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Article

Mapping translation process research: A bibliographic study on special issues since year 2005

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Abstract: This paper investigates recent developments in translation process research (TPR) as an emerging sub-discipline of descriptive translation studies by surveying articles published from 2005–2019 in special issues of eight major translation/linguistic journals. The overall trend in the field is first presented, followed by a systematic analysis of the articles in terms of authorship, regional distribution, themes, and methodology. To perform the thematic analysis, a three-layer classification system was developed, which includes the type of translation tasks, the type of study (theoretical/review or data-based research articles), and specific topics addressed in each article. This article presents distribution within each category and sub-category, followed by a discussion of trends and future research directions. The major findings are: 1) 61.36% of the articles in the database were single authored while UK and Spain had the highest number of authored publications; 2) 77.27% of the articles focused on written translation tasks, and 34.09% of the research articles were dedicated to new topics in TPR; 3) 59.38% of the publications employed more than one research method. The outcomes of this study allow future researchers investigating translation processes, such as the specific and in-depth analysis of theoretical models and the combined use of experimental and naturalistic methods, to expand the research landscape and pursue new methodological innovations.

Keywords: translation process research; bibliometric methods; authorship; highly explored topics; future developments; TPR methodologies

1. Introduction

Translation process research (TPR) has progressed rapidly in terms of theoretical development and methodological investigation since the early 1980s. TPR explores the functioning of the translator or interpreter's brain during translating[1] tasks.

This field has seen an upsurge in interest and activity ((e.g., Balling et al. 2014; Chmiel, 2016; García, 2014; Halverson, 2010; Li, 2017) and has been studied by academics from various disciplines, including psycholinguistics, cognitive science, and translation studies. These interdisciplinary approaches have led to various labels, such as process-oriented translation studies and cognitive translation studies (Lacruz and Jääskeläinen, 2018). In this paper, the author aims to evaluate recent developments in TPR as an emerging sub-discipline of descriptive translation studies by analyzing TPR-specific special issues of eight major translation/linguistic journals published between 2005–2019. These special journal issues were selected since they are an important and representative publication type in academic circles and dedicated exclusively to the topic of translation process, particularly in peer-reviewed international or national journal indexes and databases.

This paper first presents an overview of TPR, followed by a description of the research design used to select articles for inclusion in this review. The review findings

about development of TPR are then presented in terms of authorship, regional distribution, themes, and methodologies. The paper concludes with a discussion of future research opportunities.

2. Translation process research

James Holmes (1972), who named the field of research in translation (cited in Venuti, 2000, p. 177) states that descriptive translation studies (DTS), a sub-set of translation studies, include three branches: product-oriented, process-oriented, and function-oriented and defines the process-oriented sub-branch as follows:

> Process-oriented descriptive translation studies concerns itself with the process or act of translation itself. The problem of what exactly takes place in the "little black box" of the translator's "mind" as he creates a new, more or less matching text in another language has been the subject of much speculation on the part of translator's theorists, but there has been very little attempt at a systematic investigation of this process under laboratory conditions.

Indeed, translation process research can be understood in two ways. The above definition is, in its narrow sense, associated with the cognitive processes that occur in the mind of the translators. Translation processes have also been viewed from a sociocultural perspective, i.e., beginning with how texts to be translated are selected and the translation strategies to be adopted; the former represents the cognitive approach to TPR while the latter represents the social approach (Li, 2017). This study focuses on cognitive studies of translation and interpreting, i.e., TPR in its narrow sense.

Since the early 1980s, TPR has progressed rapidly in terms of theoretical development and methodological innovation for two primary reasons. First, linguistics and other related disciplines, such as psycholinguistics, cognitive science, and bilingualism, have served as the basis for research on translation processes, e.g., Carl's (2013) computational model of human translation processes, de Groot's (2011) bilingual approach to translation, the Revised Hierarchical Model (from Brysbaert and Duyck, 2010) and Paradis' (1994) neurolinguistic understanding of translation. These (adapted) theoretical proposals by cognitive-translation scholars have contributed to a general understanding of translation processes. Second, TPR development has been aided by advances in technologies used to collect different types of data to directly or indirectly examine the brain during translating tasks, e.g., corpus technology, Translog, eye trackers, functional near-infrared spectroscopy (fNIRS), and functional magnetic resonance imaging (fMRI; Liu and Zhou, 2021; Schwieter and Ferreira, 2017). By using these instruments, observational data can be gathered (e.g., corpora, behavioral, and neurological data) on which reasonable estimations may be made. Many exceptional works have reviewed how these advanced technologies benefit TPR, e.g., a corpus-assisted approach to TPR (Alves and Magalhães, 2004; Liu, 2021), think-aloud protocols (TAP), as described by ernardini (2001), eye tracking-based TPR (Jakobsen, 2014), fNIRS-based research on translation processes (Lu and Yuan, 2019), and fMRI-informed TPR (Barbara et al., 2010). Consequently, TPR is considered to be "an interdisciplinary sub-discipline of translation studies" (Gambier and van Doorslaer, 2015).

Over the last decade, scholars in translation studies as well as from other fields have applied the above-mentioned cross-disciplinary theories and methodologies to investigate translation processes. Recent efforts have been invested to such topics related to TPR as cognitive effort (Lin et al., 2018), attention or working memory (Kosma, 2007), emotion (Hubscher-Davidson, 2018), creativity (Cho, 2006), and translation competence (Sickinger, 2017), to name just a few. TPR has seen an upsurge over time, as evidenced by numerous publications in various forms (e.g., monographs, edited books, and journal articles), university-level research centers/networks across five continents (e.g., the Centre for Studies of Translation, Interpreting and Cognition of the University of Macau; Translation, Research, Empiricism, Cognition), global academic societies (e.g., the International Association of Translation, Interpreting, and Cognition; The Chinese Association for Translation, Interpreting, and Cognition; and the Chinese Society of Eco-translation and Cognitive Translation Studies), and numerous TPR-related conferences and symposiums (see more in Sun and Xiao, 2019). However, few bibliographic studies have touched upon TPR, with the exception of Sun and Xiao (2019), which to summarized the development of the field in China and abroad. Therefore, this paper provides a review of articles published in the special issues of eight indexed translation/linguistic journals to more broadly map the development of the TPR field.

3. Research design

As discussed above, the primary purpose of this research is to map the development of TPR by surveying articles published in the special issues of translation and linguistic journals. To begin, the author created a special-issue-article database including 88 research articles published in TPR-focused journal issues.

3.1. Database construction and description

Table 1. International translation/linguistics journals included in this study.

No.	Journal Name	Publisher	Indexing Information	Publication Frequency (per year)
1	Meta: Translators' Journal	Les Presses de l'Université de Montréal	Scopus; AHCI; SSCI	3 issues
2	Translation and Interpreting Studies	John Benjamin Publishing Company	Scopus; AHCI; SSCI	3 issues since 2016
3	Target: International Journal of Translation Studies	John Benjamin Publishing Company	Scopus; AHCI; SSCI	3 issues since 2013
4	Translation and Interpreting	*[2]	Scopus	2 issues
5	Translation Spaces	John Benjamin Publishing Company	Scopus	2 issues
6	Hermes-Journal of Language and Communication in Business	The School of Communication and Culture at Aarhus University	*	2 issues

The special-issue-article database was constructed from data that were obtained from eight internationally recognized translation/linguistic journals published between 2005 and 2019: Meta: Translators' Journal; Translation and Interpreting Studies; Target: International Journal of Translation Studies; Translation and Interpreting; Translation Spaces; Hermes-Journal of Language and Communication in Business;

Translation, Cognition & Behavior; and Perspectives: Studies in Translatology. These journals have each published one or two special issues on TPR, and seven of them are Scopus-indexed translation-specific journals. The articles meet peer-reviewed guidelines and thus represent a high standard of quality. **Table 1** details the selected journals.

After reviewing these eight journals, 10 issues were identified that were exclusively devoted to TPR, and two journals (Translation and Interpreting Studies; Translation Spaces) published two issues on this topic (see more details in **Table 2**). In selecting the issues and articles for this study, some exclusion criteria were adopted. First, although some special issues of other translation/linguistic journals may include scattered articles discussing cognitive studies of translation and interpreting, these were not included in the current study because the aim is to target the entire issue specifically dedicated to TPR. Moreover, one journal issue (i.e., Translation, Cognition & Behavior) was not officially named as a special issue; however, it was included because the entire issue explored TPR and was available when the research was being conducted. Furthermore, due to language constraints, special issues or articles published in languages other than English were not included; the determination was made that journals published in English, as an academic lingua franca, are representative of the field of study (Pochhacker and Shlesinger, 2002). Finally, the current study focused on research articles which included theoretical and research review articles; thus, book reviews and introductions were excluded. Overall, 88 articles were selected for the analysis.

Table 2. Special issues published in the eight journals included in this study.

Journal Name	No. of Special Issues	Guest Editor	Name of Special Issues	No. of Articles
Meta: Translators' Journal	1	Hannelore Lee-Jahnke	Processes and Pathways in Translation and Interpretation (2005)	Translation: 25; Interpretation: 8; 15 in non-English language; 18 in English
Translation and Interpreting Studies	2	Maureen Ehrensberger-Dow, Birgitta Englund Dimitrova, Séverine Hubscher-Davidson and Ulf Norberg	Describing Cognitive Processes in Translation: Acts and Events (2013)	7
		Maureen Ehrensberger-Dow, Birgitta Englund Dimitrova and Séverine Hubscher-Davidson	The Development of Professional Competence (2014)	8
Target: International Journal of Translation Studies	1	Maureen Ehrensberger-Dow, Susanne Göpferich, Sharon O'Brien	Interdisciplinarity in Translation and Interpreting Process Research	10
Translation and Interpreting	1	Mónica Giozza, Riitta Jääskeläinen, Christopher D. Mellinger and Patricia Rodríguez-Inés	Special Issue on Translation Process Research	9
Translation Spaces	2	Fabio Alves Amparo Hurtado Albir, Isabel Lacruz	Translation as a Cognitive Activity	8
		Birgitta Englund Dimitrova and Maureen Ehrensberger-Dow	Cognitive Space: Exploring the Situational Interface	7

Table 2. (*Continued*).

Journal Name	No. of Special Issues	Guest Editor	Name of Special Issues	No. of Articles
Hermes-Journal of Language and Communication in Business	1	Petra Klimant, Michael Tieber & Hanna Risku	Expertise and Behaviour: Aspects of Cognitive Translation Studies (one thematic section)	6
Translation, Cognition & Behavior	1	*	Sample issue (not a special issue), but all articles deal with cognitive aspects of Translation and Interpreting	8
Perspectives: Studies in Translatology	1	Adolfo M. García & Mónica C. Giozza	Cognitive Explorations of Translation and Interpreting (Issue 4)	7

3.2. Data analysis

The data analysis process included several steps. First, the 88 research articles were carefully read and analyzed. The meta-information from the articles was ented into Microsoft Excel 2016 to organize the data and create charts related to general trends, regions, publication years, and authorship. Second, the procedures and standards for the data description and classification were determined. More are on view in the following Section 4.2 for authorship and regional distribution, Section 4.3 for thematic analysis, and Section 4.4 for methodological aspects.

The overall trend in the special issues is reported first, followed by regional distribution, thematic analysis, and research methodologies. It is acknowledged that some problems existed in terms of the data analysis. The first problem relates to authorship; specifically, some articles were co-authored, which made counting challenging. Three counting methods were suggested, i.e., straight counting (counting the first author only), whole counting (counting each author of the article as one), and adjusted counting (counting each author of the article by fractions, e.g., Grbic´ and Pollabauer, 2008, p. 314; Yan et al., 2013). Whole counting is the most widely used method (e.g., Yan et al., 2013); thus, this study used whole counting for authorship analysis and regional distribution. However, for authors affiliated with more than one institution at the same time, only the first institution (and the corresponding institution-located country) was counted.

4. Results and analysis

4.1. Overall trend: Distribution and diachronic changes

In general, there are clear differences among the selected journals. For example, Meta: Translators' Journal, Translation and Interpreting Studies and Translation Spaces published a greater number of TPR-related articles than the other journals, as shown in **Figure 1**. In addition, four journals published fewer than 10 articles: Translation and Interpreting; Hermes-Journal of Language and Communication in Business; Translation, Cognition $ Behavior; and Perspectives: Studies in Translatology. It should be noted that Hermes-Journal of Language and Communication in Business published the smallest number of articles in its special issue because it explores broad topics in language and communication as opposed to

focusing strictly on translation-specific topics.

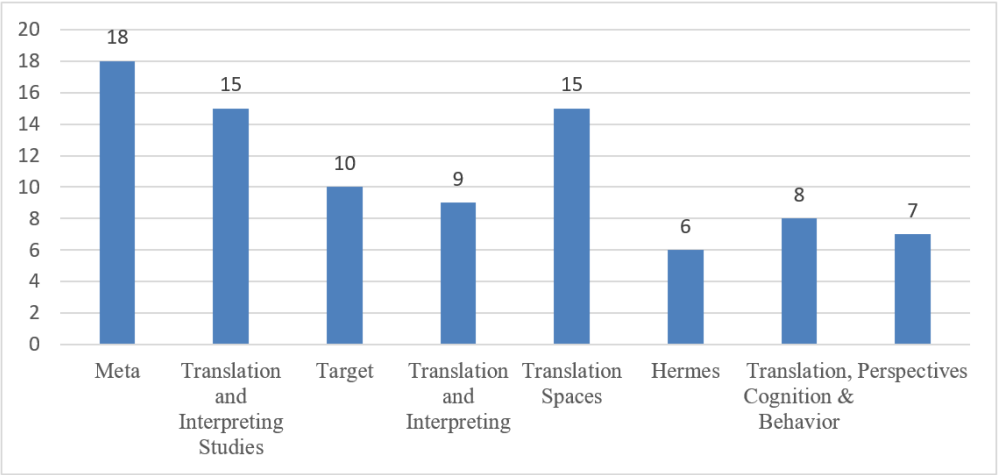

Figure 1. Distribution of TPR articles in each journal.

Figure 2 presents the diachronic changes in TPR articles in the special issues of the eight international translation/linguistic journals. As can be seen in the figure, two special issues were published in 2013, 2015, and 2018. Compared with other calendar years, the year with the greatest number of publications was 2005 with 18, followed by 17 articles in 2013 and 2015. In terms of the number of articles in each issue, 2005 has the largest number at 18. Another interesting result is that the majority of special issue articles (70) were published after 2013; this is confirmed by Li et al. (2019) who argue that TPR has increased rapidly to become one of the largest publication fields in translation studies since YEAR.

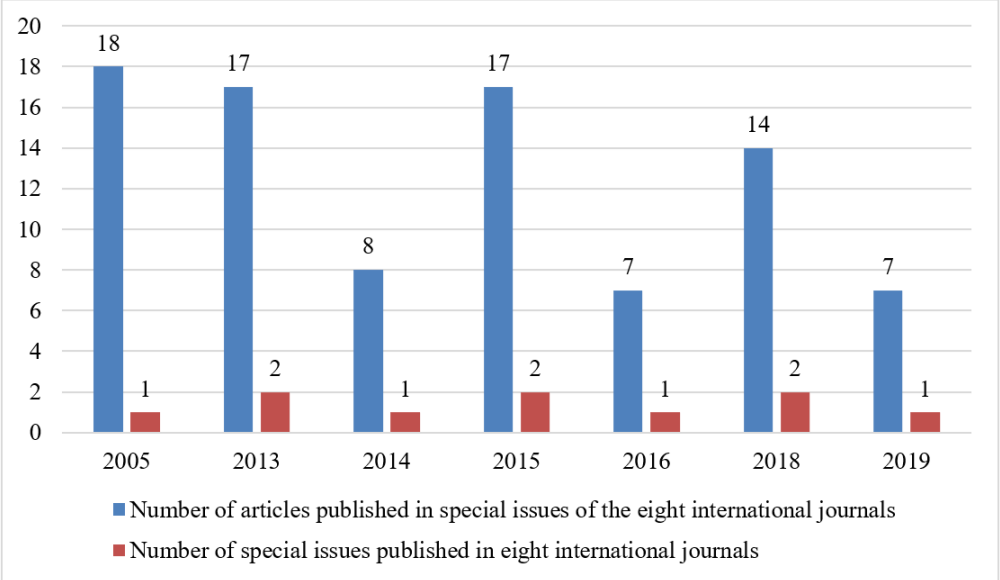

Figure 2. Diachronic changes in TPR articles.

In the following sections, systematic analyses of the collected data are presented in terms of regional distribution, authorship, themes, and methodologies. It should be mentioned that the regions are analyzed in terms of countries, as opposed to continents or cities. In addition, the themes are classified into three types: translation tasks,

theoretical/review or data-based research articles, and specific topics addressed in the database.

4.2. Authorship and regional distribution

In this section, the authorship of the database is presented together with the regional distribution, as these two factors are closely connected. In total, 166 authors published articles in these special issues, of which 54 were single authors, accounting for 61.36% of the articles. This indicates that single-authored publications remain the dominant type of authorship. In addition, 22 articles had two authors (25%), four articles had three authors (4.55%), and eight had more than three (9.09%), as shown in **Figure 3**. Furthermore, four articles had more than eight authors; one in Meta (2005) and three in Translation Spaces (2015). Two articles were authored by the Process in the Acquisition of Translation Competence Group, founded in 1997. In the humanities field, most of the publications in the current study were written by only one (61%) or two (25%) authors. However, multiple authorship began to appear which suggests that scholars in translation studies as well as other fields increased their collaboration to further explore translation processes.

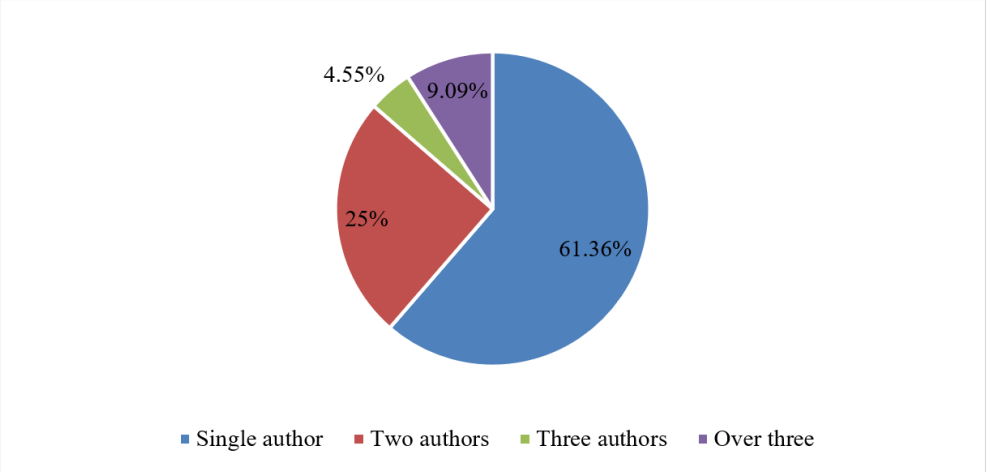

Figure 3. Authorship distribution of articles.

Although **Figure 3** clearly illustrates the authorship numbers, the regional distribution is unclear. This is due to some authors' affiliations with multiple institutions and multiple countries, in which case only the first institution and the associated country were counted, as mentioned in Section 3.2. The authors of the selected publications were associated with institutions located in 25 countries. The United Kingdom and Spain had the highest number of authored TPR publications with 13 each, accounting for 9.77%. Brazil and Germany had the next largest number of publications with 12 articles each, accounting for 9.02%. In addition, 15 countries published fewer than five articles: Argentina (3), Belgium (4), and China (3). Japan and Korea had one article each (see Appendix for a detailed breakdown of the regional distribution). **Table 3** presents the 10 most active countries which account for 69.91% of the total TPR-focused publications. Six of the listed countries are in Europe, indicating that European translation studies scholars play a significant role in TPR.

Table 3. Ten most active countries in terms of TPR articles.

No.	Name of Region	Number of Occurrences	Percentage (%)
1	United Kingdom	13	9.77
2	Spain	13	9.77
3	Brazil	12	9.02
4	Germany	12	9.02
5	Denmark	9	6.77
6	Switzerland	8	6.02
7	Australia	7	5.26
8	the United States	7	5.26
9	Canada	6	4.51
10	Finland	6	4.51
Total		93	69.91

4.3. Thematic map

Table 4. Thematic coding system.

First-Level Category	Second-Level Category	Third-Level Category	No. of Articles
Written translation	Theoretical or review articles	● Translation models (4) ● Interdisciplinary research and development on TPR (9) ● Research design and methodological issues (3) ● Metalinguistic knowledge (1) ● Translator training (2)	19
	Data-based research articles	● Process-oriented translator training (3) ● Cross-disciplinary approaches (4) ● Traditional topics (22) ● Expanded new topics (20)	49
Interpreting	Theoretical or review articles	● Cognitive-load measurement (1) ● Process orientation in interpreting (1) ● Process model of simultaneous interpreting (1) ● Interpreting strategies (1)	4
	Data-based research articles	● traditional interpreting process research topics (5) ● expanded new IPR topics (4)	9
Written translation and interpreting	Theoretical or review articles	● Neurocognitive research on translation and interpreting (1)	1
	Data-based research articles	● Phonological interference (1)	1
Post-editing	Theoretical or review articles	*	*
	Data-based research articles	● Effort in translation (1)	1
Translation and post-editing	Theoretical or review articles	*	*
	Data-based research articles	● Syntactic variation (1) ● Task type (1) ● Cognitive effort in translation and post-editing (2)	4

To evaluate themes, a three-level thematic coding system was utilized, shown in **Table 4**. The first level categorizes types of translation tasks (e.g., written translation,

interpreting, or post-editing), the second level classifies the articles as theoretical/review or data-based research, and the third level features specific topics addressed in the database. These selected research articles were grouped into four themes: traditional topics in TPR (e.g., translation problems, translation competence, translation strategies, metaphor translation, translation directionality, etc.), expanded new topics in TPR (e.g., ergonomics of translation, translation pauses, and phonological interference), cross-disciplinary approaches, and process-oriented translator training.

4.3.1. Translation task types

To fully evaluate the research themes, highly researched translation tasks were investigated and five types were identified (as shown in **Table 5**): written translation, interpreting, written translation and interpreting, post-editing, and translation and post-editing. Written translation is the most highly researched translation task, accounting for 77.27%, followed by interpreting tasks at 14.77%. Of note, post-editing is also a research focus found in the analysis (especially when combined with translation tasks), despite only accounting for a small proportion of the overall tasks at 5.69%. To understand the cognitive aspects of the transfer of the source language into the target language, written translation may be the appropriate task since it is the most widely practiced translation task at 77.27%.

Table 5. Translation task types.

No.	Name of Translation Task	Number of Articles	Percentage (%)
1	Written translation	68	77.27
2	Interpreting	13	14.77
3	Written translation and interpreting	2	2.27
4	Post-editing	1	1.14
5	Translation and post-editing	4	4.55
Total		88	100.00

4.3.2. Highly explored topics

This section presents highly explored topics located in the analysis of the second and third level coding results.

According to the coding results, on the second level, the articles are grouped into one of two types: theoretical or review publications and data-based research articles. As noted in **Table 6**, the former type accounts for 27.28% while the latter accounts for 72.73%. This indicates that TPR researchers tend to adopt empirical methods in investigating TPR-related questions as opposed to theoretical and experiential discussions only.

The categorizations in the third level, however, are more complicated, as shown in **Table 6**. There are eight subthemes suggested for coding on theoretical/review articles with 27.28%. Interdisciplinary research and development of TPR is the most frequently explored topic (11.36%), while translation models are the second most frequent at 5.68%. Furthermore, research design and methodological issues account for 3.41% of the articles, and a very small number of articles address specific topics

such as cognitive-load measurement (1.14%), interpreting strategies (1.14%), and others. Overall, 30.68% of the empirical research articles were dedicated to traditional topics in TPR, such as translation problems, translation competence, and translation strategies, but 34.09% of the articles also examined new topics, such as emotional aspects of translation processes and phonological interference. It should be noted that process-oriented translator training represents a very small number of topics studied (3.41%). However, the demand for more qualified translators and interpreters continues to grow in the translation industry; integrating process research into translator training is currently a priority for TPR researchers. In addition, many researchers also employ cross-disciplinary approaches in TPR, including socio-cognitive approaches, newswriting approaches, and history and literary-studies approaches, indicating the interdisciplinary nature of TPR.

Table 6. Thematic map of articles in the database.

Second-level Category	Third-level Category	No. of Articles	Percentage (%)
Theoretical or review articles	Translation models	5	5.68
	Interdisciplinary research and development of TPR	10	11.36
	Research design and methodological issues	3	3.41
	Translator training	2	2.27
	Metalinguistic knowledge	1	1.14
	Cognitive-load measurement	1	1.14
	Process orientation in interpreting	1	1.14
	Interpreting strategies	1	1.14
Empirical research articles	Process-oriented translator training	3	3.41
	Cross-disciplinary approaches	4	4.55
	Traditional topics in TPR	27	30.68
	Expanded new topics in TPR	30	34.09
Total		88	100.00

4.4. Methodological aspects

In this section, the research methods, instruments, and approaches adopted are described and analyzed. Here, "research methods" refers to the methods used to collect data in a study; it does not consider any theoretical aspects. Among the articles reviewed, 24 theoretical/review articles did not specifically mention research methods, while 64 articles attempted to address some TPR-oriented questions via the data obtained from 23 research tools within translation studies as well as other relevant fields of study. Of these 23 tools, 14 were used less than five times, such as E-prime, corpus, and event-related potentials, accounting for 17.21% of the total. In contrast, nine methods were used frequently (101 occurrences, 82.79%). These methods were empirical and are adapted from related disciplines, such as psychology and cognitive science, and include think-aloud protocols (TAPs) and eye tracking. Among all the methods, keylogging is the most frequently used tool with 26 occurrences (21.31%), as shown in **Table 7**. Questionnaires, TAPs, and eye tracking are the next most commonly used methods at 12.30%, 12.30%, and 10.66%.

Table 7. Most commonly used research tools in the database.

No.	Name of Research Method	Number of Occurrences	Percentage (%)
1	Keylogging	26	21.31
2	TAPs	15	12.30
3	Questionnaire	15	12.30
4	Eye tracking	13	10.66
5	Verbalization/translations/product	9	7.38
6	(Screen)recording	8	6.56
7	Interview	5	4.10
8	Case studies	5	4.10
9	Retrospective	5	4.10
Total		101	82.79

However, a single research method may not address all the questions properly, so multiple methods were sometimes used, as shown in **Table 8**. Indeed, 38 publications employed more than one research method (59.38%), while 26 articles employed only one method (40.63%). In addition, since triangulated data provides better results, 25% of the articles employed multiple data collection methods (three or more). Examining the triangulated methods, the most common combination is keylogging, TAPs, and eye tracking (questionnaire or translations). For double methods, keylogging and eye tracking are typically employed together for TPR. To date, triangulation has been considered as an optimal method for collecting data since it was first proposed by Alves (2003).

Table 8. Distribution of research methods.

No.	Number of Research Methods	Number of Occurrences	Percentage (%)
1	Single method	26	40.63
2	Double methods	22	34.38
3	Multiple methods	16	25.00
Total		64	100

5. Discussion and future directions

The results of the analysis presented above create a general overview of existing TPR interests. As an interdisciplinary sub-discipline of translation studies and "the oldest empirical research area of modern translation studies" (Muñoz Martín, 2016), TPR has undoubtedly earned its prominent position alongside corpus-based translation studies (Li, 2017). In this section, several recommendations are provided for future research based on the results of the study.

5.1. Expanding the research landscape

As a relatively young field of research, TPR is still developing and benefiting from other disciplines, i.e., psycholinguistics, cognitive science, and studies in bi/multilingualism. It has been comprehensively informed by these disciplines in terms of theoretical construction and methodological innovation. However, there are still

significant opportunities for expansion and innovation.

As an example, more multimodal translation tasks should be explored in future studies. As noted in **Table 5**, five types of translational tasks were identified. Of these, written translation was the most frequently explored task in TPR, followed by interpreting. Comparisons were also made between different tasks. Unsurprisingly, post-editing is an important part of TPR due to advances in translation technology. However, there has been very little research on multimodal translation tasks such as sign language interpreting and audiovisual translation. As Kruger (2021) notes, multimodality and cognition are underexplored in TPR, particularly the Chinese–English language pair. Although some studies have explored this (e.g., Liu and Li, 2022), this should be given more attention in future research.

The research topics presented here can also be expanded. Most of the TPR special-issue articles focused on traditional topics in TPR, such as translation/interpreting competence, translation strategies/principles, translation problems, and decision-making processes. Although some scholars conducted a preliminary analysis of new topics, such as text creation, translation processes, and ergonomics of translation, more studies are required. In addition, socio-cognitive aspects are yet to be addressed; this has been proposed as a new branch of TPR that addresses the cognitive aspects outside the brain of translators.

Furthermore, process-oriented translator training must be further enhanced. Most importantly, the contributions of TPR to the nurturing of translators and interpreters should be seriously considered when TPR projects are designed. Creating a comprehensive mapping of translation processes is vital to identifying solutions to problems in translator and interpreter training.

In addition, cross-disciplinary approaches were employed, such as the newswriting approach (Ehrensberger-Dow and Perrin, 2013), history and literary-studies approaches (Munday, 2013), and psychological approach (Hubscher-Davidson, 2013). This indicates that scholars believe TPR can be enriched by involvement from other disciplines in terms of theoretical and methodological issues related to translation processes, but more needs to be done in this respect. For example, cognitive science can contribute to the general understanding of brain functioning during translation tasks, and psycholinguistics can reveal the representation of two languages in a translator's brain and thus the workings of bilingual language processing.

Finally, more data collection instruments should be employed in future studies. As indicated in the analysis, keylogging, TAPs, questionnaires, and eye tracking were commonly used data collection tools. These are experimental methods that involve reliability and validity issues and which were systematically reviewed by House (2013). The corpus-assisted method may complement experimental ones (Liu, 2021; Liu et al., 2021) and thus it should be more frequently applied. Moreover, the combined use of methods may improve the research design. Although most studies adopted (over) two data collection methods, they were both experimental, e.g., keylogging combined with eye tracking or TAPs combined with keylogging and eye tracking. These types of combinations may not be beneficial, since they may share the same problems (House, 2013). Thus, the combination of experimental and naturalistic methods (i.e., corpora) is likely to avoid these methodological drawbacks.

5.2. Academic collaboration

Our analysis in Section 4.2 reveals that researchers from Europe, North America, and Australia tend to publish more special-issue articles focused on TPR than those from other regions. As can be seen, the five most productive countries are the UK, Spain, Brazil, Germany, and Denmark. However, the regional distribution is narrow, principally in Europe and Eastern Europe more specifically. In recent years, TPR has developed rapidly in China. Chinese scholars have uncovered the potential in researching translation processes and have established many university-level research centers exclusively aimed at TPR (e.g., the Centre for Studies of Translation, Interpreting, and Cognition, the University of Macau in 2014), initiated numerous national and international conferences on cognitive studies of translation (e.g., International Symposium on Cognitive Studies on Translation, Interpreting, and Cognition), and published monographs and edited books in this field (e.g., Liu, 2021; Li et al., 2019). Sun and Xiao (2019) provide a general overview of the scholarship related to TPR in China, including active TPR-related scholars as well as institutions in China. It should be mentioned that there needs to be a significant amount of collaboration in TPR, not only between different regions and between scholars from the same field but also between scholars from different academic fields. Increased collaboration in this field would help give TPR a promising future and possibly provide evidence for the unsolved puzzle on translation processes.

6. Conclusion

In this study, a quantitative analysis was conducted of 88 articles published in the special issues of eight internationally recognized translation/linguistic journals to survey developments in process-oriented translation studies in terms of the overall trend, the authorship, the regional distribution, and the themes. The results indicated that the topics vary from traditional (such as translation competence and translation strategies) to expanded topics, e.g., the ergonomics of translation. Authorship distribution was also examined, and it was found that the most active academic regions of the database were the United Kingdom and Spain. The most common research tools were found to be keylogging, TAPs, questionnaires, and eye tracking. It is worth mentioning here that such important factors as the cooperation between authors, the triangulated data collection methods, the interdisciplinary paradigms can contribute to the development of TPR.

However, this paper is not without its limitations. First, some of the special issues also published in English were not included since the author had no access to those issues when the investigation was started. It was also not possible to cover all topics in TPR since there must have been the scattered TPR publications included in the indexed translation/linguistic journals instead of the special issues articles. However, the selected issues may help identify TPR developments and thus will have some implications for future studies. Second, this investigation focused strictly on articles written in English since it is the only foreign language spoken by the author. Regardless of the limitations, however, this paper provides an overview of TPR developments and thus can be used to facilitate future research.

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Notes

1. Translation in this paper is a broad concept which includes different types of translation tasks across modalities.
2. The asterisk (*) indicates the information is unknown or cannot be found on the relevant website.

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