

Research Trends in Applied Linguistics from 2005 to 2016: A Bibliometric Analysis and Its Implications

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Using data of articles from 42 Social Science Citation Index (SSCI)-indexed journals of applied linguistics, this study renders a bibliometric analysis of the 2005–16 research trends in the field. The analysis focuses on, among other issues, the most frequently discussed topics, the most highly cited publications, and the changes that have occurred in the research trends. The results show that while most of the frequently discussed topics have remained popular over the 12 years, some (especially sociocultural/functional/identity issues) have experienced a significant increase of interest, but some others (particularly certain phonological/grammatical/generative linguistic topics) have witnessed a substantial decrease of interest. There has also been an increased use of new theories including those coming from distant disciplines. Furthermore, while the number of publications from traditional publication powerhouses, such as the USA, has shown a slow, albeit steady decline proportionally, those from some other countries, such as China, have exhibited a substantial steady rise. The latter countries' increasing publication rates appear to have contributed to the increased discussion of issues specific to their context. Implications of the findings are also discussed.

INTRODUCTION: BACKGROUND AND RATIONALE

For academic professionals, it should be of great interest and importance to know what research topics are most popular (and hence arguably most important) and which publications (i.e. books, book chapters, and journal articles) and authors are most influential in their discipline. This is because such information may enable them to stay current regarding research trends in the field and to make informed decisions on what research issues to investigate. Such information may also help academic institutions and government and private agencies to make more informed decisions on research funding allocation and language policy formulation. This bibliometric study attempts to provide such information regarding applied linguistics in the past 12 years (2005–16).

Bibliometrics and its use

'Bibliometrics', a term coined by Alan Pritchard (1969: 348), refers to 'the application of mathematics and statistical methods' to the analysis of scientific publications. It is important to note, though, that there had been quantitative analysis of publication information long before the term bibliometrics appeared (Cole and Eales 1917; Wilson and Fred 1935). Cole and Eales (1917) published a statistical analysis of more than three centuries' publications (1543–1860) in comparative anatomy, in which they assessed the growth rate of research in the field and the amount of contribution each European country made to the research. In general, early bibliometric studies were mainly confined to disciplines in natural science. Furthermore, limited mostly to the tabulation of publications, early bibliometric analyses were used mostly to trace and understand knowledge development in an academic discipline as opposed to measuring research productivity and the impact of publications.

However, this changed in 1963 with the official birth of Eugene Garfield's Science Citation Index (SCI), a well-designed citation indexing system he first proposed in 1955 (Garfield 1955). The SCI provides systematically compiled comprehensive bibliographic citation information regarding publications in science journals. The inclusion of citation information in bibliometric analysis has been driven by the need in research for 'the most accessible and visible tracks of this double movement of complying with the past while projecting into the future' (De Bellis 2009: xvii). Before the appearance of the SCI, keywords and subject indices were the means for searching research literature. The SCI added bibliographic citations as a new medium for such searches. The effectiveness of citation-based literature search was soon firmly established by empirical studies (Salton 1971; Weinberg 1974). Also, later research further showed that combining the use of bibliographic citations with the use of keywords and subject terms significantly enhances the efficiency of the retrieval of research literature (Pao and Worthen 1989). The tremendous success of SCI in providing fast and efficient literature searches in science soon led to the development of similar citation systems in various other fields, such as the Social Science Citation Index (SSCI) and the Arts and Humanities Citation Index (A&HCI).

Furthermore, contemporary bibliometrics in the form of SCI and SSCI has not only made it easy and fast to search and find bibliographic and citation information but has also made it possible to evaluate, in quantitative terms, the impact of publications, journals, and authors, and the productivity of academic researchers, programs, and institutions (van Raan 2005; De Bellis 2009). In fact, as pointed out by Garfield (2007: 65), the latter use of bibliometrics has been the major reason for the success of bibliometric sources like the SCI: 'the SCI's success did not stem from its primary function as a search engine, but from its use as an instrument for measuring scientific productivity'.

As additional evidence to support Garfield's point, recently bibliometric information from SCI and SSCI has been used to measure and rank the research

productivity and impact of not only individual researchers and institutions but also nations (Leydesdorff 2005; Leydesdorff and Wagner 2009; Moiwo and Tao 2013). However, a word of caution is necessary regarding the use of bibliometrics in evaluating and ranking scholars, programs, institutions, and countries because, as some scholars (van Raan 2005) have correctly pointed out, bibliometrics can be misinterpreted and/or can be misleading when not understood and used correctly.

Discipline-specific bibliometric research: Purpose and rationale of the present study

There have been many bibliometric studies on science or social science as a general field (Zhou *et al.* 2009; Ma *et al.* 2014; Liu *et al.* 2015). There have also been a few discipline-specific ones, such as Xie and Willett (2013) on computer science and Liu *et al.*'s (2015) on business management. However, based on our research, there has been only one on linguistics (Lei and Liao 2017). Furthermore, the latter study was similar to the other aforementioned studies in that it focused exclusively on examining and comparing research productivity and impact (i.e. number of publications and impact factor) across individual scholars and nations/regions. In other words, these studies fail to examine what the most frequently explored research topics are and which publications are the most highly cited—the type of information that will be of much interest and importance to researchers as well as academic institutions and government/private agencies in making funding and language policy decisions. Bibliometric analysis can quickly yield both historical and current information in this regard as shown in Cole and Eales's (1917) early quantitative analysis of publications in comparative anatomy and also in a couple recent articles on translation studies (van Doorslaer and Gambier 2015; Zanettin *et al.* 2015).

Given that there has not been such research in applied linguistics, the current study aims to uncover the aforementioned types of information for professionals and organizations in this field by examining the 2005–16 bibliometric data in applied linguistics and answering the following research questions:

- 1 What have been the most frequently explored topics?
- 2 Which publications (including journal articles, books, and book chapters) and authors have been most highly cited, that is, most influential (information that may also help reveal which research issues are most frequently explored)?
- 3 Which countries/regions have been most productive in research and publication (information that may indirectly show research trends)?
- 4 Have there been any significant changes over the 12 years related to the above questions?

Furthermore, in the process of answering the above questions, this study will also help determine whether the above measures are effective indicators of the research development and trends in the field.

METHODOLOGY

Data

For the purpose of this study, we adopted the following from the ‘Aims’ of the journal *Applied Linguistics* as our definition of applied linguistics: ‘the study of language and language-related problems in specific situations in which people use and learn languages’ (Aims of *Applied Linguistics* 2017). In other words, we focus our study on journals and publications related to language use and language learning/teaching (especially second language learning/teaching). Based on this working definition of applied linguistics, we selected 42 journals that all met each of the following three criteria:

- (i) having a focus on language use and learning/teaching;
- (ii) being included in the SSCI journal list of linguistics; and
- (iii) boasting an impact factor of at least 0.25.

The 42 journals are listed in the Appendix in a table format along with the number of articles from each journal whose bibliometric information was included in the analysis. We then downloaded from Web of Science the 2005–16 bibliometric data of a total of 10,028 articles published in these journals. It is important to note that only data of research articles were extracted, that is, we excluded other data such as those of book reviews and editorial materials. Also, the number of articles from each journal varied substantially due to the following two reasons. First, there was a large difference in the number of articles published annually among the journals. This is because some journals publish many more issues each year, while other journals publish more articles in each issue. For example, *Lingua* publishes 12 issues annually with roughly six articles in each issue, while *System* publishes approximately eight issues annually with 10 articles in each issue. Still many other journals (e.g. *Language Teaching*, *TESOL Quarterly*) publish only four issues annually. Second, for some of the journals, bibliometric information is available for only some of the past 12 years due to the fact they were not listed in the SSCI index until recent years. For example, the journal of *Assessing Writing* did not become indexed in SSCI until 2013. Therefore, for this journal, the only data available were from 2013 to 2016 (65 articles in total). Because of this substantial variation in the number of articles published each year, a valid and meaningful comparison of the numbers of citations among the journals requires a normalization of the numbers, an issue we will explain more below.

Data search and analysis

To answer the research questions mentioned above, we first queried and analyzed the entire 12 years’ data to obtain the following specific information:

- 1 most frequent terms, that is, the most frequently explored topics, in the entire 12 years as well as in each of the evenly divided 4-year periods of the 12 years (2005–8, 2009–12, and 2013–16);
- 2 most highly cited publications, including books, book chapters, and journal articles across the three 4-year periods;
- 3 most highly cited authors across the three 4-year periods and the entire 12 years; and
- 4 most productive countries/regions in research publications in the field across the three 4-year periods.

To obtain and process data for information in Item 1, we employed the following procedures.

- 1 All abstracts of the downloaded bibliometric data were extracted by a home-made Python script (a programming language);
- 2 The abstracts were lemmatized with Schmid's (1995) TreeTagger, a tool package that annotates texts with part-of-speech and lemma information;
- 3 The lemmatized abstracts were submitted to AntConc to extract *n*-grams of up to five words in length for the 12 examined years and the three 4-year periods (we will explain this issue below); monograms (all nouns) were also extracted from the part-of-speech tagged and lemmatized texts. The reason for extracting only noun monograms is that individual adjectives, adverbs, and verbs do not constitute research topics.
- 4 *N*-grams that contain pronouns, modals, and many other functional words were automatically filtered out by using stop-words because research topics are phrases that do not contain these functional words. However, articles and prepositions were not excluded because there are some research topic phrases that involve articles and/or prepositions, such as *English as a foreign language* and *focus on form*.

For item candidacy, we set a minimum frequency of 30 over the 12-year period data—a frequency we believe would be high enough to ensure the significance of the selected items but not too high to exclude important topics, as an item of this frequency would generally mean it appeared in 30 different publications. Using this frequency criterion, our queries resulted in a total of 6,344 *n*-grams (mono- and 2–5-grams combined). However, many of the items were not meaningful research topics in applied linguistics and have hence been excluded. By meaningful topics, we mean the type of individual or multiword keywords that we include in article submissions to journals in applied linguistics to help journal editors and future readers quickly identify the topics of our submitted journals, such as *multilingualism* and *academic discourse*. The items that were not considered topics consisted of the following three main categories. First, words and clusters common in language in general (e.g. *ability for* and *more likely than*). Second, concepts and issues common in research in general, but not specific to applied linguistics (e.g. *analysis of, significant difference*, and *study*). Third, concepts and issues that are common in

applied linguistics but are too general to be topics of special significance (e.g. *English* and *English language*). To identify those truly meaningful topics and screen out items in the above-named three categories, we manually went through all the keywords and *n*-grams.

It is also important to note that decisions regarding some of the items, especially those in the third category mentioned above, were not easy and involved subjectivity. The two authors often discussed extensively before making a final decision. Furthermore, our examination of the 4/5-grams showed that they were either not topics or they contained topics already identified in the keywords and bi/trigrams, for example, *English as a lingua franca* (ELF already on the list) and *critical discourse analysis of* (where *of* is not inherent to the topic *critical discourse analysis* already identified in the trigrams).

It is also important to note that we included in our selection a few research methodology-related topics, such as *meta analysis*, *mixed methods*, and *structural equation modeling*. The reason for including these highly frequently used research methodologies is that, though not topics in applied linguistics *per se*, these research methods are of great importance for applied linguists to know. This is because knowing these methods will enable them to make informed decisions regarding when and where they may employ these useful methods in their research.

Then, to help ascertain whether there was any significant difference in terms of the frequencies of the identified topics across the 12 years (i.e. whether there were diachronic changes), we divided the 12 years' data into three 4-year periods: 2005–8, 2009–12, and 2013–16. We queried the frequencies of the identified topics in each period. Then, because, as noted earlier, the number of journal articles varied substantially across the three 4-year periods, we normalized the frequencies by dividing the frequency of a topic in a period by the total number of journal articles in that period. Without normalization, the comparison would not be valid, for a topic with 40 occurrences in a period that included 800 published articles (=one in every 20 articles) does not boast the same level of prominence as a topic with the same number of (40) occurrences in a period that had 400 total publications (=one in every 10 articles). Finally, to ascertain whether there was a statistically significant difference in the frequency of the topics across the three periods, we ran a one-way *chi*-square test for each of the identified topics across the three periods.

Concerning data search and analysis for determining which publications, authors, and journals are the most highly cited, we did the following:

- 1 For the most highly cited publications, we extracted, from the downloaded bibliometric data, all the publications (including books, book chapters, and journal articles) that were cited in the articles of the 42 journals in each of the three 4-year periods and then computed the frequencies of these cited publications in the periods.

- 2 For the most highly cited authors, we identified the authors of the cited publications in each of the three 4-year periods, and then we calculated the frequencies of their citations.
- 3 To determine the most productive countries/regions in research and publications in applied linguistics, we first identified the country of affiliation of the first author of each article. Then, we computed the number of publications produced by all the authors from each country in the 12 years as well as in each of the 4-year periods. We also computed what percentage the number of publications of each country accounts for of the total number of publications in each period.

RESULTS AND DISCUSSION

This section is organized around findings regarding the aforementioned research questions: (i) the most frequently explored topics, (ii) the most highly cited publications, (iii) the most highly cited authors, and (iv) the most productive countries/regions.

The most frequently explored research topics

Based on our data search and analysis, we identified a total of 165 most frequently discussed research topics in applied linguistics. The complete list of the topics, along with their normalized frequencies across the three 4-year periods and the results of the aforementioned one-way *Chi*-square test, is provided in a table as Supplementary Material online. The topics in the list are organized into three groups based on the *chi*-square test results: (i) those whose frequency has remained statistically unchanged over the three 4-year periods (i.e. $p \geq 0.05$), (ii) those whose frequency has increased significantly, and (iii) those whose frequency has decreased significantly over the three periods. To help illustrate our discussion of the results, we include in Table 1 some sample topics organized into five groups: in addition to the above-named three groups, we have added two more: those with a noticeable but not significant rise and those with a noticeable but not significant decline.

A key finding regarding the overall results concerning the 164 most popular topics is that a large majority (133 or 81 per cent) of them have remained essentially constant over the three periods as shown in Table 1. Some of the constant topics had appeared before 2005 (the year our data began), such as *communicative competence*, while others are comparatively recent newcomers in the field in the past two decades, such as *self efficacy*, *heritage language*, and *corpus-based study*.

Some of the 164 topics did experience a significant change, however. Seventeen (10 per cent) of the topics exhibited a significant increase in frequency over the past 12 years, including *language policy*, *language ideology*, *social class*, and *multilingualism*. Fourteen (9 per cent) showed a significant decrease,

Table 1: Samples of most frequently explored topics^a

Topics	Normed- Freq 2005–08	Normed- Freq 2009–12	Normed- Freq 2013–16	Chi-value	p
Remained constant					
Communicative competence	6.54	6.29	6.29	0.01	0.99
Academic discourse	5.89	6.55	7.05	0.10	0.95
Vocabulary acquisition	9.16	7.55	9.57	0.26	0.88
Discourse analysis	12.43	9.82	12.59	0.42	0.81
Heritage language	27.49	23.41	22.66	0.55	0.76
Self-efficacy	9.82	13.85	12.08	0.68	0.71
Corpus-based (study)	11.78	17.12	14.6	0.98	0.61
Significantly increased					
Social class	0.65	1.01	11.33	16.99	0.00
Language policy	17.02	38.52	47.83	14.49	0.00
Eye tracking	1.31	3.27	13.09	13.53	0.00
EFL learner	13.09	16.36	31.72	9.71	0.01
ELF	5.24	17.88	19.39	8.52	0.01
Multilingualism	0.65	4.28	9.57	8.33	0.02
Language ideology	3.27	10.83	14.35	6.76	0.03
Significantly decreased					
Phonological awareness	24.21	7.55	6.04	16.14	0.00
Overt subject	13.74	2.27	2.01	14.94	0.00
Optimality theory	15.71	4.03	2.27	14.55	0.00
(Noun) animacy	9.82	1.01	1.01	13.11	0.00
Phonological process	7.85	1.26	0.76	9.52	0.01
Object shift	7.2	1.01	0.76	8.90	0.01
Word order	41.88	24.92	22.91	7.26	0.03
Noticeably but not significantly increased					
Semi-structured interview	2.62	6.29	11.58	5.94	0.05
Collaborative writing	1.31	6.29	9.32	5.80	0.06
Education policy	2.62	10.07	11.33	5.54	0.06
Teacher education	17.02	20.39	32.23	5.50	0.06
Mixed method	0.65	5.29	7.55	5.50	0.06
Noticeably but not significantly decreased					
Grammatical gender	13.74	4.53	6.29	5.84	0.05
Language disorder	5.24	0.5	1.26	5.56	0.06
Interactional feedback	5.89	1.26	1.01	5.55	0.06
Universal grammar	9.82	4.28	2.52	5.24	0.07
Argument structure	13.09	5.79	6.29	3.96	0.14

^aThe normalized frequencies reported here were, as noted above, the results of dividing the raw frequencies by the number of articles published in the period. Thus, they are much smaller than the raw frequencies.

such as *phonological awareness* and *overt subject*. There appear to be some patterns in the observed significant changes. For example, some of the changes seem to reflect a shift of interest in the field, while other changes seem to have resulted from other factors. The significant increase of *language policy*, *language ideology*, and *social class*, contrasted with the significant decrease of *phonological awareness*, *overt subject*, and *object shift*, may suggest that, over the past 12 years, researchers have become more interested in sociocultural and language policy issues, but less interested in the learning of some formal linguistic issues, such as phonology and syntax. This latter trend may also be tentatively seen in the items that displayed a noticeable, though not significant, decline, such as *grammatical gender* and *universal grammar*. However, as will be shown below in the section on the results of most highly cited publications, new contemporary usage-based approaches to grammar (such as cognitive construction grammar) are actually becoming popular.

Yet, some of the changes do not appear to be the results of a shift in research interest. For example, the significantly increased mention of *eye tracking* and *mobile devices* might likely have resulted from the increased use of new technologies in language teaching and research. The significant increase of *ELF* might be the result of today's much more globalized world with a much higher need for *ELF*. Furthermore, the significant increase of *EFL learner* might be due to increased publications from countries where English is a foreign language.

Most highly cited publications

In the process of identifying the most highly cited publications (including journal articles, books, and book chapters), we produced two lists: one for all the cited publications and one for the cited publications that were published since 2005. The rationale for identifying the latter is that, generally, when other factors are held constant, a publication that has a young age of less than or equal to 3 years tends to generate substantially fewer citations than a publication with an age of 5 years or more. This age effect on citation numbers can be evidenced, at least indirectly, by the fact (shown in Table 2) that while only 3 of the 20 most cited publications in the 2005–8 period were published after 2000, this number increased to 7 in the 2009–12 period and then climbed to 11 in the 2013–16 period. Furthermore, while the most recent publication year for any of the 2005–8 most cited publications was 2001, the most recent publication years for the 2009–12 and 2013–16 lists were, respectively, 2005 and 2010, a fact that further demonstrates that it is generally very difficult for a new publication in applied linguistics or perhaps other fields as well to generate a very high number of citations.

A list of the most highly cited recent publications will help us better or more completely understand what the most popular publications and topics are. Table 2 lists the top 20 most highly cited publications in each of the 4-year periods in the past 12 years regardless of when the publications were

Table 2: Top 20 most highly cited publications^a

2005–08	2009–12	2013–16
1. <i>The Minimalist Program</i> (N. Chomsky 1995) C# (citation#)96	1. <i>The Minimalist Program</i> (N. Chomsky 1995) C#125	1. <i>Common European Framework</i> (Council of Europe 2001) C#126
2. 'The role of consciousness in second language learning' (R. Schmidt, 1990 <i>Applied Linguistics</i>) C#44	2. <i>Mind in society.</i> (L. Vygotsky 1978) C#105	2. <i>Mind in society.</i> (L. Vygotsky 1978) C#109
3. <i>Mind in society.</i> (L. Vygotsky, 1978) C#43	3. <i>Longman grammar of spoken and written English</i> (D. Biber et al., 1999) C#102	3. <i>Longman grammar of spoken and written English</i> (D. Biber, et al. 1999) C#107
4. 'Attention' (R. Schmidt, 2001 in P. Robinson, ed.) C#42	4. <i>Introduction to functional grammar</i> (M. Halliday and C. Matthiessen 1985/1994/2004)** C# 93	4. <i>Introduction to functional grammar</i> (M. Halliday and C. Matthiessen 1985/1994/2004)* C# 106
4. 'Communicative competence...' (M. Swain 1985 in S. Gass and C. Madden, eds.) C#42	5. <i>A cognitive approach to language learning</i> (P. Skehan 1998) C#81	5. <i>The psychology of the language learner</i> (Z. Dörnyei 2005) C#97
6. 'Effectiveness of L2 instruction... meta-analysis' (J. Norris and L. Ortega 2000, <i>Language Learning</i>) C#40	6. <i>Language and symbolic power</i> (P. Bourdieu 1991) C#76	6. <i>The Minimalist Program</i> (N. Chomsky 1995) C#96
7. <i>A cognitive approach to language learning</i> (P. Skehan 1998) C#35	6. <i>The psychology of the language learner</i> (Z. Dörnyei 2005) C#76	7. 'The role of consciousness in second language learning' (R. Schmidt, 1990 <i>Applied Linguistics</i>) C#92
7. <i>Learning vocabulary in another language</i> (P. Nation 2001) CN#35	8. 'Communicative competence...' (M. Swain, 1985 in S. Gass & C. Madden, eds.) C#75	8. <i>Bilingual education in the 21st century</i> ... (O. Garcia 2009) C#89
7. <i>Situated learning.</i> (J. Lave and E. Wenger 1991) C#35	9. <i>Learning vocabulary in another language</i> (P. Nation 2001) C# 74	9. 'Attention' (R. Schmidt, 2001 in P. Robinson, ed.) C#84
10. <i>Genre analysis.</i> (J. Swales 1990) C#34	10. <i>Communities of practice: Learning, meaning, and identity</i> (E. Wenger 1998) C#73	9. <i>Learning vocabulary in another language</i> (P. Nation 2001) C#84
11. 'Three functions of output in second language learning' (M. Swain 1995, in G. Cook, and B. Seidlhofer eds.) C#33	11. <i>Corpus, concordance, collocation</i> (J. Sinclair 1991) C#71	11. 'Effectiveness of L2 instruction... meta-analysis' (J. Norris and L. Ortega, 2000 <i>Language Learning</i>) C#83
11. <i>Speaking: From intention to articulation</i> (Levelt 1989) C#33	12. <i>Genre analysis.</i> (J. Swales 1990) C#68	12. <i>Genre analysis.</i> (J. Swales 1990) C#81

2005–08

2009–12

2013–16

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| <p>13. 'Minimalist inquiries...' (Chomsky 2000, in R. Martin, et al. eds.) C#32</p> <p>14. <i>Input processing and grammar instruction...</i> (B. VanPatten 1996) C#31</p> <p>14. 'The role of the linguistic environment in second language acquisition' (M. Long, 1996 in W. Ritchie and T. Bahtia, eds.) C#31</p> <p>16. <i>Focus on form in classroom second language acquisition</i> (C. Doughty and J. Williams 1998, eds.) C#30</p> <p>17. <i>Introduction to functional grammar</i> (M. Halliday and C. Matthiessen 1985/1994/2004) C#29</p> <p>17. 'The output hypothesis and beyond...' (M. Swain 2000, in J. Lantolf, ed.) C#29</p> <p>17. 'Focus on form through conscious reflection' (M. Swain 1998, in C. Doughty and J. Williams, eds.) C# 29</p> <p>20. 'Conversational interaction and development...' (A. Mackey and J. Philp 1998, in <i>MLJ</i>) C#28</p> <p>20. 'Corrective feedback and learner uptake' (R. Lyster and L. Ranta 1997, in <i>SSLA</i>) C#28</p> | <p>12. <i>Identity and language learning...</i> (Norton 2001) C#68</p> <p>14. 'Attention' (Schmidt 2001, in P. Robinson, ed.) C#66</p> <p>14. <i>Common European Framework</i> (Council of Europe 2001) C#66</p> <p>16. <i>Constructing a language...</i> (M. Tomasello 2003) C#65</p> <p>17. 'Three functions of output in second language learning' (M. Swain 1995, in G. Cook, and B. Seidlhofer, eds.) C#64</p> <p>18. <i>The CHILDES Project...</i> (B. MacWhinney 2000) C#61</p> <p>18. <i>Language testing in practice</i> (L. Backman and A. Palmer 1996) C#61</p> <p>20. 'The role of the linguistic environment in second language acquisition' (M. Long 1996, in W. Ritchie and T. Bahtia, eds.) C#60</p> | <p>13. <i>A cognitive approach to language learning</i> (Skehan 1998) C#76</p> <p>13. <i>The sociolinguistics of globalization</i> (Blommaert 2010) C#76</p> <p>15 <i>Identity and language learning...</i> (B. Norton 2001) C#69</p> <p>16. 'A New Academic Wordlist' (A. Coxhead 2000, <i>TESOL Quarterly</i>) C#66</p> <p>17. <i>The CHILDES Project...</i> (B. MacWhinney 2000) C#59</p> <p>18. <i>Constructing a language...</i> (M. Tomasello 2003) C#58</p> <p>18. <i>Corpus, concordance, collocation</i> (J. Sinclair 1991) C#58</p> <p>19 <i>Lectures on government and binding</i> (N. Chomsky 1981) C#57</p> <p>19. 'The role of the linguistic environment in second language acquisition' (M. Long 1996, in W. Ritchie and T. Bahtia, eds.) C#57</p> |
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^aTo save space, no full citation information is given. For books, only title (in italics), author name, and year of publication are given (in parentheses); for journal articles, besides author name and year, journal title is also given; for book chapters, information about the editor of the book is provided. Another issue to note is that, because some publications had the same number of citations in the period, they are ranked tied at their given rank. As a result of some tied items, the 2005–8 and 2013–16 periods each have 21 items listed.

published. Table 3, on the other hand, reports the most highly cited publications published since 2005 in the entire past 12 years (i.e. no separate list for each of the three 4-year periods in the 12 years). The reason for not providing three 4-year breakdown lists for the publications that appeared since 2005 is that it is unlikely for publications published between 2005 and 2008 to generate a high number of citations during 2005–8 when they just came out.

The results in the two tables show some interesting patterns. First, several of the top most highly cited publications in Table 2 retained their high rankings throughout the three periods of the 12 years, including Vygotsky's (1978) *Mind in Society*, which kept 2nd/3rd place, Nation's (2001) *Learning Vocabulary in Another Language*, which stayed 7th/8th, and Swales's (1990) *Genre Analysis*, which remained 10th/11th. In contrast, some publications exhibited a substantial change in their citation frequencies. A few, such as Biber *et al.*'s (1999) corpus-based *Longman Grammar*, Dörnyei's (2005) *Psychology of the Language Learner*, and Halliday's (1985/1994/2004) *Functional Grammar*, showed a marked rise, while a couple of others, such as Chomsky's (1995) *The Minimalist Program* and VanPatten's (1996) *Input Processing and Grammar Instruction*, experienced a noticeable decline. Given that the publications just mentioned were mostly published at about the same time (mid-to-late 1990s), the divergent change patterns observed here seem to be the result of a shift in research interests, rather than the result of the age of publication.

For example, while the citation rate of Chomsky's (1995) book decreased from being ranked 1st in both the 2005–8 and 2009–12 periods to 6th in 2013–16, that of Halliday's (1885/1994) *Functional Grammar* ascended from 17th in 2005–8 to 4th in 2009–12 and 2013–16. A more telling fact about Chomsky's (1995) decline is that in the first 4-year period (2005–8), its citation number was so high (96) that it more than doubled that (44) of the second highest item (Schmidt 1990). In the third period (2013–16), it was ranked 6th and its number of citations (96) was much lower than that (126) of the number 1-ranked item and even lower than that (97) of Dörnyei (2005). These facts related to the decline of Chomsky and the marked rise of Halliday, Dörnyei, and Blommaert's (2010) *The Sociolinguistics of Globalization*, as well as Vygotsky's sustained high popularity, tend to suggest a likely decline in the interest in generative (mentalistic) theories but an increased interest in functional, sociocultural, and sociopsychological issues in applied linguistics. The increased interest in sociocultural issues (including *identity*) is further evidenced by Norton's (2001) *Identity and Language Learning* making both the 2009–12 and 2013–16 top 20 lists and by Lantolf's (2006) *Sociocultural Theory* making the 'since 2005' list (Table 3) as the 8th ranked item.

The results also reveal that several other topics have gained increased attention from applied linguists, including bilingual education, corpus linguistics, language policy, usage-based language acquisition theories, and the role of explicit knowledge in language acquisition. The increased interest in bilingual education and language policy is shown by Garcia's (2009) *Bilingualism in the 21st Century* (ranked the 8th most highly cited publications in the 4 years of

Table 3: *Top 20 most highly cited publications published since 2005 (2005–16)*

1. *The psychology of the language learner* (Dörnyei 2005) C#204
2. *Bilingual education in the 21st century*. . (Garcia 2009) C#134
3. 'Grammatical processing in language learners' (H. Clahsen and C. Felser 2006, *Appl. Psycholinguistics*) C#129
4. *Constructions at work: The nature of generalization in language* (A. Goldberg 2006) C#109
5. 'Measuring implicit and explicit knowledge of a second language' (R. Ellis 2005, *Studies in Second Language Acquisition*) C#103
6. *The sociolinguistics of globalization* (Blommaert, 2010) C#96
7. *Research methods in applied linguistics* (Dörnyei, 2007) C#95
8. 'Sociocultural theory and second language learning: State of the art' (J. Lantolf 2006, *Studies in Second Language Acquisition*) C#92
9. *Language policy: Hidden agendas and new approaches* (E. Shohamy 2006) C#88
10. 'Implicit and explicit corrective feedback and the acquisition of L2 grammar' (R. Ellis, S. Loewen, and R. Erlam 2006, *space Studies in Second Language Acquisition*) C#87
11. 'At the interface: How explicit knowledge affects implicit language learning' (N. Ellis 2005, *Studies in Second Language Acquisition*) C#86
12. *Incomplete acquisition in bilingualism: Re-examining the Age Factor* (S. Montrul 2008) C#82
13. *Complexity systems and applied linguistics* (D. Larsen-Freeman and L. Cameron 2008) C#81
14. *Learning and Teaching Languages Through Content: A counterbalanced approach* (R. Lyster 2007) C#74
15. *Handbook of research in second language teaching and learning* (M. Swain 2005) C#73
16. 'A Dynamic Systems Theory approach to second language acquisition' (K. De Bot, W. Lowie, and M. Verspoor 2007, *Bilingualism: Language and Cognition*) C#70
16. 'Mixed-effects modeling with crossed random effects for subjects and items' (R. H. Baayen, D. J. Davidson, and D. M. Bates 2008, *Journal of Memory and Language*) C#70
18. *Translanguaging in the bilingual classroom...* (A. Creece and A. Blackledge 2010, *Modern Language Journal*) C#69
19. *The study of second language acquisition 2nd ed.* (R. Ellis 2008) C# 67
19. *Teacher cognition and teacher education: Research and practice* (S. Borg 2006) C#67

2013–16), as well as Creece and Blackledge's 'Translanguaging in the bilingual classroom' article and Shohamy's (2006) *Language Policy* book (both making the list of the top 20 most highly cited publications that appeared since 2005). Regarding corpus linguistics, while there is no corpus-related publication on the 2005–8 top 20 list, two such publications (Biber *et al.* 1999; Sinclair, 1991) made the 2009–12 list and three (Biber *et al.* 1999; Sinclair, 1991; Coxhead

2000) appeared on the 2013–16 list, with Biber *et al.* ranked 3rd in both periods. The increased interest in usage-based theories in general (as opposed to Chomsky's innate mentalist theory) is evidenced by Tomasello's (2003) seminal work on such theories making both the 2009–12 and 2013–16 top 20 lists and by Goldberg's (2006) construction grammar book being ranked 4th on the list of the most highly cited publications published since 2005. The increased interest in the role of *explicit knowledge* in language acquisition is demonstrated by the highly cited R. Ellis's (2005) and N. Ellis's (2005) articles on the issue (with the former being ranked 5th and the latter 11th in Table 3).

It is also important to note that these findings help corroborate the findings of the most highly discussed topics reported earlier, for *bilingual education*, *corpus linguistics*, *explicit knowledge*, *identity*, and *language policy* are all among the most frequently discussed topics identified in this study. One other issue worth mentioning is that two of the top highly cited publications were not titles in applied linguistics, including Lave and Wenger's (1991) book on situated learning and Wenger's (1998) book on communities of practice. These two publications deal with learning, identity, and meaning in general. This fact may suggest that applied linguistics is perhaps shifting away from its two traditional background discipline orientations of linguistics and education by embracing theories and practices from distant disciplines, as has been shown in the application of the complexity systems theory in language learning (De Bot *et al.* 2007; Larsen-Freeman and Cameron 2008).

Most highly cited authors

For the most highly cited authors, we identified the information for each of the three 4-year periods and calculated the normalized frequency for a meaningful comparison. Table 4 lists the top 20 most highly cited authors, their raw number of citations, and their normalized number. There are a few interesting findings in the results that may help corroborate the findings about research topics reported above. First, a few of the authors, such as Chomsky and Swain, have seen their normed number of citations decreased steadily over the three time periods; in contrast, some other authors, such as Dörnyei, Hyland, and Biber, have witnessed a steady increase. Two likely reasons may explain this divergent movement. The first relates to the age of publication factor, for the authors who experienced a steady decrease were typically those whose highly cited publications were all published before the mid-1990s, while the authors who boasted an increase were those whose cited publications all appeared after the mid-1990s. The second reason may be a shift in the researchers' interests or foci. For example, the increased interest in sociopsychological issues like motivation and investment could explain the significant increase for the citations of Dörnyei, while the increased interest in corpus research and the genre or register-specific use of language may account for the rise in the citations of Biber (a renowned corpus linguist) and Hyland (a leading scholar on academic discourse/genre/literacy practices and their variations across disciplines).

Table 4: Top 20 most highly cited authors

Order	Author	2005– 8	2009– 12	2013– 16	Total	2005– 8 normed	2009– 12 normed	2013– 16 normed
1	R. Ellis	321	717	785	1,823	190.28	186.72	182.43
2	N. Chomsky	455	664	608	1,727	269.71	172.92	141.30
3	M. Swain	370	625	567	1,562	219.32	162.76	131.77
4	Z. Dörnyei	155	448	703	1,306	91.88	116.67	163.37
5	K. Hyland	139	452	637	1,228	82.39	117.71	148.04
6	M. Long	285	404	448	1,137	168.94	105.21	104.11
7	N. Ellis	172	411	477	1,060	101.96	107.03	110.85
8	J. Cummins	157	416	380	953	93.06	108.33	88.31
9	D. Biber	79	398	465	942	46.83	103.65	108.06
10	E. Bialystok	134	347	437	918	79.43	90.36	101.56
11	R. Schmidt	179	279	356	814	106.11	72.66	82.73
12	S. Gass	196	279	329	804	116.18	72.66	76.46
13	M. Halliday	115	328	340	783	68.17	85.42	79.01
14	R. Lyster	144	259	373	776	85.36	67.45	86.68
15	B. Laufer	121	313	317	751	71.72	81.51	73.67
16	R. Dekeyser	96	298	349	743	56.91	77.60	81.11
17	J. Swales	142	268	327	737	84.17	69.79	75.99
18	P. Robinson	102	307	312	721	60.46	79.95	72.51
19	L. Vygotsky	134	234	290	658	79.43	60.94	67.39
20	P. Skehan	105	287	263	655	62.24	74.74	61.12

Another finding of interest is that while many of these most highly cited authors have one or even more publications listed in the top 20 most highly cited publications mentioned above, a few of them, including Gass (12th), Laufer (15th), and Robinson (18th), do not have any single publication listed in the top 20 most highly cited publications. Based on our close examination of the search results, the reason that they have made this list without a single top 20 highly cited publication is that they had many different relatively highly cited publications, resulting in a very high total number of citations. These most highly cited authors differ from those who have made this list mainly by having one or two extremely highly cited seminal works, such as Chomsky (2nd), Vygotsky (19th), and Peter Skehan (20th). Also worth noting is the fact that a couple of the authors who have a publication listed among the top 20 most highly cited publications fail to make this top 20 most highly cited authors' list. This means that while these authors have one highly cited publication, the overall number of citations of their publications is not as high as those in the group who have many different highly cited publications without one or two extremely highly cited ones.

Most productive countries/regions

Table 5 reports, in ranking order, the most productive countries/regions in research and publication in applied linguistics across the three 4-year periods in the past 12 years. The results show that while traditional publication powerhouses such as the USA and UK have remained at the top, their percentages in the total number of publications have decreased steadily, albeit slowly. For example, the USA's production percentage has decreased from 38.53 per cent in 2005–8 to 31.49 per cent in 2009–12 and 29.49 per cent in 2013–16. In contrast, some countries/regions, such as China, Iran, Taiwan, and Turkey, have seen a steady substantial increase.¹ For example, China's production percentage has increased from 3.5 per cent in 2005–8 to 5.3 per cent in 2009–12 and 6.86 per cent in 2013–16, displaying almost a percentage doubling from 2005–8 to 2013–16. It is necessary to note that because Hong Kong and Macau are special administrative zones of China, their data are included in China's in the Web of Science system. In fact, a large number of the publications in China's data were those produced by Hong Kong-based scholars and a couple of them by Macau-based scholars. To ascertain whether mainland China's production has also increased substantially, we identified and calculated mainland China's publication numbers and percentages in the three periods. The results show the same significant increasing pattern: 12 (0.71 per cent) in 2005–8, 55 (1.4 per cent) in 2009–12, and 140 (3.25 per cent); in other words, mainland China's production increased 4.58 times percentage-wise from 2005–8 to 2013–16 (0.71 to 3.25 per cent). Substantial increases are also found in Iran's and Turkey's productions. Neither country made the top 20 list in the 2005–8 period, but Turkey made the list in the 2009–12 period, and its percentage increased again in the 2013–16 period. Iran made the top 20 list in 2013–16.

These findings suggest that more and more scholars from outside the traditional powerhouse countries are publishing in international journals in applied linguistics. Also, the findings offer further evidence for the increasing discussion of topics related specifically to English as a foreign language, such as *EFL learners*. One reason worth mentioning for the substantial increase of publications by scholars from some of these countries, especially China, appears to be increased government funding and support for research, as reported in several recent studies (Zhou *et al.* 2009; Qiu 2010; Zhang *et al.* 2013). This shows that government funding and support play an important role in research and publication productivity.

CONCLUSION AND IMPLICATIONS

This bibliometric study on applied linguistics has produced several key findings that bear important implications. The first is that although many of the most frequently discussed topics have remained popular over the 12 years, some (especially those related to sociocultural, identity, and new technology issues) have experienced significantly increased interest, while some others (particularly those concerning traditional phonological and grammatical issues) have

Table 5: Most productive countries/regions

2005–8 Country	Raw # of publications	Per cent in total publications	2009–12 Country	Raw # of publications	Per cent in total publications	2013–16 Country	Raw # of publications	Per cent in total publications
The USA	650	38.53	The USA	1,209	31.49	The USA	1,269	29.49
UK	242	14.34	UK	461	12.01	UK	472	10.97
Canada	145	8.6	Canada	280	7.29	China	295	6.86
The Netherlands	82	4.86	China	193	5.03	Canada	264	6.14
China	59	3.5	Australia	185	4.82	Australia	179	4.16
Australia	56	3.32	Japan	128	3.33	Spain	164	3.81
Japan	52	3.08	Spain	124	3.23	Taiwan	151	3.51
Germany	38	2.25	Germany	117	3.05	The Netherlands	138	3.21
Spain	34	2.02	The Netherlands	116	3.02	Germany	136	3.16
Taiwan	30	1.78	Taiwan	94	2.45	Japan	131	3.04
New Zealand	23	1.36	New Zealand	92	2.4	New Zealand	89	2.07
France	23	1.36	Sweden	53	1.38	Sweden	72	1.67
South Korea	18	1.07	Belgium	45	1.17	Belgium	68	1.58
South Africa	16	0.95	Singapore	43	1.12	South Korea	67	1.56
Israel	16	0.95	Israel	41	1.07	Singapore	64	1.49
Sweden	12	0.71	France	41	1.07	Turkey	49	1.14
Singapore	12	0.71	South Korea	38	0.99	France	47	1.09
Norway	12	0.71	Turkey	37	0.96	Iran	45	1.05
Italy	12	0.71	Italy	33	0.86	Israel	39	0.91
Belgium	11	0.65	South Africa	29	0.76	Italy	38	0.88

witnessed a significant decrease of interest. The most popular topics include the impacts of socioeconomic class, ideology, and globalization on language use/learning and identity in various local contexts, the development and use of ELF, the practice and effects of multilingualism, and corpus-based investigation of field-specific discourse and literacy practices and variations. Research on these and other topics should help us gain new and more in-depth understandings of the issues involved in language learning, use, and communication in general.

The second finding is that applied linguistics is expanding from its two traditional background discipline orientations of linguistics and education by increasingly incorporating theories and practices from distant disciplines, such as complexity theory (which originated in mathematics, physics, and computer science). This finding should encourage applied linguists to continue the trend by further exploring these and other new theories and practices from other disciplines. Of course, to do so will require us to exert more effort in learning from and collaborating with scholars from other disciplines.

The third major finding is that, while the percentages of publications from traditional publication powerhouses, such as the USA and UK, have shown a slow, albeit steady decline, those from some other countries/regions, such as China and Turkey, have exhibited a substantial steady rise. The proportional increases of publications by the latter countries appear to have partially contributed to the increase of discussion of issues specific to the context, such as EFL learners and their needs and challenges. Furthermore, the increased publications by authors from the latter countries may indicate a slow shift away from the Anglo countries and Anglo authors in applied linguistics, a trend that has already been observed in natural sciences, engineering, and other disciplines (Leydesdorff and Wagner 2009; Moiwo and Tao 2013). However, more work should be done to continue this trend. A good approach for accomplishing this is to focus on non-Anglo contexts when working on important trending topics. Mauranen's (2012) book on how academic English as an ELF has been shaped by nonnative English speakers provides an excellent example, since it addresses the increasingly important topic, ELF, by looking at the special contribution made by nonnative English speakers.

Finally, our results also indicate that bibliometric analysis can be a useful method for understanding trends in applied linguistics, as it can generate and compare large numbers of quantitative data to help reveal developmental patterns. It is important to note, however, that, to obtain a complete understanding of trends, we need to examine various types of data, including most highly discussed topics, most highly cited publications, and most highly cited authors. One type of data alone may not be adequate. For example, as shown in our study, some of the most highly cited authors do not have any publications in the list of the most highly cited publications (and vice versa), suggesting clearly the need to include both measures to obtain a truly complete picture. Furthermore, despite its quantitative nature, a bibliometric study involves qualitative analysis and hence subjectivity, especially concerning decisions on what to include in the analysis and what constitutes a research topic and a trend. Given this issue and

the rapid developments in applied linguistics, more bibliometrics research in the field is needed in the future to help test and enhance the validity and reliability of this research approach and to help keep us accurately informed about the trends in the field. Also, to validate the results of bibliometric studies, it may also be useful to survey and/or interview professionals in the field. Comparing survey results with those of bibliometric research can help determine and ensure the latter's validity and reliability.

NOTE

- 1 Admittedly, as one anonymous reviewer notes, it is possible that some of the publications by authors from these countries might be based on their theses/dissertations written at universities in the USA or other English-speaking countries.

SUPPLEMENTARY DATA

Supplementary material is available at *Applied Linguistics* online.

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APPENDIX: JOURNALS CHOSEN AND NUMBER OF ARTICLES WHOSE INFORMATION IS INCLUDED

(Numbers of articles double-checked from Web of Science on Aug 16, 2016)

Journal	Impact factor	No. of articles
<i>Applied Linguistics</i>	3.25	267
<i>Bilingualism: Language and Cognition</i>	2.330	424
<i>Studies in Second Language Acquisition</i>	2.234	193
<i>Language Teaching</i>	2	107
<i>Language Learning</i>	1.869	381
<i>Applied Psycholinguistics</i>	1.833	383
<i>Journal of Second Language Writing</i>	1.744	182
<i>Language Acquisition</i>	1.735	113
<i>Computer Assisted Language Learning</i>	1.722	246
<i>Second Language Research</i>	1.568	174
<i>Journal of English for Academic Purposes</i>	1.558	187
<i>TESOL Quarterly</i>	1.513	346
<i>Language Teaching Research</i>	1.444	251
<i>Language Learning & Technology</i>	1.382	198
<i>Cognitive Linguistics</i>	1.375	206
<i>International Journal of Bilingual Education and Bilingualism</i>	1.338	295
<i>Language Policy</i>	1.235	120
<i>Modern Language Journal</i>	1.188	418
<i>English for Specific Purposes</i>	1.143	246
<i>ReCALL</i>	1.128	138
<i>Assessing Writing</i>	1.095	65
<i>International Journal of Bilingualism</i>	1.056	258
<i>Language Assessment Quarterly</i>	0.976	143
<i>Language and Education</i>	0.921	262
<i>Language Testing</i>	0.911	210
<i>Foreign Language Annals</i>	0.908	395
<i>ELT Journal</i>	0.864	275
<i>Lingua</i>	0.844	1048
<i>System</i>	0.834	527
<i>Language Culture and Curriculum</i>	0.816	157
	0.800	63

Journal	Impact factor	No. of articles
<i>IRAL-International Review of Applied Linguistics in Language Teaching</i>	0.780	151
<i>International Journal of Corpus Linguistics</i>	0.739	96
<i>Annual Review of Applied Linguistics</i>	0.688	168
<i>Journal of Language Identity and Education</i>	0.548	271
<i>World Englishes</i>	0.545	176
<i>Language Awareness</i>	0.538	216
<i>Canadian Modern Language Review-Revue Canadienne des Langues Vivantes</i>	0.500	56
<i>Applied Linguistics Review</i>	0.429	90
<i>Corpus Linguistics and Linguistic Theory</i>	0.406	223
<i>English Today</i>	0.385	249
<i>English Teaching-Practice and Critique</i>	0.250	54
<i>VIAL-Vigo International Journal of Applied Linguistics</i>		10, 028

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