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Research trends in task-based language teaching: A bibliometric analysis from 1985 to 2020

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Abstract

This study offers a bibliometric analysis of research trends in task-based language teaching (TBLT) from 1985 to 2020. The analysis covers research questions related to the publication trends, venues for publication, productive authors, highly cited articles and references and, more importantly, the most frequently explored TBLT-related topics and their developmental patterns across the past 35 years. Results showed that TBLT was still mostly approached from the traditional cognitive-interactionist and psycholinguistic perspectives with a focus on tasks, individuals (i.e., *learners* and *teachers*), task-related variables (e.g., *task complexity* and *task repetition*), task performance, and the resultant linguistic forms. While this field of research has witnessed a growing interest in learners' individual differences and computer-mediated, technologies-assisted learning, a decreasing trend has been observed in topics related to *error* and *recast*. Implications for task-based research, pedagogy, and research methodologies are discussed.

Keywords: task-based language teaching; bibliometric analysis; research trend

1. Introduction

Task-based language teaching (TBLT), also labeled as task-based language learning and task-based instruction, constitutes an approach to language teaching and learning that prioritizes the use of authentic language to complete meaningful tasks in the target language. Pedagogically originating from communicative language teaching and solidly grounded in second language acquisition (SLA) theories and research, TBLT has been exerting a significant influence on the teaching and learning of a second or foreign language (L2/FL) since its initiation in the 1980s (Candlin, 1987; Long, 1985; Nunan, 1989; Prabhu, 1987). By focusing on authentic, communicative tasks, TBLT emphasizes learners' incidental acquisition of and engagement with language as a meaning-making tool. Hence, it constitutes a radical departure from the traditional, structural approaches that consider language as an object to be systematically taught and intentionally learned (Ellis et al., 2020; Long, 2016; Van den Branden, 2016).

TBLT is far from being a single, monolithic approach. Researchers distinguish between the strong and weak versions of TBLT[1] and acknowledge a variety of perspectives from which TBLT may be theoretically approached, such as the cognitive-interactionist, psycholinguistic, sociocultural, psychological, and educational perspectives (Ellis et al., 2020).[2] Additionally, TBLT is an important area of language teaching where pedagogy and research are complementary and closely intertwined (Ellis et al., 2020). That is, attention to TBLT comes from not only SLA researchers interested in the effects of features of task design and their implementation on learning results (e.g., Qin, 2019), but also teachers and educational authorities concerned with designing and implementing effective programs and language instruction (e.g., Robinson, 2011). As the present study aims to conduct a systematic review of TBLT as a whole and its developmental trend, it incorporates various versions and theoretical perspectives on TBLT and takes into consideration both task-based pedagogy and task-based research.

[1] The two versions of TBLT hold different viewpoints regarding the role of tasks in language teaching. The strong version argues that tasks should be the unit of language teaching, while everything else should be subsidiary. In contrast, the weak version claims that although tasks are a vital part of language instruction, they may be preceded or followed by focused instruction (see Skehan, 1996, for a more elaborate discussion).

[2] Ellis et al. (2020) elaborate on five theoretical perspectives on task-based research. The cognitive-interactionist approach examines the relationship between tasks, interaction, and acquisition, while the psycholinguistic perspective delves into the cognitive processes involved in the production of L2 tasks. In the sociocultural perspective, a task is viewed as an artefact for mediating learning through interaction. The psychological perspective draws on the theory and research that addresses individual learner factors. Finally, the educational perspective focuses on general educational theories and research that draws on educational accounts.

Over the past three decades or so, TBLT has gained a well-respected status among SLA researchers and language teachers (Ellis, 2003; Robinson, 2001; Skehan, 1996; Willis, 1996). It has recently attracted more attention and a growing number of works concerning TBLT have been published, such as monographs (e.g., Ellis et al., 2020; Long, 2015), edited volumes (e.g., Ahmadian & Long, 2021; Samuda et al., 2018), state-of-the-art articles (e.g., Ellis, 2017; Long, 2016; Van den Branden, 2016), and empirical studies (e.g., Michel et al., 2020; Qin & Zhang, 2022). Moreover, an international conference (*The International Conference on Task-Based Language Teaching*) and a newly launched journal (*Journal on Task-Based Language Teaching and Learning*) have been dedicated to the discussion of tasks and TBLT.

A number of meta-analyses have been conducted by synthesizing the effects of features of TBLT on various outcome measures. Some of them have focused on the overall effects of task-based, interaction-related features of TBLT on learners' acquisition of specific grammatical and lexical structures (e.g., Cobb, 2010; Keck et al., 2006; Mackey & Goo, 2007). Others have laid emphasis on particular issues of task features, in particular task complexity, within TBLT (e.g., Jackson & Suethanapornkul, 2013; Johnson, 2017; Sasayama et al., 2015). In comparison, few of the meta-analyses have targeted the implementation and evaluation of long-term TBLT programs (e.g., Bryfonski & McKay, 2019). These meta-analyses, along with other research syntheses (e.g., Plonsky & Kim, 2016), have contributed much to our understanding of task-based research (e.g., task-based interaction in Mackey & Goo, 2007). However, what is still lacking in this line of inquiry is a presentation of the research status and current trends of TBLT as a whole. Up to now, the field has still been unequipped with a systematic, quantitative overview of the most frequently explored TBLT-related topics and their developmental patterns that have come to the fore since its emergence.

Bibliometric analysis is a technique that uses bibliographic information to explore the research trends in a specific area (e.g., Lin & Lei, 2020) or country (e.g., Lei & Liao, 2017). It has recently begun to attract attention in the field of applied linguistics, due to its convenience and robustness in data analyses (e.g., Zhang, 2020). In particular, it has been applied to survey research in certain areas, such as multilingualism (Lin & Lei, 2020), English as a lingua franca (O'Neil, 2018), and cognitive processing of emotion words (Liu et al., 2020). Thus, in this study, we adopt the bibliometric perspective to explore the developmental trajectory of TBLT research since 1985 when Long initiated the proposal (Long, 1985). More specifically, the following questions are to be addressed:

1) What is the research status in the field of TBLT?
2) What are the research trends in TBLT?

The status of TBLT will be addressed by looking at the overall publication trend in the examined years, the major publication venues, the most productive authors in the research area, and the most highly cited articles and references. The research trends will be explored by examining the most frequently explored TBLT-related topics across the examined years. It is hoped that such a bibliometric exploration can help us better understand research concerning task-based language teaching and learning, and the resultant synthesis may be of much interest and significance to TBLT researchers, educational practitioners, syllabus designers, as well as language policy makers.

In the sections below, we first describe the methods used for the data analysis, followed by the results and discussion with regard to the research questions, with a focus on the most frequently explored topics across time. Finally, implications for task-based research, pedagogy, and research methodologies are discussed.

2. Methods

In this section, we describe the methods that were used in the study for the data analysis.

2.1. Data

The data that we used in the present study were the bibliometric information of journal articles downloaded from the Web of Science. In order to more accurately and exhaustively harvest the information of the articles on TBLT, we first consulted literature pertinent to TBLT (e.g., Bryfonski & McKay, 2019; Ellis et al., 2020; Long, 2016; Plonsky & Kim, 2016) and prepared a list of 41 TBLT-related search terms (see Appendix). Then, following previous bibliometric studies in applied linguistics such as Lei and Liu (2019b), we queried the terms in all SSCI- and A&HCI-indexed journals in (applied) linguistics and education in the Web of Science Core Collection on September 8, 2020. Similar to previous studies such as Zhang (2020), we retrieved the Web of Science Core Collection for our data since the database is considered as one of the most well-known and widely used multidisciplinary bibliometric databases, which indexes high-quality journals with their bibliometric information (Roemer & Borchardt, 2015). We set the span of the queried literature from 1985 to 2020 since, as previously indicated, TBLT research started from 1985 as Michael Long published his seminal work *A role for instruction in second language acquisition: Task-based language teaching* in that year (Long, 1985). We obtained the bibliometric information of 1,215 articles at this stage. Since some of the articles might have been irrelevant to the present study, we closely read the titles and abstracts of the articles and selected a total of 518 articles for the follow-up analysis based on the following

criteria: 1) the article should focus on language teaching or learning, rather than research issues in other subjects such as nursery, physics, chemistry, and so on; and 2) the article should be pertinent to the implementation of either the strong or weak version of a TBLT program or part of the program (such as needs analysis, task-based assessment, etc.); or 3) the article should include at least one task-relevant factor (such as task type, task feature, task condition, etc.) as the independent or dependent variables.

2.2. Data processing

First, we counted the number of publications each year for the analysis of publication trend. It should be noted that 18 of the 518 publications were tagged as "early access," and we considered them as published in 2020. Then, we counted the number of publications for each journal and for each author for the analyses of major publication venues and most productive researchers in the area.

Second, we identified highly cited articles with both the normalized and raw citation counts. We used the normalized citation count because the raw citation count may be biased in favor of earlier publications since they have more chance to receive citations (Lei & Liao, 2017; Lei & Yan, 2016). The normalized citation count was calculated by dividing the raw citation of each article by the total citation count that all articles published in the same year received. For example, the raw citation count of Skehan (2009) was 230 and the total citation count of all the 21 articles published in 2009 was 1202. Hence, the normalized citation count of Skehan (2009) was 0.1913 (230/1202 = 0.1913). It should be pointed out that we only considered the situation when more than one article was published in a certain year. If there was only one article published in a certain year, due to the limited size of the data, the normalized citation count of that article should be 1, which was skewed and meaningless. For the same reason, we also considered high raw citation counts in case some important articles were left out as a result of the normalized citation. To summarize, we combined and reported on the lists of the top 10 highly cited articles from both normalized and raw citation counts, which should paint a fuller picture of the highly cited articles in the area.

Third, we extracted all referenced works in the 518 articles and calculated their occurrence, that is, the number of citations they received in the articles. These highly cited works are considered as highly cited references in the research area (Lei & Liu, 2019a).

Last, we extracted and identified research topics on TBLT. We syntactically parsed and extracted noun phrases from the abstracts with a homemade Python script based on the package *spaCy* (Lei et al., 2020; the script will be provided upon request). We followed previous studies such as Zhang (2020) and used the

abstracts to identify the topics since the author-provided keywords are very limited in number and important topics may be overlooked (Zhang, 2020). This also applies to the titles since they are short in length. For example, in the following sentence (Example 1), both simple noun phrases such as *It*, *such joint raised performance*, *accuracy*, *complexity*, *a function*, and *task difficulty* and complicated noun phrases such as *such joint raised performance between accuracy and complexity*, *accuracy and complexity*, and *a function of task difficulty* were parsed and extracted.

Example 1

It is argued that such joint raised performance between accuracy and complexity is not a function of task difficulty… (Skehan, 2009)

We considered noun phrases as the candidate research topics for the reason that a research topic or theme is a lexical noun phrase of high frequency that occurs across a wide range of texts (Justeson & Katz, 1995; Lei et al., 2020). Due to the limited data size, we decided, after several rounds of experimentation, that for a noun phrase to be considered as a candidate topic it should occur at least five times across at least five abstracts. At this stage, a total of 296 noun phrases met the foregoing criteria. Then, we closely read the 296 noun phrases and discussed if they could be considered as candidate research topics on TBLT. Noun phrases such as *they, it, this study*, and *the results* were left out, while 94 ones were filtered in. Since some of the noun phrases were fairly similar in meaning, the 94 noun phrases were then combined into 44 research topics. For example, *task types* and *task type* were combined as the topic "task type," and *fluency, accuracy,* and *complexity* were combined as "CALF."

In order to identify the trend of the research topics, we categorized the examined years into three research phases (i.e., Phase 1: 1985-2009, Phase 2: 2010-2015, and Phase 3: 2016-2020) for two reasons. First, the categorization should strike a balance between time and data size. The data of the present study were distributed unevenly with many more works published in more recent years (see the section on results). We performed several rounds of experiments and decided on the present categorization, which seemed to be the most acceptable option, with 96 abstracts for Phase 1 and 211 abstracts for both Phases 2 and 3. Second, we considered 2009 and 2015 as the dividing years since they witnessed important publications such as Skehan (2009), Ellis (2009), and Long (2015) (see the section on result), which may in part justify their roles of the turning points in the development of TBLT research. We then calculated the raw frequency of the topics at each phase and the normalized frequency with the following formula (i.e., the relative frequency per 200 abstracts since both Phases 2 and 3 contained approximately 200 abstracts).

$$\text{Normalized frequency} = \frac{\text{Raw frequency}}{\text{Number of abstracts at the phase}} * 200$$

Finally, we performed Chi-squared tests of the normalized frequencies of each topic and determined the trend of each topic based on the standardized or Pearson residual value of its Chi-squared test. The standardized residual refers to the strength of difference between the observed and expected values, or which cell functions on the significance of the Chi-squared test (Sharpe, 2015). If the absolute value of the standardized residual was close to or larger than 2, the topic was considered as experiencing an increasing or decreasing trend; otherwise, it was stable across the examined span (Agresti, 2007).

3. Results and discussion

In this section, we describe and discuss the findings with regard to the research questions, that is, the publication trend, important publication venues, the most productive authors, the most highly cited articles and highly cited references, and, last but not least, the most frequently explored topics across time.

3.1. Publication trend

The number of publications by year is presented in Table 1 and the publication trend is illustrated in Figure 1. It can be observed that during the first two decades (i.e., from 1987 to 2006) since TBLT's first appearance in the 1980s, barely a few works were published in journals, with an annual figure of only 2 or 3 in general or 6 at most. However, this does not mean that TBLT did not attract researchers' and educators' attention at that time, as evidenced by a number of influential works on task-based teaching and learning in terms of monographs (e.g., Ellis, 2003; Nunan, 1989; Prabhu, 1987; Skehan, 1998a; Willis, 1996), edited volumes (e.g., Bygate et al., 2001; Leaver & Willis, 2004; Van den Branden, 2006), and book chapters (e.g., Candlin, 1987; Long, 1985), in addition to journal articles.

Beginning from 2007, the number of journal publications related to TBLT began to show a discernibly upward trend, reaching a peak of 53 in 2015, approximately 30 years after the launch of the field in 1985. From then on, the figure remained relatively constant, with a range of 45 to 55 annual publications (except 36 in 2018), making TBLT one of the hot topics in applied linguistics research. Such an observation is confirmed by the result of the simple linear regression that showed that the number of TBLT publications across the examined years had significantly increased ($F(1, 29) = 90.330$, $p < .001$) with a large effect size (Multiple $R^2 = .757$, Adjusted $R^2 = .749$).

Table 1 Number of publications by year

Year	Number of publications	Year	Number of publications
1987	1	2006	1
1991	3	2007	9
1992	2	2008	14
1993	1	2009	21
1994	1	2010	20
1995	3	2011	23
1996	4	2012	34
1997	3	2013	37
1998	1	2014	26
1999	5	2015	53
2000	4	2016	45
2001	6	2017	55
2002	5	2018	36
2003	6	2019	46
2004	4	2020	47
2005	2	Total	518

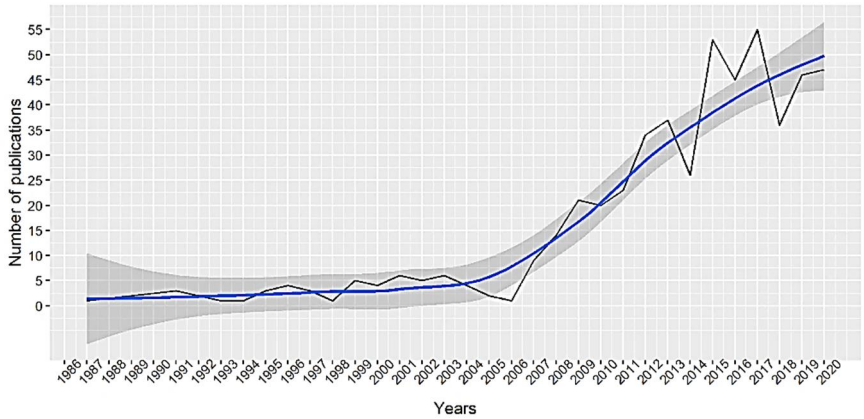

Figure 1 Number of publications by year

3.2. Publication venues

The top 10 journals in terms of the number of publications on TBLT are presented in Table 2. All of them are high-impact journals in the discipline of applied linguistics (high-impact in terms of their impact factor since they all rank amongst the top 15 journals out of a total of more than 180 SSCI-indexed linguistics journals) and are to a great extent committed to language teaching and learning. The finding seemingly implies that TBLT has been widely accepted as a pedagogical approach to the teaching and learning of an L2/FL. It is of particular interest to note that three of the top 10 journals, that is, *Language Learning & Technology, Computer Assisted Language Learning,* and *ReCALL*, are related to technology and computer-assisted learning. This demonstrates that researchers in TBLT are

also interested in investigating the use of technology and computer techniques to design, implement, and manipulate task-based teaching and learning.

Table 2 Top 10 publication venues

Journals	Number of articles published
Language Teaching Research	60
System	41
Modern Language Journal	24
Language Learning & Technology	22
Applied Linguistics	20
Language Learning	19
TESOL Quarterly	18
Journal of Second Language Writing	17
Computer Assisted Language Learning	15
ReCALL	15

3.3. Most productive authors

The authors with six or more publications on TBLT are listed in Table 3. Out of the nine authors, Peter Skehan and Rod Ellis, whose articles and books are often cited by TBLT researchers (see Tables 4 and 5), are highly productive as well, which reflects their leading roles in the field. Also, both YouJin Kim and Andrea Révész are remarkably productive in the field of TBLT, each with more than 10 published articles. Other authors listed in the table are also well-established scholars in the research area: Judit Kormos, Zsuzsanna Abrams, Laura Gurzynski-Weiss, Craig Lambert, and Caroline Payant. It should also be noted that Michael Long, though not listed as a productive author, contributed papers that are both highly cited and immensely influential (Long, 2015; Long & Crookes, 1992), which, together with his pioneering work (Long, 1985), have secured his position in the field of task-based learning and teaching.

Table 3 Productive authors with six or more publications

Authors	Number of articles published
Kim, YouJin	15
Révész, Andrea	11
Kormos, Judit	7
Skehan, Peter	7
Abrams, Zsuzsanna	6
Ellis, Rod	6
Gurzynski-Weiss, Laura	6
Lambert, Craig	6
Payant, Caroline	6

3.4. Most highly cited articles and highly cited references

The most highly cited articles based on both raw and normalized citation counts are reported in Table 4. As can be seen from the table, topping the list are state-of-the-art articles on task-based syllabus design (Long & Crookes, 1992), instruction (Skehan, 1996; Swan, 2005), and performance (Skehan, 2009), which set up conceptual and methodological frameworks for more in-depth examination of specific issues concerning task-based learning and teaching. Moreover, many listed articles are theoretical reviews and empirical studies on task complexity (Bishop et al., 1991; Robinson, 1995, 2001; Webster & Ryan, 1991) and pre-task planning (Ellis, 2009; Skehan & Foster, 1999; Yuan & Ellis, 2003), two task variables that have generated heated discussions in the field. In addition, one highly cited article addresses task-based innovation from teachers' perspective (Carless, 2004) and two others investigate feedback in task-based interaction (Mackey et al., 2003) and children's development of phonological sensitivity (Anthony et al., 2003).

Table 5 lists the highly cited references extracted from the references of 518 articles. These include some iconic books (Ellis, 2003; Long, 2015; Samuda & Bygate, 2008; Skehan, 1998a; Willis, 1996) and book chapters (Robinson, 2012; Swain, 1995) on tasks and task-based language teaching and learning, in addition to journal articles. For instance, Ellis's (2003) *Task-based language teaching and learning,* using tasks as a means of data collection and a teaching tool, established bridges between SLA research and language pedagogy. Skehan's (1998a) *A cognitive approach to language learning* discussed language learning from the perspectives of psycholinguistics, cognition, and individual differences, with a focus on the practical applications of these themes in task-based learning and language testing. Also among the most cited works by TBLT researchers but without a particular focus on tasks is Levelt's (1989) *Speaking: From intention to articulation*, a comprehensive book addressing the psycholinguistic processes of speech production in learners' first language. This testifies to TBLT researchers' interest in borrowing psycholinguistic frameworks, in particular the speech production model, to conceptualize, analyze, and explain learners' processing and production of oral tasks. Furthermore, three articles addressing the methodological issues of SLA research, including the measurements of language complexity (Norris & Ortega, 2009), the analysis of speech unit as a measurement unit of spoken language (Foster et al., 2000), and the analysis of statistical power (Cohen, 1988), were also frequently cited by TBLT researchers. The researchers' concerns on language measurements and statistical analysis are congruent with the growing number of empirical studies in this line of inquiry.

Upon a closer look at Tables 4 and 5, it can be seen that five papers are both highly cited articles and highly cited references at the same time, demonstrating

their significant role in the field. These are Skehan's (1996) proposal for a comprehensive framework for the implementation of task-based instruction and the methods by which the instruction may be put into practice, as well as two state-of-the-art articles on the cognition hypothesis (Robinson, 2001) versus the trade-off approach[3] (Skehan, 2009), the two highly influential and frequently cited yet competing theories that have ignited much empirical research on TBLT. Also listed are Yuan and Ellis's (2003) Skehan and Foster's (1999) empirical examinations of how task variables, such as task structure and planning conditions, may affect L2 learners' speech production, especially in terms of fluency, complexity, and accuracy measurements.

Table 4 Most highly cited articles

Article	Title	Raw citation	Normalized citation
Long & Crookes (1992)	Three approaches to task-based syllabus design	204	0.9577
Swan (2005)	Legislation by hypothesis: The case of task-based instruction	111	0.8880
Skehan (1996)	A framework for the implementation of task-based instruction	344	0.7765
Robinson (1995)	Task complexity and second-language narrative discourse	93	0.7561
Robinson (2001)	Task complexity, task difficulty, and task production: Exploring interactions in a componential framework	324	0.6365
Skehan & Foster (1999)	The influence of task structure and processing conditions on narrative retellings	203	0.6324
Webster & Ryan (1991)	Task complexity and manual reaction times in people who stutter	17	0.5000
Yuan & Ellis (2003)	The effects of pre-task planning and on-line planning on fluency, complexity and accuracy in L2 monologic oral production	244	0.4171
Bishop et al. (1991)	Age and task complexity variables in motor-performance of stuttering and nonstuttering children	14	0.4118
Carless (2004)	Issues in teachers' reinterpretation of a task-based innovation in primary schools	85	0.4106
Anthony et al. (2003)	Phonological sensitivity: A quasi-parallel progression of word structure units and cognitive operations	158	0.2701
Mackey et al. (2003)	Interactional input and the incorporation of feedback: An exploration of NS-NNS and NNS-NNS adult and child dyads	112	0.1915
Skehan (2009)	Modelling second language performance: Integrating complexity, accuracy, fluency, and lexis	230	0.1913
Ellis (2009)	The differential effects of three types of task planning on the fluency, complexity, and accuracy in L2 oral production	148	0.1231

[3] Robinson's (2010) cognition hypothesis was further developed into the SSARC (i.e., *stabilize*, *simplify*, *automatize*, *restructure*, and *complexify*) model, while Skehan's (2009) trade-off approach was later reconceptualized as the limited attentional capacity approach. A recent book chapter offers a comprehensive synopsis and comparison of the two (Ellis et al., 2020, Chapter 3).

Table 5 Most highly cited references

Work	Title	Citation
Ellis (2003)	Task-based language teaching and learning	148
Skehan (1998a)	A cognitive approach to language learning	133
Robinson (2001)	Task complexity, task difficulty, and task production: Exploring interactions in a componential framework	90
Levelt (1989)	Speaking: From intention to articulation	67
Foster & Skehan (1996)	The influence of planning and task type on second language performance	64
Yuan & Ellis (2003)	The effects of pre-task planning and on-line planning on fluency, complexity and accuracy in L2 monologic oral production	59
Robinson (2005)	Cognitive complexity and task sequencing: Studies in a componential framework for second language task design	58
Samuda & Bygate (2008)	Tasks in second language learning	57
Skehan (1996)	A framework for the implementation of task-based instruction	54
Skehan & Foster (1997)	Task type and task processing conditions as influences on foreign language performance	51
Long (2015)	Second language acquisition and task-based language teaching	50
Robinson (2012)	Task complexity, cognitive resources, and syllabus design: A triadic framework for examining task influences on SLA	48
Norris & Ortega (2009)	Towards an organic approach to investigating CAF in instructed SLA: The case of complexity	46
Skehan (2009)	Modelling second language performance: Integrating complexity, accuracy, fluency, and lexis	45
Swain (1995)	Three functions of output in second language learning	45
Foster et al. (2000)	Measuring spoken language: A unit for all reasons	43
Willis (1996)	A framework for task-based learning	43
Skehan & Foster (1999)	The influence of task structure and processing conditions on narrative retellings	42
Cohen (1988)	Statistical power analysis for the behavioral sciences	42
Skehan (1998b)	Task-based instruction	37

3.5. Most frequently explored topics across time

The identified research trends for each topic, based on the above-described procedures of data processing and analyses, fall into six groups. A complete list of the 40 identified topics and their groupings, their normalized frequencies across the three phases (Phase 1: 1985-2009, Phase 2: 2010-2015, and Phase 3: 2016-2020), as well as their Chi-squared, *p*., and standardized residual values are presented in Table 6.

Ten research topics, representing 25% of the total 40, have remained essentially constant in frequency over the three phases. Among the topics, the most frequent ones are *task complexity* (frequency: 27.08, 30.33, 35.07) and *task difficulty/demand* (frequency: 22.92, 17.06, 23.70), two variables related to how tasks may be sequenced in terms of less to more difficulty or complexity in pedagogical practices. This echoes the observation made in the previous subsection that studies on *task complexity* and *task difficulty/demand* are listed among the most highly cited articles and references in this line of inquiry (see Tables 4 and 5). Ranking below them are *meaning*, *testing/assessment*, *task implementation* and *pairs/dyads*, all of which are widely explored topics in task-based research with an average frequency of 5 to 10. Each of the remaining topics, that is, *strategy*, *content*, and *comprehension*, has an average frequency of below 5.

Fourteen research topics (35%) have witnessed a significant increase in frequency from Phase 1 to Phase 3. First, results display researchers' growing interest in some essential topics in this field – *task* (frequency: 50.00, 46.45, 81.52), *TBLT* (frequency: 12.50, 36.97, 46.45), *learner* (frequency: 29.17, 38.86, 61.61) and *teacher* (frequency: 6.25, 21.80, 31.28), which is consistent with the accumulating status of TBLT as a whole among SLA researchers and language teachers. It should also be noted that four task-related variables, that is, *task planning*, *task engagement*, *task repetition*, and *task modality*, experienced a dramatic gain in frequency from almost 0 in Phase 1 to around 15 to 20 in Phase 3 (except *task modality*). Such results, together with researchers' sustained interest in *task difficulty/demand* and *task complexity*, demonstrate the field's ongoing concerns with tasks and how implementation of factors related to tasks may affect learning results. An exceptional case here is *task type* (frequency: 2.08, 11.37, 7.58), which, in spite of the ascending tendency, gained less attention in Phase 3 than in Phase 2. Additionally, two measurements of task performance – *CALF* (complexity, accuracy, lexis, and fluency, frequency: 41.67, 48.34, 72.04) for monologues and *language-related episode* (frequency: 6.25, 14.22, 22.75) for interactions – have garnered growing attention over the past decades. Also noteworthy is researchers' increasing passion for *technology-related* TBLT (frequency: 4.17, 19.91, 21.80), such as topics concerning *technology*, *(synchronous) computer-mediated communication*, and *computer-assisted language learning*. Such results echo the presence of three technology-related journals as top publication venues on the one hand (see Table 2) and the broader picture of SLA research in which technology-related topics have gained momentum on the other (Zhang, 2020).

Another group of five topics (12.5%) have also manifested a noticeably upward trend, although their increase is not significant enough. Such topics are *task completion* (frequency: 2.08, 3.79, 7.58) and *task performance* (frequency: 16.67, 19.91, 26.54), two typical dependent variables in task-based research, and *task condition/characteristics* (frequency: 4.17, 3.79, 7.58), another task-related independent variable. Also, *moderating variables* (frequency: 14.58, 15.17, 21.80) including *L2 proficiency*, *working memory*, *anxiety*, and *motivation* have gathered momentum. This indicates researchers' rising interest in the psychological perspective of TBLT, that is, how individual differences may affect the learning results or task performance, in addition to the traditional, cognitive-interactionist perspective (e.g., Révész, 2011).

Two topics (5%), that is, *error/monitoring* (frequency: 12.50, 4.74, 2.84) and *recast* (frequency: 14.58, 13.27, 2.84), have become less popular within TBLT over the three phases. The downward trend of *error/monitoring* suggests TBLT researchers' gradual loss of interest in learner errors or error analysis, which may be partly due to some scholars' scepticism about native speakerism or standard language ideologies (e.g., Ortega, 2019). The decreasing frequency of *recast*, together with the noticeable yet insignificant decrease in *interaction* (frequency:

20.83, 23.70, 10.43) and *feedback* (frequency: 20.83, 20.85, 10.43), reflects that interactional feedback, which used to be widely explored among TBLT scholars in Phases 1 and 2, has received reduced concern over the past few years. However, this does not necessarily mean that task-based interaction has lost its momentum, as evidenced by researchers' continuing and rising enthusiasm for *pairs/dyads* and *language-related episode*. Rather, it might indicate a potential shift in task-based interactional research from feedback and recast to task-related independent variables (e.g., *task complexity*, *task repetition*) and measurements (e.g., *language-related episode, testing/assessment*). Two other topics showing the same noticeably but not significantly decreasing trend are *form* (frequency: 22.92, 15.17, 9.48) and *language production* (frequency: 8.33, 5.69, 3.79), which contrasts with the stable popularity of *meaning* and *comprehension* respectively.

The last group of topics (a total of five, 12.5%) features a sharp decline in frequency in Phase 2 yet regained growth in Phase 3. These topics include *pedagogy*, *task design*, *language development*, and *task-based instruction*, each with a frequency of 6 to 13 in Phases 1 and 3, but of less than 4 in Phase 2. This reflects researchers' fluctuating yet renewed interest in the pedagogical perspective of TBLT and the learners' long-term development in the target language.

Additionally, with regard to the learning contexts, topics related to both *foreign language* (frequency: 4.17, 10.43, 21.80) and *second language learning contexts* (frequency: 14.58, 18.96, 33.18) have attracted increasing attention across the three phases. As for the languages or countries involved in TBLT studies, interest in English or English-speaking countries remains predominant (frequency: 29.17, 36.97, 50.24), showing a noticeable yet insignificant increase from Phase 1 to Phase 3. Topics relevant to European countries or languages remain constant over the periods (frequency: 14.58, 15.17, 13.27), while those concerning eastern countries or languages witness a significant decrease in Phase 2 (frequency: 12.50, 2.84, 10.43).

Table 6 A complete list of topics and their trends in the three phases

Topics	P1	P2	P3	x_sq	df	*p*	res. 1	res. 2	res. 3
Remained constant									
meaning	10.42	6.64	11.37	1.33	2	.52	0.31	-0.92	0.62
strategy	4.17	4.74	1.90	1.26	2	.53	0.30	0.60	-0.90
task difficulty/demand	22.92	17.06	23.70	1.24	2	.54	0.37	-0.90	0.54
content	2.08	2.84	4.74	1.16	2	.56	-0.63	-0.21	0.85
task implementation	8.33	5.69	4.74	1.11	2	.57	0.83	-0.23	-0.61
task complexity	27.08	30.33	35.07	1.05	2	.59	-0.67	-0.09	0.76
testing/assessment	8.33	9.48	12.32	0.84	2	.66	-0.54	-0.18	0.72
comprehension	4.17	2.84	2.84	0.36	2	.84	0.49	-0.24	-0.24
pairs/dyads	6.25	6.64	7.58	0.14	2	.93	-0.22	-0.07	0.29
languages/countries - Europe	14.58	15.17	13.27	0.13	2	.94	0.06	0.22	-0.28
Significantly increased									
task planning	2.08	14.22	17.06	11.38	2	.00	-2.71	0.93	1.78
task engagement	0.00	6.64	14.22	14.56	2	.00	-2.64	-0.12	2.76

task repetition	0.00	11.37	18.96	18.01	2	.00	-3.18	0.40	2.78
task	50.00	46.45	81.52	12.56	2	.00	-1.21	-1.67	2.88
TBLT	12.50	36.97	46.45	19.19	2	.00	-3.44	0.88	2.56
learner	29.17	38.86	61.61	12.84	2	.00	-2.14	-0.66	2.80
teacher	6.25	21.80	31.28	16.15	2	.00	-3.04	0.46	2.59
technology-related	4.17	19.91	21.80	12.26	2	.00	-2.84	1.18	1.66
FL learning context	4.17	10.43	21.80	13.18	2	.00	-2.29	-0.49	2.78
CALF	41.67	48.34	72.04	9.43	2	.01	-1.68	-0.77	2.45
language-related episode	6.25	14.22	22.75	9.45	2	.01	-2.15	-0.05	2.20
L2 learning context	14.58	18.96	33.18	8.50	2	.01	-1.62	-0.70	2.32
task type	2.08	11.37	7.58	6.22	2	.04	-1.86	1.65	0.22
task modality	0.00	1.90	5.69	6.64	2	.04	-1.59	-0.40	1.99
Noticeably but not significantly increased									
languages/countries-English	29.17	36.97	50.24	5.85	2	.05	-1.55	-0.29	1.84
task completion	2.08	3.79	7.58	3.53	2	.17	-1.13	-0.33	1.46
task performance	16.67	19.91	26.54	2.41	2	.30	-0.95	-0.25	1.20
moderating variable	14.58	15.17	21.80	1.87	2	.39	-0.63	-0.49	1.11
task condition/characteristics	4.17	3.79	7.58	1.69	2	.43	-0.45	-0.61	1.06
Significantly decreased									
error/monitoring	12.50	4.74	2.84	7.82	2	.02	2.24	-0.76	-1.49
recast	14.58	13.27	2.84	8.09	2	.02	1.36	0.95	-2.31
Noticeably but not significantly decreased									
form	22.92	15.17	9.48	5.74	2	.06	1.77	-0.17	-1.60
interaction	20.83	23.70	10.43	5.32	2	.07	0.59	1.26	-1.84
feedback	20.83	20.85	10.43	4.16	2	.12	0.83	0.84	-1.67
language production	8.33	5.69	3.79	1.75	2	.41	0.98	-0.10	-0.88
Significantly or noticeably decreased in period 2									
languages/countries-eastern	12.50	2.84	10.43	6.02	2	.05	1.33	-1.96	0.63
pedagogy	8.33	1.90	8.53	4.56	2	.10	0.83	-1.74	0.91
task design	8.33	1.90	8.53	4.56	2	.10	0.83	-1.74	0.91
language development	8.33	3.79	11.37	3.72	2	.16	0.18	-1.44	1.27
task-based instruction	6.25	2.84	6.64	1.66	2	.44	0.44	-1.05	0.61

To sum up, it seems that TBLT researchers have retained and enhanced their interest in tasks, individuals involved in tasks (i.e., *learners*, *teachers*), a range of variables related to task conditions and task implementation (e.g., *task complexity*, *task repetition*), and how task-related variables may affect learners' activities and performances (e.g., *CALF*, *task engagement*). In other words, research in TBLT has been and is still typically approached from the traditional cognitive-interactionist (e.g., Mackey et al., 2003) and psycholinguistic perspectives (e.g., Robinson, 2012), with the emergence of new task-related independent (e.g., *task planning*) and dependent variables (e.g., *language-related episode*). Also, TBLT research has been conducted in both L2/FL learning contexts addressing the teaching and learning of a variety of target languages. Besides that, two conspicuous patterns are observed from the results. One is that the psychological perspective of TBLT research, that is, how individual differences may bring about divergent performances of tasks or alter the relationships between task variables and learning effects, has represented a rising trend. Another pertains to a growing concern with technology-related, task-based teaching and learning of languages. In contrast, the field has witnessed a diminished

interest in topics related to errors, recast, and feedback. It should also be pointed out that only a few topics are related to the pedagogical perspective of TBLT (i.e., *pedagogy*, *task-based instruction*) or to learners' long-term development in the target language (i.e., *language development*), while no topics have been concerned with the sociocultural perspective.

4. Conclusion and implications

This bibliometric study on TBLT has provided a bird's-eye view of important, valuable information on the publication trend, venues for publication, productive authors, highly cited articles and highly cited references. More importantly, we have identified the most frequently explored TBLT-related topics and analyzed the developmental patterns of those topics across the past decades, which may help us gain a more profound understanding of key issues related to tasks, task performance, task-based teaching, and so on. Such a synthesis of research brings with it significant implications for task-based research and pedagogy and in terms of methodological innovation.

Apart from the traditional cognitive-interactionist and psycholinguistic approaches to TBLT (e.g., Mackey et al., 2003; Robinson, 2012) which are very popular today and will probably remain so in the future, the findings seem to suggest that this research area may be further expanded in other ways. One is the emphasis on the individuals involved in task performance, including the consideration of learners' individual differences and the investigation of factors related to teachers, such as teacher training. Another implication concerns the application of technologies to task-based teaching and learning, which will enhance our understanding of the conceptualization, design, and evaluation of tasks (González-Lloret & Ortega, 2014). Moreover, research on TBLT should be conducted with a greater variety of learners, with more divergent target languages, and in more diversified learning contexts, in order to gain a more holistic picture of this teaching approach. A further implication, which, however, does not find direct support in the present findings, may be an integration of TBLT with other theoretical approaches in applied linguistics. For instance, in response to some scholars' call to move the field of SLA, including that of TBLT, forward to its meaning-oriented perspective, a few conceptual articles and empirical studies have endeavored to integrate systemic functional linguistics with TBLT (Byrnes, 2019; Ortega, 2015; Qin, 2022; Ryshina-Pankova, 2015).

The present study also has important implications for pedagogical practices. First, as task-based pedagogy and task-based research are complementary and intertwined with each other, such important data on task-based research as presented in this study will surely inform and guide the teaching and learning

practices, which may in return provide valuable feedback and impetus for further disciplinary development. Second, the topics that TBLT researchers are most interested in may overlap with issues that language educators are concerned with to some extent. For instance, the rising popularity of topics related to teachers partly reflects educationists' realization of the important role teachers play in task-based teaching, in addition to the attention already paid to learners and tasks. Third, findings from this research synthesis also provide potential guidelines for language teaching, such as the sequencing of tasks informed by research results concerning task difficulty and complexity, the recognition that tasks do not work for every individual in the same way, and the active use of various technologies that may mediate teaching and learning.

There are also some methodological considerations as to how studies like this should be conducted. For example, one possible methodological implication of this study is the use of dependency-based method for the extraction of research topic candidates. Previous bibliometric studies used either the N-grams-based method (Lei & Liu, 2019a, 2019b) or the topic modeling technique (Li & Lei, 2021) to extract topic candidates. Although such methods seem to work, they were challenged due to their manual judgment and interpretability issues (Lei et al., 2020). The present study adopted the dependency-based method and the results revealed it as an effective and efficient approach in the linguistics area with room for improvement. For example, future research may explore other measures than frequency and range as well as more sophisticated methods such as machine learning algorithms for the improvement of the newly proposed method.

Finally, it should be pointed out that the present study only used abstracts of research articles to explore TBLT-related topics. Future studies may consider full texts of not only research articles but also texts of other genres such as monographs and book chapters in order to paint a fuller picture of the research in the area. In addition, we used a list of TBLT-related search terms for the retrieval of the research data. Although such a method helped us more accurately and exhaustively harvest the data, the retrieval based on its application, may miss some emerging topics since any list of search terms may not be fully exhaustive. Future research may employ umbrella terms such as "task" to search the data.

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APPENDIX

Search terms used for the Web of Science query*

We categorize the TBLT-related search terms into three types. The first type corresponds to some general terms including *TBLT, TSLT, TBL, task-based language teaching, task-supported language teaching, task-based learning, task-based learning research, task-based instruction, task-based interaction, task-based assessment, task-based evaluation, task-based implementation, task-based innovation,* and *task-based performance.*

Additionally, as the field distinguishes the strong and weak versions of TBLT (a distinction can be found in Skehan, 1996), we also categorize the search terms into the two types. Search terms concerned with the strong version of TBLT include *task-based needs analysis, target task, pedagogic task, task syllabus, methodological principle, pedagogic procedure*, and *task-based performance test*. Those relevant to the weak version of TBLT cover such terms as *task type, task complexity, task difficulty, task repetition, task sequencing, task planning, task familiarity, task implementation, task feature, task characteristics, task modality, task design, task condition, task-based program evaluation, task grading,* and *task structure.* The inclusion of these search terms was based on two important monographs of the field (Ellis et al., 2020; Long, 2016) and some meta-analyses (Bryfonski & McKay, 2019; Plonsky & Kim, 2016).

* For terms with a hyphen such as *task-based* and *task-supported*, we searched variants with and without a hyphen for more accurate results (i.e., *task-based, task based, task-supported,* and *task supported*).