

Learning and teaching Chinese as a foreign language: A scoping review

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Abstract

Despite the growth of research in learning and teaching Chinese as a Foreign Language (CFL), no scoping review of research published in international, anglo-phone journals has been published so far. A total of 289 journal articles published in 95 journals were identified and used to provide a bibliometric mapping of research in CFL over three decades. Data from the sampled articles reveals a great diversity of focus in CFL research that has been conducted in more than 24 countries. The included articles also reflect an upsurge in research intensity across several key areas of focus, some of which are related to the distinctive linguistic features of the Chinese language. We also report on the research methods employed by the studies in our sample and the characteristics of their participants. Our mapping of the field identifies gaps in the existing literature which may subsequently inform any focused or comprehensive reviews. We conclude by setting out some implications for future CFL research, both in terms of substantive areas of focus and methodological approaches.

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KEYWORDS

Chinese as a foreign language, Mandarin, second language acquisition, systematic scoping review

Context and implications**Rationale for this study**

Our literature search indicates that there is no systematic review of international, anglophone publications on CFL research. This scoping review is the first endeavour to fill this gap by summarising relevant research over 30 years.

Why the new findings matter

The findings will help to inform the direction of future CFL research, to assist in theory building in the second language acquisition field.

Implications for researchers and practitioners

Future research should consider focusing on (a) CFL learners at pre-university levels; (b) learners with a wider variety of first language (L1) backgrounds; (c) fine-grained analysis of learner's production of spoken and written Chinese; (d) qualitative analyses. Researchers should also specify or define the target language of study to denote the specific variety of Chinese language more precisely.

INTRODUCTION**Background**

Over recent years, the numbers of people learning and teaching Chinese as a Foreign Language (CFL) worldwide have risen sharply.¹ As the current paper will show, research into learning and teaching CFL has also surged. As well as being strategically and economically important, CFL is of theoretical interest in the field of Second Language Acquisition (SLA). This is because both the Chinese language and its writing system are typologically distinct from many other second languages (L2s) which have been more frequently researched—notably English, by far the predominant focus of SLA study to date.

However, our literature search has found no existing systematic or scoping review that includes all topics within CFL research published for an international audience in the English language. The current paper takes a first step towards filling this gap, presenting a scoping review of CFL research published in English.

A scoping review aims to determine the volume and coverage of a body of literature on a given topic, offering a broad overview of its focus (Munn et al., 2018). Such an overview essentially helps researchers to make informed decisions on, for example, the resources needed and areas of particular interest before committing to any comprehensive reviews or syntheses. Our review provides a bibliometric mapping of the field, showing who is conducting research in CFL; where this research can be found; which topics have been covered; and which methods and populations have been used. We thus hope to (a) signpost relevant research for scholars, practitioners, and policy makers; and (b) shed light on growth areas

of research and areas which remain under-explored. It is not the purpose of this review to attempt to synthesise findings of previous research or provide implications for theory and pedagogy; rather, the current study intends to survey the field using a broad-brush approach to inform subsequent more in-depth reviews and empirical research.

Before describing our methods, we will provide a brief discussion of terminology. This is because there is some variation in the terms used to denote what we have chosen to call the 'Chinese' language. We will then give an overview of some of the key background to our scoping review, explaining the value of research into CFL and the need for the current paper.

Terminology

In the Anglosphere, the teaching of 'Chinese' as a foreign language usually means 'Mandarin' Chinese: for example, this is true of various large-scale initiatives designed to promote the learning and teaching of CFL in the USA, UK and worldwide (see the section '[The rise and rise of CFL](#)'). In turn, 'Mandarin' is usually used to denote 'Standard Chinese', based chiefly on a particular variety of Mandarin Chinese spoken in Beijing.

However, the English terms 'Mandarin' and 'Chinese' are not necessarily synonymous. In linguistics, Chinese or Sinitic languages are a group of language varieties, including not only Mandarin, but also several others (Gil, 2011). Some of these other varieties of Chinese are also widely spoken (Eberhard et al., 2021). Therefore, for reasons of inclusivity, it is important to remember that significant numbers of 'Chinese' speakers are not native speakers of Mandarin. Although our review, for practical reasons, inevitably focuses on the learning and teaching of 'standard' Mandarin Chinese, we would not wish these other varieties of Chinese or their speakers simply to be overlooked.

There are also two prominent scripts in use for representing Chinese languages in written form: 'simplified' and 'traditional' (McBride, 2016). Spoken Mandarin is often associated with the simplified set of Chinese characters, which are now the standard written forms used in the People's Republic of China (PRC), Malaysia and Singapore—and which will therefore be the target of learning for most learners of CFL worldwide. Again, however, it is important to note that traditional Chinese characters remain in use in other jurisdictions, including Hong Kong, Macau and Taiwan (Wei & Li, 2015).

In the current article, we have chosen to use the broad and inclusive term 'Chinese' to refer to the target of learning. This allows our review to capture research into the learning and teaching of any variety of the Sinitic language family, and of any of the writing systems associated with these varieties. It is also of interest to us to ascertain which terms are used by researchers themselves to denote the object of their inquiry, and how these terms are used.

The importance of CFL

To demonstrate why the current review is necessary and timely, this section will offer brief overviews of (a) the prevalence of CFL learning and teaching and (b) the importance of CFL in terms of SLA research and L2 pedagogy.

The rise and rise of CFL

The learning and teaching of CFL have seen considerable growth in recent years, presumably reflecting China's growing economic and political influence as one of the world's largest

economies by GDP (World Bank, 2021). The object of learning is usually Mandarin Chinese, reflecting its widespread usage: for example, it is the official spoken language in the PRC and Taiwan, and it is one of four official languages in Singapore (Chen, 1999).

In Anglophone countries, the rise in CFL has been accelerated by various national initiatives designed to increase the teaching of Chinese in schools. For example, the US government's '1 million strong' initiative, announced in 2015, aimed to 'increase the number of American students learning Chinese to one million by 2020' (IOWA, n.d.). Similarly, the UK government's 'Mandarin Excellence Programme', set up in 2016, sought to have '5000 students on track to fluency in Mandarin by 2020', a target already exceeded by January 2021 (UCL, 2021). These initiatives are in addition to the promotion of Chinese language learning worldwide by Confucius Institutes (funded by the government of the PRC). According to official statistics, there were 550 Confucius Institutes in 162 countries in 2019, supporting the learning of Chinese in 1172 'Confucius classrooms' in primary and secondary schools (Government of the PRC, 2019).

Despite the above-mentioned growth in CFL learning in the USA and UK, the actual numbers of learners involved in these countries remain small compared to those learning other foreign languages. For example, the US '1 million strong' initiative sounds ambitious, but one million is only 2% of the total number of students in US elementary and high schools (Allen-Ebranhimian, 2015). In England, uptake of CFL in schools may be growing, but it is part of the curriculum in only 3% of primary schools nationally, compared to 75% for French (Collen, 2020). The growth of CFL is also politically sensitive in some quarters, particularly the USA, where there are worries over the influence and motives of Confucius Institutes (Hartig, 2015).

Notwithstanding these caveats, the sharp growth in learning and teaching CFL makes it imperative to have a sound, research-informed understanding of the processes and outcomes involved. Our scoping review can be a key resource to researchers as a preliminary step towards a comprehensive systematic review, which will, in turn, provide robust, evidence-based foundations for effective policy and practice.

The importance of the study of CFL for SLA research

Ma et al. (2017, p. 823) refer to 'the uniqueness and complexity of Chinese language acquisition', with particular reference to lexical tones and characters. Tones are a suprasegmental feature determining the pitch contour of Chinese syllables. There are five possible tones in Mandarin (high, rising, falling-rising, falling or neutral) which distinguish between multiple morphemes that are otherwise phonologically identical syllables: for example, 八 (bā), 'eight'; 拔 (bá), 'pull'; 靶 (bǎ), 'target'; 爸 (bà), 'father'; 吧 (ba) [question particle]. This makes lexical access and language production complicated for foreign learners (Shen, 2018), given that lexical tones do not feature in Indo-European languages (Lin et al., 2010). Chinese characters (both simplified and traditional) are a logographic or 'morphemic' writing system (Cook & Bassetti, 2005). Unlike alphabetic languages, they do not systematically encode the spoken forms of words at a sub-lexical level (Cheng & Lin, 2013; Ho & Bryant, 1997; Qin et al., 2016).

Lexical tones and logographic writing systems are not, in fact, 'unique' to Chinese: other languages are tonal (e.g., Vietnamese, Cantonese) and/or include logographic characters in their writing systems (e.g., Japanese). Nonetheless, these features do distinguish Chinese from many other widely studied languages (most notably English) within the field of SLA, and this makes learning Chinese challenging for many L2 learners, especially those with an alphabetic first language (L1) background (Hu, 2010). Indeed, the US Department of State (n.d.) classifies Mandarin and Cantonese as two of only five 'super-hard languages' for

English speakers, likely to require around 2200 class hours for an average learner to reach 'professional working proficiency'—compared to around 600 class hours for Spanish. Such a level of difficulty might threaten learners' expectations of success, in spite of the high instrumental value Chinese learning may hold for learners (for the geopolitical and economic reasons explored above).

Despite the widespread learning and the distinctiveness of Chinese, as Ma et al. (2017, p. 815) observe, 'research on language education has long been dominated by studies on the teaching and learning of the English language'. This raises the question of the extent to which SLA is governed by universal processes, and to what extent it is specific to the particular L2 being learnt—or perhaps better, the particular combination of the learner's L1 and L2. More specifically, in the current context, we must ask to what extent SLA findings and theories, generated through research into the learning of English, are applicable to Chinese learning and teaching. For example, the 'dual route' model of word recognition (see Coltheart, 2005)—which 'ranks as one of the most prolific theories in modern cognitive psychology' (Share, 2008, p. 587)—was largely derived from research into reading English (Share, 2008). It appears to have limited relevance for reading Chinese characters, given that one of the model's two routes (the phonological one) is unavailable in this non-phonographic writing system. Thus, as Zhao (2011, p. 559) points out, the study of CFL may make an important contribution to wider SLA research—and related pedagogical approaches—'through verification, modification or posing challenges to research findings in the L2 acquisition of other languages'.

Existing reviews of CFL research

Given that the study of CFL is of considerable importance both in terms of SLA theory and pedagogical implications, we believe that a review of international publications within the field is much needed. Our search of the literature (as detailed in the section '[Literature search](#)') identified 10 existing papers, published in English, providing reviews of CFL research. However, six of them review a specific topic of research within CFL (Hughes et al., 2019; Ke, 2020; Li & Li, 2020; Lyu & Qi, 2020; Zhao, 2011; Zhou, 2020); one reviews just two books (Mai, 2016); and the remaining three papers are general reviews but are based on (a) publications predominantly or solely in Chinese using China-based journals and (b) literature published in a relatively short period of time, ranging from 4 years to 13 (Gong et al., 2020; Gong, Hu, & Lai, 2018; Gong et al., 2018; Ma et al., 2017). In other words, we were unable to identify any systematic review or meta-analysis of the overall trend of CFL research based on publications written in English that would address an international readership. Consequently, the current scoping review intends to take the first step towards filling this gap by providing a bibliometric mapping of the Anglophone CFL research landscape.

Summary

Given the burgeoning interest in CFL teaching and learning in recent years, it is important for researchers, educational practitioners and policy makers to have a clear mapping and overview of the research landscape. This will help them identify relevant studies to support their decision making and lay foundations for more in-depth, systematic reviews of particular areas of CFL. It will also inform future research by highlighting areas that have been under-explored to date.

We have identified no existing high-quality scoping reviews of research on CFL published in English and so the current paper addresses this gap. It does not aim to synthesise key

findings of CFL studies, nor does it appraise the quality of evidence of the primary research. Instead, our purpose has been to 'illustrate the field of interest in terms of the volume, nature and characteristics of the primary research' (Arksey & O'Malley, 2005, p. 30).

Our overarching review question is: What research is available, in English, on the learning and teaching of Chinese as a foreign language (CFL)? Specifically, we address the following sub-questions:

1. What is the volume of research published in English on the learning and teaching of CFL and where can this research be found?
2. What is the nature of this research in terms of (a) research and learning contexts, (b) focus, and (c) methods?
3. Which terms have been used to denote the language being studied?

METHODS

Literature search

A list of keywords related to the learning and teaching of CFL was devised before conducting the literature search. The resulting search string (Appendix 1), consisting of 53 words and phrases, was applied to six databases in March 2021: *Arts and Humanities Citation Index* (A&HCI); *Applied Social Sciences Index and Abstracts* (ASSIA); *Educational Resources Information Centre* (ERIC); *MLA International Bibliography*; *PsycINFO*; and *SCOPUS*. These databases were chosen for their comprehensive coverage of academic and professional literature on language and education across the sciences, social sciences and humanities.

We made a number of pragmatic decisions, based on the limited resources available to us, which can be considered as limitations of our study. First, we focused on publications in English language. This captures a large body of scholarship aimed at an international audience (Matsuda & Friedrich, 2011; Mauranten, 2003), but rules out potentially relevant work in other languages, notably Chinese itself. Second, publication type was limited to journal articles, which are easily accessible in full text; access to full texts of other publication types may be restricted or time-consuming (Gough et al., 2012; Lenkeit et al., 2015). However, this means that grey literature as well as theses and dissertations are excluded. Third, the publication period was confined to 1990–2021. Although we are aware that publications about CFL might have appeared prior to 1990, we reasoned that sampling literature over the last 30 years served our purpose of reflecting developments in the field. Fourth, resource limitations did not permit us to conduct a backward citation search. A future, complementary scoping review could address these limitations, for example by targeting sources such as doctoral theses and articles in other languages.

Filtering and inclusion

Our searches yielded 5486 publications in total. All of these were imported to *EPPI Reviewer*, a software package specially designed for managing reviews and meta-analyses. After 1341 duplicates were automatically removed by the software, the filtering process began with human scanning of the titles and abstracts of 4145 publications. An additional 262 duplicates were removed manually. Further, based on the abstracts, 3559 items were found to be either (a) irrelevant to learning or teaching CFL and/or (b) publications other than journal articles.

These were also excluded, leaving a sample of 324 journal articles focusing either solely on CFL or on CFL alongside other FLs.

We filtered the articles further by selecting articles published in peer-reviewed journals which were indexed in an open analytical tool, the *Scimago Journal & Country Rank* (SJR), and with an aggregated score of 0.2 or above. SJR indices have been widely consulted and referenced in research evaluations and reviews, bibliometric studies and information science (see, for example, Bhardwaj, 2017; Mañana-Rodríguez, 2015; Renjith & Vijayan, 2018; Tazegul et al., 2021; Yuen et al., 2018).

The criteria in our filtering stages were intended to be as inclusive as possible, while also being selective enough to identify recognised journals out of the enormous volume of publications in a digital age. After applying these criteria, 289 articles remained as the sample for our review.

Our search strategy, eligibility criteria and reporting processes followed the protocols in the PRISMA-ScR, PRISMA extension for Scoping Reviews (Tricco et al., 2018). This checklist is adapted from the PRISMA-P Statement (Moher et al., 2015), with a few items irrelevant to scoping reviews removed (for example, ‘risk of bias across studies’).

Figure 1 summarises the workflow of data sampling, journal identification and screening.

Data analysis

Reading the abstracts showed us that our 289 sample articles varied considerably in terms of the nature, focus and design (inter alia) of the studies. We therefore aimed to conduct ‘a

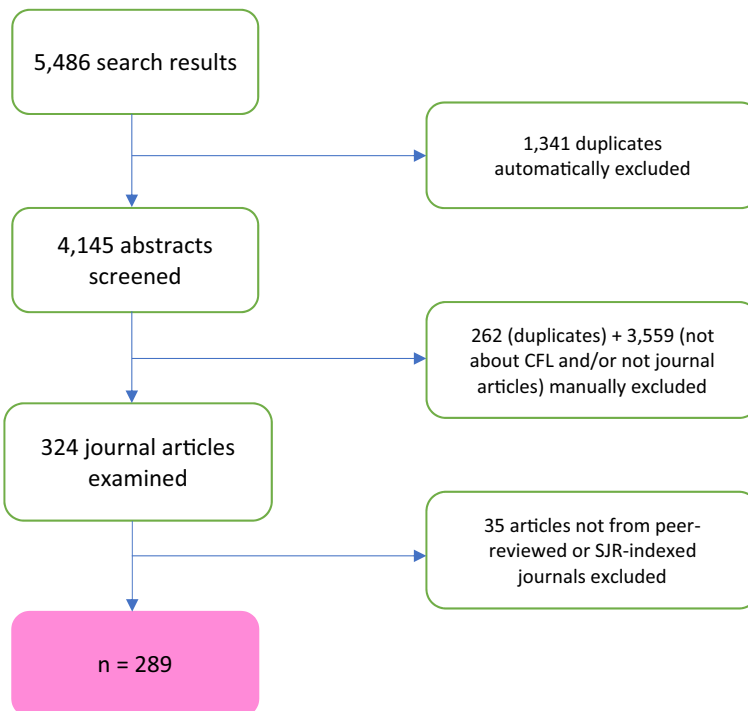


FIGURE 1 Literature inclusion/exclusion workflow

systematic mapping study based on bibliometric data [which] reveals research clusters and helps provide a taxonomy that respects that diversity’ (Fellnhöfer, 2019, p. 30).

All four authors met to devise and refine the coding scheme (Table 1). We divided the articles’ ‘main focus’ into 12 categories. The first 10 of these were determined a priori based on established categories in the SLA literature (e.g., Gass & Mackey, 2012) and on our knowledge of teaching and learning Chinese in particular. The last two were added in the process of screening the articles, as topics emerged that were not captured within the existing classification. In terms of overall study design, we initially drew up three categories: (a) intervention studies, including experimental or quasi-experimental designs, which evaluate particular pedagogical approaches; (b) empirical studies with non-intervention design, using a range of methods including surveys, interviews, tests or observations; and (c) literature reviews. On screening the articles, a fourth category was found to be needed to cover studies

TABLE 1 Mapping the characteristics of research in CFL

Article variable	Description
Year of publication	
Journal name	
Main focus	Variable that broadly covers 12 common areas in SLA research: a. Acquisition of tones/speaking/listening/phonology/phonetics b. Acquisition of characters/radicals/morphology c. Acquisition of grammar/syntax d. Acquisition of semantics/pragmatics/interculturality e. Learning to write/read f. Motivation, learning strategies or metacognition g. Interlanguage or transfer effects h. Instructional or pedagogical approaches i. Learning or teaching with technology j. Teacher factor, professional training and development k. Policy, curriculum or test evaluation, CFL at a national or systemic level l. Brain/neurological/physiological reactions
Design	Overall study design: a. Intervention studies with experimental or quasi-experimental design b. Empirical study with non-intervention design c. Literature review d. Corpus approach (study of existing speech or writing)
Method	The analytical method(s) adopted: a. Qualitative b. Quantitative c. Mixed-methods
Level	The educational level of the research participants: a. University or adult b. Secondary c. Primary d. Pre-school
First language	The native languages (L1s) of the CFL learners studied
Learner number	The number of CFL learner participants
Country	The country in which the study was undertaken
Name of language	The specific name used by the article authors to denote the language under study: a. Chinese/Chinese language b. Mandarin c. Mandarin Chinese d. Cantonese

based on existing corpora of speech or writing by CFL learners or teachers. All other categories were determined a priori and were found to be effective in classifying the literature in our sample.

This coding scheme enabled us to rapidly and economically examine a large number of articles (Munn et al., 2018; Pham et al., 2014). Data extraction—or ‘data charting’, as it is known in a scoping review (Tricco et al., 2018)—was shared between all four authors and a research assistant, based on reading the full texts of the 289 articles. Initially, all members of the data charting team independently applied the coding scheme to a sub-sample of five articles, deliberately selected to represent a range of characteristics. The team coded these articles with minimal disagreements, which were discussed, and the coding scheme further refined: for example, some code descriptions were amended for enhanced clarity. The four authors and research assistant then independently conducted data charting of the remaining articles. To assure reliability of the data charting process, the first author checked the coding of 67 articles (23% of the total). The level of agreement between the initial reviewer's codes and those of the first author (inter-rater) was 96%, indicating that our coding was highly reliable. In rare cases of disagreement, the coding was discussed and resolved between two members of the team (as recommended by Munn et al., 2018; Pham et al., 2014).

RESULTS AND DISCUSSION

Our scoping review set off with an overarching question: What research is available, in the English language, on the learning and teaching of Chinese as a foreign language (CFL)? In this section, we present and discuss our findings, taking each of our sub-questions in turn.

What is the volume of research published in English on the learning and teaching of CFL and where can this research be found?

The period 1990–2020 saw exponential growth in journal articles published in the English language on CFL (Figure 2). Our review also includes 10 articles released in the first quarter of 2021 (not included in Figure 2), which suggests a trend of continuing growth. The number of publications appears to have taken off particularly over the last 10 years or so. This may be related to the opening of the first Confucius Institute in 2004, coupled with the economic and political influence of China, promoting the learning and teaching of Mandarin worldwide.

Two further points should be noted when interpreting this result. First, as mentioned above, our literature sample consists of journal articles only, excluding other publication types such as book chapters and dissertations. Second, we filtered out 35 articles which did not meet our quality assurance criteria. Therefore, the total number of English language publications on CFL per year will be considerably higher than shown in Figure 2.

The 289 articles in our sample were published in 95 journals in total, indicating a diversity of outlets and a fragmented field. However, more than half, 151 articles, were published in 12 journals, and the remaining 138 articles appeared in 83 journals. Due to our inclusion criteria, all of the articles are published in international journals accepting papers written in English, operating a peer-review policy and indexed in the SJR. The spread of journals would have been even more pronounced, had these criteria been relaxed.

CFL research articles were most frequently published in: *Foreign Language Annals* ($n = 24$), *Modern Language Journal* ($n = 23$), *Computer Assisted Language Learning* ($n = 20$), *System* ($n = 20$) and *Second Language Research* ($n = 16$). A further seven journals each published between six and nine articles on CFL during the review period (see Figure 3).

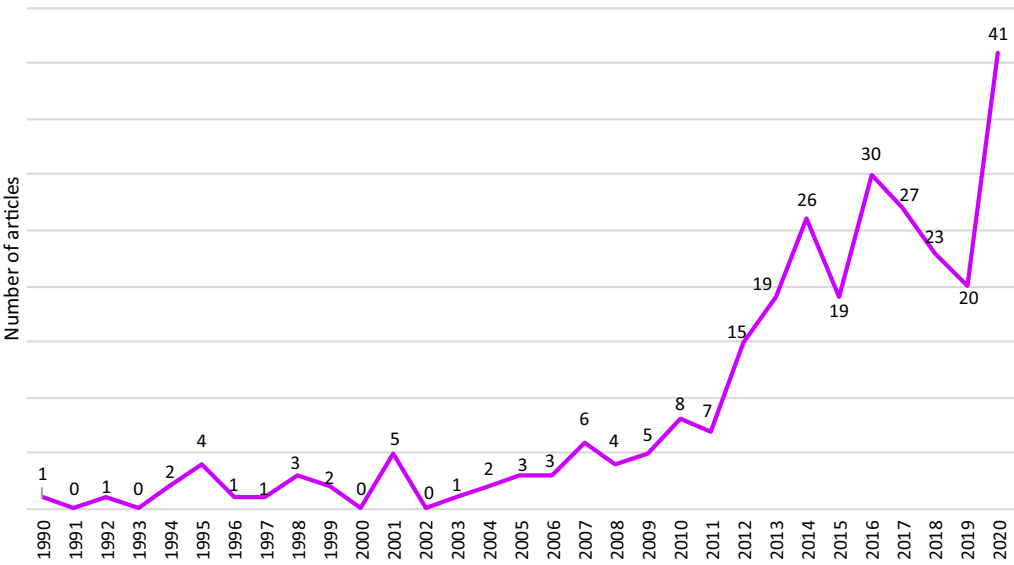


FIGURE 2 Number of journal articles on CFL published in English between 1990–2020. Ten articles published between January and March 2021 are included in the literature sample ($n = 289$) but not shown in this graph.

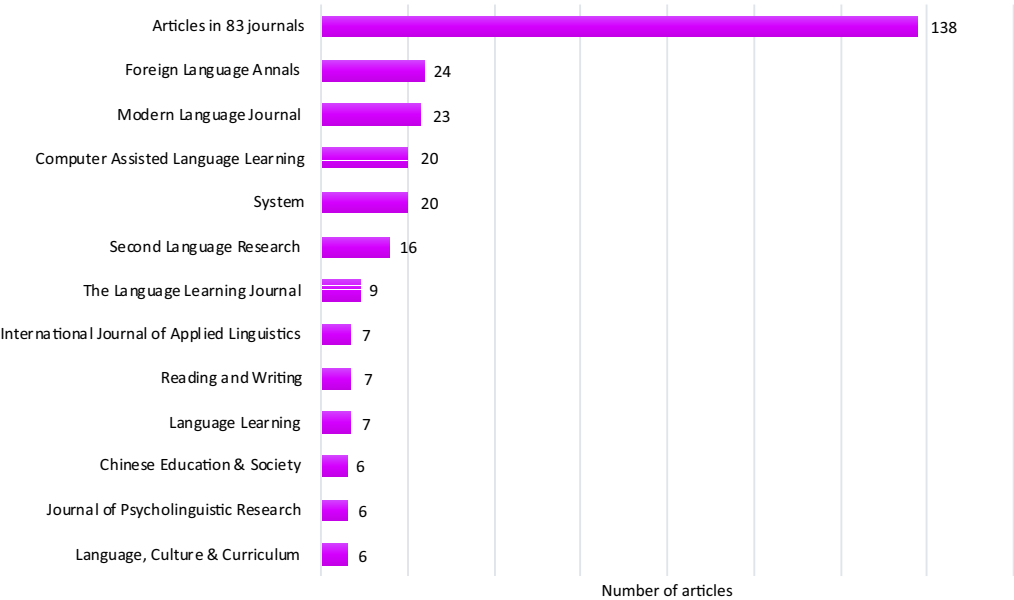


FIGURE 3 Journals prevalent in publishing CFL research in the English language ($n = 289$)

What is the nature of this research in terms of (a) research and learning contexts, (b) focus, and (c) methods?

Research contexts

For empirical studies, the research context was defined as the country or jurisdiction in which data were collected. Policy or critique papers were decided by the country that was

the focus of the article. Three articles did not report where their data collection took place, thus were categorised as 'not stated'. Ten articles are literature reviews and were coded as 'not applicable'. Eight of the sampled articles did not adopt a specific country focus, and hence also appeared in the 'not applicable' category. Four of these eight articles examined Confucius Institutes in a global context; another three discussed learning CFL without a specific country context; and one analysed CFL textbooks.

Based on this classification, Figure 4 shows the different countries in which CFL research has been conducted. Of the 289 articles included in our review, the USA has produced the highest number (36%). China comes second (16%) and the UK third (8%). Other CFL research-active jurisdictions include Taiwan (7%), Australia (5%) and Hong Kong (5%). Adding together the USA, the UK, Australia, Ireland, Canada and New Zealand, the English-speaking world has contributed to half the total outputs ($n = 144$ or 50%).

In Figure 4, the label 'multiple countries' shows that 20 studies collected data in two or three different countries. Of these, 15 collected data in two countries and five collected data in three countries. For instance, three studies collected data from both the USA and China. This means that the actual numbers of studies conducted in these countries are higher than those shown in the single-origin bars in Figure 4. Similarly, 11 studies collected data in multiple countries including the UK, meaning that the actual quantity of research conducted in the UK exceeds the 22 articles shown in Figure 4. Note that the 'multiple countries' category also includes Germany, Egypt and Israel, meaning that those countries are represented in CFL research, even though they were not the sole locations of any studies included in our review.

Since our research context category was determined by where empirical data were collected, this does not mean that the participants necessarily came from that country as well; research undertaken in a particular country might include participants from elsewhere. This

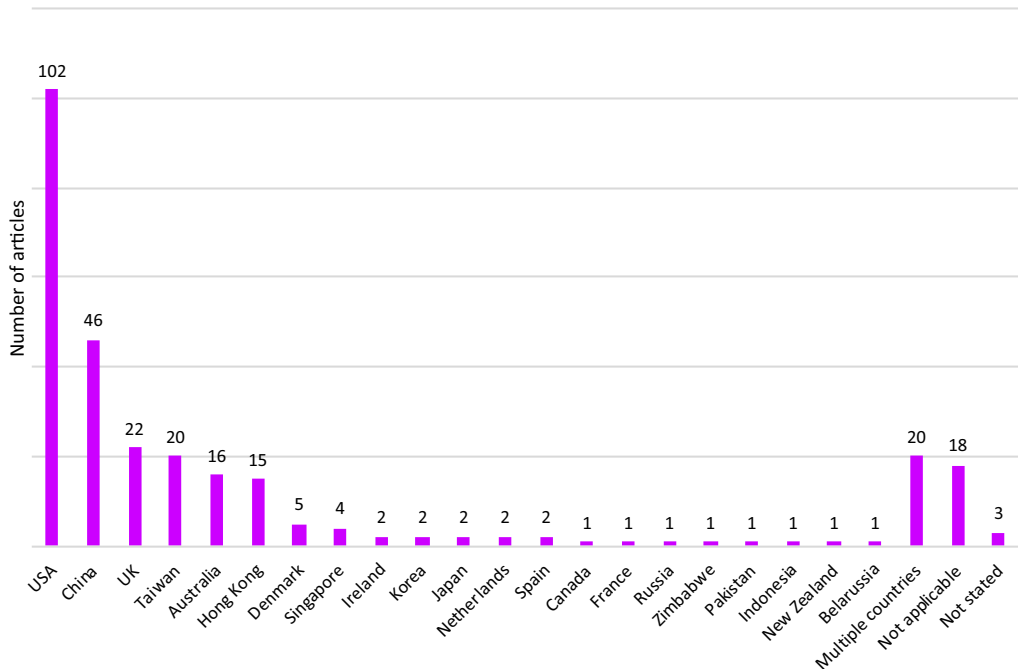


FIGURE 4 Number of English-language CFL publications conducted in different countries/jurisdictions ($n = 289$)

is particularly common in studies involving university students: many CFL learners in higher education are international students.

Learning contexts: educational level

Following the categorisation used in many of the primary studies, we defined educational level in terms of primary school, secondary school, university, or other adult learning setting. This definition also applied to teacher research that involved no learners; in such cases, we counted the educational level (primary, secondary or tertiary) in which those teachers taught.

We acknowledge that learner's L2 proficiency would also be valuable to include; however, we considered this variable problematic for several reasons. First, much of the CFL research in our sample either did not state learners' L2 proficiency, or measured proficiency in different ways. Unlike ESL or EFL, for which there are widely recognised and validated international assessments, testing in Chinese is relatively less established. The increasingly popular Chinese proficiency test, *Hanyu Shuiping Kaoshi* (HSK), developed and authorised by the government of the PRC, assesses only Mandarin and the simplified Chinese characters. Consequently, assessing L2 learners' proficiency in different varieties of Chinese in a standardised or comparable way remains a challenge in both research and classroom practice.

Figure 5 presents the educational levels on which the 289 articles focused. A striking majority (72%) focused on university level or other adult learners; an additional four articles examined CFL issues at both university and secondary school levels. In total, just 17% of articles studied learning or teaching CFL at pre-university level, focusing on secondary schools (8%), primary schools (6%), a mixture of primary and secondary schools (3%) and kindergarten (one article). One other article, a critique paper, discussed CFL at all levels. A further 28 (10%) articles were non-empirical studies which did not involve student or teacher participants.

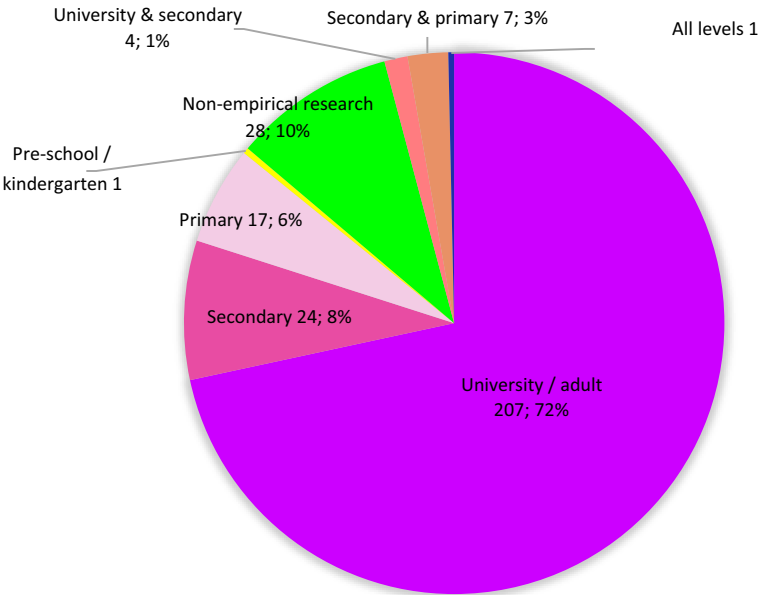


FIGURE 5 Educational levels on which CFL articles have focused ($n = 289$)

These findings echo Ke's (2020) review of 92 empirical studies on CFL reading, where the most widely studied populations were US university students. The USA is also the most research-productive country in our findings (Figure 4). The over-representation of adult learners and university students is unsurprising, given that CFL was first introduced mainly at university level in most countries, with provision only later being extended to primary and secondary schools (Starr, 2009). Further, university students are often readily accessible to researchers, who themselves often work in higher education institutions and may be particularly motivated to understand and improve teaching and learning in their own contexts.

It is unclear, however, to what extent results and implications generated from university-level and adult learners apply to younger CFL learners in primary and secondary schools. This poses challenges for improving the teaching and learning of CFL in school classrooms and for CFL teacher education, which is an ongoing problem in the field (Bao, 2019; Diamantidaki et al., 2018). Our findings thus indicate a need for more research targeting pre-university learners, particularly given the rapid rise of CFL in schools (see the section 'The rise and rise of CFL').

An over-representation of highly educated samples in the evidence base also limits the capacity for theory-building, not only in the field of CFL but also in the SLA research field at large (Andringa & Godfroid, 2019; Zhao, 2011). Some researchers warn against any conclusion on the universality of human behaviour and learning based on so-called 'WEIRD' samples—Western, Educated, Industrialised, Rich, Democratic—which are not representative of the wider global population (Henrich et al., 2010). The current review confirms an over-representation of WEIRD samples in CFL research available in the English language to date. We acknowledge, however, that this is, at least in part, likely to be a consequence of our inclusion criteria and intentional focus on anglophone literature. A complementary review of CFL literature published in other languages (notably Chinese) might help to explore this issue further. Nonetheless, we believe it is likely that the dominance of university-level learners would remain.

We also calculated how many CFL learners, in total, had taken part in the research included in our review. To make these calculations as accurate as possible, we excluded research participants who were teachers of Chinese or native Chinese speakers. In our sample, 235 articles reported empirical studies involving CFL learners as participants, though seven of these did not report the sample size. We therefore summed the number of participants from 228 articles. Over the past 30 years, 14,479 CFL learners took part in the reviewed research all told, spread across multiple countries and educational levels. However, because of the predominance of studies investigating adults or university students, only a small proportion of these participants were at school level: in total, 2519 secondary and primary students took part, or just 17% of the total (Figure 6).

It should be noted that these numbers reflect only what has been reported in our sample articles, published in recognised journals and written in English. Undoubtedly, much additional research falls outside of our sample; therefore, the actual number of learners who have taken part in CFL research surely exceeds the numbers reported here.

Learning contexts: participants' L1 backgrounds

The 14,479 CFL learner participants aggregated from our articles are native speakers of at least 37 languages. The actual number of languages may be higher, but of the 235 articles that recruited learner participants, 39 (16%) did not report participants' L1s. Figure 7 summarises participants' L1s; full details appear in Appendix 2.

Despite the diverse range of participants' L1s, native English speakers took part in nearly 70% of the studies: 111 articles (47%) investigated English L1 speakers only, while another

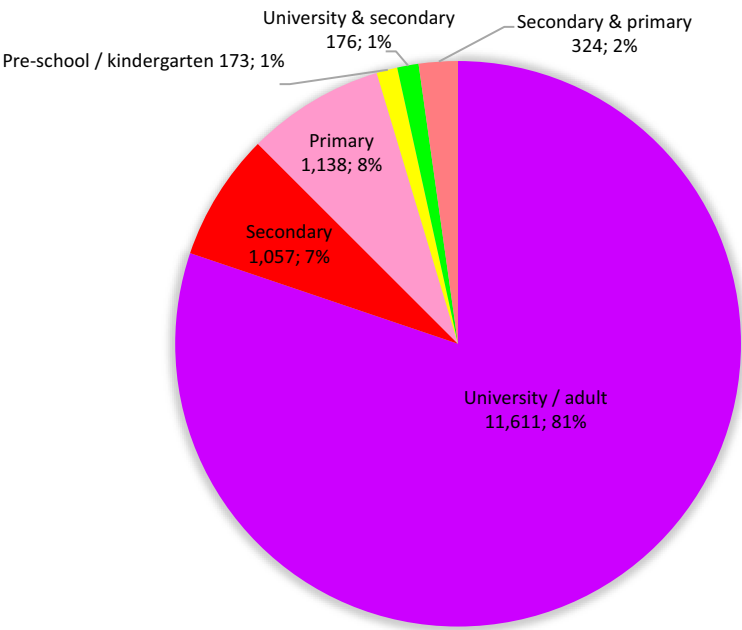


FIGURE 6 Breakdown of the number of CFL learner participants by educational levels ($n = 14,479$)

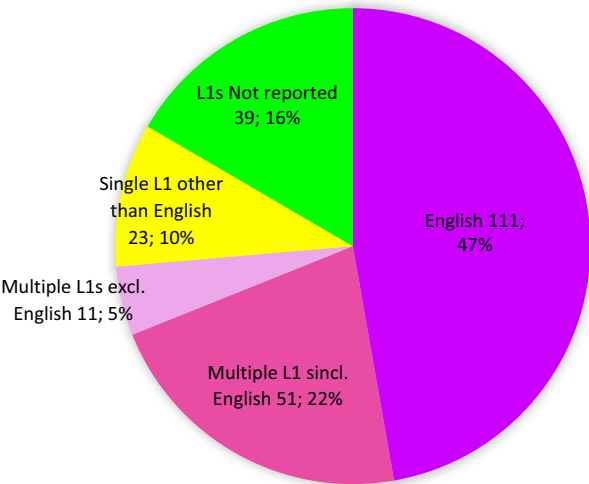


FIGURE 7 L1s of learner participants in the surveyed CFL studies ($n = 235$)

51 (22%) reported a mix of English and non-English L1s. This dominance of English native speakers in the surveyed research also reflects the fact that English-speaking countries published half of the articles in our sample (Figure 4). Of those which did investigate participants with L1s other than English, 23 (10%) studied speakers of a single L1; 11 articles (5%) recruited native speakers of different languages within a single study.

After English speakers, participants with Korean and Japanese L1 are the next most frequent participants in our sample. Out of the 51 studies that recruited speakers of multiple L1s including English, we found that Korean and Japanese native speakers participated in 26 and 22 of them respectively. Out of the 23 articles that researched speakers of a single

L1 other than English, four articles studied Korean native speakers and another four studied Japanese native speakers. On the one hand, these results echo Zhao's (2011) claim that L1 English, Korean and Japanese speakers have attracted the most attention in CFL research. On the other hand, however, the number of L1s recorded in this review ($n = 37$) far exceeds the number found in Zhao's review sample ($n = 10$).

After English, Danish is the second most researched European L1. Four studies recruited solely Danish native speakers; another three had participants with different L1s including Danish. However, on closer inspection, this emphasis on Danish L1 in CFL research appears to be due to a small group of active researchers from the Confucius Institute in one Danish university (Aalborg).

Research focus

We coded the 289 articles into 12 areas of SLA research. By and large, these areas cover the linguistic, psychological, pedagogical, physiological and socio-political aspects of L2 learning. During the data charting, each article was categorised by the predominant focus of the enquiry, which could be pinpointed by its research questions, dependent variables, keywords and/or key findings.

Amongst these 12 areas (Figure 8), the four most popular ones are: 'acquisition of characters, radicals, morphology'; 'motivation, learning strategies or metacognition'; 'learning or teaching with technology'; and 'acquisition of tones, speaking, listening, phonology or phonetics'. Taken together, these four categories form the focus of nearly half (47%) of the articles in our sample. We will therefore consider each of these in a little more detail, in descending order of frequency.

The acquisition of characters and radicals² has attracted the most research attention in our sample, being represented by 38 articles (13%). This is unsurprising, given that these orthographic features are salient characteristics of Chinese, compared to more widely studied L2s such as English.

A research topic almost equally as popular as acquisition of characters are the motivational aspects of learning CFL ($n = 37$, 13%). Motivation and learning strategies have long been dominant topics in the wider field of SLA research (Boo et al., 2015), and CFL studies

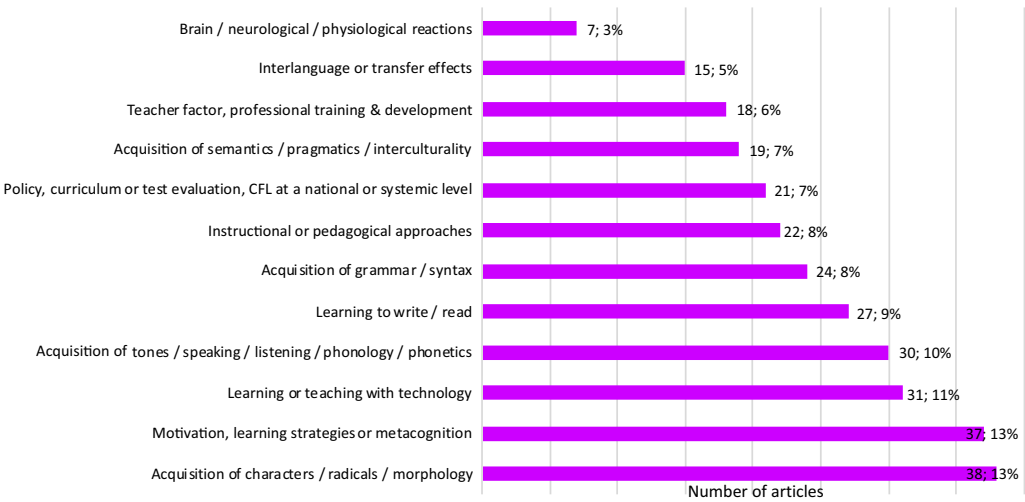


FIGURE 8 Key areas of CFL research ($n = 289$)

have demonstrated a similar trend. As noted in the section '[The importance of the study of CFL for SLA research](#)', learning CFL is likely to pose particular motivational challenges, especially for Western learners.

The third most frequently researched area is learning or teaching with technology ($n = 31$, 11%). This may be related to the fact that most studies involved students in universities ([Figure 6](#)), where the use of technology to support L2 learning may be more popular and accessible than in secondary or primary schools. Three of the 10 review articles in our sampled literature also focused on computer-assisted learning (Hughes et al., [2019](#); Lyu & Qi, [2020](#); Zhou, [2020](#)), confirming a significant interest in this area of CFL research.

The fourth most frequent topic of research was the broad phonological category of 'acquisition of tones, speaking, listening, phonology or phonetics' ($n = 30$, 10%). Within this broad category, we were particularly interested in the extent to which another salient feature of Chinese—its use of lexical tones—has been a specific focus of inquiry. Out of the 30 articles in the phonological category, over half ($n = 17$) focused entirely on the acquisition of tones. By proportion, tones contribute to a total of 5.8% out of all 289 articles.

The above findings show that, taken together, the acquisition of tones, characters and radicals account for approximately 19% of all the research areas in our current classification. However, it is likely that they were also implicated to some extent in the other 10 categories shown in [Figure 8](#). For instance, the seven articles focusing on brain or physiological reactions might have involved character or tone recognition. The prevalence of these features as a focus of research is unsurprising, given the distinctive difficulties they pose for CFL learners (see '[The importance of the study of CFL for SLA research](#)'). We also believe that the strong representation of these areas in CFL research is important. It enables hypotheses derived from research into a narrow selection of alphabetic L2s (especially English) to be tested out and extended to account for a wider variety of languages (Zhao, [2011](#)).

Correspondingly, pedagogical implications generated from research on learning alphabetic or non-tonal languages may not be strictly relevant or sufficient for informing the teaching of CFL. For example, it may be that visual-orthographic and semantic skills should be taught to CFL learners at an early stage, as opposed to phonics in learning an alphabetic L2 (McBride, [2016](#); Zeguers et al., [2018](#)).

Research methods

As shown in [Figure 9](#), most of our 289 articles employed non-intervention designs, using surveys, interviews, measures and observations (52%). Just over a quarter of articles (28%) adopted experimental or quasi-experimental designs, to measure the effects of an intervention on language learning. A further 6% of articles adopted a corpus approach using data collected from existing speech or writing, such as dialogues on online platforms. The small number of studies in this category means that fine-grained analysis of learners' naturalistic production remains a gap to fill in CFL research. Ten articles employed hybrid designs, combining two of our design categories. For example, one study (Codó & Sunyol, [2019](#)) collected data through observations, teacher interviews and student and parent questionnaires, as well as from existing speech and writing samples derived from teaching materials, class recordings and school documents. As mentioned in the section '[Existing reviews of CFL research](#)', our search also identified 10 literature reviews published between 2011 and 2020.

We created four categories to classify the approaches to data analysis used by the studies in our sample. [Figure 10](#) shows that over half (56%) of the articles analysed data quantitatively, whereas only 18% conducted qualitative analyses; 19% of the articles adopted a mixed-methods approach. A further 7% are discussion or critique papers, and so do not

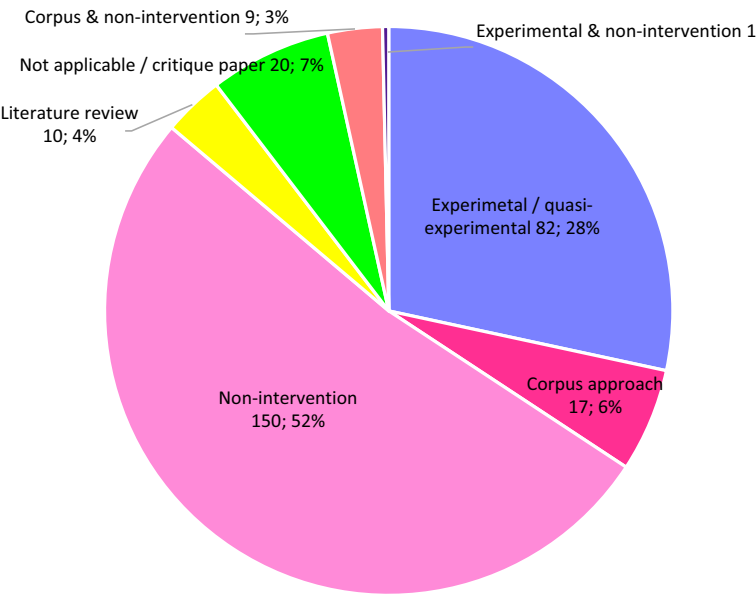


FIGURE 9 Research designs in the surveyed CFL research (*n* = 289)

have an analytical approach to categorise. Our findings here support those of Ke (2020) who focused on English publications on reading in CFL, as well as those of Ma et al. (2017) and Gong et al. (2020), who reviewed journals published in Chinese. All of these reviews of CFL research found that the majority of empirical studies employed quantitative approaches. A recent analysis of the wider SLA literature by Khany and Tazik (2019), focusing on 10 ‘prominent’ journals in the field, found a much more even balance between quantitative and qualitative approaches (40% and 42% respectively). Therefore, it seems likely that, within the anglophone literature on CFL that we have surveyed, research questions requiring qualitative analysis of rich textual data (questions of *how* and *why*) may be under-represented and this may be an issue for future research to address.

Which terms have been used to denote the language being studied?

The generic terms ‘Chinese’ or ‘Chinese language’ are the most commonly used by researchers in our literature sample, contributing to 84% of all the articles (Figure 11). ‘Mandarin’ is much less widely used, in approximately 10% of articles; 6% of articles identified the language as ‘Mandarin Chinese’. Three were inconsistent in their use of terminology, using two different terms interchangeably to denote the language of study.

Although the majority of the studies adopted the term ‘Chinese’ or ‘Chinese language’, many of these studies actually focused on learning Mandarin or the simplified writing characters associated with it. We hope that highlighting the different names adopted in CFL research, and their different referents, may be of value to researchers when considering how to denote the target language in future studies.

We were also interested in whether the 46 articles that adopted ‘Mandarin’ or ‘Mandarin Chinese’ addressed similar or different topics compared to the other 243 articles that adopted the name ‘Chinese’ or ‘Chinese language’. We did indeed find some differences in the most frequent research topics addressed by these two categories of articles. The

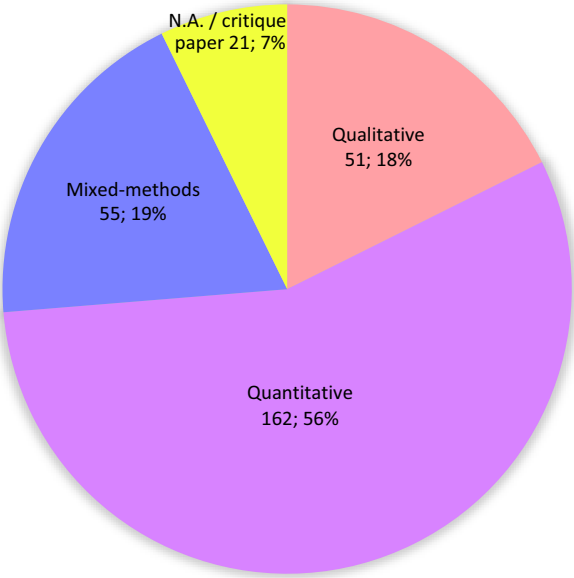


FIGURE 10 Analytical methods in the surveyed CFL research ($n = 289$)

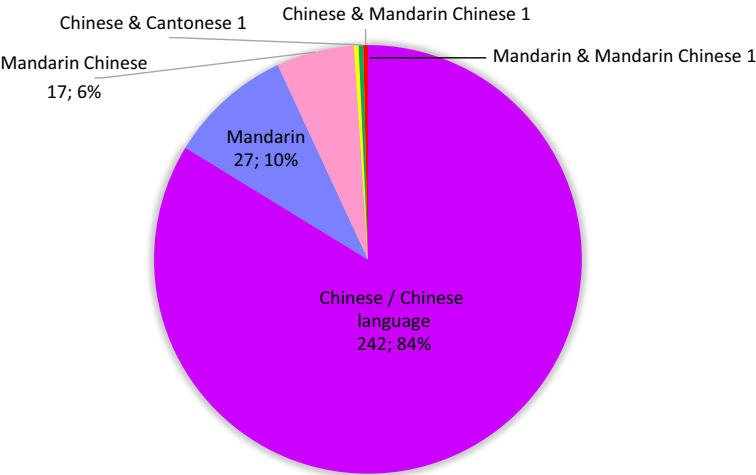


FIGURE 11 Terms used to denote the language studied in the surveyed CFL research articles ($n = 289$)

most notable difference is the greater interest in phonological topics ('acquisition of tones, speaking, listening, phonology or phonetics') amongst studies on 'Mandarin' or 'Mandarin Chinese'. This area of focus stands at 41% for this group of articles, compared to only 5% ($n = 11$) amongst the 243 other articles. Also, no articles using the terms 'Mandarin' or 'Mandarin Chinese' researched the acquisition of characters, radicals or morphology, which is why Figure 12 has only 11 categories, instead of the 12 seen in Figure 8. This may reflect the fact that 'Mandarin' generally denotes a spoken variety of Chinese, and is less strongly associated with the written form.

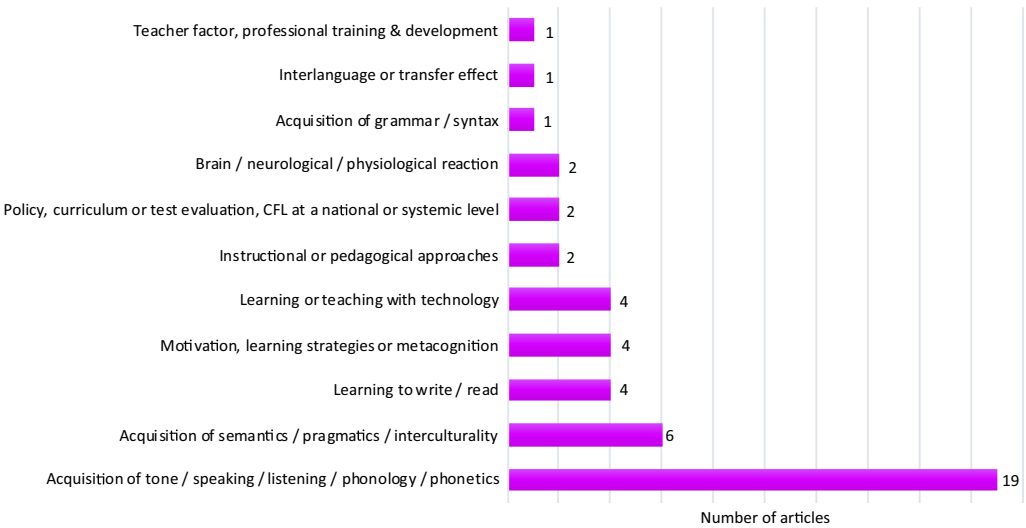


FIGURE 12 Key areas of CFL articles adopting 'Mandarin' or 'Mandarin Chinese' ($n = 46$)

CONCLUSION AND IMPLICATIONS

This scoping review provides a bibliometric mapping of anglophone articles published on CFL over the last three decades, filling what we believe to be an important gap in the literature. Previous reviews in this area have been scarce, have examined specific topics within CFL, have focused entirely or predominantly on Chinese-language literature identified from China-based databases, and/or have covered more limited time periods.

Our mapping has identified several trends in the field, which we hope may inform future research. The first point we would note relates to terminology. We found that a large majority of studies in our sample (84%) referred to the target language as Chinese, even when they in fact studied Mandarin. We would recommend greater terminological precision in future research when naming the language variety and, where relevant, the writing system (simplified or traditional characters).

A second key finding is the skewed nature of the participant samples in empirical studies on CFL. Firstly, the over-reliance on adults and university students in empirical studies limits the field's ability to provide evidence-based recommendations for teaching and learning in schools. This problem is particularly urgent in light of the burgeoning growth in the teaching and learning of CFL in primary and secondary schools worldwide (see the section 'The rise and rise of CFL'). Secondly, although this review recorded 37 different learner L1s, English speakers participated in nearly 70% of the articles. Even though this is partly a consequence of our inclusion criteria (focusing on anglophone publications), 70% is nonetheless a very large proportion and raises questions about how well learners with other L1s are represented in the literature. (We would further note that a sizeable portion of the empirical studies in our sample (16%) did not report participants' L1s at all, which we consider to be an important omission.)

Taken together, the above findings indicate the dominance of a very narrow range of learners sampled in existing CFL research published in anglophone international journals: a highly educated, adult population who are native speakers of English. Students have different motivation profiles and engagement levels at different stages of their education (Martin, 2009), and these differences are also observed in foreign language learning (Macaro & Wingate, 2004). A learner's L1 is undeniably highly pertinent to learning a foreign

language, for example due to cross-linguistic transfer effects (Odlin, 2005). Therefore, the narrow focus of research samples in these CFL studies creates serious challenges regarding the applicability of (a) pedagogical implications for learners outside this very specific group and (b) the wider scientific significance for SLA theories derived from such studies' findings. Future CFL research should be underpinned by more research focusing on learners from diverse educational levels and language backgrounds.

Since much of the accumulated evidence in SLA research is Anglocentric (e.g., Share, 2008), this raises questions about the transferability of evidence and insights from the wider SLA field to the teaching and learning of CFL. Our review found about one fifth of the articles focused on the acquisition of distinctive features of Chinese (tones, characters, radicals, etc.) that are not present in English or many other languages that are widely represented in the literature. This is important not only for understanding and informing the teaching and learning of Chinese but also for testing out theories in the wider field of SLA, and potentially extending them to account for a wider variety of languages.

We found that fine-grained analysis of learners' naturalistic speech and written language production in Chinese made up only a very small proportion of the research in our sample. There is a clear over-representation of quantitative analysis approaches within the reviewed research in CFL in comparison with the wider field. This suggests that there is scope for more work to be done with learners' output data and for future studies to employ qualitative methods in order to enable the answering of questions about how and why certain phenomena occur.

The current paper has not aimed to synthesise the key findings of CFL studies; nor does it appraise the quality of evidence of the primary research. These further steps fall beyond the remit of a scoping review (Arksey & O'Malley, 2005; Tricco et al., 2018). Instead, our primary purpose has been to generate an outline and a bibliometric mapping of a young but rapidly growing field. Hence, this scoping review has identified the types of evidence that are currently available (and those which are not), and where this evidence can be found. We also hope to have provided a strong basis for focused systematic reviews in future.

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CONFLICT OF INTEREST

The authors declared no conflict of interests.

ETHICAL APPROVAL

An ethics statement is not applicable because this study is based exclusively on published literature.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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ENDNOTES

- ¹ We define 'foreign language' loosely to denote the learning of Chinese in countries where it is not a majority or official language, by learners who were not exposed to the language in infancy or early childhood.
- ² 'Radicals' are systematic morphological or phonological constituents present in written Chinese characters.

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APPENDIX 1

LITERATURE SEARCH STRING

(TI,AB ("foreign language" OR "additional language" OR "second language" OR "third language" OR "other language" OR "L2" OR "L3" OR "MFL" OR "nonnative" OR "non-native" OR "English speaking" OR "English speaker" OR "begin*" OR "advanced" OR "level")) AND (TI,AB("Chinese" OR "Chinese language" OR "Mandarin" OR "Chinese character" OR "CFL" OR "CAL" OR ("Chinese" W/4 "grammar") OR ("Chinese" W/4 "reading") OR ("Chinese" W/4 "listening") OR ("Chinese" W/4 "writing") OR ("Chinese" W/4 "oral") OR ("Chinese" W/4 "speaking") OR ("Chinese" W/4 "literacy") OR "knowledge" OR "proficiency" OR "radical*" OR "meaning pair*" OR "orthograph*" OR "structure" OR "function")) AND (TI,AB("teaching" OR "learning" OR "pedagog*" OR "acqui*" OR "learning to teach" OR "teacher" OR "learner" OR "student" OR "professional development" OR "instruct*" OR "Bilingual education" OR "Bilingualism" OR "Multilingual education" OR "Multilingualism" OR SU.EXACT("Chinese (Second Language)") OR SU.EXACT("Chinese (Third Language)") OR SU.EXACT("Chinese (foreign language)") OR SU.EXACT ("Chinese (Additional Language)"))

APPENDIX 2

The 37 L1s spoken by the CFL learners who took part in the studies included in this review.

Arabic	Marathi
Brazilian	Mongolian
Burmese	Nepali
Cantonese	Norwegian
Danish	Polish
Dutch	Portuguese
English	Russian
Finnish	Siswati
French	Slovak
German	Spanish
Hakka	Tagalog
Hebrew	Tamil
Hindi	Thai
Indonesian	Turkish
Italian	Ukrainian
Japanese	Urdu
Korean	Vietnamese
Kyrgyz	Yoruba
Malaysian	