident and issue safety recommendations to prevent future accidents and malfunctions. As in other disciplines, the genre of MSI reports is produced with the linguistic and rhetorical features by the authors.

Although there are numerous genre studies on professional communication, it is difficult to find the literature pertaining to the maritime industry. One of a few studies is Dzeverdanovic's (2009) study that undertook a genre analysis on maritime damage reports as legal documents produced by maritime surveyors. It was found that certain segments (i.e., Introduction, Brief Narrative, and Ending) of the maritime damage reports were characterized by more formulaic discourse and lexis and thus were, predictable, whereas others were less predictable. She argued that genre analysis tools can be easily applied to establish the maritime damage report as a genre used in the maritime surveyors' discourse community. According to her, some areas (e.g., log books, engine reports, telex wording, curricula vitae) in the maritime community have already established their own genres. But we still know little about the conventional structure and typical linguistic characteristics in these genres.

Move analysis, pioneered by Swales (1990), is an important practicable method to describe genres. In move analysis, the general organization of a text is constructed with a series of moves. The rhetorical functions of moves work together to fulfill the overall communicative purpose of the genre (Connor, Davis, & De Rycker, 1995). In his initial research, Swales (1990) analyzed the introduction sections of 48 English research articles

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from a range of disciplines (i.e., physics, medicine, and social sciences), and proposed the three-move schema for article introductions, known as the Create a Research Space (CARS) model that is largely predictable in research article introductions. Swales' model shows how the moves and steps follow the sequence to interact and perform communicative functions in scientific texts. In response to the subsequent research, Swales (2004) modified his model to better reflect the variable ways the three move types are realized in different sub-genres of research article introductions. His revised model has highlighted cyclical patterns of occurrence of the move types within the introduction section, and broaden the description of the communicative purposes of the three moves. Following Swales' framework, Kanoksilapatham (2007) outlined ten general steps to conduct a corpus-based move analysis. Applying corpus approach to the move analysis enables the computational tools to investigate distributional patterns across the representative text sample.

For describing lexico-grammatical features, a more specialized corpus-based approach, Biber's (1995) multi-dimensional (MD) analysis, is widely applied. Unlike most corpus-based research, MD studies investigate language use in individual texts. This approach describes how linguistic features co-occur in each text, resulting in more general patterns of linguistic co-occurrence that hold across all texts of a corpus. The approach can thus be used to show how patterns of linguistic features vary across individual texts or genres.

1.3 Purposes of the Study

Swales' move analysis has been fruitfully adopted in various areas by which the rhetorical moves of a particular genre (e.g., Henry & Roseberry, 2001, job application letter;

Flowerdew & Wan, 2010, company audit reports; Connor, 2000, grant proposals) are investigated. Despite an extensive adoption of move analysis, most attention has been on certain area, namely research articles, and the macrostructure found in research articles is Abstract-Introduction-Method-Results-Discussion-Conclusion. This is different from that of MSI reports. By virtue of quantitative corpus analysis tools, this study attempted to provide a comprehensive description of the move types and linguistic features of the MSI reports.

The research questions of the study are threefold:

(1) What are the rhetorical move types constituting individual sections of the MSI reports?

(2) When based on the results of question 1 above, is any conventional structure among MSI reports identifiable?

(3) What are the linguistic variables featuring the moves of MSI reports?

By answering the above research questions, the study aims to discover the linguistic characteristics of the MSI reports, to improve the composition and comprehension of the MSI reports, to provide practical guidance for the authors of the MSI reports, and finally to supply the instructors with pedagogical suggestions.

The present study is valuable in a few aspects. First, this study is a first attempt to thoroughly analyze MSI reports as a genre. Second, it explores the discourse structure of all the six obligatory sections of MSI reports and undertakes a detailed linguistic description of the move types in MSI reports. Though time-consuming and labor-intensive, the comprehensive move analysis generalizes discourse structure across a representative sample of texts from MSI report genre. Finally, this description incorporates the analyses of multiple distinct linguistic features. The analysis of such a large set of linguistic features was made

possible by corpus-based technique.

1.4 Outline of the Study

To accomplish the abovementioned purposes, the dissertation is organized as follows:

Chapter 1 introduces the background of the study (what are studied and why?), the rationale of the study (the theoretical backup for the study), the purposes of the study (research questions and implications), and the outline of the study (the structural organization of the dissertation).

Following this introductory chapter is Chapter 2 which reviews the relevant literature. The definition of genre is clarified. Swales' move analysis model and Biber's multi-dimensional analysis are elucidated in this chapter as well with the influential studies in certain fields presented and discussed. IMO issued a series of documents about marine safety investigation. The regulations on the procedure, sources, and coverages of the MSI reports are listed for reference in the coda of this chapter.

Chapter 3 describes the design and context of the study, detailing the research methodologies adopted from Swales' move analysis and Biber's multi-dimensional analysis to the collection of data, the compilation of the corpus, the softwares utilized, the model procedure followed, etc.

Chapters 4 provides analyses of the MSI reports as a genre and in-depth discussion. Moves and move types in the analyzed MSI reports are determined and described in detail, which lays the foundation for multi-dimensional analysis. Applying the MAT (Multi-dimensional Analysis Tagger) program, the linguistic features of each move are highlighted and the

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closest text type marked.

Finally, Chapter 5 proposes the conclusions and implications from the study. Considering the limitations of this study, areas for the future research are suggested.

Chapter 2   Literature Review

2.1 Definition of Genre

The genre theory conceptualized in the United Kingdom in the 1980s has been applied to study situated linguistic behavior in institutionalized academic or professional settings. Genre analyses often attempts to answer why particular language patterns take the shape they do by offering more explanatory linguistic descriptions. Miller (1984), Bazerman (1994), and Berkenkotter and Huckin (1995) defined genre in terms of the typification of rhetorical action. In Martin, Christie and Rothery's work (1987), genre emphasized regularities of staged, goal-oriented social processes. While Swales (1990) and Bhatia (1993) focused on the consistency of communicative purposes. Despite so many seemingly different orientations, Bhatia (2008) summarized the common ground of them as follows:

1. Genres are recognizable communicative events, characterized by a set of communicative purposes identified and mutually understood by members of the professional or academic community in which they regularly occur.

2. Genres are highly structured and conventionalized constructs, with constraints on allowable contributions not only in terms of the intentions one would like to give expression to and the shape they often take, but also in terms of the lexico-grammatical resources one can employ to give discoursal values to such formal features.

3. Established members of a particular professional community will

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have a much greater knowledge and understanding of the use and exploitation of genres than those who are apprentices, new members or outsiders.

4. Although genres are viewed as conventionalized constructs, expert members of the disciplinary and professional communities often exploit generic resources to express not only "private" but also organizational intentions within the constructs of "socially recognized communicative purposes".

5. Genres are reflections of disciplinary and organizational cultures, and in that sense, they focus on social actions embedded within disciplinary, professional and other institutional practices.

6. All disciplinary and professional genres have integrity of their own, which is often identified with reference to a combination of textual, discursive and contextual factors.

(Bhatia, 2008, p. 23)

In the present study, the orientation led by Swales was followed to analyze MSI reports. John Swales is one of the most influential genre scholars, who defined a genre as "a class of communicative events" with particular communicative purposes commonly recognized in the discourse community which "shapes the schematic structure of the discourse and influences and constrains the choice of content and style" (Swales, 1990, p. 58). In the discourse community of MSI reports, the communicative purpose of the reports is to analyze the probable causes of an accident and propose recommendations. Bhatia espoused to

interpret genre as "language use in a conventionalized communicative setting in order to give expression to a specific set of communicative goals of a disciplinary or social institution" (Bhatia, 2004, p. 23). By producing the genre of MSI reports, report writers respond to the communicative purposes and to the environment of the MSI community.

The early published literature on genre analysis predominantly focused on academic discourses and research articles. Bhatia (2012), however, admitted that the situation in the last several years changed considerably. "There has been a substantial increase in research efforts to consider the contributions of discourse analytical studies in disciplinary fields such as law, medicine and healthcare, accounting and management, science, and technology, where there is now a better understanding of the role of language not only in the construction and dissemination of disciplinary knowledge, but also in the conduct of professional practices" (Bhatia, 2012, p. 20). The work of Grant, Keenoy, and Oswick (2001), Chiapello and Fairclough (2002), and Grant and Hardy (2004) illustrated such changes.

2.2 Corpus Approaches to Genre Analysis

Genre analyses, as a type of discourse studies, have been carried out on corpora using quantitative techniques of corpus linguistics in more recent years (e.g., Römer, 2005; Hunston, 2002; Harwood, 2005). A corpus is generally perceived as a collection of authentic texts, by virtue of its size and composition, representing a particular area of language use. The texts in a corpus have been selected to provide a sample of discourses usually for the purpose of analysis (Stubbs, 2004). Analysing large data from a corpus perspective can make the findings of studies more generalizable, and make an important contribution to understanding the characteristics of the discourses in certain genres.

Many established corpora can be applied for genre studies that examine the occurrence and reoccurrence of particular linguistic features. However, if the target of the study is a particular genre for which there is no data available, a specialized corpus has to be compiled by the researcher. A specialized corpus, as Hunston (2002) remarks, is representative of a given type of texts and used to investigate a particular type of language.

Hyland (2002) designed a specialized corpus to study the use of personal pronouns such as *I, me*, *we* and *us* in Hong Kong student's academic writing. Harwood (2005) also made up his own corpus for his study of the use of the personal pronouns *I* and *we* in journal research articles. To see how people use language in the genre of personal ads on the World Wide Web, Ooi (2001) had compiled his own specialized corpus. Hyland and Tse (2004) studied the acknowledgements in students' dissertations. Bruthiaux (1994) carried out a corpus-based study of the language of ads in personal columns in the *LA Weekly*. Small corpora of very specific genres which can have pedagogical value for teaching genres, as Sinclair (2001) has argued, can be made up relatively quickly.

Corpus-based genre analyses primarily attempt to generalize the discourse structure. Then the first step in analysing the discourse structure is to "identify the internal discourse segments of a text, corresponding to distinct propositions, topics, or communicative functions; these discourse segments become the basic units of the subsequent discourse analysis." (Biber et al., 2007, p. 11). It requires all texts in a corpus need first be divided into discourse units which can be used to find out how the discourse of corpus texts is generally organized. The generalizable corpus-based descriptions of discourse structure can be achieved through either a top-down research approach or a bottom-up research approach. The two approaches mainly differ in the order of analytical steps. In a top-down approach, the discourse unit types are determined before beginning the corpus analysis, and the entire

analysis is then carried out in those terms. In a bottom-up approach, the corpus analysis comes first, and the discourse unit types emerge from the corpus patterns (Biber et al., 2007). In this study, the top-down approach has been applied.

Connor (1996) pinpointed that the various approaches had brought new developments in written discourse analysis. It has been noted that different textual modes (e.g., narration, exposition, argumentation) used different discourse structures. The analysis of super structures was specific to a text type. "The increased interest in specific genres has further stimulated research on discourse structures of texts. Move analysis (Swales, 1981, 1990) is an example of such a specific top-down approach to genre analysis." (Biber et al., 2007, p. 15)

2.3 Swales' Move Analysis

Move analysis in genre studies was originally developed by Swales (1981) as a top-down approach to analyze the discourse structure of texts and to describe genres. It is especially valuable for genre-based writing teaching (Parkinson, 2017). Moves are semantic and functional units of texts that have specific communicative purposes (Biber et al., 2007). A text is described as a sequence of moves, where each move not only has its own purpose but also contributes to the overall communicative purposes of the genre. In Swales' words, these purposes together constitute the rationale for the genre, with texts in a genre exhibiting "various patterns of similarity in terms of structure, style, content and intended audience" (Swales, 1990, p. 58).

Therefore, the goal of move analysis is "to interpret regularities of organization in order

to understand the rationale for the genre." (Bhatia, 1993, p. 32). The analysis begins with the development of an analytical framework, identifying and describing the move types that can occur in this genre. These are the functional/communicative distinctions that moves can serve in the target genre. Some characteristics of moves have been identified through previous studies: move length varies from less than a sentence to much longer stretches, but normally contains at least one proposition; moves are identified both rhetorically (by attending to the move's purpose) and linguistically (by attending to use of sentence connectors, tense, mood, etc.); some move types occur more frequently than others in a genre and can be described as conventional, whereas other moves occurring not as frequently can be described as optional; moves may contain multiple elements that together, or in some combination, realize the move. These elements are referred to as "steps" by Swales (1990). The steps of a move primarily function to achieve the purpose of the move to which it belongs (e.g., Dudley-Evans, 1994; Hopkins & Dudley-Evans, 1988; Swales, 1981, 1984, 1990).

In addition, moves generally have distinct linguistic boundaries that can be objectively analyzed. Swales (1990) proposed a series of moves through analyzing 48 introduction sections in research articles written in English from a range of disciplines (physics, medicine, and social sciences). The three-move schema for article introductions, known as the Create a Research Space (CARS) model, is presented in Table 1. Swales' model shows "the preferred sequences and interaction of move types and steps in performing communicative functions in scientific texts, which are largely predictable in research article introductions" (Connor, Upton, & Kanoksilapatham, 2007, p. 27).

In Swales' model, Move 1 introduces the general topic of research. Move 2 identifies the more specific areas of research that require further investigation. Move 3 introduces the current research study in the context of the previous research described in Move 1 and 2.

Table 1 CARS model[1]

Move 1:	**Establishing a territory**
	Step 1: claiming centrality and/or
	Step 2: making topic generalization(s) and/or
	Step 3: reviewing items of previous research
Move 2:	**Establishing a niche**
	Step 1A: counter-claiming or
	Step 1B: indicating a gap or
	Step 1C: question-raising or
	Step 1D: continuing a tradition
Move 3:	**Occupying the niche**
	Step 1A: outlining purposes or
	Step 1B: announcing present research
	Step 2: announcing principal findings
	Step 3: indicating RA structure

Since its publication in 1990, the recursive nature of Swales' CARS model has been testified by subsequent research on the introduction section of research articles in other disciplines (e.g., Chu, 1996; Holmes, 1997; Anthony, 1999), which demonstrates how

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[1] Adopted from Swales (1990, p.14)

different disciplines manipulate a common genre to meet their own communicative needs. Swales (2004), in response to these subsequent research, modified his model to better reflect the variability in how the three move types are realized in different sub-genres of research article introductions. His revised model, shown in Table 2, "has a broader description of the communicative purposes of Move 1 and 2. It also reflects – particularly in Move 3 – the variation that occurs in introductions in different research fields and recognizes the possibility of cyclical patterns of occurrence of the move types within the introduction section" (Connor et al., 2007, p. 28).

Table 2 Swales' revised model for research article introductions[2]

Move 1:	**Establishing a territory (citations required) via Topic generalizations of increasing specificity**
Move 2:	**Establishing a niche (citations possible) via:** Step 1A: Indicating a gap, or Step 1B: Adding to what is known Step 2: Presenting positive justification (optional)
Move 3:	**Presenting the present work via:** Step 1: Announcing present research descriptively and/or purposively (obligatory) Step 2: Presenting research questions or hypotheses* (optional) Step 3: Definitional clarifications* (optional) Step 4: Summarizing methods* (optional) Step 5: Announcing principal outcomes (optional)** Step 6: Stating the value of the present research (optional)**

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[2] Adopted from Swales (2004, p. 230)

	Step 7: Outlining the structure of the paper (optional)**

* *Steps 2–4 are less fixed in their order of occurrence than the others.*

** *Steps 5–7 are probable in some fields, but unlikely in others.*

Swales' framework of move analysis has stimulated substantial research on the rhetorical structures of certain sections in academic and professional texts. In academic writing, most of the corpus-based research of a genre has focused on specific kinds of research writing, such as particular sections from research articles (Samraj, 2005; Ozturk, 2007; Ryoo, 2008), PhD dissertations from various disciplines (Bunton, 2002, 2005; Hyland, 2004; Kwan, 2006), and conference proposals (Halleck & Connor, 2006). The covered academic disciplines include biochemistry (Kanoksilapatham, 2005), biology (Samraj, 2002), computer science (Posteguillo, 1999), and medicine (Williams, 1999). There are also studies focusing on various academic genres, including university lectures (Thompson, 1994), master's dissertations of science (Hopkins & Dudley-Evans, 1988), and textbooks (Nwogu, 1991). The results of these studies denoted that though related genres will certainly share common move types, each will have their own unique structural characteristics that reflect the specific communicative functions that the genres have.

In professional discourse, the rhetorical move analyses covere legal discourse (Bhatia, 1993), philanthropic discourse (Upton, 2002; Upton & Connor, 2001), grant proposals (Connor, 2000; Connor & Mauranen, 1999; Connor & Upton, 2004), movie reviews (Pang, 2002), company audit reports (Flowerdew & Wan, 2010) and professional letters and application statements (Flowerdew & Dudley-Evans, 2002; Henry & Roseberry, 2001; Flowerdew & Wan, 2006; Ding, 2007). All the above research illustrate how different genres

can have different move types. A general conclusion can be reached that move analysis framework can be applied for the establishment of conventional structure of a certain type of discourse as a genre.

As for the elements, steps, within a move, they may or may not regularly appear, and when they appear, they can appear in different sequential order. Biber et al., (2007) underlined that some move types in a genre may be more common (or obligatory), while other moves may be optional. Lewin, Fine, and Young (2001) also underscore this characteristic of moves. Moreover, it is possible that some move types will recur in a cyclical fashion within a section of text (Swales, 2004). Each appearance of a particular move would be typically considered as a separate occurrence in the cyclical reoccurrence of a move within a section of text.

According to Bhatia (1993), the move structuring of a genre is the property of the genre itself, not something that the reader constructs. Therefore, genre analysts can generalize the move structure of texts in one genre. Researchers do not need to follow others' steps in analyzing moves. Though there are no standard methods for doing a move analysis, the commonly applied procedures have been summarized by the researchers in this field. For a corpus-based move analysis, Kanoksilapatham (2007) outlined the top-down steps as shown in Table 3. This top-down approach has been applied in present corpus-based study. The first methodological step in this method involves human judgements, which is to identify and code the move types of a text. In these steps, detailed coding indicators are required to explicitly describe the move types and steps.

Table 3 General top-down steps for corpus-based move analyses[3]

Step 1: Determine rhetorical purposes of the genre

Step 2: Determine rhetorical function of each text segment in its local context; identify the possible move types of the genre

Step 3: Group functional and/or semantic themes that are either in relative proximity to each other or often occur in similar locations in representative texts. These reflect the specific steps that can be used to realize a broader move.

Step 4: Conduct pilot-coding to test and fine-tune definitions of move purposes.

Step 5: Develop coding protocol with clear definitions and examples of move types and steps.

Step 6: Code full set of texts, with intercoder reliability check to confirm that there is clear understanding of move definitions and how moves/steps are realized in texts.

Step 7: Add any additional steps and/or moves that are revealed in the full analysis.

Step 8: Revise coding protocol to resolve any discrepancies revealed by the intercoder reliability check or by newly 'discovered' moves/steps, and re-code problematic areas.

Step 9: Conduct linguistic analysis of move features and/or other corpus-facilitated analyses.

Step 10: Describe corpus of texts in terms of typical and alternate move structures and linguistic characteristics.

To guarantee the objectivity of the coding work, intercoder reliability would be measured to determine whether different coders understand the coding indicators in the same way,

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[3] Adopted from Kanoksilapatham (2007, p. 34)

whether they all identify the same discourse segments in a text, and whether they all agree on the classification of those text segments as move or step. Mostly, move analysts would like to apply Cohen's kappa as a statistic to determine intercoder reliability. Cohen's kappa is a chance-corrected measure of intercoder reliability that assumes two or more coders, n cases, and m mutually exclusive and exhaustive nominal categories (Banerjee, Capozzoli, Mcsweeney, & Sinha, 1999). Biber et al. (2007) published a book on how corpus analysis can be used to explore the internal discourse structure of texts from particular genres. In the book, they admitted though labor-intensive and time-consuming, corpus-based move analysis is of great value, for it realizes generalizable analyses of discourse structure across representative text samples from a genre. All the previous studies have substantiated that the integration of move analysis and multi-dimensional analysis could provide a comprehensive communicative and linguistic description of the discourse of a certain genre.

2.4 Biber's Multi-dimensional Framework

As was previously mentioned, a corpus-based move analysis depends on both quantitative and qualitative techniques. Even with a quantitative analysis, the moves and move types in each text must first be identified and coded individually by the researcher(s) making qualitative judgments about the communicative purposes of the different segments of a text. Once quantitative data are run, the results must still be interpreted manually and functionally.

Multi-dimensional (MD) analysis, which is a specialized corpus-based approach to genre studies, combines quantitative and qualitative techniques. This approach describes how linguistic features co-occur in a text, further generalizing patterns of linguistic co-occurrence

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that hold across all texts of a corpus. The approach can thus be used to show how patterns of linguistic features vary across individual texts, or across genres (Biber et al., 2007). MD analysis was first used in Biber's 1986 study and then developed more fully in Biber's 1988 study. "Methodologically, the MD approach has three major distinguishing characteristics: (1) the use of computer-based text corpora to provide a broad representation of the registers in a language; (2) the use of computational tools to identify linguistic features in texts; and (3) the use of multivariate statistical techniques to analyze the co-occurrence relations among linguistic features, thereby identifying underlying dimensions of variation in a language." (Schiffrin, Tannen, & Hamilton, 2001, p. 184)

The first step in an MD analysis is to collect a corpus of texts representing a wide range of discourses in a genre. Genre analysts who apply MD analysis usually follow the same methodological steps. These steps are summarized in Table 4.

Table 4 Eight methodological steps for a complete MD analysis[4]

1. An appropriate corpus is designed based on previous research and analysis. Texts are collected, transcribed (in the case of spoken texts), and input into the computer. The situational characteristics of each spoken and written register are noted (e.g., purposes of the register, production circumstances, and other characteristics).

2. Research is conducted to identify the linguistic features to be included in the analysis, together with functional associations of the linguistic features.

3. Computer programs are developed for automated grammatical analysis, to identify – or 'tag' – all relevant linguistic features in texts.

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[4] Adopted from Biber, Connor, & Upton (2007, p. 263)

4. The entire corpus of texts is tagged automatically by computer, and all texts are edited interactively to ensure that the linguistic features are accurately identified.

5. Additional computer programs are developed and run to compute frequency counts of each linguistic feature in each text of the corpus.

6. The co-occurrence patterns among linguistic features are analyzed, using a factor analysis of the frequency counts.

7. The 'factors' from the factor analysis are interpreted functionally as underlying dimensions of variation.

8. Dimension scores for each text with respect to each dimension are computed; the mean dimension scores for each register are then compared to analyze the salient linguistic similarities and differences among the registers being studied.

Generally, MD analysis framework can be applied in identifying moves and move types. Ghadessy (1993) used MD approach to examine sixty letters selected from a large sample of 566 business communication events and found that the obligatory moves in them include Initial reference, Addressing the issue, and Closing. Lewin, Fine, and Young (2001) classifies three moves in the introduction section of social science research texts and three moves in discussion texts. Flowerdew and Wan (2006) revealed that accountants achieve the communicative goals in tax computation letters via seven moves. Bhatia (2008) investigated Chairman letters contained in corporate annual reports, and identified seven moves.

MD studies on move analysis can also be conducted with a top-down approach (Biber et al., 2007), and the findings indicate that moves in a particular genre are characterized by linguistic features. "Different moves have different functional and semantic purposes", and the move purposes can be realized "through variations in linguistic features" (Biber et al.,

2007, p. 38). Apart from analyzing and comparing text types and linguistic variation, 67 linguistic features and six functional dimensions in Biber's (1988, 1995) MD analysis technique can be used to study and compare moves. For instance, Connor and Upton (2004) adopted Biber's (1995) MD analysis technique to examine the linguistic and rhetorical features of promotion and persuasion in grant proposals written by non-profit organizations. The scores of the dimensions identified the genre of grant proposal to be highly informative, non-narrative and elaborated reference, and the scores of "overtly argumentative" dimension varied greatly among the moves, indicating that the different communicative functions of the moves demand different extent of persuasion. Connor et al. (2007) explored rhetorical appeals in the fundraising letters aiming to persuade potential contributors. Their study found that certain appeals can be predicted to occur in a certain move. Kanoksilapatham (2007) used MD analytic procedures to determine moves and linguistic variation among the move categories in different sections of 60 biochemistry articles, and found that the patterns of the functional dimensions are in uniform among the rhetorical moves in each section of the research article.

In contrast, with bottom-up approach, Biber and Jones (2007) adopted MD method to analyze the vocabulary-based discourse unit in biology research articles and found that there are important linguistic differences across the major sections of the articles and across the six different text types that are categorized in terms of their communicative functions. Csomay (2006) also analyzed the vocabulary-based discourse unit in university class sessions with MD approach and concluded that the relationships between language variation and communicative functions and instructional purposes within class sessions can be

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described.

Dimensions in MD framework were determined by a collection of linguistic features that frequently co-occur in texts, so frequency is a key element in the analysis. From the MD studies with quantitative techniques, similarities and differences in the underlying dimensions of variation have been revealed. There are two important parameters across all the discourse domains: informational vs (inter)personal dimension and narrative discourse dimension. Moreover, MD studies have uncovered dimensions particular to the communicative functions and priorities of each different domain of use (O'Keeffe & Mccarthy, 2010).

The integration of move analysis and multi-dimensional analysis in the current study makes it possible to comprehensively describe communicative and linguistic features of the discourse of MSI reports, highlighting the value of a corpus-based approach.

2.5 Marine Safety Investigation Reports

Having been applied in studying numerous professional fields, move analysis and multi-dimensional analysis haven't contributed much to maritime industry. The interest of current study was in marine safety investigation (MSI) reports which were composed to release recommendations for preventing marine accidents. According to the requirements of International Maritime Organization (IMO), member states of IMO built dedicated organizations to investigate unfortunate accidents at sea in order to find real reasons behind their occurrence. These organizations create MSI reports analyzing the causes of the accidents and providing recommendations for the industry. As effective and imperative data

for implementing safe navigation, the MSI reports are often used as valuable resources for educating maritime professionals regarding various reasons that lead to fatal accidents at sea. Preventing future accidents is the sole objective of marine safety investigation, so the MSI reports shall not be used to determine liability nor to apportion blame.

The significance of the MSI reports has been reiterated by IMO through a number of resolutions, circulars, conventions, and codes. The first was resolution A.173(ES.IV) on *Participation in Official Inquiries into Maritime Casualties* adopted in November 1968. Other resolutions followed in the subsequent years. "These individual resolutions were amalgamated and expanded by the Organization with the adoption of the Code for the Investigation of Marine Casualties and Incidents" (IMO, 2008, p. 2).

In May 2008, IMO adopted a new Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (hereafter the Code) when the Maritime Safety Committee (MSC) met in London, for its 84th session. Relevant amendments to Convention on the Safety of Life at Sea (SOLAS) Chapter XI-1 were also adopted, to make parts I and II of the Code mandatory. Part III of the Code contains related guidance and explanatory material. In this Code, the definition of MSI reports was given as follows:

> 2.12 A *marine safety investigation report* means a report that contains:
>
> .1 a summary outlining the basic facts of the marine casualty or marine incident and stating whether any deaths, injuries or pollution occurred as a result;
>
> .2 the identity of the flag State, owners, operators, the company as

identified in the safety management certificate, and the classification society (subject to any national laws concerning privacy);

.3 where relevant the details of the dimensions and engines of any ship involved, together with a description of the crew, work routine and other matters, such as time served on the ship;

.4 a narrative detailing the circumstances of the marine casualty or marine incident;

.5 analysis and comment on the causal factors including any mechanical, human and organizational factors;

.6 a discussion of the marine safety investigation's findings, including the identification of safety issues, and the marine safety investigation's conclusions; and

.7 where appropriate, recommendations with a view to preventing future marine casualties and marine incidents.

(IMO, 2008, p. 6)

To facilitate the flow of information, the final report of the safety investigation should be well structured and cover what is listed in paragraph 2.12 of the Code. The report should, within its different parts, clearly distinguish between facts and analysis. "Non-judgmental language should be used in the report. Witnesses' names and personal information which may identify them should remain confidential" (IMO, 2014, p. 10). In normal investigation practice, gaps in information that cannot be resolved are usually filled by logical extrapolation and reasonable assumptions. "Such extrapolation and assumptions should be

identified and a statement of the measure of certainty provided. Despite best efforts, analysis may not lead to firm conclusions. In these cases, the more likely hypotheses should be presented" (IMO, 2000, p. 4).

Besides the Code, relevant IMO regulations also cover the contents about MSI reports. Under SOLAS (1974) regulation I/21 and International Convention for the Prevention of Pollution from Ships (MARPOL) (1978) articles 8 and 12, administration conducting an investigation into any casualty occurring to ships under its flag need supply IMO with pertinent information concerning the findings of such investigations. Article 23 of the Load Lines Convention (1988) also requires the investigation of casualties. Under the United Nations Convention on the Law of the Sea (UNCLOS) (1994), article 94 on Duties of the flag State, paragraph 7 states that "Each State shall cause an inquiry to be held by or before a suitably qualified person or persons into every marine casualty or incident of navigation on the high seas involving a ship flying its flag and causing loss of life or serious injury to nationals of another State or serious damage to ships or installations of another State or to the marine environment. The flag State and the other State shall co-operate in the conduct of any inquiry held by that other State into any such marine casualty or incident of navigation." To fulfill the international responsibilities, member States of IMO are required to submit the MSI reports to the Global Integrated Shipping Information System (GISIS) on the IMO website. After analyzing the reports, lessons learnt would be made available in three languages on the IMO webpage.

After examining the MSI reports published in different years from various countries, it was observed that the content of them has long been commonly accepted before the

definition was codified in the Code. However, though the coverage of MSI reports has never aroused divergence, the formats of them across the nations have not been standardized. In practice, even the titles of the reports vary from state to state (e.g., UK - Accident Report, US - Marine Accident Report, Australia - Transport Safety Investigation Report, China - The Safety Investigation Report). To eliminate the ambiguity, "marine safety investigation report" which is defined explicitly in the Code is used uniformly to refer to the texts in the corpus for this study.

Achieving the same purpose and sharing the similar structure, templates for the MSI reports stipulated by the authorities of each state inevitably overlap or simulate one another. The scope of the MSI reports is within the discourse community whose members are marine safety investigators. These community members use the MSI reports to analyze marine accidents and provide recommendations. The content being codified, the structure of the MSI reports is mainly "tacitly" prescribed by its users. Since this discourse community comprises members who are experts in their fields and use specific lexis, they also have their own mechanism for sharing information.

Genre studies with regard to the maritime industry are rare, let alone MSI reports. Dzeverdanovic (2009) undertook a genre analysis on maritime damage reports which were presented by maritime surveyors as legal documents. It was found that certain segments of the report are characterized by more formulaic discourse (i.e., Introduction, Brief Narrative, and Ending) and lexis. She argued that typical genres embedded in a maritime discourse community have already been identified (e.g., log books, engine reports, telex wording, curricula vitae). Yet, a lack of intertextual knowledge is evident, i.e. the explanation of how

these particular genres correlate with the actual (maritime) setting. We still know little at present about the typical linguistic characteristics of the different move types that comprise maritime documents.

Chapter 3   Method

3.1 Research Design

Applying move analysis and MD framework, the current study was designed in the way follows a top-down corpus method which led to making up a specialized corpus of MSI reports genre. To ensure the representativeness and balance of the corpus, the authority of the resource and native language of the report writers have been taken into consideration.

Once the corpus was compiled, the qualitative step of identifying move types was carried out manually by two coders (the researcher and an expert). The subjectivity of this step required a test of intercoder reliability to see whether the move types had been demarcated with the same criteria.

After the texts in the corpus were coded with moves, sub-corpora of moves were made up for further analysis, which meant the texts of the same move were collected into one sub-corpus. To describe individual moves in detail, some typical expressions in each move were excerpted. As for the distribution of the moves, computer-aided tools were employed to obtain the statistics such as how many texts a move occurred in, how many times a move has been observed, and how many words a move comprised, and so on.

Based on the results of qualitative and quantitative analysis, a conventional structure of MSI reports were elicited. Meanwhile, the researcher noticed the remarkable differences between English and non-English native speakers' reports in allocating moves. The significance of the observed differences was measured statistically.

The subsequent MD analysis was implemented with a program which automatically tags

the texts and outputs the data and figures. The underlying mechanisms, however, need to be explained by the researcher. While comparing the tagged sub-corpora of English and non-English speakers' reports, noticeable differences in linguistic variables were also discovered and analyzed.

3.2 Context of the Study

The authors of the MSI reports are marine safety investigators who would be assigned onboard to collect the materials after a marine accident and compose the report based on the evidence. To acquire evidential materials, the investigators need to interview the master, crew, and any other persons involved. "All substantially interested states shall co-operate with the marine safety investigating state(s) to the extent practicable" (IMO, 2008, p. 13). The safety recommendations in MSI reports should be addressed to "those that are best placed to implement them, such as shipowners, managers, recognized organizations, maritime authorities, vessel traffic services, emergency bodies, and international and regional maritime organizations and institutions" (IMO, 2014, p. 10).

Extracting the MSI reports from open access on websites, this study need not involve the authors and readers of the reports. However, while identifying the move types, an expert who was an associated professor studying MSI reports in the School of Navigation at Dalian Maritime University (DMU) in China participated. The expert possessed extensive experience and expertise in reading and composing MSI reports, which enabled him to understand the overall communicative purpose of the texts and the rhetorical function of each text segment. After a training session during which the expert and researcher worked

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together to ascertain the coding criteria, the expert and researcher coded and analyzed the texts with move types independently. The coded data from the expert and researcher were applied for testing an intercoder reliability.

3.3 Data Collection

In accordance with the Code, there must be a marine safety investigation authority in a state, who is responsible for conducting investigations. The data for the current study comprised of 30 MSI reports from six IMO member states (Australia, UK, USA, China, Japan, and Korea), five reports from each state. The selected six states comply with the Code and assign authorities to publish MSI reports in English which are regarded as authentic within the maritime industry. While choosing the states and authorities, native languages of the report writers were considered, so from English and non-English speaking nations, equal numbers of reports were retrieved. Such a representative and balanced corpus made it credible to extend the findings to all the MSI reports. The reports were randomly retrieved from the websites of the national competent authorities in the six following IMO member states.

The Australian Transport Safety Bureau is an independent Commonwealth Government statutory agency governed by a Commission, and is entirely separate from transport regulators, policy makers, and service providers. The Bureau is excellent in independent investigation of accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

Marine Accident Investigation Branch, an independent unit within the Department for

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Transport of UK, investigates marine accidents involving UK vessels worldwide and all vessels in UK territorial waters. Their job is to help prevent further avoidable accidents from occurring, but not to establish blame or liability.

In the US, the National Transportation Safety Board independent Federal agency is mandated by the Congress to investigate transportation accidents, determine the probable causes of the accidents, and issue safety recommendations.

Maritime Safety Administration of the People's Republic of China, under the Ministry of Transport, is the competent authority to exercise the administration of shipping safety. They investigate marine casualty accidents in PRC coastal and inland waters, as well as accidents involving China-flagged ships in international waters.

Japan Transport Safety Board is Japan's authority for establishing transportation safety. The objective of the investigation conducted by the Board is to determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage.

The Korean Maritime Safety Tribunal has been committed to ensuring safety at sea by investigating all types of marine accidents and determining their circumstances and causes. When a Korean-flagged vessel is involved in a marine accident in the international waters or the territorial waters of a foreign state, the Tribunal dispatches investigators to protect the interest of Korean-flagged vessels and accurately identify the causes of the accident.

The analyzed MSI reports are listed in Table 5. (see Appendix 1 for specific information) Dates of the MSI reports collected were not taken into account because the reports from the same nation were rather consistent in macrostructure along the time line.

Table 5 Analyzed MSI reports

State	# of reports	Topics	From	To	Mean pages	Mean words	Mean sentences
AU	5	E,FA,FI,C,G	2007	2015	29.2	11652	469.6
UK	5	D.FO.I.C.FL	2008	2016	31	11650.6	395.2
US	5	FI.G.S.C	2000	2002	39.2	21281	991.8
CN	5	G,C,FA,E	2010	2014	15.6	3571.4	178.6
JP	5	FA,C	2014	2016	30.2	10573.4	281.8
KR	5	S,FI,E,C,D	2012	2013	12.2	2910.6	95.2

D=death; FI=fire; FO=foundering; I=injury; FL=flooding; C=collision; G=grounding;

S=sinking; FA=fatality; E=explosion

To enumerate the MSI reports under the research, the researcher designated them with the nation issued the report, a keyword in the report titles, and the date the accident occurred. The title of a MSI report was as long as *The flooding of fishing vessel Fredwood after taking the ground on a drying berth*, where *flooding* indicating the accident result was picked out as the keyword. When a text in the corpus was mentioned hereafter in this dissertation, it will be named after a code indicating nation, year, and keyword. For instance, UK-2008-D refers to the report composed by the UK authority, and the accident happened in 2008 resulting in death.

The corpus compiled with the MSI reports comprises 308,113 running words. The length of the MSI reports analyzed ranged from 8 to 57 pages (from 1927 words to 44374 words in size). Browsing through all the reports, it was found that the length of a report was determined by the accident type and complexity of the investigation, not the format. As was

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presumed, even the shortest MSI report consisted of the full compulsory sections set by the Code or authorities, which laid the foundation for our move analysis.

Considering the sophisticated facets an accident might involve with and the wide range of the accident dates, the variety of sizes and detail of the MSI reports were inevitable. Despite the different topics, dates, and sizes, it has been observed that all the reports shared the same communicative purpose and covered all the mandatory information, which subsumed them into the same genre, and secured the representativeness of the corpus.

Besides the overall corpus, some sub-corpora were also compiled for various analyses. After determining the moves, the studied MSI reports were demarcated into texts of the same moves, which composed a sub-corpus applied for quantitative analysis. While comparing the cross-cultural differences, collected reports were divided into two sub-corpora of English and non-English speaking nations' reports.

3.4 Data Analyses

3.4.1 Move analysis

Referring to the Swales' (2004) model, the moves in the MSI reports were analyzed, utilizing the ten top-down steps outlined by Kanoksilapatham (2007). The move types in each section were determined and analyzed based on the Swales' model.

The compiled corpus represented typical reports in the focused discipline of marine safety investigation. The step of move identification could be made by the subjective judgements of the researcher(s) (e.g., Crookes, 1986; DudleyEvans, 1994a; Paltridge, 1994). Thus, by ensuring different individuals code the moves with one accord, intercoder reliability of move

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demarcation need be obtained, then the framework for determining move types could be applied reliably. In this study, the reliability of the researcher's coding was evaluated in comparison to the coding of an expert in the field of the marine safety investigation.

Following Kanoksilapatham's guideline (2005), the intercoder procedure should include a training session for the coders. First, taking one text as a sample, two coders worked together determining the type of each move and segment the text into moves. Steps were not coded since they were only used to facilitate the coder's decision in ascribing moves and no place in the subsequent analyses. In order to identify the move types for MSI reports, the coders needed to understand the overall communicative purpose of the texts and then look at the function and local purpose of each text segment. It is the most difficult step for the coders to categorize the moves in distinctive rubrics. The coders needed to read and reflect the texts frequently until the final categories were settled.

In the second stage of training, both coders coded six collected MSI reports (one from each state). Difference in coding led to discussion and clarification of the criteria for coding assignments.

Finally, each coder independently coded 30 marine safety investigation reports. Based on the independent coding by the researcher and expert coder, intercoder reliability was measured by kappa value.

During the process of identifying and analyzing the move types, the differences between English and non-English speaking nations' reports were noticeable. To test whether the observed differences were statistically significant, Log-likelihood ratios of those differences were calculated.

3.4.2 Multi-dimensional analysis

For the Multi-dimensional (MD) analysis, a computer-aided program, Multi-dimensional Analysis Tagger (MAT) (Nini, 2015), was applied in this study to provide a comprehensive linguistic description of the moves in the studied MSI reports.

The MSI reports were tagged by MAT with a wide range of linguistic features (see Appendix 2), including the lexico-grammatical features used in Biber's analysis. Frequencies of the features in each text were counted and normalized to a rate per 100 words, so that comparisons could be made across moves and reports. The normalized frequencies and Z-scores of linguistic features provided the basis for dimension analysis. The program visualized the input texts on Biber's (1988) six dimensions:

Dimension 1: Involved ⟷ Informational

Dimension 2: Narrative ⟷ Non-Narrative

Dimension 3: Context-Independent ⟷ Context-Dependent

Dimension 4: Overt Expression of Persuasion

Dimension 5: Abstract ⟷ Non-Abstract

Dimension 6: On-line Informational Elaboration

A summary of these dimensions was provided in Appendix 3. The scores of above dimensions in MAT determined the closest text type of the input text, as proposed by Biber (1989) (see Appendix 4)

The MAT tagger used the Stanford Tagger (Socher, Bauer, Manning, & Ng, 2013) for the initial segmentation in parts of speech and then found the patterns described in Biber (1988). Finally, the program offers a tool for visualizing the dimensions features of the input text.

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The result of the analysis consists of a number of output files as shown in Table 6.

Table 6 The result files of MAT analysis

Corpus_Statistics.txt	a tab delimited file that shows the frequency per 100 tokens for all the linguistic variables (see below) found in the input text or corpus.
Z-scores.txt	a tab delimited file that includes the z-scores of the linguistic variables for the input file or corpus.
Dimensions.txt	a tab delimited file that contains the scores for the Dimensions as well as the averages for the corpus. The program classifies each text according to its closer text type as proposed by Biber (1989) using Euclidean distance.
Dimension#.png	a graph that displays the location of the input text's Dimension score compared to a number of genres as shown in Biber (1988: 172).
Text_types.png	a graph representing the location of the analyzed text or corpus in relation to Biber's (1989) eight text types.

Based on the results of the MAT analysis, the linguistic features of each move were scrutinized with regard to the overused lexis, closest text type, and outstanding dimensions which altogether characterized each move in the MSI reports. A contrastive analysis was later made between the MSI reports of English and non-English speaking nations.

Chapter 4   Results and Discussion

It should be first noted that, as mentioned previously, only if the two coders agreed upon move boundaries and types, the move analysis of a corpus can be conducted. The results of intercoder reliability test of the coders' work in this study was demonstrated in Table 7.

Table 7 Summarized results of intercoder reliability analysis

Section	Kappa[5]
Summary	0.945
Details	0.753
Narrative	0.783
Analysis & Conclusions	0.895
Recommendations	0.927
Average	0.861

Cohen's kappa coefficient was applied in this study to measure intercoder agreement. If the coders are in complete agreement then k = 1. If there is no agreement among the coders other than what would be expected by chance $k \geq 0$ (Cohen, 1960). Table 7 shows moves in the Summary section were more consistently and reliably identified than those in the other sections. In contrast, Details section displayed more divergence in move identification. Generally, the overall intercoder reliability measured in kappa values were deemed to be "excellent" according to the criteria set by Fleiss (1971), which backed up the validity of the

---

[5] According to Fleiss (as cited in Orwin, 1994), the interpretation of Cohen's kappa is summarized as follows: k <.40 → poor, .40 < k <.59 → fair, .60 < k <.74 → good, and k >.75 → excellent

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subsequent analysis.

4.1 The Rhetorical Move Types of the MSI Reports

4.1.1 Move identification

In keeping with the steps introduced in Table 3, the first step in corpus-based genre analysis was to identify the move types that could occur in each section of the MSI reports. The overall content of each MSI report was most likely the same as the Code stipulates, but the structures of different states' reports were not alike. By closely examining all the reports in the corpus, a macrostructure of SDNACR (Summary-Details-Narrative-Analysis-Conclusions-Recommendations) was identified throughout the studied MSI reports, notwithstanding the various sequences and titles. Besides these six obligatory sections, some optional ones were also observed (e.g., Sources & Submissions in Australian reports; Abstract in the US reports; the Outline of the Accident Investigation in Japanese reports; the Investigation in Chinese reports). In order to generalize the rhetorical structure across the genre of MSI reports, only the six obligatory sections were adopted for the further move analysis.

The task of determining move types and boundaries was carried out by reference to numerous previous move studies. Consulting the findings of these studies, together with detailed analyses of two coders, 14 moves were identified in the six obligatory sections, and they were outlined in the model of Table 8. All moves of the obligatory sections in the corpus were identified and assigned into one of the 14 move types.

Table 8 Model of moves in the MSI reports

SUMMARY	**Move 1:** *Accident presentation*
	Step 1: *Process*
	Step 2: *Results*
	Move 2: *Conclusions*
	Move 3: *Recommendations*
DETAILS	**Move 4:** *Information of the involved parties*
	Step 1: *Particulars*
	Step 2: *Background*
	Step 3: *Equipment*
	Step 4: *Manning and watchkeeping*
	Move 5: *Situation of the accident*
	Step 1: *Damage and pollution*
	Step 2: *Environmental conditions*
	Step 3: *Medical and Pathological Information*
	Step 4: *Search and rescue*
	Move 6: *Relevant documents*
	Step 1: *Regulations and guidance*
	Step 2: *Voyage data recorder recovery and data*
	Step 3: *Similar accidents*
NARRATIVE	**Move 7:** *Pre-accident events*
	Move 8: *Accident*
	Move 9: *Post-accident events*
ANALYSIS &	**Move 10:** *Aim*
CONCLUSIONS	**Move 11:** *Background information*
	Move 12: *Findings*
RECOMMENDATIONS	**Move 13:** *Action taken*

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Move 14: *Action advised*

To realize the communicative functions, moves may contain multiple elements in some combination. These elements were referred to as "steps" by Swales (1990). The steps of a move primarily function to achieve the purpose of the move to which it belongs. For instance, Move 1 of Summary section of the MSI reports was realized via step 1 and 2.

As Swales (2004) notes, it is not the case that move types necessarily occur sequentially in a text, neither do the steps. Some move types will recur in a cyclical fashion within a section of text. Typically, a text often switches from one move type to another and then back again to the first. Each appearance of a particular move would be considered as a separate occurrence (Biber et al., 2007).

In the case of the MSI reports, the communicative purpose of Summary section was realized via 3 moves, and each of the 3 moves represented a particular communicative function. However, the sentences in Summary section did not necessarily start from Move 1 (Accident presentation), followed by Move 2 (Conclusions), followed by Move 3 (Recommendations). In fact, these 3 move types were interspersed throughout Summary section, so were their implicative communicative functions. Each occurrence of the text segment with different communicative function from the former one was coded as a separate move. The following excerpt from the corpus illustrated the cyclical reoccurrence of the move types in Summary section of the MSI reports:

SYNOPSIS (from UK-2013-C)

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Para. 1) At 0033 on 19 March 2013, the container vessel CMA CGM   <M1.2[6]>
Florida and the bulk carrier Chou Shan collided in the East China Sea
resulting in both vessels sustaining serious damage, and approximately 610
tonnes of heavy fuel oil being spilled from CMA CGM Florida. There were
no injuries.

(Para. 2) CMA CGM Florida had left Yang Shan, China, on 18 March and   <M1.1>
was heading towards Pusan, Korea. Chou Shan was heading from
Qinhuangdao, China, towards the east coast of Australia. CMA CGM
Florida's Filipino second officer, who was the officer of the watch, altered
course to starboard to pass between a group of fishing vessels on the port
bow and a vessel on a reciprocal course to starboard.

-This resulted in a risk of collision with Chou Shan, which was crossing   <M2>
CMA CGM Florida from port to starboard.

-Chou Shan's officer of the watch then used the Very High Frequency   <M1.1>
(VHF) radio to request that CMA CGM Florida pass around Chou Shan's
stern. The VHF radio conversation was conducted in Mandarin by CMA
CGM Florida's Chinese second officer, who had joined the vessel in Yang
Shan and was on the bridge for familiarisation.

(Para. 3) CMA CGM Florida's Filipino officer of the watch did not   <M1.1>

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6   <Mn.n> represents the sequence of move types. For example, <M2> is Move type 2; <M1.1> is Move
type 1, Step 1.

understand Mandarin and was unaware that the Chinese second officer had, tacitly, agreed to Chou Shan's request.

- Both vessels altered course to port, which resulted in a continued risk of <M2>
collision with each other.

- CMA CGM Florida's Chinese second officer then called Chou Shan on <M1.1>
the VHF radio to request that both vessels pass port-to-port. This was agreed to by Chou Shan's officer of the watch.

-Both vessels then altered course to starboard, resulting in a collision. <M2>

(Para.4) CMA CGM Florida's second officers and Chou Shan's officer of <M2>
the watch considered that it was appropriate to use VHF radio for collision avoidance, contrary to industry advice. Furthermore, Chou Shan's officer of the watch considered that it was appropriate to use VHF radio for negotiating a passing protocol that was contrary to Rule 15 of the International Regulations for Preventing Collisions at Sea.

(Para. 5) CMA CGM Florida's Filipino officer of the watch lacked <M2>
situational awareness. Contributing to this was the Chinese second officer's incomplete translation of the VHFM radio communications with Chou Shan and the Filipino officer of the watch's disproportionate reliance on Automatic Identification System (AIS) target Closest Point of Approach and Time to Closest Point of Approach information.

(Para. 6) CMA CGM International Shipping Company PTE Ltd (CMA <M3>
CGM) and Sincere Navigation Corporation have each taken action aimed

at preventing a recurrence. A recommendation has been made to CMA CGM for it to take appropriate measures to ensure its company shipboard policies and procedures are adhered to and that its masters recognise the importance of engaging with and motivating crew in the safe and efficient management of its vessels. Sincere Navigation Corporation has been recommended to review and amend its safety management system to ensure that VHF radio is not normally used for collision avoidance and that its masters are empowered to provide specific metrics in their standing orders as to when they should be called by the officer of the watch. The International Chamber of Shipping and the Maritime and Coastguard Agency have been recommended to update their respective guidance on the use of AIS data for collision avoidance.

Paragraph one elaborated the time, location, and results of the accident (Move 1, step 2). The second paragraph began with a specific narration about the crew's operation (Move 1, step 1). Then it was concluded that the operation posed a contributing factor to the accident (Move 2), followed by another narration about the crew's operation in the accident (Move 1, step 1)

The third paragraph began by describing the situation after the operations (Move 1, step 1). The following sentence remarked the second contributing factor to the accident (Move 2). Then the next operation by the crew was presented. (Move 1, step1). The last sentence of this paragraph indicated another contributing factor to the accident. (Move 2).

The fourth and fifth paragraphs summarized the findings from the investigation. (Move

2). The last paragraph began with depicting the actions taken by the involved parties which could be part of recommendations for anyone in the maritime industry. Then all the following three sentences were further recommendations raised by the author for potential beneficiaries. (Move 3)

This similar cyclical pattern of the move distribution was found in the other sections of the sample report (UK-2013-C). In effect, no MSI reports in the studied corpus was strictly structured as a series of moves in Table 8. The numbers assigned to the moves and steps in the model of Table 8 indexed the common order in which the moves often appeared in these MSI reports. Therefore, sentences distributed discretely in a text could possibly belong to a single move type.

4.1.2 Move description

In spite of the cyclical fashion of the move distribution, a sequential model (in Table 8) has been established based on the order moves usually followed in the MSI reports. The analysis of individual move types and steps in each section was implemented in the sequence set in this model. The following part described in detail how the moves and steps were constructed in each section.

1. SUMMARY

As shown in Table 8 above, Summary sections in the MSI report corpus were composed of 3 moves which meant that every statement in Summary section could be attributed to one of these 3 moves:

Move 1: *Accident presentation* briefed the accident, which usually began this section.

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Move 1 was realized via two steps.

Step 1: *Process* narrated where, when and how the accident happened:

(1) *At about 1447 on 13 July, a fire started in the engine room…*[AU-2014-F]

Step 2: *Results* reported what damage and loss the accident caused:

(2) *The chief officer suffered pelvic injuries…*[UK-2011-I]

Move 2: *Conclusions* summarized probable causes and contributing factors to the accident found in the investigation:

(3) *The investigation found that the mooring arrangement, mooring line monitoring and emergency response on board Fredwood were inadequate.* [UK-2016-F]

Move 3: *Recommendations* released the crucial safety massages from the accidents and what measures the involved parties were suggested to take for avoiding the similar accidents:

(4) *Sincere Navigation Corporation has been recommended to review and amend its safety management system…*[UK-2013-C]

Examining the moves in Summary section thoroughly, it was evident that some moves occurred more frequently than others, which is underscored by Lewin, Fine, and Young (2001) as a salient characteristic of moves. The moves occurring more frequently in a genre were regarded as the conventional, whereas other moves occurring not as frequently were the optional. Table 9 shows the distribution of individual moves in the Summary section of the studied MSI reports. Table 9 reveals that the moves were not equally well presented in Summary section of the studied MSI reports. The frequencies moves occurred differed in that some were conventional, and some were optional.

Table 9 Distribution of moves in the Summary section

Move Types	Frequency of Occurrence	No. of Observations	No. of Words
Move 1: Accident presentation	100.00%	73	3,927
Move 2: Conclusions	63.33%	21	2,722
Move 3: Recommendations	50.00%	15	1,622

Kanoksilapatham (2003) set the cut-off frequency of 60% as a potential measure of move stability for the move posited in her study, which meant any move occurring in 60% or more of the certain sections in the corpus was considered a conventional move. If a move's occurrence was lower than 60%, it was considered optional. This measure was cited in the present study. Thus, based on the data in Table 9, in Summary sections of the studied MSI reports, Move 1 and 2 were conventional.

2. DETAILS

Details section had 3 moves, and each move was realized via several steps:

Move 4: *Information of the involved parties* detailed the necessary information of the involved parties for further analysis. This move focused on the vessels or the parties in the accident without external factors.

Step 1: *Particulars* was an obligatory segment included in all MSI reports, either in Detail section or in Appendices. While in most MSI reports vessel particulars were listed in a table, description as follows also appeared:

(5) *It has an overall length of 229 m, a beam of 36.5 m, a depth of 18.5 m and a deadweight of 77 672 tonnes at its summer draught of 12.82 m.* [AU-2007-E]

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Step 2: *Background* introduced the nation, company and certificates of the involved vessels. If any of the involved parties were not a vessel, the necessary background information of the party should be presented as well:

(6) *...the yacht was owned by Callisto Marina Holdings, Cayman Islands, and managed by Marine Construction Management, United States of America. It was registered in the Cayman Islands and classed with Lloyd's Register (LR).* [AU-2013-F]

Step 3: *Equipment* described the structure and function of the equipment relevant to the accident. As the vessel particulars, some equipment onboard might be presented in tables. Most of the MSI reports demonstrated the equipment in statements, highlighting how they were related to the accident:

(7) *The ship air-conditioning compressor was produced by Shanghai Refrigerating Machine Manufacture, it was a 70 series Freon refrigeration compressor* [CN-2014-E]

Step 4: *Manning and watchkeeping* introduced all the crew and their duties. Passengers were also mentioned if there were any:

(8) *Master A had been serving as a chief officer and master on vessels managed by Temm Maritime Co., Ltd. ...since October 2005.* [JP-2014-C]

Move 5: *Situation of the accident* covered the external factors might influence or be influenced by the accident.

Step 1: *Damage and pollution* presented the damage to vessels or persons and pollution to environment caused by the accident:

(9) *CMA CGM Florida suffered extensive damage to the port side.* [UK-2013-C]

Step 2: *Environmental conditions* elaborated the meteorological and geographical

condition while the accident occurred:

(10) *The weather in the area was overcast, with a northeasterly wind blowing at about 6 to 8 m/s.* [KR-2012-E]

Step 3: *Medical and Pathological Information* included the medical measures have been taken for the injuries in the accidents:

(11) *According to the proof of death issued by Korea S-JUNGANG hospital, the Second Engineer and Zhang's death was accidental.* [CN-2014-E]

Step 4: *Search and rescue* was the segment describing the measures and actions for researching and rescuing vessels or persons:

(12) *At around 19:40 the eight crew members of Vessel B moved from Vessel C to the patrol boat.* [JP-2015-C]

Move 6: *Relevant documents* released all the necessary data and recordings for further analysis. 3 steps constituted this move.

Step 1: *Regulations and guidance* embraced the relevant rules and instructions, international or local, applicable to the accident:

(13) *In 1987, the Montreal Protocol prohibited the use of ozone depleting gasses.* [AU-2014-F]

Step 2: *Voyage data recorder recovery and data* referred to any data recorded by the equipment or in paper documents on board which was critical for revealing the truth and analyzing the causes:

(14) *It is recorded on ShenNeng 1's crew competency assessment report released in the second half of 2009 that "the chief mate Mr.Lingzhixin is weak in safety*

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management"...[CN-2010-G]

Step 3: *Similar accidents* was rare in the corpus (only three observed) which exhibited the documents of similar accidents to the investigated one:

(15) *On 24 March 2012, the Netherlands-registered cargo vessel Spring Bok collided with the Maltese-registered liquefied petroleum gas tanker Gas Arctic.* [UK-2013-C]

As was displayed in Table 10, though the frequency of the occurrence varied across the moves, all the moves in Details section occurred in more than 60% of the studied reports, which meant that Move 4, 5, and 6 were all conventional in Details sections.

Table 10 Distribution of moves in the Details section

Move Types	Frequency of Occurrence	No. of Observations	No. of Words
Move 4: Information of the involved parties	100.00%	114	33,695
Move 5: Situation of the accident	90.00%	66	15,789
Move 6: Relevant documents	73.33%	66	36,216

3. NARRATIVE

The moves in Narrative section of the MSI reports were divided chronologically into pre-accident, accident, post-accident events. Therefore, the statements in this section usually started with concrete time and location to clarify when and where the events happened.

Move 7: *Pre-accident events* described the events leading to the accident:

(16) *At 0413, the ship passed the Fairway Landfall buoy (Figure 2) and continued in a south-easterly direction at 14 knots,* [AU-2015-G]

Move 8: *Accident* reported the occurrence of the accident:

(17) *At about 0300, Fredwood took the ground and began to lean away from the quay wall.* [UK-2016-F]

Move 9: *Post-accident events* depicted the immediate reactions of the involved parties to the accident:

(18) *After the grounding, the passengers were given access to an "open bar" by the vessel's management.* [US-2001-G]

Based on the statistics in Table 11, these three moves occurred almost in every report in the corpus, so all of the three move types in this section were marked conventional.

Table 11 Distribution of moves in the Narrative section

Move Types	Frequency of Occurrence	No. of Observations	No. of Words
Move 7: Pre-accident events	100.00%	39	18,960
Move 8: Accident	100.00%	40	8,889
Move 9: Post-accident events	93.33%	32	11,250

Among these three moves, Move 8 ranked top in the No. of Observations (40) but used the least words (8,889 words), which indicated that although the occurrence of the accidents was mentioned most frequently, the events before and after the accidents were articulated in more detail.

4. ANALYSIS & CONCLUSIONS

Analysis section, the most sophisticated part in the MSI reports, mostly incorporated comprehensive information from the other sections, for digging out the probable causes and

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contributing factors to the accident. It was observed that the content of the following Conclusions section was extracted from this section in most of the analyzed MSI reports. Restating and highlighting the findings of analysis in the Conclusions section helped clarify the probable causes that might be buried in the lengthy Analysis section. The communicative function of Conclusions section was also realized by some parts of Analysis section. According to the definition of move, those statements achieving the same communicative purpose should be coded as the same move type (Swales, 2004). Hence, Analysis and Conclusions were integrated for the move analysis and comprised three possible move types.

Move 10: *Aim* was not included in all the studied MSI reports. In fact, this move in the corpus was only found in English-speaking countries' reports: Australia, UK, and US. The statements in this move elaborated the purpose of the section:

(19) *The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.* [UK-2008-D]

Move 11: *Background information* provided evidence supports for the analysis. Before drawing any conclusions, description of the facts was sometimes necessary. Those facts could be the flashback of the accidents, the status of the equipment, the recorded conversation of crewmembers, etc. Certainly, only the facts constituted the contributing factors would be contained in this move. However, since the Details and Narrative sections were composed with the factual information sufficiently, almost half of the MSI reports in the corpus did not repeat them but analyze the causes directly:

(20) *The chief officer alerted the captain to the fire after discovering the crew members*

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who had been sleeping in the aft cabin under the poop deck burned and collapsed on

the bridge and in the mess hall. [KR-2012-F]

Move 12: *Findings* set out the results of the analysis, listing the probable causes. In that the MSI reports did not aim to determine liability or apportion blame, direct and indirect contributing factors in this move were presumed to be the more the better:

(21) *The National Transportation Safety Board determines that the probable cause of the*

grounding of the Finest was the failure of the vessel master to use appropriate

navigational procedures and equipment to determine the vessel's position while

approaching the Shrewsbury River channel. [US-2001-G]

As mentioned previously, only native English-speaking authors composed MSI reports in the corpus with Move 10 (Aim). To put it in statistics, the frequency of occurrence of Move 10 was 40% in the corpus. Similarly, the occurrence of Move 11 (46.67%) was not frequent, either. According to the criterion of move stability and the distribution data in Table 12, Move 10 and 11 were optional in the Analysis and Conclusions section. But Move 12 (findings) was conventional occurred in all the MSI reports analyzed.

Table 12 Distribution of moves in the Analysis & Conclusions section

Move Types	Frequency of Occurrence	No. of Observations	No. of Words
Move 10: Aim	40%	16	1,187
Move 11: Background information	46.67%	17	9,269
Move 12: Findings	100%	61	62,072

Different from the frequency of occurrence which demonstrated the percentage of the

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reports with the certain move in the corpus, No. of observations counted how many times a certain move has been observed. The basic standard for one observation was without interruption of other moves, even though some moves can be as long as several pages. Compared with Details section whose moves distributed discretely, the moves in the Analysis and Conclusions section did not inserted one another frequently, which led to less observations but more words.

5. RECOMMENDATIONS

Recommendation section in the MSI report corpus released the final suggestions to prevent the similar accidents from future reoccurrence. In some reports, actions taken by the involved companies or organizations were covered, or aligned as a separate section. The purpose of this section was to advise feasible actions for vessels or any related units to avoid similar accidents. Either the effective actions taken or actions advised could be adopted by anyone in the maritime industry. Therefore, the rhetorical function of this section was realized via two moves.

Move 13: *Action taken* enumerated the measures that were taken by the parties involved in the accident for preventing the similar accidents, including issuing circulars, modifying regulations, educating crewmembers, etc:

(22) *Briggs Marine Contractors Ltd has: Issued a Safety Notice notifying its fleet of the circumstances of this accident*, [UK-2011-S]

Move 14: *Action advised* were recommended by the authority to persons, companies, or organizations related to the accident:

(23) *The ATSB recommends that Sydney Ports Corporation takes safety action to address*

the pilotage requirements that apply to privately operated yachts like Calliope. [AU-
2013-F]

The two moves in the Recommendations section were not allotted evenly. Distinguished
by the frequency of occurrence, Move 13 was optional, and Move 14 was conventional.

Table 13 Distribution of moves in the Recommendation section

Move Types	Frequency of Occurrence	No. of Observations	No. of Words
Move 13: Actions taken	36.67%	28	5,352
Move 14: Actions advised	93.33%	34	3,835

As is seen in Table 13, the difference of the occurrence frequency between Move 13 and
14 was large, while the No. of observations of them was not of great gap. The statistics
showed that though Move 13 only appeared in one out of three MSI reports, the No. of
observations were almost equal to Move 14 that occurred in nearly all MSI reports in the
corpus. By looking closely at the reports, it was found that most observations of Move 13
occurred in Australian MSI reports.

4.2 The Conventional Structure of the MSI Reports

4.2.1 The conventional moves of the MSI reports

Applying the measures in previous move studies with the specific features of MSI reports,
14 rhetorical moves have been identified in the studied MSI reports, among which ten moves
were conventional and four optional.

Summary section has two conventional moves: accident presentation and conclusions.

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Recommendations, an optional move of Summary section, occurred in half of the studied MSI reports (15 observed). Details section was of the most steps, each move being realized via several steps. Moves in Details and Narrative sections were all conventional with high frequency of occurrence in the studied MSI reports. In Narrative section, Move 8 (accident) was most frequently observed but used the least words (8,939) among the 3 moves. Since Conclusions section in most studied MSI reports were repetition and extraction of some parts of Analysis section, these two sections were integrated for the current move analysis. The move using most words (62,569) in MSI reports, Move 12 (Findings), was the only conventional move in the three moves in this integrated section. The final Recommendations section comprised Move 13 (actions taken) and 14 (actions advised). Move 14 was conventional with 93.99% frequency of occurrence while Move 13 was optional occurring in 36.67% of MSI reports in the corpus. The data of the moves in MSI reports corpus were shown in Table 14 as below.

Table 14 Overall move distribution in the MSI reports corpus

Sections	Move Types	FOO[7]	NOO[8] (N=622)	NOW[9]
SUMMARY (109 observations, 8,271 words)	Move 1: Accident presentation **	100.00%	73	3,927
	Move 2: Conclusions**	63.33%	21	2,722
	Move 3: Recommendations*	50.00%	15	1,622

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[7] FOO=Frequency of Occurrence

[8] NOO=No. of Observations

[9] NOW=No. of Words

DETAILS (246 observations, 85,700 words)	Move 4: Information of the involved parties **	100.00%	114	33,695
	Move 5: Situation of the accident**	90.00%	66	15,789
	Move 6: Relevant documents**	73.33%	66	36,216
NARRATIVE (111 observations, 39,099 words)	Move 7: Pre-accident events**	100.00%	39	18,960
	Move 8: Accident**	100.00%	40	8,889
	Move 9: Post-accident events**	93.33%	32	11,250
ANALYSIS & CONCLUSIONS (94 observations, 72,528 words)	Move 10: Aim*	40%	16	1,187
	Move 11: Background information*	46.67%	17	9,269
	Move 12: Findings**	100%	61	62,072
RECOMMENDATION (62 observations, 9,187 words)	Move 13: Actions taken*	36.67%	28	5,352
	Move 14: Actions advised**	93.33%	34	3,835

** Move 1,2,4,5,6,7,8,9,12,14 were conventional.

*Move 3,10,11,13 were optional.

The results of the move analysis in the present study was congruent with those of previous move studies in four aspects:

First, moves were quite variable in length because moves were identified by the communicative purpose that the author tried to accomplish, regardless of whether it was achieved in one sentence or several paragraphs. In the analyzed MSI reports, a move could be as short as ten words in Move 5 of the Details section *(Calliope is a 42 m, 453 GT, 7 motor yacht.*), or as long as several paragraphs, even several pages.

Second, some genres have a relatively simple move structure, with only two or three basic

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communicative functions (e.g. three moves in research article introductions), while other genres may have a complex move structure (e.g. seven moves in the letter of application), with many different communicative functions. Compared with the biochemistry research articles in Kanoksilapatham's 2005 study, the MSI reports possessed simple move structure as the research articles did, 14 moves in total and two to four moves in each section. The communicative function of each move was distinct obviously from one another and contributed to the overall communicative purpose altogether.

Third, while some moves may be realized through two or more different steps, other moves may only be expressed in one general functional-semantic way. In 14 moves of the MSI reports, Move 1, 4, 5, and 6 were realized via 2 to 4 steps, and the other moves achieved the communicative functions in one semantic way.

Finally, move types can be used in different sequential order, or recur in a cyclical fashion within a section of text. The numbers to the moves in the model were just assigned according to the common order they followed in these MSI reports. Variation in the order of both moves and steps is possible, and it is common that one single move could be identified anywhere throughout a report section.

4.2.2 Cross-cultural comparison in move structure

Besides the above-mentioned characteristics, it is also worth noting that the times the same move was observed in English and non-English speaking nations' reports were apparently different. As seen in Table 15 below, it was discernable that Move 3 and 10 merely occurred in English native MSI reports; Move 2, 11 and 13 were mostly observed in English native

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MSI reports; 12 out of 14 moves had more observations in English native MSI reports.

Table 15 Move observations in English and non-English

speaking nations' MSI reports

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14
ES[10]	41	17	15	66	34	44	17	17	17	16	11	44	25	20
NES[11]	32	4	0	48	32	22	22	21	15	0	6	17	3	14

Although the observations of each move obviously differed in English native and non - native reports, it was not well-founded to claim that English and non-English native authors constituted the MSI move structure in different ways. However, Log-likelihood calculator could help test whether the differences of move observations between English and non-English native reports were statistically significant or not. The results of the calculation were shown in Table 16.

Table 16 The Log-likelihood ratios of move

observations in the ES and NES MSI reports

	ES Corpus 384		NES Corpus 236	
Move	**Observations in ES corpus**	**Observations in NES corpus**	**Log-likelihood**	**Sig.**
1	41	32	1.01	0.314 -
2	17	4	3.57	0.059 +

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[10] ES=English Speaking

[11] NES=Non-English Speaking

3	15	0	#	#
4	66	48	0.78	0.377 -
5	34	32	2.96	0.085 -
6	44	22	0.64	0.424 +
7	17	22	5.36	0.021 -
8	17	21	4.60	0.032 -
9	17	15	1.03	0.310 -
10	16	0	#	#
11	11	6	0.06	0.813 +
12	44	17	2.81	0.094 +
13	25	3	10.68	0.001 ** +
14	20	14	0.14	0.710 -

*Note: * indicates that the observed difference is statistically significant with 95% confidence*

**, 99% confidence.

***, 99.9% confidence

+ means that the target move type is overused in ES reports compared with NES reports

– means underused.

In Table 16, there were two moves, Move 3 and 10, without significance data because no observation of these two moves were in NES sub-corpus. Move 3 (recommendations) in the Summary section briefed the crucial safety messages from the accidents and what measures the involved parties were suggested to take for avoiding the similar accidents. Move 10 explained the aim of accident analysis. The following excerpt of Move 10 was extracted from AU-2014-C:

> *The safety issues identified during this investigation are listed in the*

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Findings and Safety issues and actions sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal safety recommendations or safety advisory notices.

All of the directly involved parties were provided with a draft report and invited to provide submissions. As part of that process, each organisation was asked to communicate what safety actions, if any, they had carried out or were planning to carry out in relation to each safety issue relevant to their organisation.

By illuminating the aim of accident analysis, Move 10 urged the involved parties to address the safety issues. Observed only in ES reports, M3 and 10 made a point that English native authors tended to write more extensively over recommendations.

The Log-likelihood ratios in Table 16 denoted that the observations of Move 7 and 8 in ES and NES reports were significantly different with 95% confidence. Compared with the other moves, Move 7 and 8 occurred more frequently in NES MSI reports corpus. Move 7 (pre-accident events) described the events leading to the accident. Move 8 (accident) reported the occurrence of the accident. By examining Move 7 and 8 in the MSI report corpus, it was found that some NES authors described the accident process that each involved vessel (or party) experienced separately. The Narrative section of JP-2014-C illustrated this type of

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move structure:

2.1.4 Progress of the Accident According to the Statements of the

Relevant Persons

(1) Vessels A, C, and D ... .

(2) Vessel B ... ...

(3) Vessel E ... ...

(4) Tokyo MARTIS ... ...

In this way, Move 7 and 8 occurred in every narration of different parties involved. The cyclical reoccurrence of these two moves has been dealt with by considering each appearance of a move as a separate occurrence.

Another remarkable significance data was about Move 13. The observation difference of Move 13 in ES and NES reports was statistically significant with 99% confidence. ES authors showed their preference in applying this move, which enumerated the measures that were taken by the parties involved in the accident for preventing the similar accidents, including issuing circulars, modifying regulations, educating crewmembers, etc. This echoed with the previous presumption that ES authors tended to think more highly of the possible recommendations compared with NES authors.

In a similar vein, the number of words used in each move, disclosed in Table 17, also underscored the differences between ES and NES reports. Table 17 shows at a glance that ES authors wrote more words in all the moves than NES authors. However, considering the size gap between ES and NES sub-corpora, the observed differences could not be recklessly attributed to linguistic variation.

Table 17 The number of words in the ES

and NES MSI reports

	ES	NES	TOTAL
M1	2478	1449	3927
M2	1814	908	2722
M3	1622	--	1622
M4	24244	9451	33695
M5	10512	5277	15789
M6	28734	7482	36216
M7	10368	8592	18960
M8	5273	3616	8889
M9	7787	3463	11250
M10	1187	--	1187
M11	6982	2287	9269
M12	39787	22285	62072
M13	3662	1690	5352
M14	2225	1610	3835
TOTAL	146675	68110	214785

Once again, the Log-likelihood calculator was utilized for testing the significance of the statistic differences. Table 18 reveals the calculation results. The values in Table 18 confirmed that the differences of word numbers were significant in Move 4 (information of the involved parties), Move 6 (relevant documents), Move 9 (post-accident events), Move 11(background information), and Move 13 (actions taken). Move 4, 6, and 11 provided the concrete material and evidence for the accident analysis, and Move 9 and 13 both pertained

to the actions taken by the involved parties.

Table 18 The Log-likelihood ratios of the word numbers

in moves of the ES and NES MSI reports

| Move | ES Corpus 146675 | | NES Corpus 68110 | |
	Observations in ES corpus	Observations in NES corpus	Log-likelihood	Sig.
1	2478	1449	47.53	0.000***-
2	1814	908	3.38	0.066 -
3	1622	0	#	#
4	24244	9451	213.35	0.000***+
5	10512	5277	21.15	0.000***-
6	28734	7482	2208.22	0.000***+
7	10368	8592	1527.61	0.000***-
8	5273	3616	316.41	0.000***-
9	7787	3462	4.50	0.034* +
10	1187	0	#	#
11	6982	2287	221.85	0.000***+
12	39787	22285	492.64	0.000***-
13	3662	1690	0.04	0.833 +
14	2225	1610	178.14	0.000***-

Conversely, the numbers of words in ES Move 1 (accident presentation), Move 5 (situation of the accident), Move 7 (pre-accident events), Move 8 (accident), Move 12 (findings), and Move 14 (actions advised) were significantly less than those in NES counterparts. All these moves coincided with the elements that the Code required a MSI

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report need to comprise.

All above findings synthesized into consideration, the prevailing conventional structure of MSI reports could be constituted as follows in Table 19.

Table 19 Conventional structure of MSI reports

Sections	Moves
SUMMARY	Move 1 Accident presentation
DETAILS	Move 4 Information of the involved parties
	Move 5 Situation of the accident
	Move 6 Relevant documents
NARRATIVE	Move 7 Pre-accident events
	Move 8 Accident
	Move 9 Post-accident events
ANALYSIS AND CONCLUSIONS	Move 12 Findings
RECOMMENDATIONS	Move 14 Actions advised

Apart from the moves in Table 19, the other moves identified in the corpus were mostly in the ES MSI reports. In other parlance, NES authors prudently composed the MSI reports with the mandatory elements while ES authors unconventionally extended the scope of the MSI reports to embrace anything they thought crucial.

4.3 The Featured Linguistic Variables of the MSI Reports

4.3.1 Text types of the conventional moves in the MSI reports

In this study, Multi-dimensional (MD) analysis was used to provide a comprehensive linguistic description of the moves in the studied MSI reports. By extending MD approach

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to the MSI report corpus, some typical linguistic patterns of variation within moves were identified.

MAT was the computer-aided program applied for MD analysis, by which the distributions of the linguistic features were analyzed in each text of the MSI reports corpus. Then the systematic co-occurrence patterns among those linguistic features—the dimensions—were identified. "Once the dimensions of variation were identified, moves and move types can be compared along each dimension" (Nini, 2015). As shown in Table 14 above, move analysis has segmented the obligatory sections in the 30 MSI reports into 622 individual moves. The MAT tagger tool showed the scores for the dimensions found in the moves of the MSI reports as in Table 20. Moreover, MAT program classified each text according to its closest text type as proposed by Biber (1989) using Euclidean distance.

Table 20 The scores of dimensions in moves

in the MSI reports

Filename	D1[12]	D2	D3	D4	D5	D6
M1	-21.6	-0.59	-0.23	-6.31	3.58	-2.54
M2	-14.8	-1.42	4.58	-3.57	5.71	-0.02
M3	-18.6	-3.16	14.19	2.99	5.68	0.1
M4	-21.7	-0.79	5.15	-5.81	2.14	-2.24
M5	-20.4	-1.83	2.6	-6.08	1.13	-2.22
M6	-19.1	-1.99	6.01	-1.25	1.69	-1.21
M7	-19	-0.82	0.14	-3.24	0.65	-0.7

---

[12] Dn represents the type of the dimension. For example, D1 is Dimension 1.

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M8	-15.7	0.95	-0.84	-2.75	0.95	-0.64
M9	-18.7	0.35	0.58	-2.47	2.12	-1.07
M10	-20.2	-5.4	10.93	6.31	8.17	2.1
M11	-15.1	-1.21	1.84	-2.95	6.51	-0.78
M12	-11.8	-0.09	4.36	-0.25	5.12	-0.57
M13	-18	-2.58	9.5	1.64	2.89	-0.76
M14	-18.7	-4.33	11.72	5.07	2.36	0.83

Significant linguistic differences have been detected by these dimensions among the moves. In light of the rare observations of the optional moves, in the MD analysis, only the conventional moves were scrutinized. The following subsections described how the conventional moves (Move 1, 2, 4, 5, 6, 7, 8, 9, 12, and 14) differed with respect to the dimensions.

Move 1: Accident presentation

Move 1 only bore positive loading on D5, which denoted that the texts of this move provided information in a technical, abstract and formal way, as in scientific discourse. A high score on D5 means that the text presents many passive clauses and conjuncts (among other features). MAT program output a graph that displayed the location of the input text's dimension scores compared to a number of genres Biber (1988) proposed. MAT program printed the closest genre to the user's text next to the title of the graph. Figure 1 was the graph of D5 of Move 1 which manifested that the closest genre to D5 is official documents.

The lowest score for this move was on D1, which indicated that the text was informationally dense and presented many nouns, long words, and adjectives (among other features).

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Dimension 5- Abstract vs Non-Abstract Information-Closest genre: Official documents
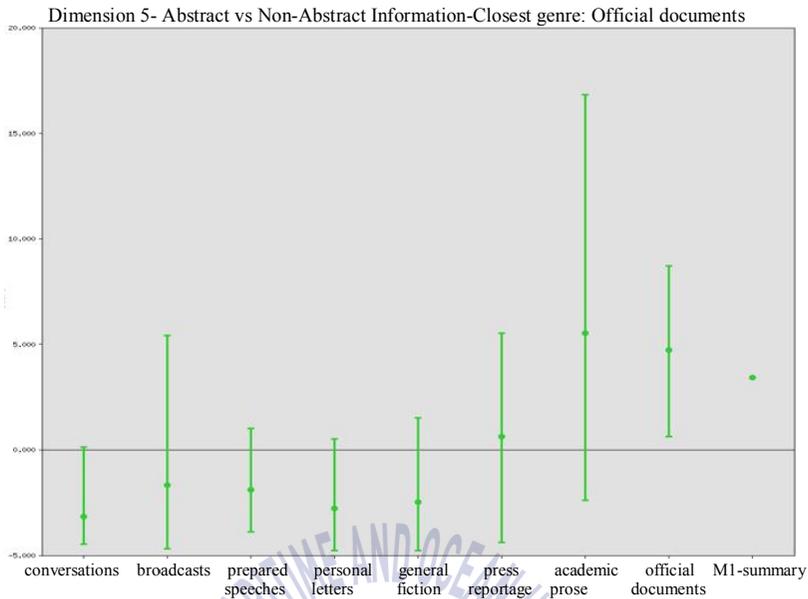
Figure 1 Genre type of Dimension 5 in Move 1

The closest genre type to D1 of Move 1 was also official documents. Low score on D1 and high score on D5 classified Move 1 as Learned Exposition (LE).

Move 2: Conclusions

Move 2 had positive and high scores on D3 and D5. D3 was the scale between Context-Independent Discourse and Context-Dependent Discourse. A high score in this dimension indicated that the text presented many nominalizations and was not dependent on the context (e.g., academic prose). The closest genre types to D3 of Move 2 were academic prose as shown in Figure 2, so was D5.

The lowest score of Move 2 occurred on D1 whose location was also closest to academic prose in the genre graph.

The text type of Move 2 was, as informational and formal as Move 1 but more technical,

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designated as Scientific Exposition (SE).

Dimension 3- Explicit vs Situation-Dependent Reference-Closest genre: Academic prose
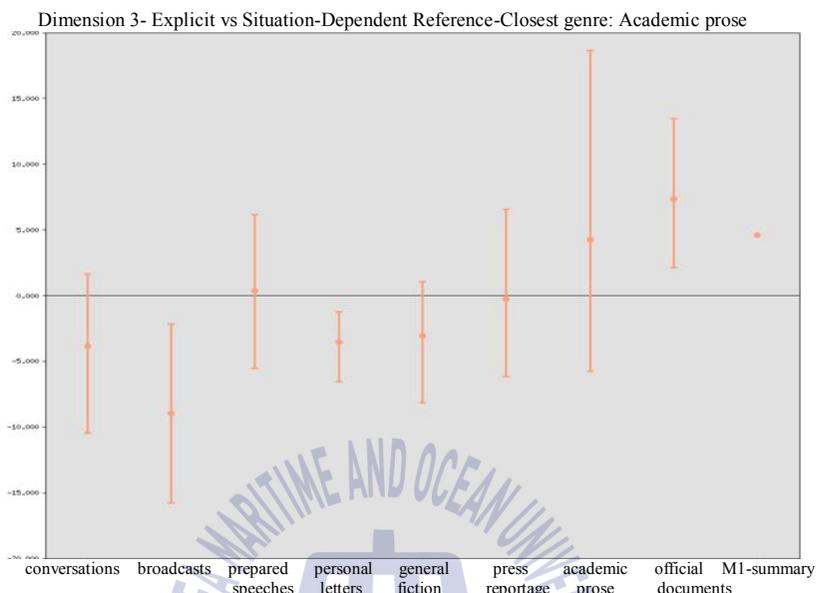
Figure 2 Genre type of Dimension 3 in Move 2

Move 4: Information of the involved parties

As Move 1, Move 4 belonged to LE text type, bearing low score on D1, high score on D3 and D5. However, the closest genres to these dimensions in Move 4 were different from those in Move 1. D1 of Move 4 was located closest to official documents in the graph, D3 academic prose, and D5 press reportage (see Figure 3, 4, and 5).

The closest genre of D5 in Move 4 was press reportage that was the characterizing genre of general narrative, but the score of D5 was not as influential as the key determiner of the text type of Move 4. Move 4 provided dense information in a technical, abstract, and formal way that was not dependent on the context, which decided the text type of Move 4 was LE.

Dimension 1- Involved vs Informational Production-Closest genre: Official documents
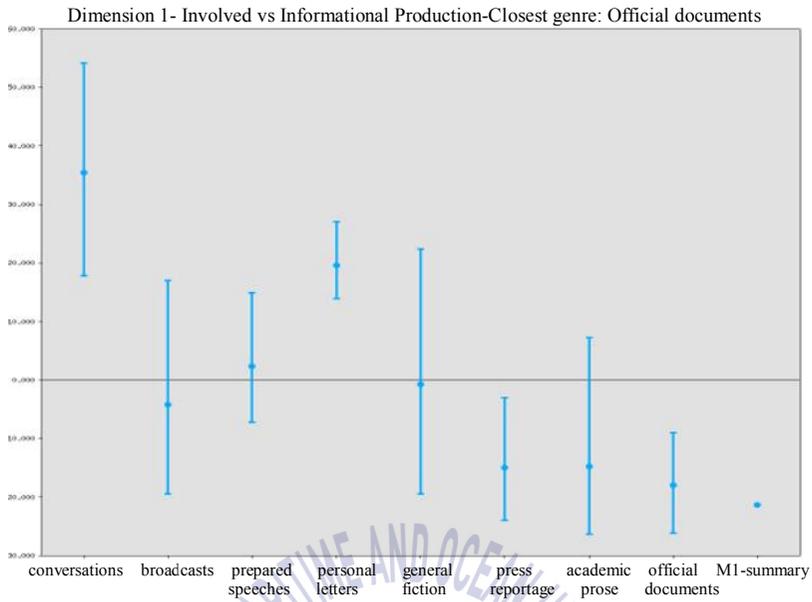
Figure 3 Genre type of Dimension 1 in Move 4

Dimension 3- Explicit vs Situation-Dependent Reference-Closest genre: Academic prose
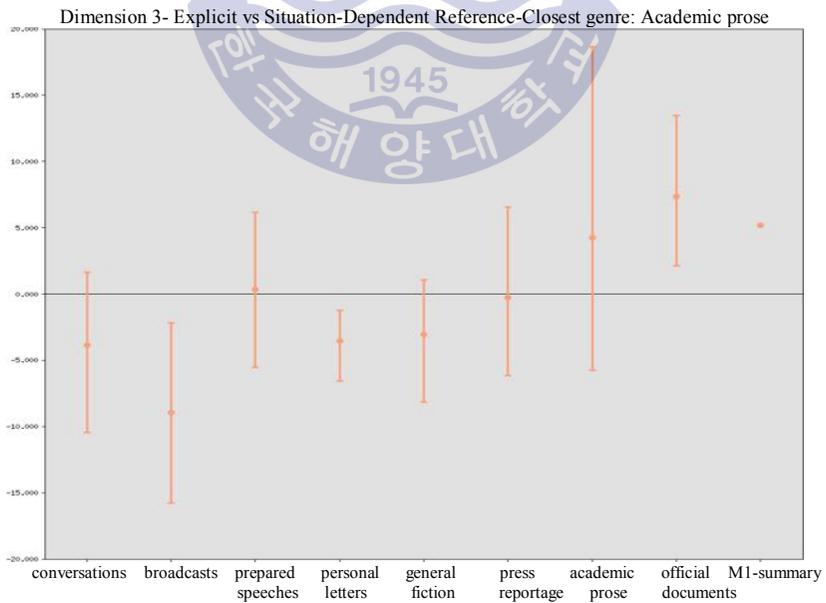
Figure 4 Genre type of Dimension 3 in Move 4

Dimension 5- Abstract vs Non-Abstract Information-Closest genre: Press reportage
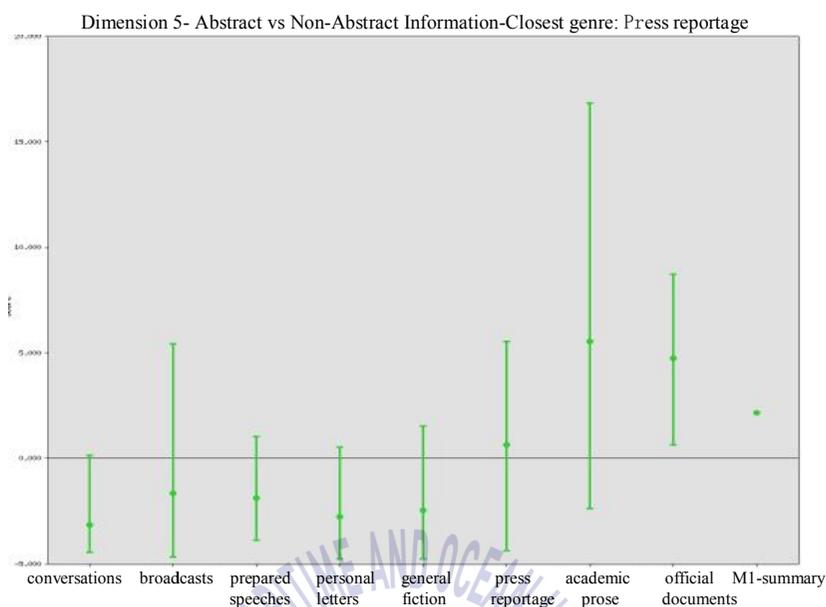
Figure 5 Genre type of Dimension 5 in Move 4

Move 5: Situation of the accident

The text type of Move 5 was also LE. D1, D3 and D5 in Move 5 located closest to official documents, academic prose, and press reportage as those in Move 4. Whereas the outstanding linguistic variables were different which would be spelled out in the following sub-section.

Move 6: Relevant documents

Move 6, again, belonged to LE. However, D3 in Move 6 was closest to official documents rather than academic prose as in Move 4 and 5 (see Figure 6).

Move 7: Pre-accident events

Move 7 also belonged to LE as Move 6, but D3 is closest to prepared speeches (see Figure 7). Prepared speeches characterized imaginative narrative. Since the score of D3 was not as

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high as the determinant, the general text type of Move 7 was determined by D1 and D5. D1 was closest to official documents, and D5 press reportage.

Dimension 3- Explicit vs Situation-Dependent Reference-Closest genre: Official documents
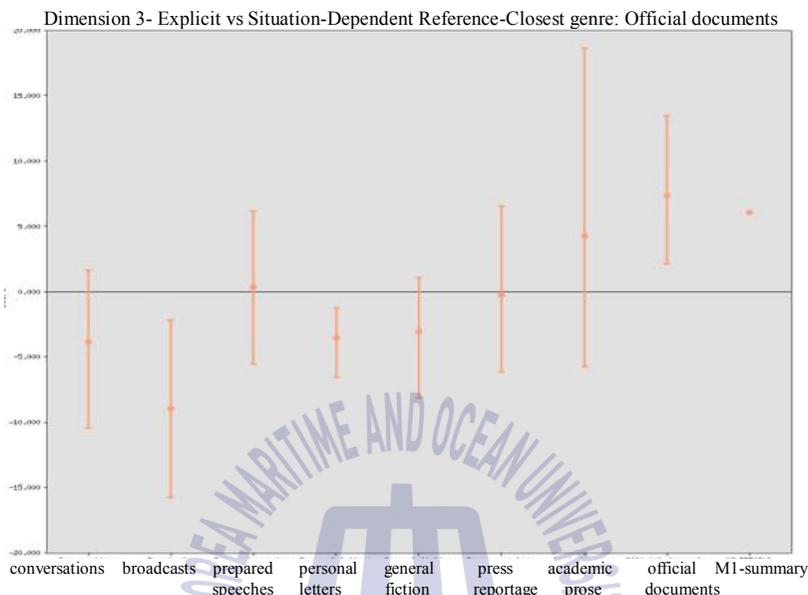
Figure 6 Genre type of Dimension 3 in Move 6

Dimension 3- Explicit vs Situation-Dependent Reference-Closest genre: Prepared speeches
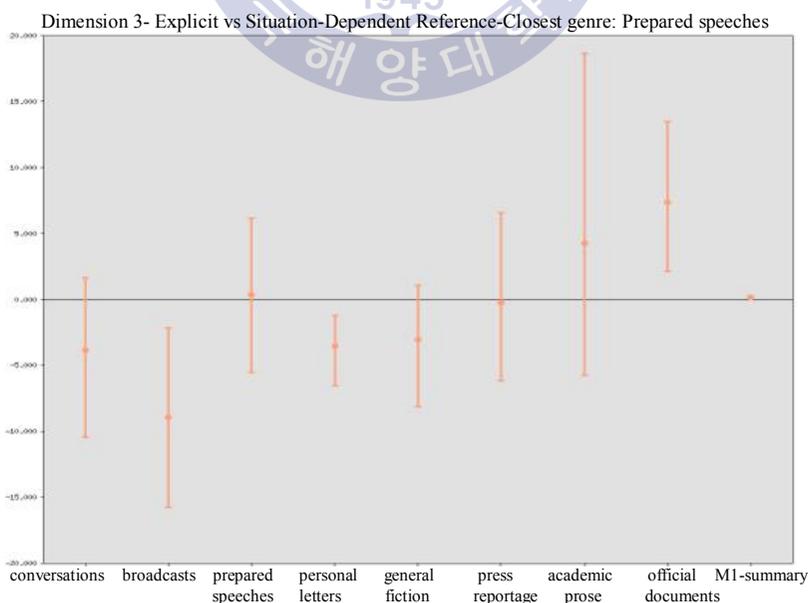
Figure 7 Genre type of Dimension 3 in Move 7

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Move 8: Accident

The text type of Move 8 was General Narrative Exposition (GNE) which differed from all the other moves. GNE, characterized by low score on D1 and high score on D2, typically used narration to convey information. D1 and D2 in Move 8 resembled press reportage and prepared speeches respectively as shown in Figure 8 and 9.

Move 9: Post-accident events

Move 9 was classified into LE though D3 was closest to prepared speeches that presented an extreme narrative concern (see Figure 10).
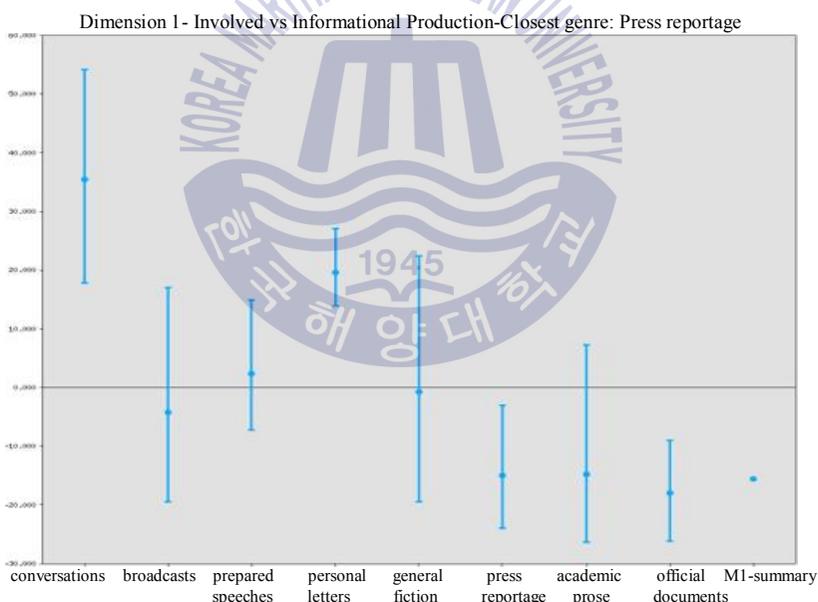
Figure 8 Genre type of Dimension 1 in Move 8

Dimension 2- Narrative vs Non-Narrative Concerns-Closest genre: Prepared speeches
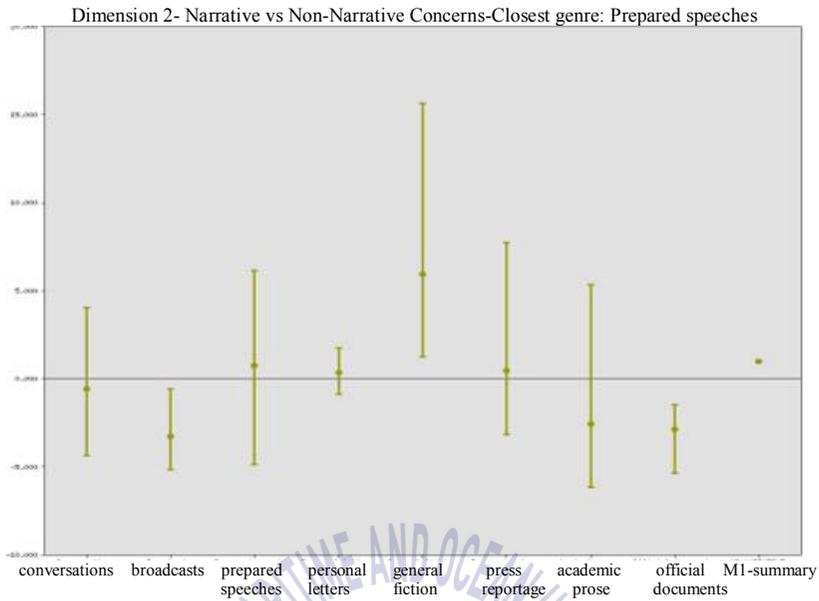
Figure 9 Genre type of Dimension 2 in Move 8

Dimension 3- Explicit vs Situation-Dependent Reference-Closest genre: Prepared speeches
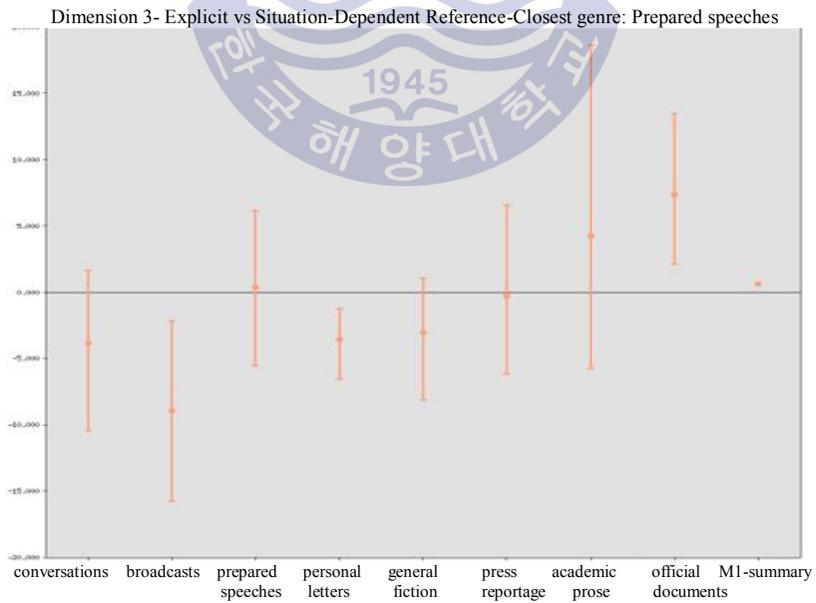
Figure 10 Genre type of Dimension 3 in Move 9

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Move 12: Findings

The communicative function of Move 12 was to release the results of the accident analysis, in which the information conveyed was required as formal as possible, especially with technical parameters. Therefore, it was not out of the expectation that Move 12 was featured as SE. Among all the conventional moves in the studied MSI reports, the other SE type was Move 2 as mentioned earlier. The significant determiners of this text type were D1, D3, and D5, which all were closest to academic prose in Move 2 and 12. However, the other dimensions in these two moves resembled different genres. In Move 2, D2 and D6 were conversations, and D4 was broadcasts; in Move 12, D2 was personal letters, and D4 and D6 were official documents. Move 2 and 12 both displayed the findings of investigation, but the differences on D2, D4, and D6 between these two moves were rational because Move 2 in Summary section was shorter in length and brief in content which were shared features with conversations and broadcasts, and Move 12 was more formal and detailed like letters and official documents.

Move 14: Actions advised

The text type of Move 14 was LE with the highest score on D3 and lowest on D1. According to the summary of Biber's (1989) text types, LE texts should bear low score on D1, and high score on D3 and D5. In Move 14, the score of D5 was not as high as expected. The second highest score was on D4 which was closest to personal letters as shown in Figure 11.

Dimension 4- Overt Expression of Persuasion-Closest genre: Personal letters
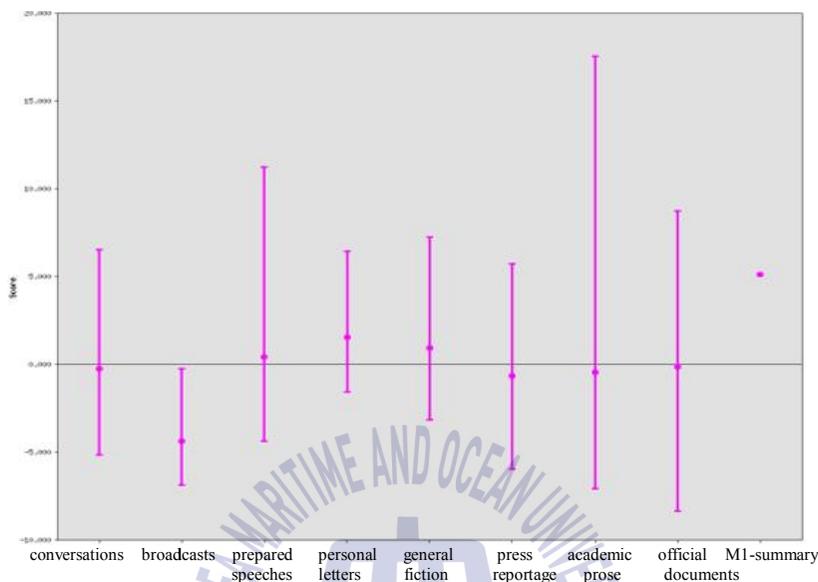
Figure 11 Genre type of Dimension 4 in Move 14

To sum up, most of the conventional moves in MSI reports corpus were identified as LE that comprised typically informational as well as formal texts. Move 2 and 12 were SE that were relatively technical. Move 8 was GNE that narrated to deliver information.

The closest text type of each move in the studied MSI reports were listed in Table 21 below.

Table 21 Text types of the moves in the MSI reports

Move	M1	M2	M4	M5	M6	M7	M8	M9	M12	M14
The closest text type	LE	SE	LE	LE	LE	LE	GNE	LE	SE	LE

The closest text types of the moves were determined by the Z-scores of six dimensions. Figure 12 visualized the Z-scores of six dimensions in ten conventional moves.

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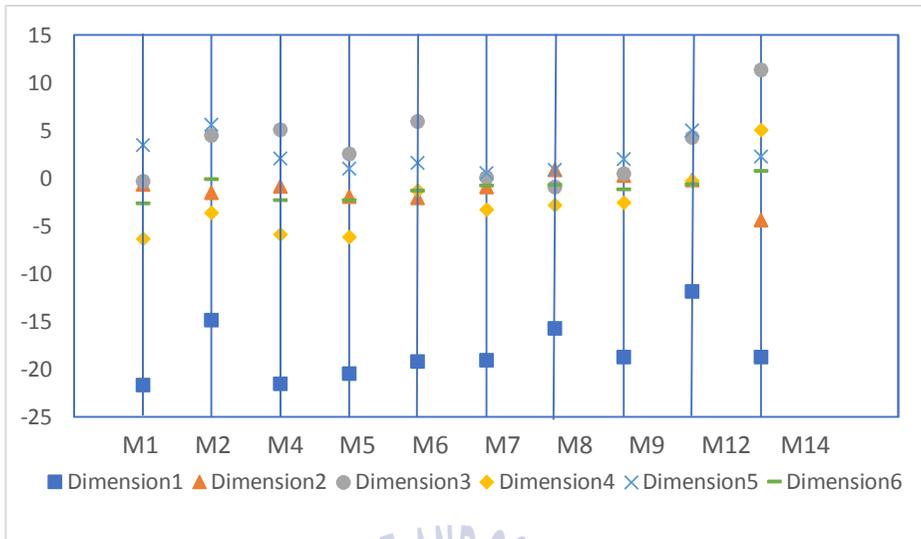
Figure 12 Z-scores of dimensions in conventional moves

in the MSI reports

On D1, the lower the Zscore was the more informational the text was. Move 2 and 12 were of the highest score on D1, which meant these two moves were relatively less informational than the other moves. The rationale behind it should be that Move 2 and 12 concluded the results of the marine safety investigation instead of providing information. Meanwhile, Move 2 and 12 were also the highest on D5 that indicated the text were composed in a technical, abstract, and formal way (Nini, 2015). D2 was about the narrative or non-narrative concerns. The fact that Move 8 ranked top on this dimension was reasonable in that the rhetorical function of Move 8 was to detail the occurrence of the accident.

The Z-score of Move 14 on D3 was the highest, which figured that the texts in this move were not dependent on the context. In most MSI reports analyzed, the suggestions in Move 14 were given in lines of separated provisions. To recommend actions to be taken for

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avoiding similar accidents, Move 14 also ranked top on D4 that measured Overt Expression of Persuasion. The content in Move 14 explicitly marks the author's point of view as well as their assessment of likelihood and/or certainty (Nini, 2015). D6 measured On-line Informational Elaboration. According to Nini (2015), high scores on this variable indicate that the text is informational in nature but produced under certain time constraints. The distances between the scores on D6 of all conventional moves were not big. Only one positive score on D6 was born by Move 14 which might present more postmodifications of noun phrases (Nini, 2015).

4.3.2 Linguistic variables of the conventional moves in the MSI reports

The score of each dimension was determined by the co-occurred linguistic variables. Both LE and SE type moves were identified with low score on D1 and high scores on D3 and D5, which meant that these texts presented many nouns, nominalizations, long words, adjectives, passive clauses and conjunctions (Nini, 2015). GNE bore low score on D1 and high score on D2, which indicated that the moves of this type presented many nouns, long words, adjectives, past tenses and third person pronouns (Nini, 2015). MAT program output a file recording the Z-scores of the linguistic variables in each move. The underused and overused linguistic variables in each move were listed as well. We could consult Table 22 for the characterizing linguistic variables in the conventional moves. It was obvious that all conventional moves of the MSI reports underused RB (Total adverbs), and some underused [BEMA] (Be as main verb). The following sub-section elaborated the overused linguistic variables in each move.

Table 22 Characterizing linguistic variables in

conventional moves in the MSI reports

Filename	Underused variables	Overused variables
M1-Accident presentation	RB [BEMA]	NN [PASTP] [SERE]
M2-Conclusions	RB	CONJ NN OSUB THAC TSUB [SERE] [SPIN]
M4-Information of the involved parties	RB	NN [PASTP] [SERE]
M5-Situation of the accident	RB	NN [SERE] [SPIN] [WZPRES]
M6-Relevant documents	RB	NN PHC [SPIN] [WZPRES]
M7-Pre-accident events	RB	NN PLACE [SERE] [SPIN]
M8-Accident	RB [BEMA]	NN [SPIN]
M9-Post-accident events	RB [BEMA]	NN [SPIN]
M12-Aim	RB	CONJ NN PHC PRED THAC [SERE] [SPIN]
M14-Actions advised	RB [BEMA]	AWL NN NOMZ PHC TO TSUB [SPIN] [SUAV] [WZPRES]

* [ ] signified sentence structures

Move 1: Accident presentation

Texts belonging to Move 1 were typically expositions that were formal and focused on conveying information. Z-score test of the linguistic features showed that NN, [PASTP] and [SERE] were overused in this move compared with other ones. NN referred to any noun that has been tagged by the Stanford Tagger and that has not been identified as a nominalization or a gerund. Plural nouns (NNS) and proper nouns (NNP and NNPS) were also included in

this count. The NNs of high frequency in Move 1 were *vessel, port, ship, board, crew, fire, cargo, coast, guard,* and *passengers.*

[PASTP] represented past participial clauses. This tag was assigned when a punctuation mark was followed by a past participial form of a verb (VBN) followed by a preposition (PIN) or an adverb (RB) as seen in an extract from the corpus below.

the Coast Guard patrol boat, valued [PASTP] at $ 80,000, was declared

[SERE] counted and tagged a sentence relative every time when a punctuation mark is followed by the word *which*:

The flashback started a small fire on the deck, which [SERE] was [SPAU] [BYPA] quickly extinguished by the three men.

Move 2: Conclusions

Move 2 was SE type text. The featured linguistic variables in this move were CONJ, NN, OSUB, THAC, TSUB, [SERE], and [SPIN].

CONJ stood for conjuncts, such as *as, consequently, furthermore, hence, instead, notwithstanding, similarly, therefore, thus* which were found in Move 2.

NNs of high frequency were *safety, collision, bridge, speed, vessel, board, cause, investigation,* and *procedures.*

OSUB meant other adverbial subordinators, like *since, while, whilst, whereupon,* etc. In Move 2, eleven *while* and one *since* have been spotted.

THAC tagged *that* preceded by an adjective:

It is probable that_THAC the accident of collision between…

TSUB was *that* relative clauses on subject position, for example:

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Current guidance on the methods that_TSUB can be used to assess the stability of...

[SERE] in Move 2 had 5 hits. One of the instances was as follows:

the Centinel System's lube oil hose, which [SERE] allowed the hose to come   ...

[SPIN] (Split infinitives) were identified every time when an infinitive marker *to* was followed by one or two adverbs and a verb base form:

Hence, he was not in a position to [SPIN] properly monitor the yacht's progress.

Move 4: Information of the involved parties

According to the Z-scores, the overused linguistic variables in this move were NN, [PASTP], and [SERE]. The examples of these variables were as follows:

NNs: *vessel, master, engine, ship, accident, coast, years, time, company, guard,* and *board*

[PASTP]: *The unit comprises a fully automatic pressure jet oil burner, integrated [PASTP] with a single electric motor.*

[SERE]: *There were 18 crews on board the ship, which [SERE] meets the requirements of ship TM's Minimum Safety Manning Certificate.*

Of note was that the overused linguistic variables in Move 4 were of the same types as those in Move 1, but the top ten NNs were different. The most NN in Move 1 and 4 were both *vessel*. However, as for the persons involved, *master* was frequently mentioned in Move 4, but *crew* and *passengers* were relatively overused in Move 1. It could be attributed to the different communicative purposes of these two moves. Move 1 presented the occurrence and results of the accident in which crew and passengers' reactions and loss might be more involved. Move 4 provided the information of the related parties in the accident in which master played a critical role.

Move 5: Situation of the accident

It has been mentioned previously that the characterizing dimensions of Move 4 and 5 resemble the same genres, but while looking closely at the linguistic features, disparities were obvious between these two moves. Move 4 overused NN, [PASTP], and [SERE], but the outstanding linguistic variables in Move 5 were NN, [SERE], [SPIN], and [WZPRES]. The examples of these variables were listed as below:

NNs: *vessel, coast, guard, accident, port, area, damage, weather, time, wind*

[SERE]: *individual was directly involved in a marine casualty , which [SERE] is defined as material damage*

[SPIN]*: the port guidelines and\/or their ability to [SPIN] safely maneuver their yacht within*

[WZPRES] tagged a present participial form of a verb which was preceded by a noun (NN):

the port authority, maintains a 24-hour vessel traffic service which aims to provide vessels using [WZPRES] the port with an information service,

Move 6: Relevant documents

The linguistic variables of high Z-scores in this move were NN, PHC, [SPIN], and [WZPRES]. NNs of high frequency were *vessel, safety, vessels, coast, guard, pilot, fishing, accident, master,* and *ship.*

PHC referred to phrasal coordination. This tag was assigned to any *and* that is preceded and followed by the same tag:

The harbor authority TM's management team and_PHC board of trustees.

Move 7: Pre-accident events

To present the pre-accident events, Move 7 applied specific linguistic patterns such as NN, PLACE, [SERE], and [SPIN]:

The top ten NNs in move 7 were *vessel, master, port, officer, cargo, pilot, speed, bridge, ship,* and *starboard.*

PLACE tagged place adverbials like *ashore, north, inside, around, east, across, west, east, alongside, ahead, astern, behind, south, away, upstairs, beneath, near, outside, etc.*

Move 8: Accident

The overused linguistic variables in Move 8 were NN and [SPIN]. The NNs of the highest frequencies were *vessel, starboard, room, engineer, master, engine, fire, port, officer,* and *bridge.*

The example of [SPIN] in Move 8 was as the following excerpt:

He then tried to [SPIN] manually ignite the burner to test its operation.

Move 9: Post-accident events

Move 9 shared the same types of featured linguistic variables with Move 8, NN and [SPIN]. Whereas the most frequent NNs were not the same. In Move 9, the top ten NNs were *vessel, master, boat, water, engineer, engine, passengers, room, fire,* and *coast.*

Move 12: Findings

Move 12, like Move 2, was SE type text. The determining linguistic variables were CONJ, NN, PHC, PRED, THAC, [SERE], and [SPIN].

CONJ in Move 12 were *as, consequently, furthermore, hence, however, in addition, in contrast, instead, likewise, moreover, nevertheless, nonetheless, notwithstanding, on the*

other hand, otherwise, rather than, similarly, therefore, and *thus.*

NNs of top frequencies were *vessel, safety, master, vessels, port, fire, cargo, crew, ship,* and *officer.*

PRED represented predicative adjectives such as in the following sentence:

… …had interpreted to be behavior that was acceptable_PRED to the master.

Move 14: Actions advised

The members of overused linguistic variables in Move 14 were AWL, NN, NOMZ, PHC, TO, TSUB, [SPIN], [SUAV] and [WZPRES]. Among these variables, AWL, NOWN, and [SUAV] were salient compared with other moves.

AWL referred to Average Word Length. The Stanford Tagger defined a word as any string separated by space in the text. Mean length of words in Move 14 was 5.40 which was the longest amidst all conventional moves of the studied MSI reports.

The most occurred NNs in this move were *safety, vessel, action, vessels, system, board, management, procedures, training,* and *company.*

NOMZ was the tag for nominalizations which classified any noun ending in -tion, -ment, -ness, or -ity, plus the plural forms. The most used nominalizations in Move 14 were (in decreasing order) *action, recommendation(s), management, operation(s), requirement(s), association, investigation(s), stability, document(s),* and *inspection.*

[SUAV] tag found the suasive verbs listed by Quirk & Crystal (1985). In Move 14, the most frequent suasive verbs was *recommend*, and then *ensure, stipulate, require, request, propose, instruct, determine, desire, decide,* and *arrange* followed.

In a nutshell, moves closest to LE did not share many determining linguistic variables

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except for NN. The most frequently used NN in this type of moves was *vessel*. Besides NN, other featured variables occurred in more than one LE move were [SERE], [SPIN], [WZPRES], and [PASTP]. [SERE] tagged *which* following a comma, which signified non-restrictive clauses. [SPIN] identified split infinitives with adverb(s) between *to* and a verb base form. [WZPRES] denoted present participial following nouns. [PASTP] stood for past participial clauses. All these featured variables were forms to provide modifying, parenthetic, or supplementary information, which composed LE type moves to be informationally dense.

CONJ, PRED and THAC were only overused in SE type moves. CONJ targeted conjuncts; PRED indicated predicative adjectives; THAC tagged *that* preceded by an adjective. The information presented in these three forms were defining and identifying, which created precise and scientific tone of the moves.

The GNE type, Move 8, was featured with the same linguistic variables (NN and SPIN) as LE type Move 9 did, which was possibly because Move 8 and 9 both described the events and procedures of the accidents. However, Move 8 only narrated the moments accidents happened, and Move 9 elaborated the immediate reactions of all involved parties which covered more comprehensive information.

The mean word length in Move 14 was the longest, and the overused variables the most, among which [SUAV] referred to suasive verbs. These suasive verbs specifically served the purpose of this move to recommend practical measures for preventing future similar accidents.

4.3.3 Cross-cultural comparison in linguistic variables

In the process of move analysis, disparities between the ES and NES reports have been

observed. Hence the linguistic variables needed to be scrutinized within these two groups of texts. When the ES and NES MSI reports were input into the MAT program, the output files sent out the statistic results that were visualized below:
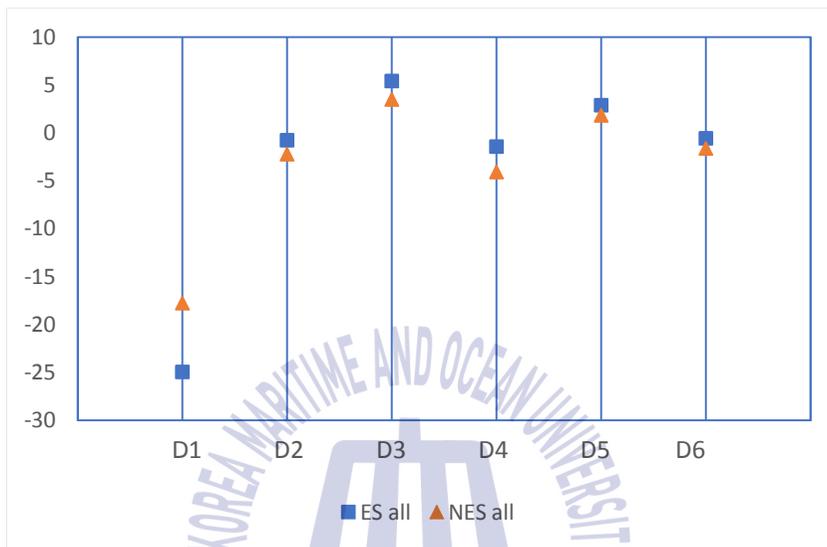
Figure 13 Z-scores of dimensions in the ES and NES MSI reports

The Z-scores of dimensions in the ES and NES MSI reports affirmed that they both belong to LE type of texts. Figure 13 clarified the differences between the ES and NES MSI reports on dimensions, where the values of these two sub-corpora on D1 posed the largest gap denoting that the ES MSI reports were more informational than the NES ones. Another distinct difference appeared on D4 where the ES MSI reports applied more overt expressions of persuasion than did the NES ones. This result echoed with former findings in move analysis that ES authors proposed more recommendations than the NES ones did because the expression of persuasion was primarily used to state the author's suggestions that were overt in Move 14 (actions advised).

As for the featured linguistic variables in the ES and NES reports, the program showcased them in Table 23.

Table 23 Characterizing linguistic variables

in the ES and NES MSI reports

	Underused variables	Overused variables
ES	RB	NN, PHC, TTR, [SERE], [SPIN]
NES	RB	NN, PHC, THAC, [PASTP], [SPIN]

From Table 23, it could be inferred that the ES reports possessed a greater lexical variety in light of the higher Z-score on TTR. The overuse of [SERE] in the ES MSI reports illuminated that the English native authors preferred sentence relative pattern as seen in …*also caused a small fire on the deck, which_WDT [SERE] was quickly extinguished.*

The NES authors tended to use more THAC (*That* adjective complements) and [PASTP] (Past participial clauses). It was found that THAC in the NES MSI reports was mostly used for assessing or evaluating likelihood and/or certainty (e.g. *It is probable that_THAC the Spring was to be put through the fore fairlead.*). The most frequent PRED with THAC was *probable.* The others were *likely, desirable, possible,* and *unaware.* [PASTP] was intrinsically in passive voice (e.g. *Included [PASTP] in agenda for senior officer pre-joining briefing*…). Passive voice was taken as an effective means to achieve the objectivity of the texts. It could be assumed that, using more THAC and [PASTP] patterns, the NES authors tended to analyze the accident more prudently and cautiously, and try to avoid any definite conclusions.

Chapter 5   Conclusions

5.1 Research Findings

The current study aimed to analyze MSI reports within the theoretical sphere of genre. Based on corpus approaches, Swales' (1995) move analysis and Biber's (1988) multi-dimensional (MD) framework were applied to explore the rhetorical structure and linguistic variables of the MSI reports. The analyzed corpus consisted of 30 authentic MSI reports from six countries (Australia, UK, US, China, Japan, and Korea). Combining quantitative and qualitative methodologies, initial procedures of move identification were accomplished manually. Wordsmith 5.0, SPSS software, Loglikelihood calculator, and MAT program were the computer-aided tools utilized to obtain statistics for further analyses. On determining the moves and move types, general top-down steps proposed by Kanoksilapatham (2007) were used to conduct in-depth analysis.

Following the top-down research procedure, the researcher worked together with an expert in MSI profession to demarcate the moves in the MSI reports. Prior to deciding the move types, six obligatory sections (Summary-Details-Narrative-Analysis-Conclusions-Recommendations) were first settled according to the related IMO guidelines and the macrostructure of the collected MSI reports. Intercoder reliability tested, 14 moves in the six obligatory sections have been finally identified. Each obligatory section was composed of two to four moves functioned individually to reach the overall purpose, rhetorical functions of some moves being realized via several steps. The characteristics of moves concluded from

previous seminal studies were checked and detected in this study. First, the distribution of moves could be cyclical in a text, which meant the discrete sentences in the text possibly served as one move. In the studied MSI reports, moves in each section were not organized in series. Nevertheless, 14 moves and the subordinate steps were coded in the sequence where they usually occurred. Second, some moves appeared more frequently than the others. Cut off at 60% occurrence in the corpus (Kanoksilapatham, 2003), ten moves in the MSI reports were marked as the conventional, four the optional. Last but not the least, the lengths of moves could be of great difference. The shortest move located in this study was of ten words, the longest several paragraphs.

In the subsection of move description, each move and step were elaborated, both individual and overall communicative purposes being articulated. Summary section was composed of two conventional moves (Move 1 and 2) and 1 optional move (Move 3). Move 1 briefly introduced the process and results of the accident via two steps. Move 2 summarized the findings of the investigation. Move 3 sketched the suggestions for involved parties. Even if Move 3 was absent in many MSI reports, Move 1 and Move 2 collaborated to impress the audience with the key information at the beginning of MSI reports. Details section covered the most body of MSI reports, and included the most steps. Each of three conventional moves in this section was made up with several steps, which aimed to demonstrate the background (Move 4), situation (Move 5), and related data (Move 6) of the marine accident. Narrative section expatiated the process of the accident from Move 7 (pre-accident events), Move 8 (accident), to Move 9 (post-accident). Analysis and Conclusions sections were incorporated for move identification in that the communicative purpose of

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Conclusions was identical to certain segments of Analysis. Move 10 (aim) was only observed in 40% of the MSI reports. Move 11 (background information) was also included in less than half of the studied MSI reports. These two moves were thus recognized as the optional. Move 12 (findings) was the conventional occurred in all of the studied reports. Moreover, the cyclical pattern of moves in these two sections was not as frequent as in other ones. Recommendations section was composed of Move 13 (action taken) and Move 14 (action advised). Move 13 was optional and mostly occurred in Australian reports.

The observation that some moves only appeared in MSI reports of certain nations drove the study further to compare the statistics of the ES and NES MSI reports. The statistic of move observation showed that Move 3, 10, and 13 were overused significantly in the ES MSI reports. Move 3 briefed the recommendations. Move 10 emphasized the importance of the analysis. Move 13 listed the actions taken by involved parties. It could be postulated that the ES authors tended to stress the measures for avoiding accidents. On the other hand, the occurrences of Move 7 and 8 were significantly higher in the NES MSI reports. A close examination revealed that it was due to the specific structure of the Narrative section in some NES MSI reports that did not describe the accident chronologically but individually based on the involved parties. Each time when an individual's experience was narrated, both Move 7 and 8 would be counted anew. The other parameter for cross-cultural comparison was the number of words. The ES authors used more words in Move 4, 6, 9, 11, and 13, while the NES authors used more in Move 1, 5, 7, 8, 12, and 14. It seemed that the NES authors followed the guideline of the Code more carefully by highlighting the mandatory elements for MSI reports, while the ES authors extended the scope to public information as much as

possible. Based on the results of move analysis and cross-cultural comparison, the conventional structure of MSI reports had been established with Move 1, 4, 5, 6, 7, 8, 9, 12, and 14.

The results of move analysis built the frame model for MD analysis, in which the optional moves were excluded. All the texts of conventional moves were input into the MAT program that scored the six dimensions for deciding the closest text type of each move. The output files of MAT contended that most of the studied moves were recognized as Learned Exposition; Move 2 and 12 were Scientific Exposition; Move 8 was General Narrative Exposition. Learned Exposition was characterized with dense information and formal tune. Scientific Exposition was also formal but more technical. General Narrative Exposition delivered information in narrative rather than in argumentative or expository writing.

By comparing the Z-scores of the six dimensions in the conventional moves, the outstanding dimensions for individual moves were located. Move 2 and 12 ranked top on D1, which certified that these two moves were less informational than the other moves. Move 8 scored highest on D2 due to high narrative concern. Move 14 reached the climax on D3, D4, and D6, which reflected that Move 14 was not much dependent on the context, and adopted plentiful persuasive expressions and postmodifications of noun phrases.

Keeping abreast of text types, Z-scores of the linguistic variables were output as well, which specified the lexico-grammatical patterns featured in each conventional move. By and large, NN was the overused variable across all the moves, and the most frequent NN in all the moves was *vessel*. The determining linguistic variables in LE type moves were [SERE], [SPIN], [WZPRES], and [PASTP], which constituted the LE moves with modifying,

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parenthetic, or supplementary information. CONJ, PRED, and THAC were characterizing in SE type moves, whose information was relatively defining and identifying. The only GNE type move, Move 8 was featured with NN and [SPIN]. Move 14 was of the longest mean word length and most overused variables, among which [SUAV] was significant in fulfilling the rhetorical function of this move.

The differences between the ES and NES reports in move analysis inspired the researcher to compare them in MD analysis phase. The distinct differences were visualized on D1 and D4. The statistic values elucidated that the ES MSI reports were more informational and employed more overt expressions of persuasion than did the NES ones, which was consistent with the previous findings in this study that the ES authors proposed more recommendations than did the NES ones. Differences were perceived on exerting linguistic variables as well. ES authors wrote with more lexical types and sentence relative structures. NES authors, however, showed their preference in using *That* adjective complements and past participial clauses. *That* adjective complements in the NES MSI reports were found concurrent with words assessing likelihood and/or certainty such as *probable*, which revealed that the NES authors were not willing to draw conclusions definitely. Passive voice in past participial clauses was interpreted as a means to achieve objectivity of the analyses.

All in all, the findings from move and MD analyses have portraited MSI reports delicately as a genre. Complying with the requirements in the Code, collected MSI reports covered six obligatory sections whose rhetorical functions were realized via 14 moves. The individual functions of each move, which were implemented with distinct linguistic variables, collaborated to achieve the overall communicative purpose of the MSI reports, that is, to

explore the possible causes to the accidents and propose the feasible advices for avoiding similar recurrence.

5.2 Implications of the Study

The current study made contributions to genre analysis in several ways. First, it first focused and explored the MSI reports thoroughly as a genre. Second, it analyzed the discourse structure of all six conventional sections (Summary – Details – Narrative – Analysis – Conclusions - Recommendations) and undertook a detailed linguistic description of the moves in MSI reports. Nwogu's 1997 study was the initial one that described moves in all four sections of research articles based on the analysis of 15 medical articles. In Kanoksilapatham's 2005 thesis, 60 biochemistry research articles were first analyzed for move structure through all the sections. Move analysis has rarely been applied to an entire corpus of texts because it is highly labor-intensive. However, this investment of labor pays off by enabling generalizable analyses of discourse structure across a representative sample of texts from a genre. Third, the move description in this study incorporated the analysis of the multiple distinct linguistic features, which was made possible by corpus-based techniques. This study successfully applied MD analysis, with both qualitative and quantitative approaches, to systematically identify the linguistic features associated with each move type (representing different communicative purposes) and to provide a more comprehensive description of rhetorical organization in MSI reports.

The corpus in the current study was compiled with authentic MSI reports randomly selected from the sources issued by competent authorities, which guaranteed the

representativeness of the data. While choosing the authorities, the language background of the MSI reports writers was taken into consideration, so equal numbers of reports were retrieved from English and non-English speaking nations. Such a representative and balanced corpus made it credible to extend the findings on the sample corpus to all MSI reports. Professional and pedagogical implications could be generalized in the MSI field.

The professional implications of this study went for the authors as well as the audience of the MSI reports. The audience of MSI reports could be those who have abundant professional background in the maritime industry (e.g., seafarers, shipowners, managers, maritime authorities, recognized organizations, vessel traffic services, international and regional maritime organizations and institutions), and thereby were able to comprehend the special lexis and knowledge of the field. Knowing how the MSI reports were constructed with rhetorical moves would help the audience cull the key information efficiently. There would be no denying that the authors of MSI reports would benefit more from the findings of this study. The authors of the MSI reports were marine safety investigators, who must have worked in the maritime industry for years and been trained to attain the required certification and qualification. Without a mandatory template available, the marine safety investigator from every involved nation had to work independently to find the appropriate way in writing MSI reports. The results of move identification in the present study provide them with the conventional structure embraced by various nations, which actually deduced the common methodology to compose MSI reports. The functional move analysis enables the marine safety investigators to penetrate the uniformity and consistency embedded in various forms of MSI reports, which would guide the discipline to improve standardization. The obligation

of marine safety investigators is to inform the potential audience of the exhaustive analysis and recommendations, though some probable causes are not of high certainty. Hence, the authors of MSI reports need to maintain the probability and objectivity of the conclusions through certain linguistic variables and lexico-grammatical patterns. MD analysis in this study elaborated the text types of individual moves and the featured linguistic variables in these moves, which was valuable reference materials for MSI reports authors.

Pedagogically, the results of the analysis can be applied for creating a syllabus and courses for navigational and marine officers who want to become marine safety investigators. This analysis of MSI reports will provide practicable information for instructors teaching MSI report writing as in research articles writing. Cheng (2008) assigned genre analysis tasks to graduate students in their fields. Students read and responded to the genre structure of assigned sections of particular research articles, which required the student writer name a move, outline its content, define its purpose(s), and analyze language features in the move. Peacock (2011) espoused introducing students to the concepts of moves first, then the names of moves, the function of each move. Finally, examples of moves should be presented, firstly with the moves marked and then without marked moves. In the case of MSI reports, the current study described the moves, their closest text type, typical linguistic variables and so on, which would assist students to note the features of the MSI reports, and then compose their own reports. Besides the move constitution, instructors' concern could also go to linguistic features such as vocabulary of high frequency, tenses, modals, mood, etc.

Parkinson (2017) pointed out that such pedagogical procedure was especially invaluable to non-native speakers. The differences between native and non-native English authors in

writing MSI reports have been scrutinized in this study. Compared with native English authors, non-native authors tended to be more cautious to incorporate any information beyond the scope of guidelines in the Code. Even for the conventional moves, non-native authors should be encouraged to be more active as native authors did. While selecting linguistic variables, non-native authors need to be properly instructed especially in language use such as persuasive expressions, passive voice, *That* adjective complements, and so on.

Applying the suggestions from the studies of Cheng (2008) and Peacock (2011), MSI reports writing was expected to be instructed in the following sequence. Firstly, professional maritime trainees need to be acquainted of the definition of move. Then, an example section of MSI report with moves marked will be showed for trainees when the typical features of move should be highlighted, such as cyclical patterns and various lengths. While explaining the functions of moves in the exhibited section, the instructors are suggested to put forward how the linguistic variables collaborated to realize the functions. After familiarizing trainees with the move features in the sample section, instructors may require trainees to practice identifying moves in other sections of a MSI report. Finally, trainees will be asked to complete writing a report on their own. For non-native English writers, special prompts written by natives could be brought out for comparison when significant differences may occur.

5.3 Limitations of the Study

Despite the efforts to be as generalizable as possible, some limitations in this study must be addressed. The findings of this study could have been enriched and validated if the data

were collected directly from marine safety investigators. Bazerman (1988) and Miller (1984) opined that social context played a critical role for the professional who were obliged to select rhetorical strategies in writing texts of given genre. Bhatia (1993) also advocated asking "Why are specific discourse-genres written and used by the specialist communities the way they are?" (p. 11). As such, by analyzing only the texts without involving the processes of producing and consuming the texts, corpus approaches suffered from the shortcoming that the resources were gleaned from open access but not from the writers personally. Therefore, in further genre studies, researchers were advised to observe, interview, and work with the actual writers for collecting the information about the writers and the environment they worked in (see, e.g., Berkenkotter & Huckin, 1995; Bazerman & Prior, 2004).

Furthermore, if the rhetorical structure of MSI reports had been compared with the texts of other genres in the maritime industry, some more meaningful findings would have been gained. A larger corpus may produce a deeper and wider exploration for the authors and audience of the genre analyzed. Although the conventional moves identified in this study fitted the expectations formulated in relation to MSI reports in the IMO guidelines, the optional sections and moves skipped in this study also deserved researching to better understand how the MSI reports writers accomplished the given rhetorical functions.

Appendix 1: The MSI reports analyzed

No	Nation	Topic	Date	Pages	Words	Sentences
1	UK	Death	Jan 18, 2008	43	10776	372
2	UK	Foundering	Dec 20, 2011	46	16313	552
3	UK	Injury	Nov 21, 2011	8	3314	112
4	UK	Collision	Mar 9, 2013	46	24054	791
5	UK	Flooding	Apr 6, 2016	12	3796	149
6	US	Fire	Jun 6, 2000	45	44374	2077
7	US	Grounding	Jan 4, 2001	30	11356	541
8	US	Fire	Sep 28, 2001	25	9969	532
9	US	Sinking	Dec 30, 2002	47	19555	875
10	US	Collision	Jan 12, 2002	51	21151	934
11	AU	Explosion	Apr 2, 2007	28	9128	385
12	AU	Fatality	Feb 8, 2013	25	10592	379
13	AU	Fire	Jul 13, 2014	37	14590	613
14	AU	Collision	May 8, 2014	23	10012	392
15	AU	Grounding	Feb 28, 2015	33	13938	579
16	CN	Grounding	Apr 3, 2010	14	4480	245
17	CN	Collision	Jun 15, 2010	13	3684	179
18	CN	Collision	Feb 27, 2011	16	2689	133
19	CN	Fatality	Jan 11, 2011	13	3125	126
20	CN	Explosion	May 21, 2014	22	3879	210
21	KR	Sinking	Mar 13, 2010	12	2790	94
22	KR	Fire	Jan 1, 2012	12	2703	96
23	KR	Explosion	Jan 15, 2012	10	2221	73
24	KR	Collision	Mar 8, 2012	12	2812	88
25	KR	Death	Jul 2, 2013	15	4027	125
26	JP	Fatality	Jul 27, 2014	8	1927	60
27	JP	Collision	Aug 29, 2014	32	12356	422
28	JP	Collision	Dec 18, 2014	57	20152	487
29	JP	Collision	Feb 26, 2015	40	14182	348
30	JP	Fatality	Oct 27, 2016	14	4250	92

Appendix 2: List of the taggers for the variables

AMP: Amplifiers

ANDC: Independent clause coordination

AWL: Average word length

BEMA: Be as main verb

BYPA: By-passives

CAUS: Causative adverbial subordinators

CONC: Concessive adverbial subordinators

COND: Conditional adverbial subordinators

CONJ: Conjuncts

CONT: Contractions

DEMO: Demonstratives

DEMP: Demonstrative pronouns

DPAR: Discourse particles

DWNT: Downtoners

EMPH: Emphatics

EX: Existential there

FPP1: First person pronouns

GER: Gerunds

HDG: Hedges

INPR: Indefinite pronouns

JJ: Attributive adjectives

NEMD: Necessity modals

NN: Total other nouns

NOMZ: Nominalizations

OSUB: Other adverbial subordinators

PASS: Agentless passives

PASTP: Past participial clauses

PEAS: Perfect aspect

PHC: Phrasal coordination

PIN: Total prepositional phrases

PIRE: Pied-piping relative clauses

PIT: Pronoun it

PLACE: Place adverbials

POMD: Possibility modals

PRED: Predicative adjectives

PRESP: Present participial clauses

PRIV: Private verbs

PRMD: Predictive modals

PROD: Pro-verb do

PUBV: Public verbs

99

RB: Total adverbs

SMP: Seem|appear

SPAU: Split auxiliaries

SPIN: Split infinitives

SPP2: Second person pronouns

STPR: Stranded preposition

SUAV: Suasive verbs

SYNE: Synthetic negation

THAC: That adjective complements

THATD: Subordinator that deletion

THVC: That verb complements

TIME: Time adverbials

TO: Infinitives

TPP3: Third person pronouns

TSUB: That relative clauses on subject position

TTR: Type-token ratio

VBD: Past tense

VPRT: Present tense

WHCL: WH-clauses

WHOBJ: WH relative clauses on object position

WHQU: Direct WH-questions

WHSUB: WH relative clauses on subject position

WZPAST: Past participial WHIZ deletion relatives

WZPRES: Present participial
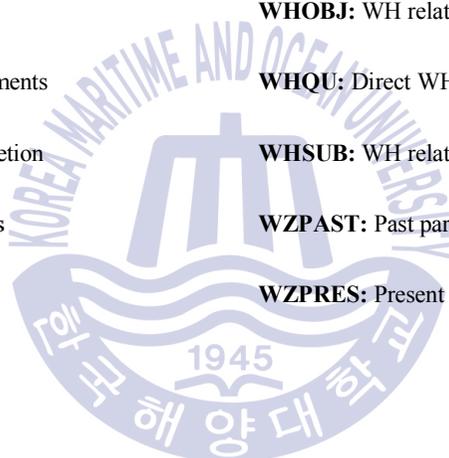
Appendix 3: A summary of Biber's (1988) dimensions

Dimension	Description
1	Dimension 1 is the opposition between Involved and Informational discourse. Low scores on this variable indicate that the text is informationally dense, as for example academic prose, whereas high scores indicate that the text is affective and interactional, as for example a casual conversation. A high score on this Dimension means that the text presents many verbs and pronouns (among other features) whereas a low score on this Dimension means that the text presents many nouns, long words and adjectives (among other features).
2	Dimension 2 is the opposition between Narrative and Non-Narrative Concerns. Low scores on this variable indicate that the text is non-narrative whereas high scores indicate that the text is narrative, as for example a novel. A high score on this Dimension means that the text presents many past tenses and third person pronouns (among other features).
3	Dimension 3 is the opposition between Context-Independent Discourse and Context-Dependent Discourse. Low scores on this variable indicate that the text is dependent on the context, as in the case of a sport broadcast, whereas a high score indicate that the text is not dependent on the context, as for example academic prose. A high score on this Dimension means that the text presents many nominalizations (among other features) whereas a low score on this Dimension means that the text presents many adverbs (among other features).

4	Dimension 4 measures Overt Expression of Persuasion. High scores on this variable indicate that the text explicitly marks the author's point of view as well as their assessment of likelihood and/or certainty, as for example in professional letters. A high score on this Dimension means that the text presents many modal verbs (among other features).
5	Dimension 5 is the opposition between Abstract and Non-Abstract Information. High scores on this variable indicate that the text provides information in a technical, abstract and formal way, as for example in scientific discourse. A high score on this Dimension means that the text presents many passive clauses and conjuncts (among other features).
6	Dimension 6 measures On-line Informational Elaboration. High scores on this variable indicate that the text is informational in nature but produced under certain time constraints, as for example in speeches. A high score on this Dimension means that the text presents many postmodifications of noun phrases (among other features).

Appendix 4: A summary of Biber's (1989) text types

Text Type	Characterizing Genres	Characterizing Dimensions
Intimate Interpersonal Interaction	telephone conversations between personal friends	high score on D1, low score on D3, low score on D5, unmarked scores for the other Dimensions
Informational Interaction	face-to-face interactions, telephone conversations, spontaneous speeches, personal letters	high score on D1, low score on D3, low score on D5, unmarked scores for the other Dimensions
Scientific Exposition	academic prose, official documents	low score on D1, high score on D3, high score on D5, unmarked scores for the other Dimensions
Learned Exposition	official documents, press reviews, academic prose	low score on D1, high score on D3, high score on D5, unmarked scores for the other Dimensions
Imaginative Narrative	romance fiction, general fiction, prepared speeches	high score on D2, low score on D3, unmarked scores for the other Dimensions
General Narrative Exposition	press reportage, press editorials, biographies, non-sports broadcasts, science fiction	low score on D1, high score on D2, unmarked scores for the other Dimensions
Situated Reportage	sports broadcasts	low score on D3, low score on

		D4, unmarked scores for the other Dimensions
Involved Persuasion	spontaneous speeches, professional letters, interviews	high score on D4, unmarked scores for the other Dimensions

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