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A Comparative Analysis of English Abstracts and Summaries of Chinese Research Articles in Three Library and Information Science Journals Indexed by the Taiwan Social Science Citation Index

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Abstract

English summary is a unique research genre that emerged in response to foreign scholars' needs for Taiwanese scholarship. It was developed as a solution to the problems caused by the inadequacy of English abstracts and the difficulties in translating full Chinese journal articles into English. Informative English summaries help Chinese journals to be used and indexed by foreign databases and citation indexes. However, different authors write in different ways. The structure and composition of English summaries remains unknown. To enhance our understanding of what has been presented to foreign readers, this study explored the structural and compositional differences between English abstracts and summaries. Abstracts and summaries of Chinese research articles published in three TSSCI-indexed library and information science journals in 2016 and 2017 were content analyzed. The results indicate English abstracts and summaries shared the same focus on reporting authors' research. The IMRD structure was decomposed, combined, and reorganized when authors wrote English summaries. Authors reported their research in relatively diverse ways in summaries than in abstracts.

Keywords: Genre Analysis; English Abstracts; English Summaries; Extended Abstracts; Scholarly Communication

1. Introduction

Different forms of document representation have become even more important as the growing amount of information overwhelms what users can potentially process. Most journal publishers in Taiwan provide English abstracts that go along with Chinese research articles. Some provide both English abstracts and English summaries. English summaries are also known as long English abstracts or extended abstracts. Some journal publishers require authors to submit English summaries after their Chinese manuscripts are accepted, or their articles will not be published. The length of English summary varies, ranging from 750-1,500 words (e.g., *Research in Arts Education* and *Journal of Library and Information Science Research*). English summaries are longer than abstracts. They are a relatively complete representation. Foreign researchers may rely on English titles, English abstracts, and/or English keywords to determine whether a research article is relevant to their information needs. English summaries may serve more functions. They may become searchable and browsable in a full-text database or if they were published in an e-journal. If the information in a summary is sufficient to a specific information need, foreign researchers may

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rely on it for references. English summaries may also trigger interest in original research articles. Hence, they play a key role in motivating the use of Chinese research articles and facilitating scholarly communication across different cultures.

However, authors often have to figure out how to write English or Chinese summaries on their own, including what should be included and how to organize different pieces of information within word limits. These have challenged novice authors, especially in disciplines where a consolidated set of guideline and/or an example is unavailable, such as the library and information science (LIS) discipline. Some authors may consult existing summaries, while some may not. It remains unclear what has been presented to foreign readers. As an intermediate mechanism, it is important to understand what constitutes English summaries and the extent to which they differ from abstracts to unfold their identities. Therefore, this study aimed at exploring the structural and compositional differences between English abstracts and summaries.

Some LIS journals in Taiwan provide both English abstracts and summaries. Among all, three were indexed by the 2015 and 2017 Taiwan Social Science Citation Index (TSSCI), including *Journal of Educational Media & Library Sciences* (*JoEMLS*), *Journal of Library and Information Science Research* (*JLISR*), and *Journal of Library and Information Studies* (*JLIS*). These journals vary slightly in their subject scopes, publishing schedules, types of articles they accept, and word limits of English abstracts. They all provide editing and translation services. Authors can write English summaries by themselves or they can provide Chinese summaries for journal publishers to translate. Either way, journal publishers will charge for the editing and/or translation services. Editorial boards also Romanize the Chinese references cited in summaries. This allows English databases to create citation indexes. It also satisfies the need for Chinese recognition (Journal of Educational Media and Library Sciences [JoEMLS], 2013c). *JoEMLS* pioneered in providing English summaries. English summaries first appeared in *JoEMLS* in Volume 45, Issue 1 in October 2007. They are placed at the end of the full-text pdf files in *JoEMLS*. According to the editor-in-chief (Chiu, 2007), these were provided to respect English authors and increase the accessibility and citing rates of Chinese articles. *JoEMLS* had been included in several prestigious foreign databases, including: Scopus, LISTA, LISA, PAIS, and so on. There were foreign submissions and subscribers. Foreign readers frequently requested for English versions of Chinese articles. Thus, English summaries were provided to complement English abstracts and attract foreign submissions. As the editor-in-chief wrote in the editorial, "*JoEMLS* authors who contribute in Chinese would need to supply English summaries to improve the visibility of articles and the accessibility of scholarly referencing worldwide… Accordingly, the *JoEMLS* now provides English Associate Editor (EAE) to help with language concerns (Chiu, 2007)."

JoEMLS is published by the Tamkang University Press. The Department of Information and Library Science and Chueh Sheng Memorial Library at Tamkang University work together to manage *JoEMLS*. *JoEMLS* has changed its titles and publishing schedules since its commencement.

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It started as a monthly journal, but changed to a quarterly journal in 1980. It then changed to a tri-annual journal since October 2016. It regularly publishes in March, July, and November now. It is an international scholarly journal (JoEMLS, 2013a). It adopts both open access and for-profit commercial database mechanisms. Full-text articles, including editorials, can be accessed through the Airiti Library database. Some full texts are also available on *JoEMLS'* official website. Printed versions and electronic versions are published simultaneously. Its scope includes the following areas of studies: library science, information science and technology, books and publishing industries, educational technologies that reflect LIS applications and development and information communication (JoEMLS, 2013b). It accepts research articles, brief communications, review articles, observation reports, and book reviews. It does not accept non-original translated works. *JoEMLS* advices authors to adopt the IMRD structure to write research articles. English abstracts should be written within 300 words. Authors who submit in Chinese have to provide English summaries that contain appropriate citations to have their articles published after receiving acceptance letters. English summaries should faithfully reflect original articles. English summaries should be written within 1,200-1,500 words. *JoEMLS* helps authors translate or transliterate Chinese citations appeared in English summaries (JoEMLS, 2013c).

English summaries started to appear in *JLIS* in Volume 8, Issue 1 in June 2010. They are placed between English abstracts and the original Chinese articles. *JLIS* is published by Department and Graduate Institute of Library and Information Science, National Taiwan University. It is the first research journal in library science in Taiwan. It is a bi-annual, double-blind peer-reviewed journal that publishes in June and December. Its scope includes the following areas: library science, information science, computer science, bibliography, archival studies, educational technologies, and other LIS-related areas. It adopts the open access mechanism. Full texts of research articles are available on its official website (https://jlis.lis.ntu.edu.tw/). Printed versions and online versions are published simultaneously (Journal of Library and Information Studies [JLIS], 2019). *JLIS* was indexed by Scopus on January 21, 2019. English abstracts should be written within 300 words. Authors who receive acceptance letters for their Chinese submissions are required to submit English extended abstracts that contain appropriate citations. *JLIS* has provided free English summarization services since 2010. The editorial board summarized authors' Chinese articles and translated into English. Unfortunately, this service did not continue. *JLIS* started to charge authors for editing English extended abstracts or translating Chinese summaries into English ones (JLIS, 2019). English extended abstracts should be written within 1,200-1,500 words. Tables, figures, and references are excluded from such word limits. Chinese extended abstracts should be written within 1,500 words for translation. Tables, figures, and references are included in such word limits (JLIS, 2018).

To enhance its international impact, *JLISR* started to provide English summaries in Issue 10, Volume 5, No. 2 on June 1st, 2011. They are placed at the end of the full-text pdf files. *JLISR* is published by *Library Association of the Republic*

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of China (Taiwan). It is a bi-annual journal that publishes in June and December. Two issues published each year are gathered together as a volume. *JLISR*'s scope includes the following areas: library and information science, information communication, documentation, archival studies, and other related areas. It accepts theoretical or methodological papers, empirical research, or systematic reviews. It does not accept translated works, brief comments and communication, and unrevised full-length degree theses. It is a double-blind peer-reviewed scholarly journal (Journal of Library and Information Science Research [JLISR], 2017a). Full texts of research articles are available on its official website (http://lac3.glis.ntnu.edu.tw/volume.php). English abstracts should be written within 200 words. Authors should provide English summaries and translate their references into English for foreign readers' references after their articles are accepted. English summaries should be written within 1,200-1,500 words. Tables, figures, and references are excluded from word limits. Chinese summaries should be written within 1,500 words. If Chinese summaries have more than 1,500 words, the translation fee will be determined based on word counts (JLISR, 2017a, 2017b).

English abstracts and summaries of Chinese research articles published in *JoEMLS*, *JLISR*, and *JLIS* in 2016 and 2017 formed the corpus for the present study. This study is part of a larger research project that compared English abstracts and summaries of Chinese articles published in TSSCI-indexed journals. Six journals indexed by the 2015 and 2017 TSSCI provide both English abstracts and summaries, with three fall in the library and information science field. Other three journals were *Research in Arts Education* (*RAE*), *NTU Management Review* (*NTU MR*), and *Sports & Exercise Research* (*SER*). This article will report the results of analyzing the three LIS journals partly because Chinese articles in these journals shared the same characteristics. The topics were diverse and authors adopted diverse research methods. These demonstrate the interdisciplinary nature of library and information science. Additionally, this article will only report the results of analyzing English abstracts and summaries. The original study included interviewing journal editors and authors. Due to space limitation and the richness of the data collected by interviews, interview results will only be provided to explain the rationale behind data analysis and facilitate the interpretation of results.

What follows is the structure of this article: First, previous studies on abstracts and components of different sections of research articles were reviewed. Then, how English abstracts and summaries published in the three LIS journals were collected and analyzed was reported. This article precedes to present the structure and components of English abstracts and summaries, followed by the comparisons between the two. It concludes by the contributions this study made, limitations, and future research directions.

2. Literature Review

Due to the lack of research on English summaries, this study reviewed previous research on abstracts and different sections of research articles to facilitate data analysis.

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2.1 Abstracts

2.1.1 Definitions and types of abstracts

The International Standard Organization (ISO) (1976) defines an abstract as "an abbreviated, accurate representation of the contents of a document, without added interpretation or criticism" in ISO 214: 1976(en). It emphasizes the objectivity of abstracts. The National Information Standards Organization (NISO) (2015) defines an abstract as "a brief and objective representation of a document or an oral presentation." In other words, abstracts should be short and authentically depict the documents they represent. Summaries that contain salient points often appear at the end of engineering and scientific papers (Bernier, 1980). A summary serves as a reminder that reminds readers of key points they have gone through. NISO (2015) defines it as "a brief restatement within a document (usually at the end) of its salient findings and conclusions intended to complete the orientation of a reader who has studied the preceding text." This points out an abstract is a standalone genre separated from the original document, whereas a summary is part of the document that may not be separable. The latter should be used with the original document (Bernier, 1980). Apparently, NISO's definition of a summary is different from journal publishers' practices in Taiwan. It may be useful to examine the definition of an extract as well. NISO (2015) defines an extract as "one or more portions of a document selected to represent the whole." This definition describes English summaries better because they should contain essential information regarding a research. Despite the definitional discrepancy, this study used the term summary because almost all the TSSCI-indexed journals that provide English summaries use it, including *JoEMLS*, *JLISR*, *SER*, *NTU MR*, and *RAE*. Only *JLIS* uses the term extended abstract.

An abstract accurately and concisely represents the structure and content of a document (Chu, 2003). It provides an overview or introduction to the document. It serves as an entry point because it helps users identify the basic content of a document (NISO, 2015; Wikipedia, 2017), although certain pieces of information are inevitably lost in the abstracting process (Chu, 2003). By reading abstracts, readers do not have to read the whole documents to determine the relevance to their information needs. Abstracts also help readers adjust their information-seeking strategies. They can identify important terminologies from abstracts and refine their search (Montesi & Owen, 2007). Scientific abstracts can keep researchers updated with their fields. This is particularly important because the proliferation of academic publications has caused information overload. Additionally, a well-written abstract helps readers capture the main themes or arguments of the original document. It can facilitate readers' understanding of the entire document. Furthermore, abstracts consolidate the main ideas of a document; thus, they can remind readers of the content after they have read it (Cross & Oppenheim, 2006).

There are three types of abstracts, including: (1) Informative abstract: It contains substantial, detailed information. It may serve as a surrogate of the original document. Sometimes its information is sufficient for readers' purpose and it may not be necessary to consult the original document (Cleveland & Cleveland, 2013; Zhang & Liu, 2011); (2) Indicative abstract: It describes

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the aboutness of a document without revealing detailed information. It cannot serve as a surrogate because it only points out what readers are able to find. They have to consult the original document to access the information they wish to find (Cleveland & Cleveland, 2013; Zhang & Liu, 2011); and (3) Critical abstract: It represents and evaluates the content of the original document. Such evaluation is usually conducted by subject specialists who are knowledgeable about the subject and/or methodologies. Their evaluative comments add value and bring insight, which are not available from the original document (Chu, 2003; Cleveland & Cleveland, 2013; Hahn & Mani, 2000). Regardless of how informative an abstract is, it should never become a replacement of the original document. A journal abstract may contain both informative and indicative elements. It informs readers of certain details as well as indicates what can be found in the article (Cleveland & Cleveland, 2013; Zhang & Liu, 2011).

2.1.2 Styles of abstracts

Ideally an abstract should be written in the style similar to the original document. In practices, abstracts can be written in different styles. First, an abstract can be written as a paragraph(s) in a narrative style. Narrative abstracts have many problems, including inconsistent formats and levels of clarity. They often do not represent the main content of an article (Zhang & Liu, 2011). Second, an abstract may have a formal structure. Structured abstracts have distinct section headings, which are often designated by the journal. Some journals take the structured approach to guide authors to write informative abstracts. Structured abstracts were developed to help health professionals select valid journal articles that are relevant to clinics around late 1980s to early 1990s in the medicine field (U.S. National Library of Medicine, 2016; Zhang & Liu, 2011). Now they are widely employed in a variety of disciplines across sciences, social sciences, and humanities. Structured abstracts allow authors to systematically present their findings because they write according to prescribed headings (Hartley, 2004; NISO, 2015). They tend to be more complete and informative. They can enhance retrieval, facilitate peer review, and help practitioners and policymakers to access research findings (Guimarães, 2006; Mosteller, Nave, & Miech, 2004; U.S. National Library of Medicine, 2016). Structured abstracts can also force authors to write and think in logical order (Salager-Meyer, 1990). The quality of structured abstracts is better than narrative abstracts in that they contained necessary and important information (Hahs-Vaughn & Onwuegbuzie, 2010; Taddio et al., 1994). Hartley and Betts (2009) used a simple yes/no checklist to analyze articles relevant to Hartley's research interests. They found all narrative abstracts were deficient because of the lack of one or more key components. Hence, they suggested authors write structured abstracts first and then remove headings if journals do not accept abstracts with headings.

2.1.3 Structure and components of abstracts

Abstracts of original research articles, just like the articles, tend to contain the IMRAD/IMRD (Introduction, Methods, Results, and Discussion) sections, although these may not be explicitly differentiated by section headings (Guimarães, 2006). Some journals also require authors to write conclusions, implications, or originality/

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value (e.g., Journal of Documentation) (Hartley, 2014). Developing the structure of abstracts needs to consider disciplinary conventions and norms and types of documents being submitted. It is important for journals to provide an appropriate number of headings because insufficient headings or general headings may result in less informative abstracts. The headings should be distinguishable among each other so that authors are guided to provide accurate information (Zhang & Liu, 2011). The organization of IMRAD/IMRD represent logical progression of thought patterns (Salager-Meyer, 1990), although the research conduct that an article reports may not follow such sequence. Although most standards suggest authors follow the IMRD sequence to write abstracts, some scholars have suggested to move the conclusion sections to the forefront. However, readers prefer the traditional sequence because placing the conclusions at the end of abstracts helped them judge the validity of conclusions by reading the methods and results first. Additionally, it was not logically sound to start the abstract with a conclusion (Zhang & Liu, 2011).

Different components of an abstract may be given different weights. Under-represented components are merged and expressed together in a sentence. This is called embedding (Montesi & Urdiciain, 2005). A specific component may be embedded in another component. For example, methodology is often embedded in other components, such as introduction or results (Montesi & Urdiciain, 2005). Additionally, components may not be organized based on the IMRD structure. Some components precede others, which are different from readers' expectations. This is called reversal (Montesi & Urdiciain, 2005). Sometimes a specific component is divided and distributed in different parts. This is called recycling (Montesi & Urdiciain, 2005). Moreover, a specific component may be omitted, either by a single author or systematically by authors in a discipline or research venue. The types of research being reported, editorial requirements, the maturity of a discipline, authors' cultures and languages, and expected readership may contribute to imbalanced weights among different components, and the embedding, reversal, recycling, and omission of components. Abstracts in a discipline may systematically follow a compositional structure that is different from the IMRD structure (Montesi & Urdiciain, 2005).

A complete journal abstract should include the following components: (1) Purpose: The objectives and scope of a study; (2) Methodology: Describe the techniques and approaches employed to collect and analyze data; (3) Results: Concisely report the results; (4) Conclusions: State the implications of the results as how they relate to the purpose of the study. These may include: suggestions, recommendations, applications of the results, and contributions to theories, methodology, and practices; and (5) Collateral and other information: Authors may include incidental but valuable findings (NISO, 2015). Liddy (1991) conducted a three-phase study to uncover the typical structure of informative abstracts that reported empirical research. This structure was composed of: (1) Background: Relation to other research, new terms defined, institution, administrators, and location of study; (2) Purpose: Hypothesis (independent and dependent variables), research questions, and research topic; (3) Methodology: Subjects

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(sample selection and control population), no. of experiments, time frame, procedures (conditions and materials), data collection, and data analysis; (4) Results: Reliability and discussion (unique features and limitations); (5) Conclusions: Significance of results, implications, practical applications, and future research needs; and (6) Appendices: References and tables. The above components do not always standalone by themselves.

2.1.4 Comparative analysis of abstracts across disciplines and languages

Socio-cultural factors affect the rhetoric structure of research output produced by different academic communities. Expected readership also contributes to cross-cultural differences in rhetoric structure (Martín, 2003). A number of previous studies have compared the structure and components of abstracts written in different languages across disciplinary boundaries. Tibbo (1992) compared the abstracts in analytical chemistry, development psychology, and American history, which were drawn from natural sciences, social sciences, and humanities respectively. The abstracts she analyzed represented journal articles, with some history abstracts represented dissertations. Additionally, the journal abstracts in history she analyzed were written by professional abstractors, not authors. Regardless of types of source documents and authorship, history abstracts did not conform the American National Standards Institute (ANSI) and ISO standard. History journal abstracts did not contain background information. In contrast, chemistry abstracts and history dissertation abstracts did. All chemistry abstracts contained purpose statements and scope, but the percentage of psychology and history abstracts contained these was pretty low. More chemistry and psychology abstracts, and history dissertation abstracts contained methodology and results statements. History abstracts contained many subjective and descriptive sentences critical to historical explanation. Busch-Lauer (1995) compared English and German abstracts of 20 English medical research articles, case studies, and review articles. He made the following comparisons: German and English abstracts written by Germans, German and English abstracts written by English native speakers, and English abstracts written by English native speakers and non-native speakers. The results demonstrate both English and German abstracts did not follow the structure and argumentation of original articles. Authors' purposes and abstracting skills determined the structure. They relied on their skills to translate German abstracts into English. German's ways of thinking were transferred. Sometimes incorrect information was also conveyed. The abstracts Busch-Lauer (1995) analyzed emphasized background information, but frequently omitted purpose, scope, and conclusions. Abstracts written by English native speakers often began with a topic sentence that indicates purpose and methodology, which deviated from non-native speakers' reading expectations. Martín (2003) compared English and Spanish abstracts published in prestigious experimental phonetics and psychology journals. Both English and Spanish abstracts followed the IMRC sequence. The introduction parts appeared the most frequently in both, which made them obligatory. "Establishing a niche" of the introduction parts appeared frequently in English but not in Spanish abstracts. The methods

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parts appeared the second most frequently. Some authors coalesced the introduction and methods parts. Spanish abstracts frequently omitted the results parts. Moreover, a few Spanish abstracts were written in more than one paragraphs. Finally, cyclic patterns were not found in both English and Spanish abstracts. Šauperl, Klasinc, and Lužar (2008) compared English and Slovenian abstracts in pharmacology, sociology, and linguistics and literature. These were selected from natural sciences, social sciences, and humanities respectively. Background was valued by pharmacology, sociology, and Slovenian linguistics and literature authors. English and Slovenian abstracts in pharmacology varied in their composition. Methods and results appeared the most frequently in the former, whereas background and results appeared the most frequently in the latter. The ways pharmacology authors reported their results were different. Direct results appeared frequently in English abstracts, whereas indirect and previous results appeared frequently in Slovenian abstracts. The types of research that English and Slovenian journals accepted contributed to such differences because Slovenian journals rarely published original research. Results appeared the most frequently in sociology in both English and Slovenian abstracts, followed by methods and background. A new component—topic statement—appeared in both. Slovenian abstracts followed the results-method-background-topic sequence. The linguistics and literature abstracts published in the two journals that Šauperl et al. (2008) analyzed were written in Slovenian. No English counterparts were analyzed. Results also appeared the most frequently in these journals and this was the only components that many abstracts contained. Similar to Slovenian pharmacology abstracts, the results were indicative, rather than informative. Sequential patterns were not identified.

2.2 Moves and steps that comprise different sections of research articles

Studies have been conducted to unfold the structure and components of research articles in different disciplines. Swales (1990, 2004) and Swales and Najjar (1987) proposed the "Create a Research Space (CARS)" model based on an investigation of the moves that realized the introduction sections of research articles across hard sciences, social sciences, and life and health sciences. Each move consists of multiple functionally distinct steps. A move is a text segment characterized by a bundle of linguistic features (e.g., lexical meaning and propositional meanings). These features signal the content of the discourse that this segment embodies and give it a uniform orientation (Nwogu, 1997). A move can be realized by structures ranging from a word, a phrase to several sentences, but it is common that a move is realized in a sentence (Pho, 2008). The structure of the introduction sections is similar to that of an abstract (Montesi & Urdiciain, 2005). How different moves are structured and organized depends on the history of disciplines, subject matter, types of research articles (e.g., clinical reports and experimental reports) and authors' intentions and summarizing skills (Busch-Lauer, 1995; Ozturk, 2007; Williams, 1999). Even within a specific discipline, there is no single organizational framework for a specific type of research articles or sections. Some moves and steps have relatively stable roles and

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positions, while some do not. Some moves and steps may be used flexibly to fulfill their rhetoric functions (Samraj, 2002). The moves and steps that Swales (1990, 2004) identified include: (1) Establishing a territory: Claiming centrality, making topic generalization, reviewing items of previous research; (2) Establishing a niche: Counter-claiming, indicating a gap, question-raising, continuing a tradition, presenting positive justification; (3) Occupying the niche: Outlining purposes/presenting goals of present research, announcing present research, announcing principal findings, predicting results, indicating RA structure.

Building on Swales' CARS model, Kanoksilapatham (2005) investigated the rhetorical structure of biochemistry research articles. She identified the moves comprising different sections and the steps comprising different moves, which are organized in Table 1.

Holmes (1997) analyzed the discussion sections of 30 research articles in history, political science, and sociology. The moves in his analytic scheme include: (1) Background information; (2) Statement of results; (3) (Un) expected outcome; (4) Reference to previous research; (5) Explanation of unsatisfactory result; (6) Generalization; (7) Recommendation; and (8) Outlining parallel or subsequent developments. The moves in the discussion sections in political science and sociology were similar to those in natural sciences, especially chemical engineering. However, these moves were less predictable and cyclical. The discussion sections in research articles in history were very different from those in other disciplines in that they tended to be shorter and they did not exhibit cyclical patterns.

Building on Hopkins and Dudley-Evans' (1988) analysis of the discussion sections of research articles and dissertations, Peacock (2002) analyzed 252 discussion sections published in 40 journals in seven disciplines, including: physics, biology, environmental science, business, language and linguistics, public and social administration and law. The moves comprising the discussion sections, the structure, and the differences between those written by native speakers and those written by non-native speakers were analyzed. The new model that Peacock (2002) developed contained eight moves. Moves including "claim," "finding," and "reference to previous research" appeared the most frequently. These seemed to be obligatory. Interdisciplinary differences in the use of moves were found. For example, moves such as "reference to previous research" and "limitation" appeared infrequently in physics and environmental science. Differences in the use of moves between native speakers and non-native speakers were also found. For example, non-native speakers used "limitation" infrequently in physics and biology. Cyclical patterns such as the combination of "[un] expected outcome" and "reference to previous research" were also found. Moreover, the types of move cycles appeared differently in different disciplines. For example, the cycle "[un]expected outcome" and "explanation" was important to science, whereas "reference to previous research" and "claim" was important to social science. Differences in move cycles also appeared between native speakers and non-native speakers.

Ruiying and Allison (2003) analyzed the results, discussion, conclusion and pedagogical implication sections of 20 empirical research articles from four journals in applied linguistics.

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Table 1. Moves and Steps Comprising Biochemistry Research Articles

Introduction	Methods	Results	Discussion
Move 1: Announcing the importance of the field	Move 4: Describing materials	Move 8: Stating procedures	Move 12: Contextualizing the study
Step 1: Claiming the centrality of the topic	Step 1: Listing materials	Step 1: Describing aims and purposes	Step 1: Describing established knowledge
Step 2: Making topic generalizations	Step 2: Detailing the source of the materials	Step 2: Stating research questions	Step 2: Presenting generalizations, claims, deductions, or research gaps
Step 3: Reviewing previous research	Step 3: Providing the background of the materials	Step 3: Making hypotheses	Move 13: Consolidating results
Move 2: Preparing for the present study	Move 5: Describing experimental procedures	Step 4: Listing procedures or methodological techniques	Step 1: Restating methodology (purpose, research questions, hypotheses restated, and procedures)
Step 1: Indicating a gap	Step 1: Documenting established procedures	Move 9: Justifying procedures or methodology	Step 2: Stating selected findings
Step 2: Raising a question	Step 2: Detailing procedures	Step 1: Citing established knowledge of the procedure	Step 3: Referring to previous literature
Move 3: Introducing the present study	Step 3: Providing the background of the procedures	Step 2: Referring to previous research	Step 4: Explaining differences in findings
Step 1: Stating purpose(s)	Move 6: Detailing equipment (optional)	Move 10: Stating results	Step 5: Making overt claims or generalizations
Step 2: Describing procedures	Move 7: Describing statistical procedures (optional)	Step 1: Substantiating results	Step 6: Exemplifying
Step 3: Presenting findings		Step 2: Invalidating results	Move 14: Stating limitations of the study
		Move 11: Stating comments on the results	Step 1: Limitations about the findings
		Step 1: Explaining the results	Step 2: Limitations about the methodology
		Step 2: Making generalizations or interpretations of the results	Step 3: Limitations about the claims made
		Step 3: Evaluating the current findings	Move 15: Suggesting further research (optional)
		Step 4: Stating limitations	
		Step 5: Summarizing	

Note. Adapted from "Rhetorical Structure of Biochemistry Research Articles," by B. Kanoksilapatham, 2005, *English for Specific Purposes, 24*(3), pp. 289-291.

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Their research was different from other research on the rhetoric structure of individual sections in that it assumed adjacent sections interact with each other. Each section should not be treated as an independent section that functions by itself. They identified the moves and steps from presenting results to closure, including: (1) Discussion: Background information, reporting results, summarizing results, commenting on results, summarizing the study, evaluating the study, deductions from the research; (2) Conclusion: Summarizing the study, evaluating the study, deductions from the research; and (3) Implications: Summarizing the study, dealing with pedagogic issues, evaluating the study, deductions from the research. The results showed the above sections were indeed inter-related. They also confirmed Brett's (1994) findings in that they both found cyclic patterns of reporting and commenting on results in the results sections. The communicative functions the above sections served overlapped, although their focuses varied. These sections were used flexibly to close research articles. The headings that authors used revealed the communicative functions the above sections served.

2.3 Problems related to English summaries

Lin, Lin, Shaw, Chen, and Jhang (2013) investigated problems related to developing English summaries for original Chinese monographs published in Taiwan for international scholarly communication. The following problems have challenged such development: (1) Problems in translating Chinese into English: Differences in Chinese and foreign readers' ways of thinking and in Chinese and English expressions and writing conventions, the lack of corresponding concepts in different languages, the consistency in translating terminology in specific disciplines, and the lack of standardized Romanization have brought translation difficulties; (2) Problems in summarizing practices: The content and constituent components of English summaries varied across disciplines and types of research conduct. Critiques could be added to add values. Issues regarding who should write English summaries and their intellectual properties have also raised concerns. (3) Incentives for scholars to participate in this effort: The lack of incentives has challenged the development of English summaries. Additionally, it is not necessary to completely translate a work. Translating selected works under subsidy might be viable (Bernier, 1980); (4) Current limitations in the translation and publishing industries: Translators must be proficient in three languages, including Chinese, English, and the terminology and norms of the discipline in which a work is situated (Bernier, 1980). However, there is a lack of such translators in Taiwan. Moreover, professional translators prefer to translate journal articles in hard science and business, which allows them to charge more. Publishers are not motivated to provide English summaries neither because it would increase the cost; and (5) The effectiveness of using English summaries to facilitate scholarly communication: Scholarly communication should rely on original monographs because intricate arguments cannot be effectively presented in English summaries. Instead of serving as the surrogate, English summaries should indicate where these arguments are because these are critical to humanities research. Additionally, enhancing the citation rates

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should not be set up as one of the purposes of providing English summaries. Other services, such as providing e-books and online purchasing, could be provided to facilitate scholarly communication.

3. Research Methods

3.1 Data collection

All the Chinese research articles published in the three LIS journals in 2016 and 2017 were collected to ensure the topic diversity and recency of the corpus. Editorials and English research articles were excluded. Table 2 illustrates the number of articles analyzed. The topics of these articles fell into the following areas: data reuse, research evaluation, information behaviors and information needs, information literacy instruction, health information behaviors, service quality in libraries, reading studies, bibliometrics, e-books, innovation in libraries, open government data, sinology, bibliotherapy, and digital humanities. Almost all the authors are Taiwanese. Only two articles were written by Chinese. The three LIS journals were indexed by TSSCI. To be indexed by TSSCI, journals have to be evaluated based on a set of criteria every year. The criteria were classified into four major items, including: journal format, article format, editorial work, and publishing status. There were other conditions that would negatively affect the evaluation results, including: the percentage of issues that were not sent to the Research Institute for the Humanities and Social Sciences of Ministry of Science and Technology on time, issues were not published on time, and the percentage of articles published by authors who work in the hosting institutions (Ministry of Science and Technology, Research Institute for the Humanities and Social Sciences, 2015). In general, the management of the three journals was more rigorous than journals that were not indexed by TSSCI.

English abstracts and full texts of Chinese research articles were downloaded from either the official websites of the three LIS journals or the Airiti Library database. English summaries were copied from full texts and pasted on Word files. Dedoose, a cross-platform application for analyzing qualitative data, was used to facilitate data analysis. Two separate projects were created on Dedoose—One for analyzing abstracts and the other for summaries.

3.2 Data analysis

Content analysis was implemented to analyze the corpus (Neuendorf, 2001; Schreier, 2012). Abstracts were first analyzed, followed by summaries. Data analysis involved developing and revising the coding scheme, coding the corpus, and revising the coding decisions until the

Table 2. Journals and Number of Articles Included

Journal titles	*N* in 2016	*N* in 2017	Total
JoEMLS	11	9	20
JLISR	8	7	15
JLIS	9	7	16
Total	28	23	51

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definitions of different categories encompassed all the variations found in the corpus and were clearly differentiated from each other. It was an iterative process in which the coder's knowledge evolved. The coder had to be able to read English and be knowledgeable about this study and previous genre research. Thus, the author completed data analysis by herself. Abstracts from the aforementioned six journals were read and compared. Both deductive and inductive approaches were adopted. The sections, moves, and steps identified by previous research were applied and adjusted. Some coding categories were developed inductively from abstracts. A coding category—theoretical framework—derived from interviews. An interviewee contended it should be included in English summaries, rather than literature review. Thus, it was added. A coding scheme that contained definitions and examples of different coding categories was developed. It was revised along data analysis. After all the abstracts were analyzed and the coding scheme was fully developed, all the abstracts were analyzed again. Difficult coding decisions were resolved. Confusing coding categories, such as "state purpose(s)" and "specify research themes," were differentiated and all the excerpts assigned to these codes were re-coded. Excerpts assigned to specific codes were scrutinized and corrected. The above process ensured intra-coder consistency and the accuracy of coding decisions. The same coding scheme was then applied to analyze summaries. Additional coding categories, including "justify methods," "restate methodology," and "acknowledgement," were developed. The definition of a category—"describe tasks/treatment/procedures"—was expanded. Summaries were also analyzed and the coding scheme was revised following the same iterative process to ensure intra-coder consistency and the accuracy of coding decisions. Table 3 presents the coding scheme. Shortened excerpts from abstracts and summaries are provided as examples. "Abstract: None" indicates excerpts were not found in abstracts. These moves and steps were exclusive to summaries.

Abstracts and summaries were analyzed at corresponding levels of granularity. Abstracts were coded at the highest levels of granularity—including moves and steps—because all abstracts were unstructured. They did not have section headings. In contrast, summaries were coded at all levels. Section headings were coded at the section level and the content of a section was coded at either the move or step level. For example, two codes—including "Conclusions" and "Suggestions"—were used to code headings entitled "Conclusion and Suggestions." Two codes—including "Introduction" and "Methods"—were used to code the heading "Research Goals and Methods." In this case, authors of a summary divided steps of the introduction section and integrated their research questions into the methods section. To further analyze section headings that did not conform the IMRD structure, the coding category "other section headings" was created to encompass new headings.

Summaries were also analyzed along four dimensions, including: types of research that summaries reported, whether they were structured or unstructured, whether they contained tables and/or figures, and whether they contained citations. These dimensions emerged in interviews. When

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Table 3. The Coding Scheme

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
Introduction	Announce the importance of the field	Describe background	Provide background or contextual information that is important to the present research conduct	Abstract: In recent years, some scholarly journals have indicated that they accept rewritten or extended version of a conference paper as long as new content are added to the journal article manuscript and that the original conference paper is included in the references.
				Summary: Parent-child Doctors' Mailbox is an example of children' s library instruction programs. This program is conducted in National Library of Public Information, and is targeted specifically at elementary school students.
		Claim the centrality of the topic	Describe how widespread or important an issue/ problem/phenomenon is	Abstract: Therefore, helping undergraduates appropriately cope with negative emotions generated by breakups is a topic worth exploring.
				Summary: With increasing awareness of nutrition and improving one's health as well as of food safety issues... Therefore, health foods have become increasingly popular nowadays.
		Make topic generalization	Describe what happens generally	Abstract: Because of human resource shortages at public libraries, providing these services depends on volunteers.
				Summary: The adequacy and sufficiency of patients' knowledge of medication will influence the consequences of medication use.
		Review previous research	Describe what previous research has done or found	Abstract: In this research field, most studies have focused on the central government level.
				Summary: Numerous researchers have focused specifically on topics of global issues.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
	Prepare for the present study	Indicate a gap(s)	Describe what previous research has not addressed or there is a lack of relevant research	Abstract: There is still limited research discussing the determinants of open government data. Summary: There is still limited literature addressing the development of metadata framework of open data, not to mention literature on using metadata to manage open government data.
		Indicate the problem(s)	Point out the practical problems that need to be addressed or solved	Abstract: Breakups with significant others are among the main reasons for emotional disturbance problems in Taiwanese undergraduates...their negative emotions can easily accumulate, influencing their mental health. Summary: This type of course has been greatly criticized for its low learner engagement, resulting in marked low course and video completion rates.
	Introduce the present study	State purpose(s)	Point out the overarching goal, aim or purpose of the present study	Abstract: to explore the categories of problem patrons and their behavioral characteristics. Summary: The current study aims to investigate the information behavior of primary caregivers of children and adolescents with rare diseases.
		Propose a new approach/Draw on theories	Describe the concepts, models, theories, or perspectives that the present study draws on or develop a new approach to solve specific problems	Abstract: This study uses the modified model for mobile business value creation (MBVC). Summary: Inquiry-based learning revolves around students' natural curiosity, emphasizing student's initiative in seeking information, and independent learning for critical thinking.
		Specify research themes	Detail the aspects of a phenomenon or sub-topics under investigation	Abstract: We conducted the following study by comparing the EPUB e-textbook and SCORM e-learning content models, primarily focusing on these three elements: 1) content presentation, 2) metadata, 3) content package structure.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
				Summary: Based on literature review, four aspects of interagency information sharing, including technological, organizational, legislation and policy, and external environmental perspectives, have been investigated, and influencing factors are induced and proposed.
		List research questions	State the research questions that the present study will answer	Abstract: None Summary: The following questions guided this study: 1) Is there any difference on learner recall among videos with different camera shot and background designs?
		Clarify definition/ coverage/ assumption	Define important concepts, or specify the scope of the present study or article, or describe the assumptions on which the study was based	Abstract: Emotional labor refers to their devoting considerable effort to controlling their emotions in order to maintain the library image and provide patrons with satisfactory service. Summary: The concept of open data is that, without violating privacy and national security, government data should be open, freely used, and redistributed by the public. Summary: This study focused on investigating academic library innovations from the organization framework, without discussions on individual creativity or technological innovation.
		Describe expected contributions	State how the results of the present research may contribute to theories and/ or practices	Abstract: None Summary: The results could also be a valuable reference for scholars in related academic fields.
		Describe procedure	State the procedure of how the study was conducted	Abstract: None Summary: Accordingly, a set of semistructured in-depth interviews was conducted to identify the types of problem patrons encountered by public service librarians...

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
		Present findings	Briefly describe the results of the study	Abstract: None Summary: Through empirical testing and verification, this system has successfully integrated relevant library and information science open access journal resources in DOAJ and E-LIS directories, and operated smoothly online, providing services for researchers in library and information science.
	Outline the structure of the article		Describe how the article or a specific section is organized and point out what is discussed in different sections	Abstract: The concept of literary warrant is first briefly discussed... Summary: The literature review in this paper was organized into three sections. First, current regulations and restrictions pertaining to health foods and food and nutrition labels were presented...
Literature Review	The main body		Review previous research that is relevant to the present study	Abstract: None Summary: Children's reading rooms of public libraries are the best place for children and their families and friends to develop reading interests, such as discovering and reading picture books (Liu, Ito, Toyokuni, Sato, & Nakashima, 2012; Stooke & McKenzie, 2009).
	Theoretical framework		Develop and present the theoretical framework along with literature review	Abstract: A framework was developed based on the review of the relevant literature on cultural products, value creation and digital content. Summary: Search performance can be further divided into two dimensions: a. The quality of the search results. b. Users' search experience with the tools.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
	State hypotheses		Develop the hypotheses that will be tested in the present study	Abstract: None Summary: Hypothesis 2 was formed: When there is a higher creative self-efficacy of university librarians, they would perform higher level of innovative behaviors
Methods	Justify methods		State the rationale behind adopting a specific data collection method	Abstract: None Summary: This study deploys a "questionnaire survey" , which can afford maximal expression of subject responses.
	Describe the overall data collection approach		The overall approach that the author adopts to data collection and/or analysis, including experiments, case study, grounded theory, quantitative or qualitative approach	Abstract: The methodology of multi-case study Summary: This study employed a qualitative and interpretive case study approach to analyze the observed phenomenon (Orlikowski, 2000; Pettigrew, 1987; Sutton & Hargadon, 1996).
	Describe pretest/ pilot study		Indicate how the pretest or pilot study has been conducted, including participants, instruments, and time frame	Abstract: None Summary: Ten children were involved in the pilot study, which served as a guidance to adjust data collection methods in order to enhance the validity and reliability of findings.
	Select data collection site		Indicate the physical setting in which the study took place	Abstract: This study was conducted in an elementary school in the area of Chiayi. Summary: Two academic libraries in northern Taiwan that were undergoing incremental or radical innovations were selected as the cases to be investigated, and were termed as Library A and Library B in this study.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
	Describe sampling or exclusion criteria		Indicate the sampling techniques and/or the conditions/criteria that determine what were excluded	Abstract: Under stratified sampling and cluster sampling Summary: The snowball sampling technique is suitable in such situations where members of a population are difficult to locate.
	Recruit participants		Describe the ways participants were recruited	Abstract: None Summary: The study participants were solicited from health-based social network sites that are popularly visited by women; these included PTT Health Board, which is the largest bulletin board system in Taiwan, and FashionGuide Health Forum.
	Describe subjects		There were two types of subjects, including the target of the study (e.g., projects, organizations, archives, journal articles) and human participants through which the target was investigated.	Abstract: It employed the case study methodology to examine two collaboration projects between the Bright Ideas Design, Co. Ltd. and National Palace Museum. Summary: It focused on the top 50 Taiwanese companies that were most productive in scientific research as measured by paper quantity.
	Collect data	Employ data collection methods	Describe the specific methods implemented to collect data (e.g., interviews, focus groups, survey)	Abstract: This study used an in-depth interview Summary: Data collected included interviews, participant observations, tests, and document analyses.
		Describe the data being collected	Detail what data have been collected, including participants' experiences or opinions, journal articles, observational notes, etc.	Abstract: We observed and recorded each identity's cognitions, thoughts and opinions about leaf labels. Summary: For the comprehensiveness and representiveness of samples, this research scrutinized articles in print or in electronic format published before September 2016

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
		Describe data source	Indicate where the data were collected, such as specific databases	Abstract: Research data included information obtained from semi-structured interviews and secondary sources. Summary: Web of Science (WoS) was used as the data source.
		Describe experiment design	State the specific experimental design the study adopted	Abstract: A 2 x 2 Latin-square design was adopted where the interfaces and the genres served as the within-subject factors. Summary: A 2 x 2 Latin square experimental design was conducted in which the interfaces (social vs. subject based navigation) and the genre (fiction vs. non-fiction) served as the within-subject factors
		Assign subjects	Describe how the subjects were assigned into different groups in experiments	Abstract: Ninety-eight university students in southern Taiwan were voluntarily recruited as participants and randomly assigned into four groups with different video design. Summary: The participants were randomly assigned into one of the four groups.
		Describe tasks/ treatment/ procedures	Describe what participants were instructed to do, the treatments different groups received, or how the data were collected in different phases	Abstract: The study selects the ebook catalogs of two academic libraries and two commercial companies, designs 6 kinds of searching tasks, and asks the users of academic libraries to search the catalogs. Summary: The participants were asked to start with a "seed" book, being a title with which they are familiar...
		State time frame	Describe the temporal aspect of data and/or data collection, including the period during which data were collected and how long participants received treatments	Abstract: Papers from the 2011 meetings were used as the sample Summary: The data collection was conducted during the 2017 spring semester.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
		Develop research instruments	Describe how research instruments were developed, such as questionnaires and experimental interfaces	Abstract: Relevant literature was reviewed for framing the research questions and designing the questionnaire items for survey. Summary: The experimental videos were adapted from a Taiwan MOOC Digital Content Production (course delivered fall 2016 by the researcher).
		Employ specific measurement	Indicate the measurements used to design research instruments	Abstract: None Summary: The questionnaire items are measured using a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree).
		Employ data collection equipment	Indicate the facilities adopted to collect data	Abstract: None Summary: All the acts performed on the interfaces, including clicking, reading, and saving were recorded by the screen capture software Morae.
	Analyze data	Employ data analysis methods/ measurements	Describe the methods or measurements used to analyze data	Abstract: Through statistical analysis Summary: The researchers of this study conduct a content analysis on the interview transcripts.
		Describe the data being analyzed	Indicate what aspects of data were analyzed	Abstract: the emotional healing efficacy of movies was analyzed based on whether the subjects experienced the processes of identification, catharsis, and insight. Summary: An analysis on the contents and items of regulations on manuscript submission and format requirements of the targeted forty-seven journals was conducted, and a comparison of the Romanization of Chinese citations of these journals was made.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
		State the purpose of data analysis	Describe what was expected to identify or discover from data analysis	Abstract: Based on structural equation modeling of data, this study is to examine the relationships between the above antecedents and moderator of innovative behavior. Summary: Key themes under investigation were identifying the demographics of the consultation seekers (question askers), expression styles while communicating medication information needs...
		Adopt data analysis software	Indicate the software or application used to facilitate data analysis	Abstract: None Summary: Data analysis was conducted using a Microsoft Office Excel-based codebook...
	Verification		Indicate how the quality of the research was ensured or the results were verified	Abstract: None Summary: We also employ member checking to make sure the liability and accuracy of data.
Results	Summarize individual results		Detail the findings	Abstract: The results showed that the information needs of nurses were to resolve clinical problems in patient care and to write progress reports. Summary: Analyses showed that, in regards to motivations, participants re-used existing data for the following reasons: (1) they were unable to collect large-scale or long-term data on their own...
	Evaluate system performance		Describe whether the proposed approach/ technique/system outperformed previous ones	Abstract: Our study found that the recognition accuracy is raised because of a combination of syntax rule with name algorithm. Summary: Compared with other automatic rule construction and quasi-machine learning methods, we have a better performance particularly for precision.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
	State comments on the results	Explain findings	Indicate the possible causes that lead to what has been found	Abstract: None Summary: This study also found that the transliteration of foreign location names is very similar to personal names, and that is why the CKIP usually mistakenly identifies them as Nb.
Discussion	Consolidate results	Restate methodology	Briefly state the research methods again	Abstract: None Summary: This study followed the analytic approach taken by Lin (2011) and Chang and Lin (2015) to identify the various kinds of pleasures a reader may perceive when reading a particular textual genre.
		Summarize results	Describe the overall findings	Abstract: None Summary: H1, H2, and H3 of this study are all supported by the analysis results. Results are as shown in Figure 2, 3 and 4.
		Refer to previous literature	Mention previous research, such as what has been found	Abstract: The charms of mystery fiction may be systematically described by following four of Hudson's (1910) conceptualization of fiction elements: i.e. the plot, characters, time and place, and the author's view of life prevailed in the stories. Summary: This study identified seven types of reading pleasures based on empirical evidence, some of them beyond the pleasures mentioned by Charles, Morrison, and Clark (2002), Matta (2010) and Saricks (2009).
		Compare results with literature	Describe the differences between the present study and previous research, usually in findings	Abstract: None Summary: As for reading behaviors, the experimental and control groups did not have significant differences, which differs from the findings of Guthrie et al. (2013) who found that positive reading motivation could forecast student behavior dedication.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
	Suggest further research		Indicate what requires more investigation	Abstract: None Summary: As the numbers of OA and non-OA papers were rather disproportionate, the effect of OA model on the first citation speed requires further observations.
Conclusions	Make overt claims or generalization		Generalize findings to draw conclusions	Abstract: The results support that change is a critical drive to motivate mobile enterprise strategies. Summary: In conclusion, this study found that the food package information perceived as being the most important by consumers included product name, brand name, ingredient information, food additive information, and information on certified functions.
	Significance		Describe the theoretical and/or methodological contributions the study makes	Abstract: The study initiated a new innovative teaching model in Problem-based learning, that is, to integrate the two teaching methods, and called it "blended flipped online instruction." Summary: The contributions of this study include: (1) supplementing the model for mobile IT business value creation and (2) reexamining and integrating the performance of enterprise mobility.
	Implications		Indicate the areas to which the findings can be applied	Abstract: The analysis and the findings of this paper may shed lights on the future cultural and creative productions between memory organizations and collaborating designers. Summary: The findings and recommendations of this study can offer implications for the pedagogical implementation of a PI curriculum to enhance information literacy among college students.

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Table 3. The Coding Scheme (continued)

Sections	Moves	Steps	Definitions	Shortened excerpts (Abstract/Summary)
	Limitations		Describe what has not able to do in the conduct of the study	Abstract: None Summary: This study is preliminary due to limited personnel and time constraints.
	Suggestions	Practical applications	Provide advice to improve practices	Abstract: To strengthen the effect of agricultural information dissemination, some suggestions were made. Summary: Based on the results of this study, suggestions are made below. 1. University libraries should have exclusive e-book catalog systems and platforms.
		Future research needs	Describe what could be done in future research	Abstract: This study suggested that further studies could adopt the concept of Altmetrics to investigate the first-usage speeds through the formal and informal communication channels. Summary: Future studies can expand the scope and collect survey responses from different universities.
	Indicate content		Describe the content and/or the structure of the article	Abstract: This paper provides suggestions to teachers for further collaborations based on these findings. Summary: In the end of this study, practical suggestions are offered based on research results.
Acknowledge-ment			Appreciate the support the author(s) receive, such as financial assistance	Abstract: None Summary: This study is partial research results of a National Science Council Grant Proposal (MOST 103-2410-H-030 -068 -).
Other section headings			Headings other than IMRD	Abstract: None Summary: Differences between Leiden Manifesto and DORA

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asking the differences between English abstracts and summaries, an interviewee who had served on the editorial board of one of the three journals for a long time and who was an author of several summaries responded, "English summaries have citations and tables/figures, while abstracts do not." Additionally, an interviewee mentioned she had to transform her tables into narratives when she wrote her Chinese summary. Thus, this study explored the extent to which summaries contained tables and/or figures and citations. Table 4 presents the results of the above analysis.

Most summaries reported empirical research. These included technical-oriented articles because empirical data were used, such as "*Analyses of the Standard Classification of Fields Based on the Directory of Faculty Expertise from Open Data*." Summaries that reported how systems were developed were unique to *JoEMLS*, including "*Design and Implementation of a Library and Information Science Open Access Journal Union Catalogue System*." These summaries were structured, but they did not contain tables and/or figures and citations. Summaries that reported history research were found in *JLISR* and *JLIS*. The scope of these two journals included archival history. The two summaries demonstrated contrasting features. One was structured, while the other was unstructured. All summaries in *JLIS* were structured. Additionally, more *JLIS* summaries contained tables and citations. In contrast, *JoEMLS* had more unstructured summaries and those without tables and/or figures and citations.

4. Results

4.1 Structure and components of English abstracts

Table 5 presents the frequency of sections, moves, and steps in abstracts and summaries. The most frequently appeared steps in three journals include: State purpose(s), summarize individual results, describe subjects, employ data collection methods, claim the centrality of the topic, indicate

Table 4. Research Types and Number of Articles

Dimensions	Journal titles	JoEMLS	JLISR	JLIS
Research types	Empirical research	17 (85%)	13 (86.7%)	13 (81.3%)
	Conceptual discussion	1 (5%)	1 (6.7%)	2 (12.5%)
	History research	0	1 (6.7%)	1 (6.3%)
	System development	2 (10%)	0	0
Structuration	Structured	13 (65%)	13 (86.7%)	16 (100%)
	Unstructured	7 (35%)	2 (13.3%)	0
Visual presentation	With tables and/or figures	3 (15%)	3 (20%)	6 (37.5%)
	Without tables and/or figures	17 (85%)	12 (80%)	10 (62.5%)
Citations	With citations	10 (50%)	9 (60%)	14 (87.5%)
	Without citations	10 (50%)	6 (40%)	2 (12.5%)

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Table 5. Frequency of Moves and Steps in English Abstracts (A) and Summaries (S)

Sections	Moves	Steps	JoEMLS		JLISR		JLIS	
			A	S	A	S	A	S
Introduction	Announce the importance of the field	Describe background	4	3	2	3	1	5
		Claim the centrality of the topic	9	14	8	11	4	10
		Make topic generalization	3	5	2	4	1	8
		Review previous research	1	2	1	4	0	4
	Prepare for the present study	Indicate a gap(s)	2	8	4	7	0	12
		Indicate the problem(s)	7	15	8	13	5	6
	Introduce the present study	State purpose(s)	19	19	15	13	17	10
		Propose a new approach/Draw on theories	6	1	2	3	3	5
		Specify research themes	1	5	1	6	0	8
		List research questions	0	5	0	3	0	4
		Clarify definition/coverage/assumption	2	10	2	9	4	7
		Describe expected contributions	1	5	1	2	0	1
		Describe procedure	0	4	0	1	0	3
		Present findings	0	1	0	1	0	0
	Outline the structure of the article		0	2	0	0	1	2
Literature Review	The main body		0	5	0	4	0	2
	Theoretical framework		0	0	0	2	1	0
	State hypotheses		0	2	0	0	0	0
Methods	Justify methods		0	0	0	2	0	0
	Describe the overall data collection approach		3	7	2	2	3	3
	Describe pretest/pilot study		0	0	0	3	0	3

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Table 5. Frequency of Moves and Steps in English Abstracts (A) and Summaries (S) (continued)

Sections	Moves	Steps	JoEMLS		JLISR		JLIS	
			A	S	A	S	A	S
	Select data collection site		1	8	0	6	1	7
	Describe sampling or exclusion criteria		0	2	1	1	0	2
	Recruit participants		0	2	0	1	0	2
	Describe subjects		10	21	9	13	10	14
	Collect data	Employ data collection methods	11	20	8	7	10	12
		Describe the data being collected	6	12	5	18	4	13
		Describe data source	0	5	0	5	1	5
		Describe experiment design	0	0	1	2	0	0
		Assign subjects	1	2	2	4	0	0
		Describe tasks/treatment/procedures	2	5	3	8	0	4
		State time frame	1	12	2	9	3	8
		Develop research instruments	6	17	4	7	4	6
		Employ specific measurement	0	2	0	0	0	1
		Employ data collection equipment	0	0	0	1	0	0
	Analyze data	Employ data analysis methods/measurements	3	19	3	7	1	12
		Describe the data being analyzed	1	2	1	2	1	1
		State the purpose of data analysis	2	4	0	0	1	2
		Adopt data analysis software	0	3	0	0	0	2
	Verification		0	5	0	1	0	4
Results	Summarize individual results		17	17	11	9	13	7
	Evaluate system performance		1	1	1	2	0	0
	State comments on the results	Explain findings	0	3	0	3	0	1

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Table 5. Frequency of Moves and Steps in English Abstracts (A) and Summaries (S) (continued)

Sections	Moves	Steps	JoEMLS		JLISR		JLIS	
			A	S	A	S	A	S
Discussion	Consolidate results	Restate methodology	0	3	0	0	0	1
		Summarize results	0	8	0	9	0	11
		Refer to previous literature	1	2	0	5	0	0
		Compare results with literature	0	3	0	6	0	2
	Suggest further research		0	1	0	1	0	2
Conclusions	Make overt claims or generalization		0	11	0	8	1	8
	Significance		5	1	0	4	2	4
	Implications		0	5	0	5	2	7
	Limitations		0	1	0	2	0	2
	Suggestions	Practical applications	8	13	0	8	4	9
		Future research needs	0	10	0	3	1	10
	Indicate content		6	1	5	0	3	1
Acknowledgement			0	2	0	0	0	0

the problem(s), describe the data being collected, develop research instruments and indicate content. This indicates the major focus was to report their research. The least frequently appeared moves and steps include: outline the structure of the article, theoretical framework, describe sampling or exclusion criteria, describe data source, describe experiment design, refer to previous literature, make overt claims or generalization and future research needs. Moves and steps that comprised the literature review and discussion sections almost disappeared in abstracts. The scarcity of the above moves and steps probably could be attributed to word limits.

The above steps tended to be organized in logical sequence, regardless of their frequencies. The amount of moves and steps varied. Some began with "state purpose(s)," while some began with "describe background," "claim the centrality of the topic" or "indicate the problem(s)." Most began with "claim the centrality of the topic." Some ended with "summarize individual results," "significances," "practical

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applications" or "indicate content." Almost all abstracts contained "state purpose(s)," except two *JoEMLS* abstracts. Nevertheless, *JoEMLS* abstracts had the highest frequency of this step. Most abstracts had "describe subjects" and "employ data collection methods." Most abstracts contained "summarize individual results." Important findings were reported. While "summarize individual results" took more space in a few abstracts, most moves and steps scattered in different places in abstracts. "Practical applications" appeared in some *JoEMLS* and *JLIS* abstracts. The original articles were written to influence practices, including library and academic evaluation practices.

Sometimes moves and steps of different sections were combined. Moves and steps of the methods sections were combined with "state purpose(s)." "This study used card sorting method to investigate female consumers' preferred classification scheme, and adopted in-depth interview method to identify the organizing rules they lived by" could serve as an example. Moves and steps of the methods sections were usually combined and written together. "Semi-structured, in-depth interview was used to understand the experiences of 14 researchers from sociology, political science, education, economics, and psychology" could serve as an example. Moves and sections of other sections, especially "claim the centrality of the topic," "summarize individual results" and "practical applications," tended to stand alone. For example, authors tended to report their results and provide practical advice separately.

4.2 Structure and components of English summaries

4.2.1 Sections of English summaries

Structured English summaries were composed of sections, moves, and steps, while unstructured ones were composed of moves and steps. Table 6 presents the frequency of sections that appeared in summaries. Sections, moves, and steps exclusive to the summaries of the three TSSCI-indexed LIS journals include: recruit participants, restate methodology, and acknowledgement. Although the literature review and discussion sections did not appear frequently, they tended to be integrated into the introduction, results, or conclusions sections respectively. All *JLIS* summaries contained the introduction sections, while two unstructured *JLISR* summaries and seven *JoEMLS* summaries did not. Only eight summaries in three journals contained literature review. Unstructured summaries, including those reported empirical research and conceptual discussion, did not have the methods and results section headings. Only seven summaries contained the discussion sections and corresponding headings. All were empirical research. Most structured summaries contained the conclusion sections, including those reported empirical research and conceptual discussion.

In general, summaries followed the IMRC organization. However, authors did not always used the IMRD/IMRC section headings. They often substituted conventional headings with other terms. For example, "summary," "preface," "research goals and methods," "research questions" and "purpose" had been used to replace "introduction." Most "literature review" remained the same, with one combined with "hypotheses building" and the other was termed "current

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Table 6. Frequency of Sections in English Summaries

Journals/Sections	JoEMLS	JLISR	JLIS
Introduction	16	13	17
Literature Review	3	4	1
Methods	11	13	13
Results	11	11	14
Discussion	3	3	2
Conclusions	12	11	15
Suggestions	6	4	3
Other Section Headings	6	4	12

development." Section headings including "glossary" and "the PBL model" replaced literature review to introduce important concepts and model. "Methodology" was frequently used to denote the methods sections. Terms including "study design and implementation," "research design and conducting" and "design/methodology/approach" were also used. "Findings," "research findings" and "results and analysis" were often used as headings for the results sections. The discussion sections were often combined with either the results or conclusions sections. Discussion and conclusions co-occurred four times. Results and discussion co-occurred three times. It only stood out as a separate section once. The heading "conclusions and suggestions" was frequently used for the conclusions sections. Conclusions and suggestions co-occurred frequently (N = 14). "Practical implications," "conclusions and recommendations" and "research limitations/implications" had also been used as headings. The scarcity of the literature review and discussion sections demonstrates just like English abstracts, the major purpose of English summaries was to report the research authors conducted.

"Other section headings" appeared more frequently in summaries that reported conceptual discussion and empirical research. Sections in the former tended to be sub-topics of the major topics under discussion and they tended to be organized in chronological order. For example, "origins and development of peer review," "current status of peer review research" and "future development of peer review" were organized according to chronological order in the summary of "*History, Research, and Challenges: A Systematic Analysis of Peer Review for Journals, Grants, and Faculty Appointment*." Sections in the latter tended to be steps that originally belonged to specific sections, such as "research questions," "purpose," "research instruments" and "research area and limitations." These steps became individual sections in some summaries.

Two summaries—one in *JLISR* and the other in *JLIS*—began with abstracts without headings, followed by the introduction sections. While most summaries ended with the conclusions sections,

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several ended with findings or discussion sections. Moreover, the content of a section did not always correspond to its heading. For example, a *JLISR* summary ended with a discussion section. However, it actually comprised of moves in the conclusion section, including "make overt claims or generalization," and "implications." Sometimes research questions were listed in the end of the introduction sections, while sometimes they were placed in the "research questions and methods" sections.

Overall, introduction, methods, results and conclusions were the most frequently appeared sections. Authors used various terms for section headings, especially for the methods and results sections. They combined different sections within word limits, but they also broke down steps within specific sections to create new sections. This indicates these journals respected authors' decisions in determining what should be included and how different sections, moves, and steps should be organized in summaries.

4.2.2 Moves and steps in different sections of English summaries

Table 5 presents the frequency of sections, moves, and steps appeared in summaries. Steps exclusive to summaries include: list research questions, describe expected contributions, describe procedure, present findings, literature review: the main body, literature review: state hypotheses, justify methods, describe pretest/pilot study, recruit participants, employ specific measurement, employ data collection equipment, adopt data analysis software, verification, explain findings, restate methodology, summarize results, compare results with literature, suggest further research, limitations, acknowledgement, and other section headings. The lack of the above moves and steps in abstracts did not mean they were not important. Rather, it meant authors strived to present the essentials of their research within word limits. Thus, they had to make exclusion decisions. With sufficient space, authors were able to make their summaries informative with the addition of these sections, moves, and steps.

The most frequently appeared moves and steps include: describe subjects, describe the data being collected, state purpose(s), employ data collection methods, employ data analysis methods/measurements, claim the centrality of the topic, indicate the problem(s), and summarize individual results. An article was written or a study was conducted to achieve a major purpose. A study involved different types of subjects and authors described them in detail. Additionally, sometimes a study employed multiple data collection methods and collected different types of data. Thus, frequencies were high. High frequencies of "indicate the problem(s)" and "summarize individual results" partly indicate the importance of the problem(s) a study intended to solve and presenting what has been found. The least frequently appeared moves and steps include: employ data collection equipment, theoretical framework, state hypotheses, present findings, justify methods, describe experiment design, evaluate system performance, acknowledgement, and indicate content. The scarcity of these moves and steps probably could partly be attributed to the methods authors adopted and word limits. Additionally, only two empirical research "justified methods." Nine summaries contained "verification," including eight empirical research and a system development.

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The number of moves and steps in the introduction sections in summaries varied. Some contained more, but two only contained one step. The former was similar to the introduction section of a full research article. Readers can acquire an overview of the study being reported. In the latter cases, "state purpose(s)" was placed in the literature review section or it was not written. The step "state hypotheses" appeared twice. One in the literature review section and the other in the methods section. The former was about library management. The author received her Ph.D. in management. As she described in the interview, management scholars tend to develop hypotheses while reviewing literature. The latter's hypotheses derived from the author's previous research. These hypotheses were proposed after the author described the research instrument (questionnaire) and the measurements she adopted. Authors tended to organize the data collection and analysis methods they adopted in different phases and the results of each phase in chronological order in summaries that reported action research, system development, and technical-oriented empirical research. While some authors only presented the final, overall results, some stated summarized, individual results in detail in the results sections.

Sometimes authors placed moves and steps in other sections. For example, authors of a summary stated their purposes in the "Research Design and Conducting" section. Sometimes authors placed steps of a section in other sections. For example, an author listed three research questions in the beginning of the "research questions and methodology" section. Authors probably organized steps of adjacent sections based on logical order. Some steps co-occurred several times, including: "describe sampling and exclusion criteria" and "describe subjects" ($N = 5$), "employ data collection methods" and "describe the data being collected" ($N = 5$), "describe the data being collected" and "state time frame" ($N = 4$), and "employ data collection methods" and "describe procedure" ($N = 4$). "Describe sampling and exclusion criteria" overlapped "describe subjects" because the subjects participated in authors' studies met the criteria they set up. Thus, sometimes they co-occurred. The following excerpt serves as an example: "All participants were required to have worked more than three years and most of them were directors who were familiar with all tasks in their institutions." Sometimes a text segment embodied multiple steps. For example, an author summarized experiment results first and explained the causes by presenting what participants said in interviews in the "Results and Discussion" section. The interview results were presented as explanation. The following excerpt serves as an example: "Several possible reasons for the superiority of videos recorded by two cameras with alternating angle shots on recall were uncovered through the informal interviews conducted after the experiment."

4.2.3 Tables and/or figures in English summaries

This study further analyzed the tables and/or figures in summaries. Table 7 illustrates the number of tables and figures in different sections of English summaries. Tables appeared in the methods and results sections. Tables and figures were used primarily to present results and research instruments, especially in quantitative research. Tables were also used to present interview guides and participants' profiles in qualitative research. Several problems related to tables and figures

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Table 7. Number of Tables and Figures in English Summaries

Journals	Sections	*N* of tables	Sections	*N* of figures
JoEMLS	Methods	2	Methods	1
			Results	3
JLISR	Methods	3	Methods	2
	Results	2		
JLIS	Methods	4	Results	12
	Results	16		

were identified. First, some tables and figures were not explicitly addressed in the texts of *JLISR* and *JLIS* summaries. Readers have to match textual descriptions with the tables and figures by themselves. For example, Table 2, 3, 4 and Figure 1, 3, 4 were not mentioned in a *JLIS* summary. What made it worse was that some tables and figures were not placed near the corresponding texts because of the layout. These may prevent foreign readers from effectively navigating within the summaries. Second, some tables were not numbered appropriately. For example, Table 3 should be numbered as Table 2 because there was no Table 2 in a *JLISR* summary. This probably could be attributed to the lack of reviewing mechanism for English summaries.

4.3 Comparisons between English abstracts and summaries

Overall, the amount of sections, moves, and steps in summaries was higher than that of abstracts. Comparing English abstracts and summaries based on Table 5 reveals the following results:

1. Introduction: (1) "State purpose(s)" appeared less frequently in *JLISR* and *JLIS* summaries. This probably because authors listed research questions their studies aimed to answer or they specified the themes under investigation. The author of a *JLISR* summary did not state her purpose(s). She indicated the problems in the beginning of the introduction section. Foreign readers probably are able to infer that this study's purpose was to solve the problem the author indicated. (2) Frequencies of "specify research themes" and "clarify definition/coverage/assumption" were much higher in summaries than in abstracts. Authors probably had more space to detail the aspects of the phenomena covered in their investigation. (3) "Propose a new approach/draw on theories" appeared more frequently in *JoEMLS* abstracts than in summaries. These included the area a study was grounded in and the concepts that authors employed to study specific phenomena. (4) "Outline the structure of the article" appeared four times. Two indicated the development of original articles. Two appeared to describe what was reviewed in the literature review sections of original articles. These were written by the same corresponding author. The following excerpt serves as an example: "The literature review in this paper was organized into three sections. First, current regulations and restrictions pertaining to health foods and food and

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nutrition labels were presented...” This illustrates several summaries had indicative elements.

2. Literature review: This almost disappeared in abstracts, but they appeared in some summaries.

3. Methods: (1) The frequency of “describe the overall data collection approach” increased in *JoEMLS* summaries. Authors of these summaries tended to adopt quasi-experimental design, case study, and action research. These were the overarching data collection approaches. Authors adopted other methods to collect data within these approaches, including interviews and focus groups. (2) Several authors “described pretest/pilot study” they conducted and whether the results were included in the formal study in summaries. The frequency of “describe sampling or exclusion criteria” increased a lot in summaries. (3) The frequency of “describe subjects” increased a lot in summaries. One reason that caused the increased frequency of “describe subjects” was that there were two types of subjects. One was the target of the study, including organizations, projects, and journals. The other was human subjects through which the first type was investigated. For example, “two collaboration projects between NPM and BrightIdeas” was the major subject and “the decision makers and staff involved in the development” who participated in interviews were the second type of subjects in “*A case study of value creation out of cultural artifacts collaborated between the National Palace Museum and the Bright Ideas Design, Co. Ltd*.” (4) The frequency of “employ data collection methods” increased a lot in *JoEMLS* summaries. Authors described how they collected data in detail. (5) The frequency of “describe the data being collected” increased a lot in summaries in three journals. The data being collected included: conference papers, journal articles, human subjects’ demographic information and views, number of valid questionnaires, and online data such as medication consultation questions. (6) The frequency of “describe data source” increased a lot in summaries in three journals. Summaries that indicated where the data were obtained tended to report bibliometrics studies (e.g., “*Industrial characteristics and scientific collaborations of Taiwanese companies with high scientific productivity*”) and those collected online data from specific websites (e.g., “*An analysis of the questions of online medication consultation service*”). The two *JoEMLS* summaries that reported system development used data from collaborators and online sources. (7) Frequencies of “describe experiment design” and “assign subjects” did not increase much in summaries probably because only a few studies adopted the experimental approach. (8) The frequency of “state time frame” increased a lot in summaries in three journals. These included the periods during which the studies were conducted, the frequency and length of data collection, the temporal aspects of the data being collected (e.g., “articles in print or in electronic format published before September 2016”), and how often and how long experimental treatments took place. (9) The frequency of “develop research instruments” increased a lot in summaries. These included: how interview guides and surveys were developed, how information literacy curricula, platforms, experimental interfaces, and tasks were designed and how emotional healing movies were selected. (10) The frequency of “employ data analysis methods/ measurements” increased a lot in summaries.

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"Employ data collection methods" appeared more frequently than "employ data analysis methods/ measurements" in abstracts. Authors tended to emphasize how they collected data in abstracts. Summaries provide more space for them to write about how data were processed and analyzed in detail.

4. Results and Discussion: (1) The frequency of "summarize individual results" decreased in *JLISR* and *JLIS* summaries. This probably because authors chose to "summarize results," although this belonged to the discussion section of research articles. (2) Although not many authors "referred to previous literature," the frequency of "compared results with literature" increased.

5. Conclusions: (1) The frequency of "make overt claims or generalization" increased a lot in summaries. This probably could be attributed to the fact that authors did not have sufficient space to report their conclusions in abstracts. They had to focus on reporting their findings. (2) "Significance" was more frequently mentioned in *JoEMLS* abstracts. In contrast, *JLISR* and *JLIS* authors tended to state the significance of their research in summaries. (3) The frequency of "implications" increased in summaries in three journals. This probably could also be attributed to the space that summaries provided. (4) The frequency of "practical applications" increased in *JLISR* summaries. Authors tended to write many advices for stakeholders to improve practices. Most practical advices were written in narrative styles. Only a few listed them as bulletin points. (5) "Indicate content" appeared more frequently in abstracts than in summaries. Some abstracts ended with indicating what was discussed or provided in original articles, which were often suggestions/recommendations and methodological and practical implications. This probably could be attributed to word limits. Authors were not able to elaborate within word limits. Summaries provided more space. Thus, authors were able to provide their suggestions in the end.

5. Discussion

English summary is a unique research genre that the LIS discipline created. Six TSSCI-indexed journals provide both English abstracts and summaries and three fall into the LIS discipline. Compared to other disciplines, LIS is more active in international scholarly communication. Systematic disciplinary efforts sustained for a long time. The fee-based editing and translation services that *JoEMLS*, *JLISR*, and *JLIS* provide are similar. They have consulted each other's requirements and services to develop theirs. English summaries are placed in different places of the full-text pdf files. *JoEMLS* and *JLISR* seem to treat them as an attachment. English summaries in *JLIS* precede the original Chinese research articles. Their importance is manifested.

This article does not present the results of analyzing other three TSSCI-indexed journals. However, the analysis reveals "recruit participants" and "acknowledgement" were unique to LIS summaries. Although other disciplines also recruited human participants, their authors tended to describe the number and demographic information of participants without stating how these were recruited. Some editors and authors were not certain about whether to include acknowledgement in summaries, while some contended it should be included. Nevertheless, all of them agreed this should definitely be included

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in original Chinese research articles. Including acknowledgement in English summaries may help foreign readers understand how a specific study was completed and link it to the complete research project. Foreign readers may be able to obtain more information since some research reports are publicly available. It is also important to demonstrate the contributions that Taiwan's funding institutions make to research endeavor.

Some of the moves and steps this study identified have not been identified by previous studies. These include: propose a new approach/draw on theories, specify research themes, clarify definition/coverage/assumption, describe expected contributions, describe pretest/pilot study, and verification. Although "propose a new approach/draw on theories" did not occur frequently, its appearance demonstrates that LIS research adopted theories, models, and concepts from other disciplines. What has been adopted included: the consideration set model from marketing literature, inquiry-based learning, the concepts of public history and features of digital archives and Web 2.0, the model for mobile information technology, and so on. "Clarify definition/coverage/assumption" helped readers develop an initial understanding of key concepts or the scope of investigation. "Movie therapy involves watching appropriate movies for soothing negative emotions" could serve as an example. Additionally, this study found "describe background" tended to appear in the beginning of abstracts and summaries and this was part of the centrality claim. Authors first described background and then stated the importance of the issues being addressed. This was similar to Samraj's (2002) findings. However, sometimes this step appeared in the methods sections to provide background information regarding data collection site and subjects. "Justify methods" appeared in the beginning of the methods sections. Kanoksilapatham (2005) found it in the results sections. Embedding was also found. Embedding occurred more frequently in abstracts due to word limits. Different moves and steps of different sections or those within a section were combined to form a sentence, especially the methods sections. "This study employed content analysis to select movies about breakups and recruited 14 undergraduates suffering from breakups" could serve as an example.

The frequency of moves demonstrates LIS authors tended to announce the importance of the field by claiming the centrality of the topic. They prepared for the present study by indicating the problem(s). Gaps in the literature were less frequently mentioned. Conservation biology authors' adopted the same rhetorical strategies to write their introductions (Samraj, 2002). This probably could also be attributed to disciplinary orientation, boundaries, and levels of establishment. Just like conservation biology, LIS is characterized as an applied, interdisciplinary, and emergent discipline. LIS research was conducted to solve real-world problems. The sections, moves, and steps this study uncovered were identified based on the functions a specific text segment signaled and the linguistic features it encompassed. They represent the rhetoric choices that authors made. Authors expressed their studies in diverse ways. The functions of some moves or steps were similar. They were replaceable. Authors chose one among others when writing English summaries. For example, "specify research

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themes" and "list research questions" varied in expressions, but they served the same rhetoric purposes. An interviewee who was both an editor and author mentioned sometimes she specified research themes and sometimes she listed research questions. Although the functions of some moves or steps were not identical, such as "state purpose(s)" and "propose a new approach/draw on theories," they have been viewed as two sides of the same coin. For example, an interviewee argued "propose a new approach/draw on theories" could be the purpose of a research. "In this study, we applied syntax rules of names and places to process Chinese NER, and extracted features from Wikipedia to assist disambiguation and thereby help to improve recognition accuracy" could serve as an example. The low frequencies of "describe expected contributions," "describe procedure," "present findings," and "outline the structure of the article" indicate these were frequently omitted. The introduction sections of English summaries were half as complete as that of research articles.

Most summaries skipped the literature review sections and preceded to describe research methods. Only a few contained this section. These summaries reported conceptual discussion and empirical research. Additionally, only two summaries contained theoretical frameworks and both reported empirical research. This probably could be attributed to research design, the availability of the literature they cited to foreign readers, and word limits. Only the most relevant studies that informed the development of authors' research were cited. In a few cases, authors indicated what was reviewed in original articles. While an author indicated literature review should contain the most important literature that informed the development of the research, another author dropped it because the literature she cited was written in Chinese. It is not available to and hence not useful to foreign readers. Authors focused on describing subjects, data collection and analysis methods, the data being collected, time frame, and research instruments in the methods sections. Data analysis methods were usually omitted in abstracts, but included in summaries. "Justify methods" rarely appeared. Authors described how their studies were carried out in a straightforward way. They probably did not think justification was necessary because their studies have been scrutinized in the peer review process. The difference between "results: summarize individual results" and "discussion: consolidate results: summarize results" lied in the former reported different parts of the results, while the latter jumped to the overall results directly without elaborating the detail. LIS authors took both approaches to report their results. Slightly more authors chose the former. However, rarely were the findings explained and compared with previous literature. Finally, some authors drew conclusions from results and stated implications and limitations. Suggestions regarding what to do to improve practices were provided. This not only reflects the applied orientation of the LIS discipline, but also echoes their heavy use of "indicate the problem(s)" to claim the centrality of their research. Summaries allowed authors to describe future research needs with more word limits, while abstracts did not. Thus, future research needs were omitted in abstracts. In this regard, the results/discussion, and conclusion sections of English abstracts and summaries in LIS resembled those in arts education, and sports

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& exercise research that this study also analyzed. In contrast, management authors focused on elaborating the contributions their studies have made, and limitations and future research needs. Overall, English abstracts and summaries in LIS followed the IMRC structure. Almost all LIS abstracts and summaries were informative, with some contained indicative moves.

6. Conclusions

This study content analyzed and compared English abstracts and summaries of 51 Chinese research articles in three TSSCI-indexed LIS journals. Overall, English abstracts and summaries in LIS shared the same focus on reporting authors' research. Less relevant information was not presented. As a unique research genre that bridged the Taiwan academic community and the rest of the world, the logical but flexible structure and components of English summaries reflected the diverse research topics and types of research that LIS scholars embraced. The results demonstrate that the IMRD structure of research articles was decomposed, combined, and reorganized when authors wrote Chinese/English summaries. Authors reported their research in relatively diverse ways in summaries than in abstracts.

This study took the initiative to unfold the identities of English summaries in the LIS field by revealing their constituent sections, moves, and steps and how these were structured. The results enhance our understanding of what has been presented to international readers. The differences between abstracts and summaries allow us to understand what was omitted in abstracts, what was added in summaries, and structural variations in LIS summaries. Editorial boards of LIS journals could exploit the results to decide whether they would like to take the structured approach, especially for English summaries. This may help foreign readers form consistent expectations and facilitate their navigation within English summaries. Editorial boards could also develop guidelines or templates that contain the sections, moves, and steps this study identified to instruct authors to write informative abstracts and summaries. It is suggested that LIS journals and authors proofread tables and figures before publishing. It would help foreign readers quickly identify the tables, figures, and/or corresponding textual descriptions if authors indicate which tables and figures they should read.

This study had several limitations that should be addressed by future research. First, it did not analyze full research articles and compared them with English summaries. Thus, it is not clear how representative these summaries were and what components were dropped. Next, this study did not analyze English abstracts and summaries of Chinese articles published in non-TSSCI-indexed LIS journals, such as *Journal of Library and Information Science*. Future research can bridge this gap by exploring the structural and compositional differences between TSSCI-indexed and non-TSSCI-indexed LIS journals. Third, this study only analyzed English abstracts and summaries published in 2016 and 2017. Future research could explore how English summaries have evolved since its debut by including those published in the past. Furthermore, this study did not delve into the citations in English summaries. Uncovering the extent to which citations were removed from original articles, salient

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characteristics of citations in English summaries and the removed ones, factors that lead to keeping and removal decisions would help us better understand how English summaries were written. It is also crucial to understand how the removal and/or lack of citations affects the credibility and trustworthiness of a study and foreign readers' use of LIS research articles published in Taiwan. As well, it is crucial to explore what components should be included and how they should be organized from foreign readers' perspectives. This will help us understand how informative an English summary should be to help them use a Chinese study published in Taiwan. Finally, comparing English abstracts and summaries across disciplines could help us better understand the information needs, modes of communication, and identities of different disciplines.

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三種收錄於臺灣人文及社會科學引文索引之圖書資訊學期刊之英文摘要與摘錄比較研究

A Comparative Analysis of English Abstracts and Summaries of Chinese Research Articles in Three Library and Information Science Journals Indexed by the Taiwan Social Science Citation Index

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摘　要

英文摘錄為獨特的研究文體，因應國外學者對臺灣學術之需求而生，用以彌補英文摘要之不足，並解決翻譯中文研究文章全文之困難。資訊充足之英文摘要能促進中文期刊之使用，協助其被國外資料庫與引文索引收錄。然而，不同的作者寫作方式不同，我們對英文摘錄之結構與組成所知有限。為瞭解臺灣學者究竟呈現什麼給國外讀者，本研究探討英文摘要與摘錄之結構與組成之異同，以內容分析來分析三種收錄於臺灣人文及社會科學引文索引之圖書資訊學期刊於2016與2017年出版之英文摘要與摘錄。結果顯示英文摘要與摘錄之共同焦點在於報導圖資作者之研究，作者撰寫摘錄時解構了IMRD之架構，結合並重組不同元素，以更多元的方式來撰寫英文摘錄。

關鍵字：文體分析、英文摘要、英文摘錄、延伸摘要、學術傳播

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