

REVIEW ARTICLE

Exploring the Relevant Factors of Willingness to Communicate (WTC) in Language Learning—A Systematic and Bibliometric Approach

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ABSTRACT

Recent years have witnessed a surge of interest in learners' Willingness to Communicate (WTC) within the L2 learning environment. This study aims to explore current trends, remarkable subjects, influential authors, sources and interplay of WTC variables in L2 learning from 1985 to 2023. A total of 259 articles were selected through PRISMA for the visualization of VOSviewer, and 221 publications for the citation network analysis with CitNetExplorer. The findings revealed 3 major variables with the capacity to influence WTC: individual traits, teachers' roles, and learning environments. Prominent themes include the rising trend of positive psychology, the importance of motivation, confidence, attitudes, the application of teacher immediacy and WTC in L2 learning. The study also highlights the significance of considering peer and cultural factors in future research. By providing a rigorous overview of the literature, this study contributes valuable insights into the current state of WTC in L2 learning education.

Keywords: Willingness to Communicate (WTC); PRISMA; Bibliometric; Relevant Factors; Language Learning

1. Introduction

In light of the rapid advancement of educational studies, Willingness to Communicate (WTC) has been a potentially important factor influencing the linguistic achievement in second language (Ducker, 2024). WTC

is relevant to language learning, and significantly shapes learners' communicative skills development and language acquisition (Elahi Shirvan et al., 2019). And WTC stands as a critical element of language acquisition in modern linguistic framework (Jelinkova

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et al., 2023). In the EFL learning context, students who have higher expressive skills benefited more than peers who are reserved and reticent (Ducker, 2024). Therefore, it is necessary for more studies in language learning to focus on communication, and further analyze the possible factors influencing WTC (Amirian et al., 2022).

To explore differences between the study and previous studies about WTC, the author created a detailed table including time range, research approaches, instruments employed, and sample counts, as depicted in **Table 1**. A study systematically established a framework to explore WTC elements under the domain of second language acquisition (Zhang et al., 2018). The second research undertook a bibliometric and content analysis of 313 selected

articles about the cross-cultural adaptability of international students in tertiary education (Wilczewski & Alon, 2023). In addition, another study used bibliometric analysis to have an overview of the developmental trends in WTC studies in the English as a Second Language (ESL) field (Ma et al., 2023). Previous research has further analyzed the possible elements of WTC and its influence, yet there remains a missing link of knowledge regarding the trends and methods employed in the relevant studies. Thus, there is still controversy over the potential factors associated with WTC and their interactions in language learning, and further research is needed. What's more, employing a systematic and bibliometric method exerts a significant importance in promoting the development of second language education.

Table 1. The contrast with prior research about WTC.

Number	Time	Design	Tools	Count	Background
1	1997–2017	Systematic	Propose a framework	35	SLA
2	1994–2021	Bibliometric and content	Histeite, Biblioshiny, VOSviewer	313	L2 higher education
3	1900–2022	Bibliometric	Biblioshiny, VOSviewer	428	ESL context
The study	1985–2023	Systematic and bibliometric	PRISMA, VOSviewer, CitNetExplorer	221	Language learning

In order to cover the current shortage and advance the development, this study used a method combined with systematic and bibliometric analysis. The study used three clustering tools respectively to explore the potential factors regarding WTC in language learning from 1985 to 2023. Firstly, the imported studies were systematically reviewed and screened according to PRISMA principles. Then, the author used bibliometric analysis tools-VOSviewer and CitNetExplorer to check the selected studies. The PRISMA principles made sure the articles' quality and perfected the search process, while VOSviewer offered insights into popular topics related to the field. CitNetExplorer helped to find future research trend by finding similarities and differences between studies. Finally, the study came to the results by

visualization and citation network analysis, which advanced profound research through literature clustering. Through an overview of current studies, the study's aim is to identify the factors affecting WTC and find the relationships between learners' WTC and language proficiency. The results offered a comprehensive overview of WTC and facilitated the future development of L2 language studies.

2. Literature review

2.1 Concepts related to Willingness to Communicate (WTC)

McCroskey and Baer (1985) supposed that Willingness to Communicate (WTC) included a personality-centered, trait-oriented capacity

across different communication contexts and target population. Some studies held that students proficient in their native language or second language may hesitate to communicate (Katsaris, 2019). Considering the results of different studies, researchers paid attention to WTC in language learning environments gradually. Macintyre (1998) thought that WTC showed a continuous trend to engage in verbal communication in different environments, gradually construed as a feature of one's personality. Ma (2023) proposed that WTC indicated an individual's thought or readiness to engage in communication acted with one or more people in short time.

The main body of the WTC model was from the focus on the significant roles of L2 utilization (Clément et al., 2003). Many learners experienced changes in their WTC both temporally and situationally (Macintyre et al., 1998). In second language acquisition (SLA), there has been a recent focus towards WTC's dynamic features, particularly those characterized by inherent states. Within this framework, personal communicative behaviors varied differently across short intervals and contextual circumstances (Zhang et al., 2018). Under the circumstances, an increasing number of research has redirected their attention towards the variables with the capacity to influence WTC (Macintyre et al., 1998).

2.2 Theoretical underpinnings of factors relevant to WTC in language learning

It is widely acknowledged that many variables possess the ability to influence an individual's WTC (Clément et al., 2003). Many studies regarded WTC as a dynamic, versatile trait influenced by the interactions between personality traits and environmental conditions in the learning context (Katsaris, 2019). In order to clarify the potential factors of WTC, Macintyre (1998) explored a framework to address that L2 communication's proficiency was shaped by immediate situational factors and enduring influences. The situational influences were temporary and contingent on context,

like teachers' support, peers' cooperation and class climate (Zhang et al., 2018). And relationships among communities and learners' attributes should also be considered (Macintyre et al., 1998). Further discussion explores the contribution of each factor to enhance WTC (Ghadirzade Toosy & Jajarmi, 2023).

Many studies found that learners' features contributed significantly to the promotion of communication proficiency in language learning (Cheng & Xu, 2022). A study regarded grit, self-confidence, and intrinsic motivation as significant predictors affecting learners' WTC (Liu, 2017). Another research suggested that WTC is shaped by interactions of learner-related intrinsic and extrinsic motivation (Dewaele, 2019). Among them, intrinsic motivation notably influenced interactive involvement more (Ito, 2021). Other findings indicated that personality traits and emotional factors like attitudes and anxiety facilitated effective second language communication efficiency (MacIntyre & Charos, 1996). In foreign language learning, anxiety was inversely correlated with learners' WTC, while pleasure and linguistic proficiency of instructors were positively correlated with WTC (Dewaele, 2019). Prior studies explored that students with lower anxiety showed higher communication desire (Liu, 2017). Many research has demonstrated a notable correlation between students' persistence and their WTC in L2 learning (Shirzadeh & Jajarmi, 2023). Some studies held that reserved people were more likely to participate in cross-cultural verbal communication (Wang et al., 2022). Furthermore, it is important for learners to utilize the features of WTC to enhance academic achievement in English classroom settings (Pasban & Haddad Narafshan, 2020).

Considering the facts from previous studies concerning the features of WTC, a comprehensive review of potential factors is required to substantially enrich the content of the study. The author has summarized the specific variables with the capacity to impact WTC, as depicted in **Figure 1**.

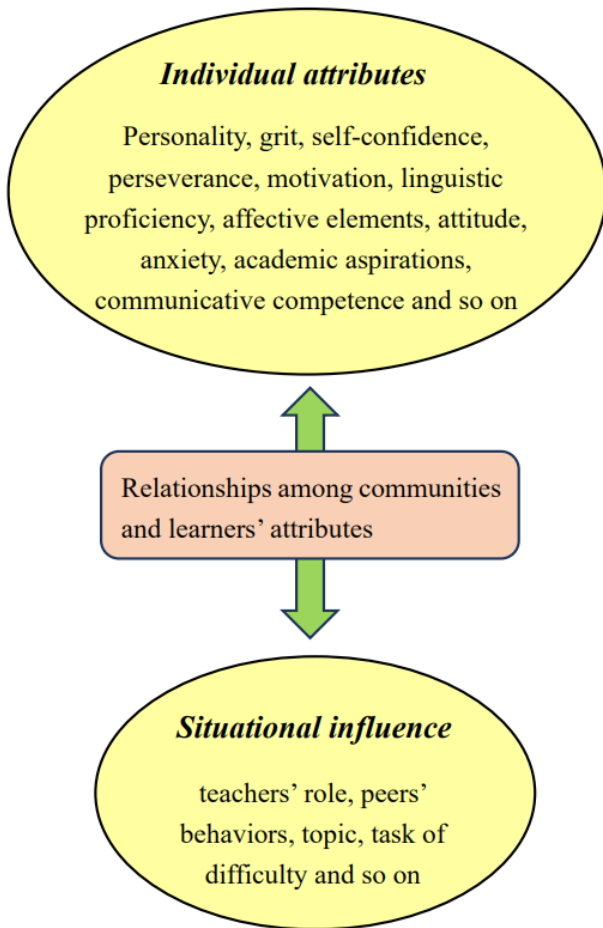


Figure 1. A graph of specific variables in previous studies.

2.3 The proposal of research questions

The combination of clustering tools has created the chance for research on WTC, leading to an increasing trend of bibliometric analysis in language learning studies. And using bibliometric and systematic analysis has become crucial to find the rules and explore the forefront of this field, enabling insights into publication trends and popular study themes (Lin & Yu, 2023). The study seeks to clarify the significant factors on WTC in language acquisition and explore how these factors interact to enhance both learners' WTC and language proficiency. Given the research gaps identified in previous facts, the author aimed to address the following research questions:

RQ1: What are the top 10 authors, keywords, organizations, and countries in the studies related to

WTC in language education?

RQ2: What are the heated trending research themes in the studies related to WTC in language education based on co-occurrence data?

RQ3: What are the top 10 cited sources and year-based trend in the studies related to WTC in language education based on co-citation data?

RQ4: What are the potential influencing factors for WTC in language learning?

RQ5: How do individual traits and conceptual factors shape WTC in language learning?

RQ6: How do other variables interplay to enhance WTC in language learning?

3. Method

3.1 Study aim and overview

The author tries to clarify the relevant elements affecting WTC in language learning environments. Moreover, an exploration of the relationship among elements is needed. Firstly, The author imported studies related to WTC on Web of Science and then selected them depending on the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocol (PRISMA-P) (Page et al., 2021). Then, the author imported the obtained data into VOSviewer to define popular themes and questions, therefore making an early map of WTC's term co-occurrence. Furthermore, with the help of VOSviewer, it became possible to explore relationship and development trend of studies about WTC in language acquisition. Finally, the author employed CitNetExplorer to make sure the interactions between the studies and topics according to the publication timeline.

3.2 Literature search and criteria

In December 2023, the process of literature search was took through "Web of Science" database. The search option utilized the terms "Willingness to Communicate" AND "language" in the core collection of "Web of Science" that included Science Citation Index Expanded (SCI-EXPENDED) (from 2013 to 2023), Social Science Citation Index (SSCI)

(from 2008 to 2023), Arts & Humanities Citation Index (A&HCI) (from 2008 to 2023), Emerging Sources Citation Index (ESCI) (from 2019 to 2023), Current Chemical Reactions (CCR-EXPANDED) (from 1985 to 2023) and Index Chemicuc (IC) (from 1993 to 2023).

In order to enhance the precision and relevance of the selected studies, the researcher employed the PRISMA as shown in **Figure 2** to conduct a systematic review firstly. The criteria for the inclusion and exclusion of identified studies were delineated as follows. The studies would be excluded if they: (1) were duplicate, (2) were out of language educational scope, (3) no abstracts, (4) were irrelevant to the proposed research, (5) had unclear and ambiguous results. Conversely, studies were considered to be included if they: (1) had clear conclusions, (2) focused on WTC in language learning, (3) provided enough information and (4) had rigorous research design.

In order to clarify the principles of the chosen studies, the authors employed the American Educational Research Association (AERA) framework to conduct a thorough evaluation. Each study underwent scrutiny based on a set of criteria including the formulation of research questions, the coherence of design, the validity of evidence sources, the precision of measurement and classification, the rigor of analysis and interpretation, the extent of generalizability, adherence to ethical standards in reporting, and the clarity and appropriateness of title, abstract, and headings. The evaluation process involved assigning values ranging from 1 to 5 for each standard. The studies were evaluated by two researchers, demonstrating substantial inter-rater reliability, as indicated by a kappa coefficient of 0.637.

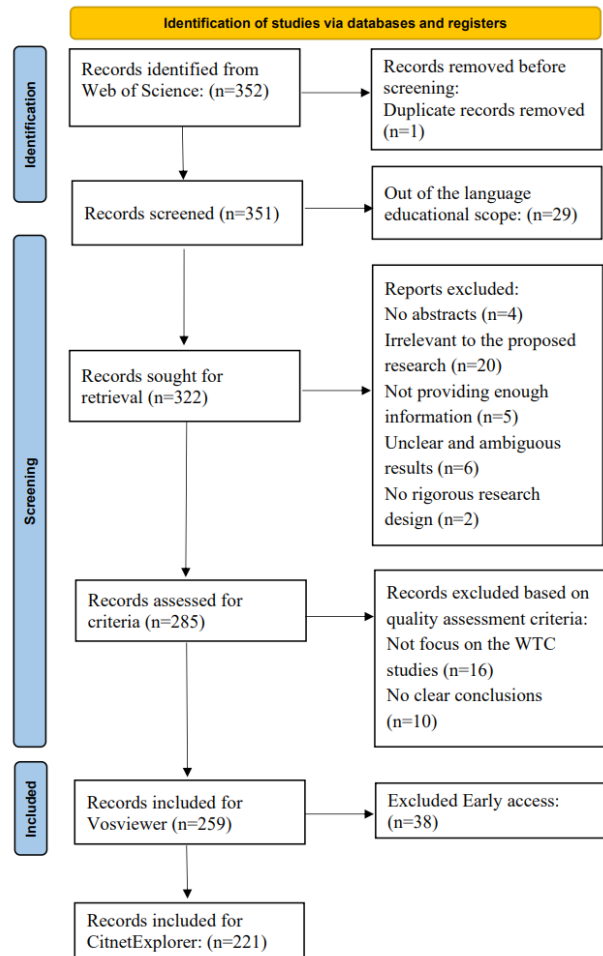


Figure 2. A flowchart of literature retrieval.

3.3 Setting the tools and data analysis

The abstracts, titles and references related to the selected articles were imported in the form of plain text documents. Two main software tools, namely VOSviewer (Van Eck & Waltman, 2010) and CitNetExplorer (Van Eck & Waltman, 2014), were employed in this study for visualization and citation network analysis. Bibliometric maps showed clusters and their citation relations by using VOSviewer. CitNetExplorer, enhanced by VOSviewer, made it easier to find information about co-citations and bibliographic couplings among articles or specific publications.

To further analyze the significance of WTC in language learning, the analysis will use VOSviewer to focus on the top 20 authors, keywords, countries,

and organizations with the highest citations or occurrences within the relevant literatures. Online-first articles lack publication years, hence early access works had to be excluded to avoid technological problems. Then, the remaining search results needed citation network analysis, using longest path analysis to find the citation relations between different articles' theories.

4. Results

4.1 The top 10 authors, keywords, organizations, and countries in the studies related to WTC in language education

The authors used VOSviewer to find the leading ten authors, sources, organizations, and countries. Citation analysis was conducted, with authors, organizations, and countries selected as units of analysis. Co-occurrence analysis was also performed, with keywords chosen as the unit of analysis. For authors, a minimum threshold of 3 publications per author was set, resulting in 22 out of 427 authors meeting the criteria. For organizations, a minimum threshold of 5 documents per organization was set, yielding 12 out of 226 organizations meeting the criteria. Similarly, for countries, a minimum threshold of 9 documents per country was set, with 14 out of 43 countries meeting the criteria. Regarding keywords, a minimum threshold of 5 occurrences per keyword was set, resulting in 83 out of 933 keywords meeting the criteria.

Based on the tables provided, Macintyre emerged as the most frequently cited author in the field of willingness to communicate, with 782 citations and 203 links. Following this, the keyword "2nd-language" ranked second with 138 occurrences and 909 links, apart from the keyword "Willingness to Communicate". Cape Breton University was identified as the most cited organization, accumulating 842 citations and 186 strength links. Additionally, the People's Republic of China stood out as the most frequently cited country, with 96 documents, 1725 citations, and 1486 strength links.

The results are as follows in **Table 2–5**.

Table 2. The top 10 authors from the results.

Number	Authors	Citations	Link
1	macintyre, peter d	782	203
2	peng, jian-e	526	220
3	khajavy, gholam hassan	484	145
4	lee, ju seong	427	226
5	ghonsooly, behzad	227	73
6	reinders, hayo	173	23
7	pawlak, mirosław	152	108
8	dewaele, jean-marc	147	65
9	zarrinabadi, nourollah	145	60
10	mystkowska-wiertelak, anna	133	52

Table 3. The top 10 keywords from the results.

Number	Keyword	Occurrences	Link
1	willingness to communicate	144	857
2	2nd-language	138	909
3	L2	128	797
4	model	119	783
5	motivation	94	660
6	English	92	651
7	attitudes	82	552
8	anxiety	65	479
9	confidence	50	351
10	immersion	37	262

Table 4. The top 10 organizations from the results.

Organizations	Documents	Citations	Strength
Cape Breton University	14	842	186
Shantou university	14	547	185
The Education University of Hongkong	18	433	142
University of Bojnord	8	289	105
Ferdowsi University of Mashhad	6	236	92
The University of Melbourne	5	167	35
Adam Mickiewicz University	6	159	74
University of Isfahan	7	159	64
Islamic Azad University	12	64	77
National Taiwan University of Science and Technology	5	34	18

Table 5. The top 10 countries from the results.

Countries/Areas	Documents	Citations	Strength
People’s Republic of China	96	1725	1486
Iran	61	990	807
Canada	21	945	519
Australia	11	547	349
England	15	382	315
New Zealand	9	343	186
South Korea	9	276	225
Japan	16	265	209
Poland	9	239	215
Saudi Arabia	9	163	164

4.2 The heated trending research themes in the studies related to WTC in language education

To address RQ2, the authors explored the prominent topics about WTC in language acquisition. Using the “analyze results” function in Web of Science, the study focused on the top five research domains, mainly in language, education, and psychology. Linguistics emerged as the most popular research area, including 206 records, and 57.06% of the total, as showed in **Table 6**.

Table 6. The top 10 “Web of Science” Categories records.

Number	Web of Science Categories	Count	Percentage
1	Linguistics	206	57.06%
2	Education Educational Research	194	53.74%
3	Language Linguistics	73	20.22%
4	Psychology Multidisciplinary	38	10.53%
5	Communication	17	4.71%
6	Psychology Experimental	14	3.88%
7	Psychology Social	11	3.05%
8	Psychology Educational	10	2.77%
9	Social Sciences Interdisciplinary	7	1.94%
10	Multidisciplinary Sciences	6	1.66%

The selected studies was analysed using VOSviewer, leading to the visualization of 79 keywords in **Figure 3**. These keywords were organized into 7 clusters based on their associations, represented by different colors, illustrating how they interrelated in published articles. To identify prominent themes, representative topics were summarized for each cluster, as presented in **Table 7**. Cluster 1 and 2

encompassed the largest proportion of keywords, comprising 22.78% and 18.99% of the keywords respectively, centered on concepts such as “anxiety”, “attitudes”, and “emotions”. This observation suggested a potential link between affective aspects of individual differences and WTC. Conversely, cluster 4 and 7, covering 15.19% and 3.8% of keyword occurrences respectively, featured “second language learning” and “teacher immediacy” as representative keywords, suggesting a focus on contextual factors within willingness to communicate studies.

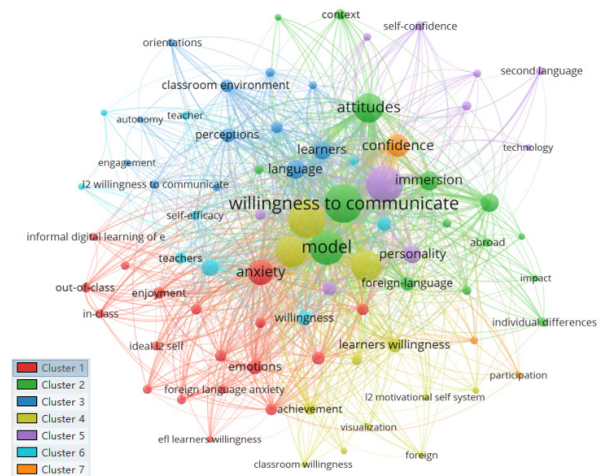


Figure 3. Visualization of co-occurrence of keywords.

Table 7. Representative keywords from the results.

Cluster	Count	Percentage	Representative keywords with high occurrences
1	18	22.78%	Anxiety, emotions, enjoyment, positive psychology, performance
2	15	18.99%	Attitudes, immersion, impact, individual differences, context
3	12	15.19%	Acquisition, autonomy, engagement, perceptions, orientations
4	12	15.19%	Competence, second language learning, learners’ willingness, English
5	10	12.66%	Technology, self-confidence, personality, perspective
6	9	11.39%	Communicate, self-efficacy, teachers, emotional intelligence,
7	3	3.80%	Confidence, participation, teacher immediacy

Cluster 1 consisted of 18 items, like Willingness to Communicate (Occurrence = 144, Total link strength = 886), anxiety (Occurrence = 65, Total link strength = 500), emotions (Occurrence = 21, Total link strength = 187), positive psychology (Occurrence = 14, Total link strength = 137) and proficiency (Occurrence = 16, Total link strength = 138). Cluster 2 was comprised of 15 items, including attitudes (Occurrence = 82, Total link strength = 572), individual differences (Occurrence = 9, Total link strength = 49) and immersion (Occurrence = 37, Total link strength = 270). 12 items were included in cluster 3, like language (Occurrence = 36, Total link strength = 231), perceptions (Occurrence = 20, Total link strength = 161) and autonomy (Occurrence = 5, Total link strength = 32). There were 12 items in cluster 4, such as motivation (Occurrence = 94, Total link strength = 685), achievement (Occurrence = 14, Total link strength = 122) and competence (Occurrence = 11, Total link strength = 94). Cluster 5 included 10 items, like technology (Occurrence = 65, Total link strength = 26), personality (Occurrence = 30, Total link strength = 208) and communicative competence (Occurrence = 8, Total link strength = 44). 9 items were in Cluster 6, like communicate (Occurrence = 19, Total link strength = 131) and self-efficacy (Occurrence = 8, Total link strength = 51). There were 3 items in cluster 7, such as confidence (Occurrence = 50, Total link strength = 364) and participation (Occurrence = 5, Total link strength = 32).

4.3 The top 10 cited sources and year-based trend in the studies related to WTC in language education

With the help of the citation report function of Web of Science database, the study analyzed the frequency of citations and publications related to the concept of WTC in language education from 2008 to 2023. Obviously, both the path of publications and the citations exhibited a clear upward trend across the timeframe, while there still existed more fluctuations in publications than citations, as showed in **Figure 4**. Specifically, the figure showed that citations of WTC continued to increase from 2008 to 2022 in language education, followed by a notable

decline in 2023. At the same time, the publications of WTC revealed a decline in 2016, followed by a peak in 2021. It is worth noting that the interest and achievements of WTC studies have significantly increased in the past four years.

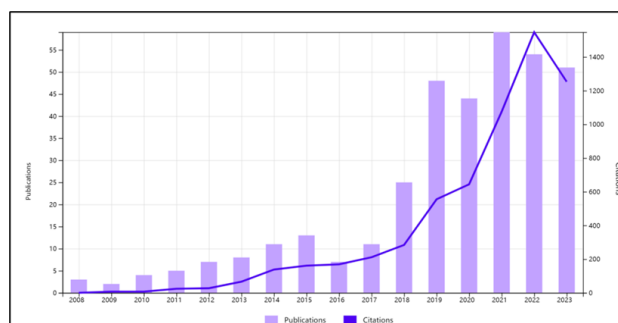


Figure 4. Publications and citations of WTC in language education.

To get a more detailed comprehension of the WTC studies, the authors employed VOSviewer’s co-citation function, setting cited sources as the analytical unit with a minimum citation threshold set at 20. Among 3661 sources, 78 surpassed this threshold. Each of these 78 sources had total co-citation link strength assessment, as showed in **Table 8**. Notably, “System” emerged as the highest cited journal in language education about WTC, getting 1143 citations and a link strength of 35277.

Table 8. The top 10 journals from the records.

Number	Source	Citations	Strength
1	System	1143	35277
2	The Modern Language Journal	890	26330
3	Language Linguistics	649	19919
4	Language Learning	293	10996
5	Language Teaching Research	331	10794
6	Journal of Language and Social Psychology	287	9854
7	TESOL Quarterly	196	8460
8	Journal of Multilingual and Multicultural Development	236	8160
9	Studies in Second Language Acquisition	197	7884
10	Studies in Second Language Learning and Teaching	182	6269

4.4 The potential influencing factors for WTC in language learning

To answer the following research questions, the study relied on the functions of CitNetExplorer, a sister program for bibliographic analysis (Van & Wartman, 2000). CitnetExplorer’s clustering function allowed the publications to strongly connect with each other in terms of citation relations in the same cluster (Van & Wartman, 2004). The author obtained data (n = 404, citation links = 4622) from 1959 to 2023 and found the rest two clusters and 4 publications due to the limitations on the minimum size requirement. Group 1 was used as the research source to answer RQ4, RQ5 and RQ6. It contained 382 publications with 4486 citation links, ranging from 1959 to 2023. Group 2 consisted of 18 publications with 19 citation links, ranging from 1986 to 2023.

To address the research questions through CitNetExplorer, the author found the longest path from Group 1. The longest path commonly connected the publications with the topic of author co-citation analysis. And the function of drill down selected relevant publications to help the current network (Van & Wartman, 2004). In order to find more heated research themes, the authors drilled down several proper paths and found group 3 of 6 publications with 8 citation links from 1996 to 2018, group 4 of 6 publications with 13 citation links from 1980 to 2018 and group 5 of 7 publications with 13 citation links from 1985 to 2019. The details of citation network were shown in **Figure 5**.

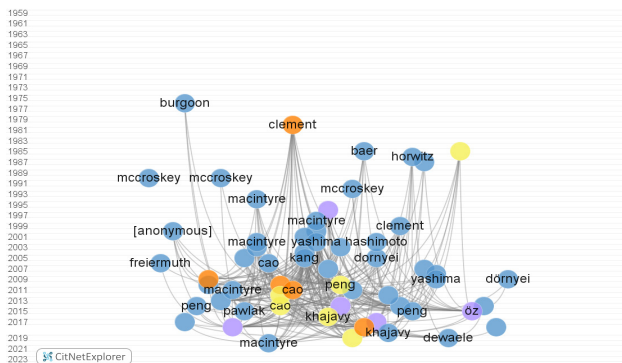


Figure 5. The citation network of publications.

Upon selecting Macintyre and Zhang in CitNetExplorer, the figure showed six publications and eight citation links from 1996 to 2018. Following an exploration of the longest path, the authors explored the citation relationships among the six publications, as showed in **Figure 6**.

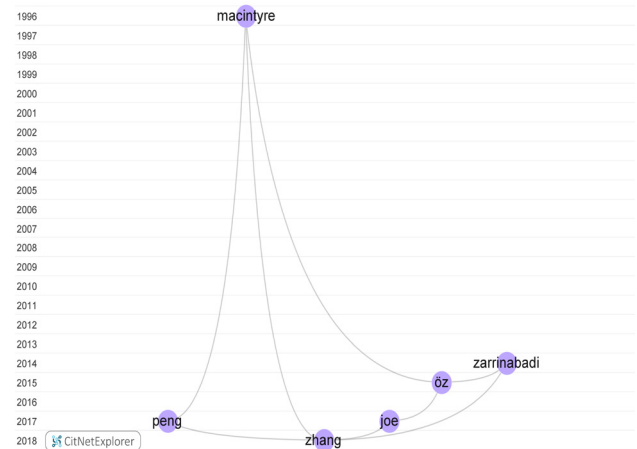


Figure 6. The citation network of group 3.

The six publications mainly centered on the potential factors impacting WTC in second language (L2) and English as a Foreign Language (EFL) settings. These elements were classified into three categories: individual traits, the role of teachers, and learning contexts.

According to the citation network, individual traits have been studied since the earliest study in 1996 of Macintyre. He used path analysis to find that significant role of affective variables such as attitudes, motivation, perceived competence, and anxiety on the frequency of L2 communication. Additionally, he indicated that global personality traits and language-related affective variables also had influence on L2 communication from the view of psychological contexts (MacIntyre & Charos, 1996). Furthermore, another study in 2015 also found that communication competence and apprehension significantly influenced EFL learners’ WTC in Turkey, with motivational factors indirectly affecting WTC, promoting the curriculum development and teacher education (Öz et al., 2015).

Teachers’ role had influence on learners’ WTC in the English classroom. Zarrinabadi (2014) held that factors such as wait time, error correction, topic

selection, and support significantly influenced WTC, addressing the significant role of teachers in shaping students' WTC. Moreover, Peng (2017) emphasized the importance of considering multimodal communication, indicating the necessity for language instructors to integrate diverse resources such as language, gesture, and chance to enhance WTC and classroom engagement.

The situation-dependent and transient nature of WTC also had potential implications in L2 classrooms (Peng et al., 2017). Joe (2017) suggested that WTC was strongly predicted by satisfaction of basic psychological needs driven by a positive classroom social climate. And weakly influenced by learners' perceived competence, while intrinsic motivation did not significantly predict WTC (Joe et al., 2017). Moreover, Zhang (2018) held that WTC changed from stable, trait-like communicative tendency to its dynamic, state-like components, particularly focused on situational antecedents and their interactions in L2 learning. These results showed that context was a potential variable to study learners' WTC and exerted a significant impact in second language (L2) acquisition (Joe et al., 2017).

4.5. How do individual traits and conceptual factors shape WTC in language learning

To explore the citation connections between publications related to WTC, the authors traced six publications with 13 citation links from 1980 to 2018, beginning with Clement's work in 1980 (new version in 2003) and ending with Yashima's publication in 2018. The detailed process was presented in **Figure 7**. The citation network revealed that individual traits and conceptual factors were prominent topics of WTC in language learning.

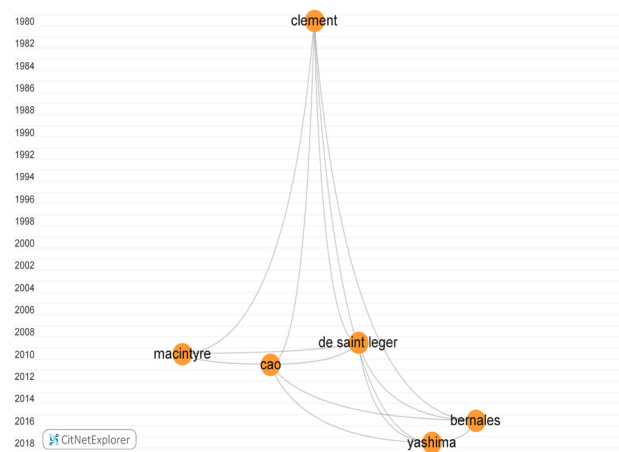


Figure 7. The citation network of group 4.

According to the citation network, the earliest study of group 4 in 2003, showing the significance of contextual, individual, and social factors in L2 usage, and predominantly focused on using L2 acquisition to enhance intercultural communication (Clément et al., 2003). Another study found that attributes such as personality and proficiency, and contextual factors like peer responses could influence learners' frequency of communication (Yashima et al., 2018). Furthermore, Cao (2011) suggested that the emergence of situational WTC in L2 classrooms was influenced by a combination of individual traits such as self-confidence, personality, emotional features, and perceived communicative opportunities, as well as classroom contextual variables including topic, task, interlocutor, teacher, group size, and linguistic considerations. These findings addressed the importance for language instructors to recognize the interactions of these factors in shaping students' WTC (Cao, 2011).

Moreover, it was obvious that factors as social, contextual, and individual factors influenced learners' decisions to speak or remain silent (Bernales, 2016). Findings found a link between predicted and actual participation, and some factors like classroom norms, teacher expectations, speaking goals, and motivation, would make a difference on it (Bernales, 2016). A study explored that students' self-confidence in speaking increased over time, positively influencing their WTC, and motivation also varied due to different interactions in small group discussions (Léger & Storch, 2009). And

in the face of the situation, another study introduced Kuhl's theory, which regarded preoccupation, volatility, and hesitation as key concepts, linking WTC to action control disruptions, perceived competence, and communication anxiety (MacIntyre & Doucette, 2010).

4.6 How do other variables interplay to enhance WTC in language learning

We screened the previous studies from the citation network and found that there were 7 publications and 13 citation links from 1985 to 2019 in group 5, as showed in **Figure 8**.

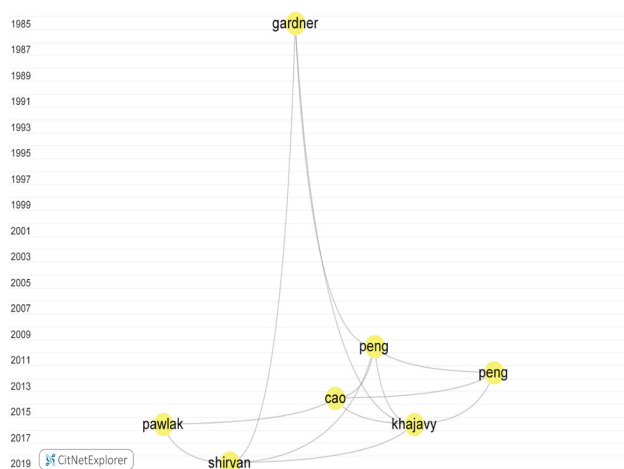


Figure 8. The citation network of group 5.

It is obvious that most studies focused on the relationship between various factors on WTC. The earliest study of Gardner in 1985 focused on how attitudes and motivation influenced the acquisition phase, and how this acquisition could subsequently alter or reinforce initial attitudes (Gardner, 1985). A study found six key factors influencing classroom WTC: learner beliefs, motivation, cognition, linguistics, affect, and classroom environment (Peng, 2012). According to a study, classroom environment was a primary predictor of L2 WTC, with communication confidence mediating the influence of motivation and English proficiency on WTC (Khajavy et al., 2016). Another research also suggested that classroom environment significantly predicted WTC, communication confidence, learner beliefs, and motivation, with motivation indirectly influencing WTC through confidence, as well as

learners' beliefs directly impacting motivation and confidence (Peng & Woodrow, 2010). Moreover, the classroom environment exerted direct influence on learners' attitudes, motivation, and communication confidence (Khajavy et al., 2016).

Many studies have found classroom WTC was dynamic, not trait-based, influenced by individual traits, classroom environment, and linguistic factors. These factors interacted, either enhancing or hindering WTC, with individual variations making prediction challenging (Cao, 2014). A Quantitative and qualitative analysis showed that changes in WTC were influenced by contextual and individual factors (Pawlak et al., 2016). Enhanced WTC occurred notably in small groups or pair interactions in familiar environments. A deeper study of learners' motivation for speaking or remaining silent could create conducive classroom environments, thereby fostering communication and enhancing linguistic development (Pawlak et al., 2016). A meta-analysis found WTC had moderate correlations with perceived communicative competence, language anxiety and motivation, and perceived communicative competence had the strongest impact, with potential moderators influencing these relationships (Elahi Shirvan et al., 2019).

5. Discussion

To further study the information of WTC, it is imperative to explore prominent keywords and popular researchers from the results. Drawing from previous studies and primary bibliometric analysis of WTC in language acquisition, we could proceed to discuss RQ1 and RQ2 in greater depth.

5.1 Bridging L2 and WTC: Emerging trends and insights

RQ3 has represented an obvious increase in studies related to WTC. According to the findings of citation network analysis, Macintyre was found the most frequently cited author, while China stood out as the country with the highest number of co-cited documents of WTC in language acquisition. The

facts encouraged more studies to make the potential contributions of WTC.

What could be pay attention is that keyword “L2” was found the most cited term after WTC. This was an attractive finding of the popular publications about WTC in language acquisition. Many studies have found obvious links between L2 WTC and its actual patterns (Katsaris, 2019). A study suggested that the major goal of the learning process was to foster students’ willingness to seek and participate in real communication interactions. In other words, the primary aim of the L2 education was to foster the development of WTC (Macintyre et al., 1998). Furthermore, there still existed a study that integrated WTC with L2 acquisition, using a socio-cognitive framework to find social, environmental, and individual determinants (Cao, 2014). These facts indicated that WTC could significantly influence the achievement of learners’ proficiency in second language learning (Ducker, 2024).

5.2 Tracing from personal traits to learning contexts

RQ4 aimed to explore the factors that might affect the changes of WTC. Many studies have explored the effects of WTC from the view of behavioral changes made by contextual factors (Pawlak et al., 2016). In L2 classroom settings, WTC was influenced by a combination of personal attributes as affections, self-assurance and perceptions of communication opportunities. In addition, classroom dynamics, including discussion topics, task complexity, teachers’ behavior, and linguistic factors, affected WTC (Cao, 2011). Ideas about potential factors influencing WTC varied in different publications. A framework suggested that the dynamics of WTC were mainly influenced by comprehension skills and perceived communication competence (Macintyre et al., 1998). Some studies revealed that WTC was also shaped by factors such as introversion, self-esteem, and to a certain degree, anomalous emotional states (Macintyre et al., 2003). Other research has suggested that some elements, such as personality, having potential to predict

variables (Sadeghi Ordoubadi et al., 2023).

RQ5 wished to find the relations between personal characteristics and educational settings in WTC. There is an evidence showed that the learners’ verbal participation and silence in classrooms are affected by various social, contextual, and personal factors (Bernales, 2016). Learners’ readiness to communicate is prevented by the occurrence of errors and fear of social embarrassment (Jelinkova et al., 2023). It is crucial for students to have intense motivation and minimize feelings of anxiety when speaking in public area (Wu & Lin, 2014). Moreover, differences in learners’ WTC could be found across proficiency levels (Cheng & Xu, 2022). Extroverted learners with high sociability, generally performed higher levels of WTC compared to introverted learners. Similarly, people with high self-esteem tend to be more confident in their ability to communicate, while those with low self-esteem often avoid talking to others because they are afraid of being criticized (Shirzadeh & Jajarmi, 2023).

5.3 Decoding through cultural insights and teachers’ contribution

RQ6 further analyzed the interactions between elements of WTC in language education. On the one hand, culture could be a key factor. In low waitance cultures, individuals tend to express themselves promptly without delay. Whereas in high waitance cultures, learners prefer to wait and then express themselves (Pishghadam, 2024). The research on WTC initially emerged in western countries and has gradually spread to Eastern countries over time.

On the other hand, lecturer’s personalities, support, and educational approaches could shape learners’ WTC (Zarrinabadi, 2014). A research found that some factors included following the classroom rules and instructor’s expectation (Bernales, 2016). If teachers showed criticism or negative feedback about language errors or pronunciation, it might lead to learners’ increased anxiety and reduced confidence, thereby inhibiting their WTC (Shirzadeh & Jajarmi, 2023). In addition, teachers who dominated classroom interactions and did not provide equal

opportunities for all students to speak might discourage less assertive learners from participating. Some studies suggested that the willingness of learners to engage in communication was influenced by conformity (Léger & Storch, 2009). Peer pressure in classrooms could hinder individual expression and reduce learners' WTC (Ghadirzade Toosy & Jajarmi, 2023). These findings contributed to the promotion of current theoretical and empirical understandings within an interdisciplinary framework, particularly in relation to psychology.

6. Conclusion

6.1 Findings

The present study firstly used the clustering tool PRISMA, visualization, and citation network analysis to explore WTC in language settings. The quantitative methodology allowed the VOSviewer and CitNetExplorer to find the development and relationships of WTC variables. It revealed a growing focus on WTC in L2 models in domestic studies since 2019, with interdisciplinary trends in language education, sociology, and psychology. Through theoretical models from prior studies, the study identified individual traits, teachers' roles, and learning contexts as influential factors on WTC, which interacted to hinder or enhance learners' WTC based on personal factors. Confidence, motivation, classroom environments and linguistic proficiency were prominent factors in previous studies influencing WTC in language learning. Moreover, considerations of peer and teachers' attitudes are essential for future language studies. Instructors should prioritize understanding the relationships between these variables and arrange them appropriately to help learners improve their WTC competence in language education.

6.2 Limitations

Several limitations are showed in this study. On the one hand, due to CitNetExplorer's inability to import various file formats, the authors

systematically accessed literature from the Web of Science database, potentially resulting in an inadequate number of studies (Hou & Yu, 2023). In addition, the inclusion of studies published long ago maybe hard to update to latest versions. However, the bibliometric analysis promotes the store of keywords, co-cited authors, and organizations through citation networks, helping the analysis of developmental trends. Secondly, the exclusion of early access articles during bibliometric analysis may lead to an incomplete exploration of creative ideas. Nevertheless, visualizations of popular topics can compensate for these limitations and guide researchers towards the most relevant areas of inquiry.

6.3 Implications for future studies

Over recent decades, research on WTC has experienced steady growth, particularly in the second language learning. This topic has attracted considerable attention, particularly in the education and linguistics field (Ma et al., 2023). From a theoretical perspective, some studies have emphasized the need to enhance the theoretical understanding of the relationships between WTC variables in various contexts. It is crucial to establish the conceptual framework to analyze the impact of language and communication (Wilczewski & Alon, 2023).

From a practical standpoint, there was a significant relation between perceived communication competence and WTC in both first and second languages (Ito, 2021). Some studies could provide L2 educators and learners with insights into the significance of WTC in language learning. It is beneficial for researchers to perceive new research directions, relevant sources, and opportunities for collaboration (Ma et al., 2023). Another study suggested that the crucial implication is to reduce language anxiety among students (Ducker, 2024). The approach may enhance their WTC, thereby promoting the target language proficiency both inside and outside the classroom. To foster students' WTC and increase their participation in class activities, teachers should strive to create a friendly and comfortable classroom atmosphere

that alleviates foreign language anxiety (Ghadirzade Toosy & Jajarmi, 2023).

Author contributions

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Conflict of interest

The authors declare no conflict of interest.

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