Reiss's Text Typology Theory's Research Hotspots and Its Application in Translation Based on the C-E Translation of An PhD Dissertation Study on Recognition Methods for Multiple-Player Behavior in Football Match Videos

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Abstract. Katharina Reiss's text typology theory has deeply influenced the translation industry both domestically and internationally since its inception. Its value is not only reflected in providing reliable reference paradigms for the inheritance and innovation of modern and contemporary translation theories, but also in its powerful guidance for translation practice. This study utilizes the visualization capabilities of CiteSpace and CNKI to analyse the research hotspots on this theory in the literature collected from the Web of Science and CNKI databases from 1991 to 2023 to acknowledge Reiss's contributions and explore the cutting-edge research directions of this theory. At the same time, the researcher of this paper also optimizes this theory to translate a doctoral thesis on football match video recognition from Xiamen University, for the purpose of verifying the classicality and practicality of Reiss's text typology theory.

Keywords: Text Typology Theory, C-E Translation, CiteSpace, Football Match Videos

1. Introduction

In the 1950s and 1960s, translation theoreticians studied translation from a linguistic viewpoint. In the 1970s, the German School's functionalist theories of translation came into being [1]. Katharina Reiss, Hans Vermeer, Justa Holz-Manttari and Christina Nord were its four distinguished representative [2]. As a break from the traditional translation and an important complement to translation theories, the functionalist concept of translation raised by the German School gives a new perspective to translation studies [3]. The fields of translation study have been expanded since the functionalist approach was added to the exploration of translation problems [4].

Reiss (1971), as the initiator, developed a model of translation criticism that built on the concept of equivalence but viewed the text, rather than the word or sentence, as the level at which communication is achieved and at which equivalence must be sought [5]. According to her, the target text should be equivalent to the source text in terms of conceptual content,

linguistic form and communicative function. Reiss's text typology theory classifies all texts into three main types: informative, expressive, and operative. She thinks that the text type determines the special translation procedure and that the determining factor judging the target text is the transmission of the predominant function of the source text [6].

Due to her collaboration with Hans J. Vermeer (1984) in the book *General Foundations of Translation Theory* [7], Reiss first proposed the concepts of "teleology" and "translation functionalism", and was recognized as the founder of functional translation theory. Reiss (1989) conducted a detailed analysis of the relationship among text function, text type, and translation standards, involving both linguistic aspects (semantic, lexical, grammatical, and stylistic features) and nonlinguistic aspects (context, theme, time, location, reader, speaker, and emotional factors) [8]. Text research and text typology theory provide more actionable parameters and a basis for evaluation models of translation quality [9]. Based on the informative type, expressive type, and operative type of language, Reiss's reference model of discourse type principle highlights the principle of text type, thereby expanding the meaning of pure language level to the communicative purpose of translation. This principle extends the previous research focusing on the word and syntax levels to the evaluation model of discourse reference [10].

2. Research Hotspots

In this section, the author first utilized Web of Science to retrieve relevant foreign literature and research hotspots and resorted to CiteSpace to conduct visual analysis of the literature at home and abroad. Afterwards, the author employed the "advanced search" function of CNKI to search the domestic research results of text typology theory and then used the visual analysis function of CNKI to conduct visual analysis of the selected literature.

2.1 Based on WOS

Web of Science is an important database platform for obtaining global academic information. The three major citation indexes (SCIE+SSCI+A&HCI) of Web of Science include over 12,400 authoritative and highly influential international academic journals worldwide, covering disciplines such as natural sciences, engineering technology, social sciences, and arts and humanities. Therefore, the author chose Web of Science as the data source for foreign literature and utilized CiteSpace's function of "keyword clustering" to mine the themes of the papers in the core collection of WOS by referring to the relevant results.

The literature in this report was collected from the Web of Science, and an advanced search was conducted by using the subject word "text typology". According to the search results, the earliest documents appeared from January 1, 1991 to March 31, 2023, as the deadline for publication, and a total of 817 articles were retrieved (as shown in Figure 1).

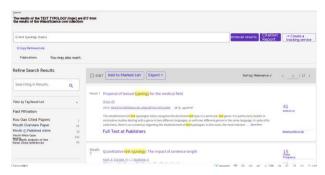


Figure 1 Source of Literature

2.2 Keyword Clustering

Research hotspots are the focus of attention for scholars in specific academic fields, as well as the embodiment of the main issues discussed in this field during a certain period. Keywords, often used to study and explore hot issues in a certain field, condense the essence of a paper. Based on this, the author used CiteSpace for clustering analysis of keyword cooccurrence.

The software runtime was set to "1991-2023", the threshold value was set to K=25, and the Year Per Slice was set to "2". The pruning method contained annual pruning and overall network pruning. Visual analysis was conducted to directly reflect the research hotspots of text typology theory. The keyword clustering view presented is shown in Figure 2, with color blocks representing the clustering area. Node N was 420, the number of connections E was 740, and the network density was 0.0084. The size of module value O is related to the density of nodes and scientific clustering analysis. The larger the Q value is, the better the clustering effect. The average contour value S can be used to measure the homogeneity of the cluster. The higher the value S is, the higher the homogeneity of the network, indicating that the cluster has a high reliability. In Figure 2, the value of Q is 0.8078 (greater than 0.3), which indicated that this network structure clustered well; the value of S was 0.7399 (greater than 0.5), which had high homogeneity and indicated that this clustering view was significant and reasonable, and the different clusters were better divided. From the keyword clustering view, it formed a total of 11 clusters: #1machine learning, #2objects, #3life, #4event extraction, #5content analysis, #6cluster analysis, #7bibliometrics, #8disrespect, #9microstructure, #10perceptions, #11text, around which the research on text typology theory was centered (Shown in Figure 2), with "machine learning", "objects" and "life" ranking at the forefront. The average years of the top five clusters were between 2010 and 2020, which showed that the relevant research had matured during this period. The largest cluster was "machine learning" in 2019 with 36 keywords while the main keywords were "sentiment analysis", "social media", "crisis communication" and so on. The top five clusters were "machine learning", "objects", "life", "event extraction", and "content analysis".

Wang Zhiwen (2012) believed that, "the behavior recognition in football game videos involves specific research content such as feature extraction, object-tracking and detection, behavior representation, classifier construction, and behavior recognition, requires the utilization of technologies such as motion object detection, segmentation, tracking recognition, semantic representation and inference, and covers disciplines such as pattern recognition,

image processing, graphics, computer vision, machine learning, and artificial intelligence, which is a challenging and interdisciplinary research direction" [11]. Accordingly, high-frequency clusters such as "machine learning", "event extraction", and "content analysis" were all within the scope of the original text of this translation practice, and the close correlation between these hotspots and text typology theory fully proved the guiding significance of text typology theory for the translation of informative texts.

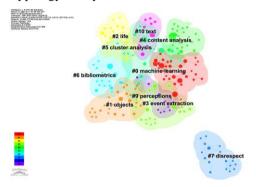


Figure 2 Keyword Clustering Mapping Knowledge Domains

2.3 Based on CNKI

The China National Knowledge Infrastructure (CNKI) is the world's largest "digital library" with full text information, initiated and built by Tsinghua University. It covers various databases, such as journals, doctoral and master's theses, conference literature, newspapers, foreign language literature, yearbooks, encyclopedias, dictionaries, statistical data, patents, standards, achievements, and manuals. Each database provides three search functions: basic search, advanced search, and professional search, in which advanced search is not only the most commonly-used function but also the function utilized in this section.

Based on the fact that the number of documents retrieved was small and the quality was not high after the subject word was only set to "Reiss's text typology theory", the author decided to expand the scope of the search and improve the quality of the documents to understand the publication of Reiss's text typology theory in high-level academic papers in China. Therefore, the author entered "text typology theory" or "Reiss's text typology theory" in the "subject" column of the "search criteria input area" of the "advanced search" page of CNKI. It not only helped to obtain some academic papers that compare Reiss's text typology theory with Newmark's text typology theory but also made contributions to obtaining more articles about this theory's origin and development from the relatively grand topic of text type theory. At the same time, to investigate the research situation of domestic scholars in the 21st century and to echo the search time range of the previous topic word, the author still limited the time range in the search control area to 2020-2023. Regarding the source categories of journals, the author selected "SCI", "EI", "Chinese core journal criterion of PKU", "CSSCI", and "CSCD" as the five core journal catalogs, and obtained a total of 65 relevant documents, as shown in Figure 3.

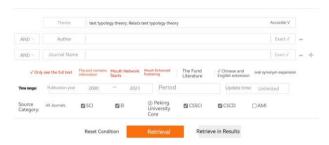


Figure 3 Search Page with the Theme of "text typology theory" or "Reiss's text typology theory"

Subsequently, the author selected all 68 documents and used the "Visual Analysis" function in the "Export and Analysis" column of CNKI to derive the overall trend analysis chart of "text typology theory" or "Reiss's text typology theory" from 2000 to 2023. Figure 4 shows that from 2000 to 2021, domestic scholars' research in this field experienced five fluctuations of ups and downs. From 2021 to 2022, the topic began to warm up in core journals, and no relevant papers were retrieved in 2023. Overall, in the first 22 years of the new century, at least one core journal article each year explored the topic of "text typology theory" or "Reiss's text typology theory", and at most 10 high-level papers each year studied the topic. Apparently, "text typology theory" or "Reiss's text typology theory" shows signs of activity at the top of the domestic academic community every year. Specifically, regarding the topic of "Reiss's text typology theory", only one article included in the Chinese core journal criterion of PKU specifically explored it in the past 20 years, but 74 master's degree theses made use of this theory as their guiding theory, which indicated that Reiss's text typology theory was mainly active in the focus of translation practice reports for master's degree graduates. Of course, the author acknowledged that in the past 20 years, a significant number of 65 core journal papers in the domestic academic community have referred to Reiss's text typology theory, although it was not the only topic or main content to demonstrate.



Figure 4 Overall Trend Analysis of 65 Documents with the Theme of "text typology theory" or "Reiss's text typology theory"

Then, by using CNKI, the author generated a source distribution map of 65 documents with the theme of "text typology theory" or "Reiss's text typology theory". Figure 5 shows that 10.77% of the relevant literature was published in *Shanghai Journal of Translators*, 6.15% was published in *Chinese Translators Journal*, and 7.69% was reported in *Chinese Science & Technology Translators Journal*, accounting for 24.61% of the total literature. The three have been high-level academic journals specializing in translation. That the columns on scientific and technological translation or applied translation in the three high-level journals in the Chinese translation field have published academic papers on text type theory or Reiss's text typology theory can demonstrate the text typology theory's capability of guiding scientific and

technological translation, which has not only been affirmed and recognized by top Chinese translation journals and scholars to some extent but also injected confidence into the author's application of this theory to guide translation practice.



Figure 5 Source Distribution of 65 Documents

2.4 Keyword Emergence

Keyword emergence provides evidence that specific keywords are associated with a surge in frequency, indicating that a potential topic has or is attracting unusual attention from researchers at a specific time. Therefore, the detection of keyword emergence is considered an indicator of highly active research fields, which can be used to explore emerging trends. Figure 6 shows the emerging words in this research field displayed by the Web of Science in the past 32 years. The starting year in the table was the year when the frequency of the corresponding keyword started to surge, while the ending year was the time when the frequency of the keyword tended to stabilize. The emergence intensity represented the degree to which the frequency of the keyword suddenly increased during the emergence time, usually accompanied by research enthusiasm. The red bar indicates the duration of the corresponding emergent word, and there were 25 emergent words in this table.

From the perspective of time series, "academic writing", "behavior", "linguistic typology", and other start times were the earliest. In addition, from the perspective of flash duration, "academic writing", "behavior", and "natural language processing" have longer flash durations, demonstrating that they have been the focus of relevant research for quite a long period of time. According to the emergence intensity of the emergent words, it can be found that the emergence intensity of "impact", that of "typology", and the one of "text typology" were very high, manifesting a significant change in their frequency. The emergent word "academic writing" in 2005, the emergent word "text stylistic" in 2015, the emergent word "internet" in 2017, the emergent word "machine learning" in 2019, the emergent word "content analysis" in 2020, and the emergent word "classification" in 2021 were all closely related to this report. The source text of this translation practice report is the academic monograph Study on Activities Recognizing Method of Multi-players of Video of Football Game, which belongs to the fields of computers, artificial intelligence, and automation, and the emergent word "machine learning" is one branch thereof. At the same time, this academic monograph is highly theoretical and of high academic value, which coincides with the emergence of the word "academic writing". Under the guidance of Reiss's text typology theory (which fully overlaps with the word "text typology"), this report conducts a textual analysis of both source text and target text in translation practice (which is the same as the word "content analysis"), and classifies multiple topics such as translation process, theoretical framework, and case study (which fully overlaps with the word "classification"). These

similarities strongly demonstrate this translation practice report's characteristic of tracking academic hotspots and its high compatibility with Reiss's text typology theory.

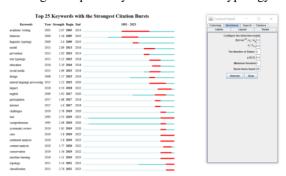


Figure 6 Top 25 Keywords with the Strongest Citation Bursts (Based on Web of Science)

To gain a deeper understanding of the evolution and development trends in this field, the author used CiteSpace to generate emergent words based on relevant research in the field of CNKI. The results are shown in Figure 7, including the year of emergence, duration, and intensity of emergence. On this basis, this report looked forward to research development trends from three perspectives: emergence intensity, duration, and emergence time. Figure 7 reveals the emergence of words in the field of text typology theory research in the past 23 years. The starting year in this figure was the year when the corresponding keyword frequency started to surge, and the ending year was the time when the keyword frequency tended to stabilize. The emergence intensity represented the degree to which the keyword frequency suddenly increased during the emergence time, usually accompanied by research enthusiasm, and the red bar represented the duration of the corresponding emergence word. There are 28 highlighted words in Figure 7. From the perspective of time series, "text type", "translation standards", "functional translation theory", and "functionalist translation theory" were the earliest to start, making them the focus of early researches. In addition, from the perspective of the duration of emergence, "functionalist translation theory", "functional translation theory", and "translation standards" have had a relatively long emergence time, suggesting that they have been the focus of research over significant periods of time.

According to the emergence intensity of emergent words, it can be found that the emergence intensity of "text type" (strength=36.61), "functional translation theory" (strength=21.27), and "skopos theory" (strength=15.22) is very high, manifesting a significant change in their occurrence frequency. In Figure 7, the prominent word "translation report" in 2013, the prominent word "case analysis" in 2014, and the prominent word "post-editing" in 2020 were closely related to this translation practice report. The postediting and case analysis of this report were conducted under the guidance of Reiss's text typology theory, which verified the prominent word "text typology" in 2002, the prominent word "functional translation theory" in 2002, the prominent word "translation criticism" in 2006 and the prominent word "text analysis theory" in 2015 and fully proved the guiding significance of Reiss's text typology theory for this translation practice and this translation practice report. Among them, "postediting" not only had a high degree of prominence but was also close to the current time. Combined with the unstoppable development trend of the machine translation with post-

editing (MPTE) model, "post-editing" has become the latest emerging research hotspot in the field of text typology theory. Overall, with the passage of time, social progress, and changes in the external environment, the research content and research hotspots of text typology theory have been constantly changing, which reveals the sustainability and vitality of this theoretical research from another perspective.

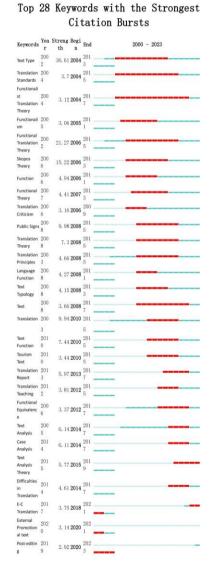


Figure 7 Top 28 Keywords with the Strongest Citation Bursts (Based on CNKI)

3. Text Typology Theory's Application in Translation Research

3.1 A Brief Introduction to the Source Text

In this English translation practice, the translator was guided by Katherina Reiss's text typology translation theory to translate. Anchored in the tracking of academic hotspots and recognition of the trend of Chinese and foreign translation in China, the source text of this translation practice is a PhD dissertation of Xiamen University, namely, *Study on Recognition Methods for Multiple-Player Behaviour in Football Match Videos* (Chapters 1 to 3) written by Wang Zhiwen, a professor of Guangxi University of Science and Technology specialized in artificial intelligence. At the time of publication, this dissertation, supported by the National Natural Science Foundation project "*Research on Team Behavior Recognition Methods in Video Football Games Based on Multiple Feature Fusion*" (Project Number: 61462008), changed its name into *Research on Behavior Recognition Method for Multiple Players in Football Match Video Based on Feature Fusion* which was published by Southwest Jiaotong University Press in 2015.

3.2 A Discussion on the C-E Translation under the Guidance of Text Typology Theory

Here are the cases selected by the translator to confirm the errors in the original text, and correct them in the translated text, accompanied by detailed analysis of every sentence structure. In the following analysis, the author utilizes "ST" to refer to "Source Text", uses "TT" to represent "Translated Text", makes use of "TTMT" to express the meaning of "Translations Translated by Machine Translation", optimizes "RT" to symbolize "Revised Text".

Example 1: Improper Collocation

ST: Then ...

TT: Then, an orthogonal wavelet transform is utilized to decompose a football game video image into components with different sizes, positions, and directions. Before the inverse transform is performed, the size of certain coefficients in the wavelet transform domain can be changed, so that the components of interest in the football game video image can be selectively increased and the components that have little impact on the image processing results can be reduced.

Analysis: The error of this sentence is improper collocation. The words "amplify" and "decline" in Example 1 are not suitable for matching with the word "component". The translator believes that it is more appropriate to interpret the word "amply" as "increase", and the word "decline" as "reduce", and then translate with corrected semantic terms to ensure the accuracy of the translation.

Example 2: Lack of Ingredients

ST: The parts ...

TT: The parts of interest in the image are highlighted in the image enhancement process of football game videos while the unnecessary information in the image is weakened or removed

in order to obtain a more practical image or convert it into an image that is more suitable for human or machine analysis and processing.

Analysis: The error of this sentence is incompleteness of ingredients. The sentence guided by "thereupon then" in Example 2 has no subject. If the sentence is translated as a passive sentence, the translation text will appear top-heavy. When understanding this sentence, the translator connected it with the previous sentence and changed the full stop before "thereupon then" to a comma. As a result, the components have been no longer incomplete with the semantics coherent.

Example 3: Logic Error

ST: When ...

TT: When the camera scanned from one side of the stadium to another, the clouds changed; when it began to rain accompanied by other variations, the lighting conditions altered.

Analysis: The problem of the original sentence has two aspects, one is the misuse of punctuation, the other is semantic repetition. Just as other elements, a punctuation also plays a very important role in a sentence, especially the period and comma, which express the termination and pause of content. Correct punctuation is essential for a translator to correctly understand the original text and generate an appropriate translated text while incorrect punctuation can mislead a translator and his or her readers. Before conducting the analysis, the translator divided the original sentence into four clauses based on the three commas, naming them clause 1, clause 2, clause 3, and clause 4. The translator believed that the comma between clause 2 and clause 3 should be changed to a semicolon, because both clause 1 and clause 3 are adverbial clause of time, while both clause 2 and clause 4 are the subject sentences of their corresponding adverbial clause, indicating the actions that took place during that period. However, a comma is used in that position of the original sentence, which has significantly changed the sentence structure. Clause 1 is still an adverbial clause of time, while clause 2, clause 3 and clause 4 have become three parallel main sentences, which is obviously inconsistent with the meaning of the original sentence. Therefore, the translator insisted that the comma between clause 2 and clause 3 should be changed to a semicolon. The second mistake in the original sentence lies in the repetition of the meaning in clause 3. In Chinese, "rain" is originally a sentence whose structure is subject-predicate, and the word "start" limits the action to the beginning of the rain process. The verb "happen" is rigidly connected to "rain", resulting in semantic redundancy. Therefore, the translator changed the clause "when it starts to rain" into the clause "when rain begins to fall and other conditions occur", and translated clause 3 as "when it began to rain accompanied by other variations", thus clearly expressing the connotation that "rain" is the main action and "and so on" refers to the secondary actions.

Example 4: Vocabulary and Phrase Error (Mistranslation of Term)

ST: Although ...

TTMT: Although the P-M method has achieved some results in suppressing noise and preserving important features of the image, it is pathological and unstable. (Translated by Bing Microsoft Translator)

RT: Despite its effects in suppressing noise and preserving important features of images, the P-M method has shown to be ill-conditioned and unstable.

Analysis: The Dictionary (7th Edition) says: "morbidity, a state of abnormality in the mind or physiology". This meaning is apparently more applicable to the field of humanities and social sciences in which it is translated as "pathological" or "pathogenicity", but in the field of natural sciences, this meaning and translated text may not be appropriate. In the field of image processing, "a pathological problem" refers to the problem that the output result is very sensitive to the input, and even a small (or subtle) noise in the input data will lead to a large change in the output where the word "morbidity" has an agreed and matured English name, namely, "ill-conditioned", which was the case in the source text, so the translator translated it as "ill-conditioned" instead of "pathological".

Example 5: Syntax Error (Error of Hierarchy)

ST: Chapter 2 ...

TTMT: Chapter 2 firstly introduces mean filter denoising, median filter denoising, PDE-based image denoising, full variational image denoising and fractal wavelet transform denoising and this paper proposes a fractal wavelet adaptive image denoising algorithm based on multivariate statistical model and compares their performance. (Translated by Deepl Translate)

RT: Chapter 2 firstly introduces the mean filtering denoising, median filtering denoising, image denoising based on PDE, total variation image denoising, fractal wavelet transformation denoising and the fractal wavelet adaptive image denoising algorithm based on multivariate statistical model proposed in this paper, and compares their performance.

Analysis: When reading through the original text, the translator found an inconsistent expression. This sentence is far from unsuitable if it exists alone, but not smooth in the original text. Because the predicate "introduces" in the original text is closely followed by five objects related to the denoising algorithm, and "and" is clearly followed by the sixth object, which should be juxtaposed with the first five ones. Therefore, the expression in the original text is incorrect. The past tense of the word "proposed" should be changed into the past participle of that, thereby weakening the sense of existence of the verb "propose" and strengthening the importance of the object's headword "algorithm".

Example 6: Semantic Error (Ambiguous Reference of Pronouns)

ST: The ...

TTMT: The drawbacks of these algorithms are that it is difficult to model accurate behavioural representations, various different competitions cannot share models, and they are limited by the development of pose estimation algorithms. (Translated by Deepl Translate)

RT: The disadvantages of these algorithms included the difficulties in establishing accurate behaviour representation models, the inability to share models among different competitions and the limitations imposed by the development of pose estimation algorithms.

Analysis: The translator's analysis of the original text showed that there were three objects in this sentence. Deepl Translate linked the last two objects of this sentence together, which made sense to a certain extent, but the use of "they" in the translated text did not make it clear

whether "they" referred to "competitions" or "algorithms", which may lead to readers' misunderstanding. In addition, "various" and "different" in the translated text generated by machine translation were semantically repetitive, so one of the two should be deleted. To eliminate the ambiguity derived from "they", the translator employed non-predicate structure guided by the three nouns "difficulty", "inability", and "limitation" to form the objects when revising the translated text produced by machine translation.

4. Conclusions

Through the retrieval and analysis of historical data, this study finds that the importance of Reiss's text typology theory to translation theory and practice cannot be ignored. It still maintains a certain degree of popularity in the academic papers published in recent years, especially in the application of "post-editing". Based on this discovery, this research applies the translation theory to the translation practice of a doctoral thesis published under the support of the National Natural Science Foundation of China, and completed the embellishment and modification of the translated text with satisfactory results.

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