



From Clinical Treatment to Classroom Interventions: A Bibliometric Analysis of the Evolution of Speech Anxiety

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Abstract. Speech anxiety serves as a significant barrier to language acquisition and communicative competence; however, a systematic mapping of its evolving research landscape remains limited. This study conducted a bibliometric analysis of speech anxiety literature from 1955 to 2025 to map keyword co-occurrence networks, publication trends, and influential works, capturing the field's trajectory from early clinical investigations to contemporary educational applications. Using Harzing's Publish or Perish software, 200 documents were initially retrieved from Google Scholar, and 191 articles were selected via PRISMA screening for network analysis in VOSviewer. The results revealed a distinct thematic shift from foundational clinical treatments toward modern classroom-based and multimodal interventions. The ten most-cited articles predominantly focused on cognitive-behavioral approaches and acoustic markers of anxiety, establishing a robust intellectual foundation for current pedagogy. However, the analysis identified critical gaps in longitudinal research on the sustained efficacy of classroom-based interventions and the scarcity of studies integrating anxiety-reduction strategies into authentic instructional settings. The study concludes that while the field has matured, future research should prioritize longitudinal, classroom-centered designs that leverage emerging educational technologies to develop holistic, anxiety-sensitive pedagogies that enhance learner well-being and speaking proficiency in diverse academic environments.

Keywords: Educational Interventions; Foreign Language Learning; Foreign Language Speaking Anxiety; Public Speaking; Speech Anxiety

Introduction

Speech anxiety, often referred to as foreign language speaking anxiety or second language speaking anxiety, is a negative emotional state characterized by feelings of fear, nervousness, and apprehension when required to speak in a foreign or second language, commonly triggered by concerns about making mistakes, fear of negative evaluation, limited vocabulary and grammar knowledge, and performance pressure (Ivana, 2024; Lu, 2024; Peng, 2025; Rajendran et al., 2025). Understanding this phenomenon is crucial because it significantly hinders language learning and speaking performance, acting as a substantial barrier to effective language acquisition and communicative competence among learners (Lu, 2024; Mustamir, 2024; Rajendran et al., 2025; Yan, 2024; Zarin, 2025). Recognizing the underlying causes—such as low self-confidence, communication apprehension, and insufficient exposure to the language—enables educators to create supportive learning environments and develop targeted interventions, including gradual exposure to speaking tasks, anxiety-reducing classroom activities, and cognitive-behavioral approaches, while tailoring teaching strategies to meet diverse learner needs and ultimately enhance both academic success and learners' psychological well-being (Lu, 2024; Mustamir, 2024; Rajendran et al., 2025; Yan, 2024; Zarin, 2025).

Concerns about speech anxiety primarily revolve around its negative impact on language learning and communication performance. Key issues include fear of negative evaluation, low self-confidence, communication apprehension, and performance pressure, which can lead learners to avoid speaking tasks and hinder their language development. Limited vocabulary and grammar knowledge, cultural factors, and inadequate classroom management further exacerbate anxiety, making it a significant barrier to effective speaking in second or foreign languages. Speech anxiety also affects psychological well-being, causing distress and reducing motivation to participate in speaking activities. Addressing these concerns involves creating supportive learning environments, gradually introducing speaking tasks, incorporating anxiety-reducing interventions such as role-playing and technology-based practice, and tailoring strategies to individual learner profiles. Effective management of speech anxiety is crucial for enhancing communicative competence and



academic success in language learners (Elahemer & Said, 2022; Lu, 2024; Mustamir, 2024; Rajendran et al., 2025; Zarin, 2025).

Studies on speech anxiety in second- or foreign-language learning have highlighted its detrimental impact on learners' confidence, communicative competence, and overall academic performance across various contexts (Lu, 2024; Peng, 2025; Rajendran et al., 2025). These works emphasize the importance of understanding the causes of speech anxiety and of implementing strategies such as supportive classroom climates, gradual exposure to speaking tasks, and cognitive-behavioral techniques to reduce learners' fear and avoidance of oral activities (Ivana, 2024; Mustamir, 2024). However, despite the growing body of primary research on speech anxiety interventions and their psychological effects, a conspicuous absence persists in systematic bibliometric analyses mapping the intellectual structure, thematic evolution, and citation patterns within this field. While narrative reviews and meta-analyses have synthesized findings on intervention efficacy (Elahemer & Said, 2022; Zarin, 2025), few studies have employed quantitative, evidence-based methods such as co-citation analysis, keyword co-occurrence mapping, and network visualization to objectively identify research clusters and underexplored domains across the speech anxiety literature. This gap is particularly critical, given that bibliometric approaches can reveal hidden thematic shifts, such as the transition from clinical treatments to classroom-based interventions, and pinpoint geographic, contextual, and methodological gaps that traditional reviews may overlook (Donthu et al., 2021). Consequently, a comprehensive bibliometric analysis is necessary to systematically document the field's evolution, clarify its intellectual landscape, and provide empirical guidance for future research priorities in speech anxiety scholarship.

Conducting a bibliometric analysis of speech anxiety provides a systematic and empirical overview of the field that traditional narrative literature reviews cannot fully offer. It enables researchers to map the topic's evolution over time and identify the most-cited articles, revealing citation patterns that shape the development of research on speech anxiety. Through techniques such as co-occurrence analysis, a bibliometric study can uncover hidden research clusters, emerging themes, and underexplored subtopics that might be overlooked in selective or small-scale reviews. The time frame of 1955 to 2025 was selected to capture the full historical trajectory of speech anxiety research, from early clinical and behavioral investigations in the mid-20th century to contemporary classroom-based and technology-enhanced interventions. This seven-decade span allows for a comprehensive examination of paradigm shifts, from systematic desensitization and behavioral treatments to multimodal educational approaches, and ensures inclusion of both foundational works that established the field's theoretical frameworks and recent studies addressing emerging contexts such as virtual reality exposure therapy and network-based models of anxiety. This evidence-based mapping not only clarifies the intellectual structure and research front of speech anxiety studies but also helps future researchers, educators, and policymakers strategically target gaps, prioritize funding, and design studies that align with global trends while addressing neglected areas.

Research Objectives

This study aimed to conduct a bibliometric analysis of the literature on speech anxiety from 1955 to 2025. Specifically, this study aimed to:

1. analyze the co-occurrence links between terms;
2. identify the articles' year of publication; and
3. identify the ten most-cited articles.

Literature Review

Clinical Foundations of Speech Anxiety

The earliest speech anxiety literature was strongly rooted in clinical and behavioral treatment. Studies by Meichenbaum, Gilmore, and Fedoravicius (1971), Fremouw and Zitter (1978), and Ayres and Hopf (1985) established that speech anxiety can be reduced through structured intervention such as desensitization, skills training, and visualization. These studies were important because they treated speech anxiety as a measurable and modifiable condition rather than a fixed personal limitation. They also laid the empirical foundation for later work on intervention design and outcome measurement. However, much of this early research relied on controlled settings, small sample sizes, and narrow participant groups, which limited its direct applicability to classroom and multilingual learning contexts.

Subsequent clinical and psychophysiological studies expanded this perspective by examining how anxiety appears in actual speech behavior. Kasl and Mahl (1965) showed that disturbances and hesitations in spontaneous speech are associated with anxiety, while Natale, Entin, and Jaffe (1979) found that vocal interruptions vary according to speech and social anxiety. Laukka et al. (2008) further demonstrated that acoustic features of speech can reveal anxiety in socially phobic speakers. Taken together, these studies suggest that speech anxiety is not only experienced internally but also observable in voice quality, fluency, and

interaction patterns. Even so, the literature still lacks sufficient longitudinal evidence on how these observable markers change following intervention across diverse educational settings.

Classroom-Based Interventions

As the field developed, researchers increasingly examined speech anxiety in classrooms and language-learning contexts. This shift reflects a broader recognition that anxiety is shaped not only by psychological disposition but also by teacher behavior, task structure, peer evaluation, and classroom climate. Horwitz (2016), Dewaele and MacIntyre (2014), and Yan and Horwitz (2008) show that foreign-language learners often experience anxiety in situations where oral performance is highly visible and errors are publicly exposed. In these studies, speech anxiety is not treated simply as an internal problem; it is presented as a product of instructional conditions that can either intensify or reduce fear. However, most of this literature remains concentrated in specific language-learning settings, relies on cross-sectional designs, and relies heavily on self-report data, leaving limited evidence on how classroom anxiety develops over time or across different institutional contexts.

More recent studies support interventions that lower threat while increasing meaningful speaking practice. Elahemer and Said (2022) reported that university-level interventions often combine gradual exposure, confidence-building, and classroom support. Sukamto et al. (2021) and Pratiwi (2024) similarly suggest that low-pressure speaking activities and teacher encouragement can help learners participate more willingly. Lestiono and Lee (2024) add that virtual reality exposure therapy is emerging as a promising strategy for reducing public speaking anxiety in educational settings. Across these studies, the strongest results appear when interventions are embedded in realistic instructional tasks rather than delivered as isolated psychological exercises. At the same time, the evidence base remains uneven because many studies are small-scale, short-term, or limited to single sites, making it difficult to determine whether the reported gains persist beyond the immediate intervention period.

Technology-Assisted Interventions

Technology-assisted intervention adds a third dimension to the field. Recent studies explore virtual reality, online practice environments, and other digital tools that enable learners to rehearse speaking in safer, more controlled settings (Lestiono & Lee, 2024; Yalçın, 2014). These approaches are promising because they can simulate speaking pressure while still offering repeated practice, immediate feedback, and reduced fear of face-to-face judgment. When digital tools are embedded in structured instructional activities, some studies report improved confidence and lower anxiety, suggesting that technology may be most effective when used as part of a broader pedagogical design rather than as a stand-alone solution (Huang & Liu, 2025; Lestiono & Lee, 2024).

Even so, the evidence remains uneven. Many technology-based studies use small samples, limited follow-up, and inconsistent measures of speaking anxiety, which makes it difficult to draw firm conclusions about long-term effectiveness. Recent reviews also indicate that although technology can reduce anxiety through psychological safety and personalized feedback, it may also create cognitive overload or reduce human interaction when poorly designed (Huang & Liu, 2025). As a result, technology-assisted interventions appear promising, but their value depends heavily on instructional design, learner readiness, and the quality of implementation.

Bibliometric Mapping and Field Structure

Bibliometric analysis has become especially useful because the field is now large enough to require mapping of patterns, themes, and influential works. Donthu et al. (2021) note that bibliometric methods can reveal publication trends, research clusters, and intellectual structure in a way that a narrative review alone cannot. Applied to speech anxiety, this approach helps trace the movement from early clinical intervention to more recent classroom-based and technology-supported research. However, the bibliometric literature still needs deeper integration with substantive findings from educational and psychological studies, since many mapping studies describe patterns without fully explaining their implications for intervention design or classroom practice.

The bibliometric pattern also suggests that the field is becoming more diverse in both method and focus. Earlier studies concentrate on treatment and symptom reduction, while newer work increasingly examines language-learning settings, technology-enhanced interventions, and the social-cognitive dimensions of speaking anxiety. This indicates that a single lens no longer controls speech anxiety research. Instead, it is

evolving into a multidisciplinary field that integrates psychology, language education, and instructional design, although the relationships among these strands remain underdeveloped in the literature.

Methodology

Research Design

This study employed a bibliometric analysis to systematically map and quantify research trends on speech anxiety. Bibliometric methods were used to identify dominant themes, research gaps, and the intellectual structure of the field by examining publication patterns, co-occurring keywords, and conceptual linkages across studies, providing an objective overview that reduces the selectivity and subjectivity typical of narrative reviews (Donthu et al., 2021; Zarin, 2025).

Data Sources and Search Strategy

The literature corpus was compiled on December 1, 2025, by retrieving records from Google Scholar using Harzing's Publish or Perish software 8 with the exact search string: **"speech anxiety"**. The search was limited to English-language journal articles indexed in Google Scholar. The selection and reporting workflow followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure transparency and reproducibility in the identification, screening, eligibility assessment, and inclusion of records (Page et al., 2021). A PRISMA flowchart was prepared to document database searching and record retrieval, screening, eligibility assessment, and final inclusion.

Inclusion and Exclusion Criteria

Records were included if they were English-language journal articles primarily focused on speech anxiety or closely related constructs in second-language, foreign-language, or speaking-anxiety contexts. Records were excluded if they were books, book chapters, conference papers, editorials, duplicates, or documents clearly irrelevant to the study objectives. Of the initial 200 retrieved records, seven documents were removed because they were books and therefore did not align with the article-focused scope of the bibliometric procedure. Two additional records were excluded after title and full-text screening for being irrelevant to the study objectives. After these exclusions, the final dataset comprised 191 articles for bibliometric mapping (Page et al., 2021).

Data Extraction and Analysis

Citation and bibliographic data were extracted using Harzing's Publish or Perish software and imported into VOSviewer for analysis (Harzing, 2016; van Eck & Waltman, 2010). VOSviewer version 1.6.20 was used to conduct keyword co-occurrence analysis using association-strength normalization. The analysis was configured with a minimum keyword occurrence threshold of Speech anxiety, and a thesaurus file was applied to merge synonymous terms, correct spelling variants, and remove irrelevant or overly generic terms before mapping. Resulting maps displayed the frequency and strength of keyword co-occurrence, revealing clusters of thematically related terms, central and peripheral concepts, underconnected themes, and potential research gaps—particularly around student engagement, opinion sharing, and classroom-based interventions in specific cultural contexts (van Eck & Waltman, 2010; Zarin, 2025). Citation counts were retrieved on December 4, 2026, to ensure consistency when ranking the most-cited articles.

Taken together, the prominence of anxiety- and treatment-related clusters relative to more modest links to classroom participation, communicative competence, and assessment suggests that the field has paid less systematic attention to integrative pedagogical frameworks that connect anxiety reduction with active, confidence-building speaking practice. This interpretation is consistent with prior work showing that public speaking and L2 speaking anxiety studies have focused heavily on measuring and alleviating anxiety, while comparatively fewer investigations design and test classroom-based, dialogic interventions that simultaneously foster participation and manage anxiety (Horwitz, 2016; Dewaele & MacIntyre, 2014; Yan & Horwitz, 2008; King & Smith, 2017).

Overlay Visualization of Terms

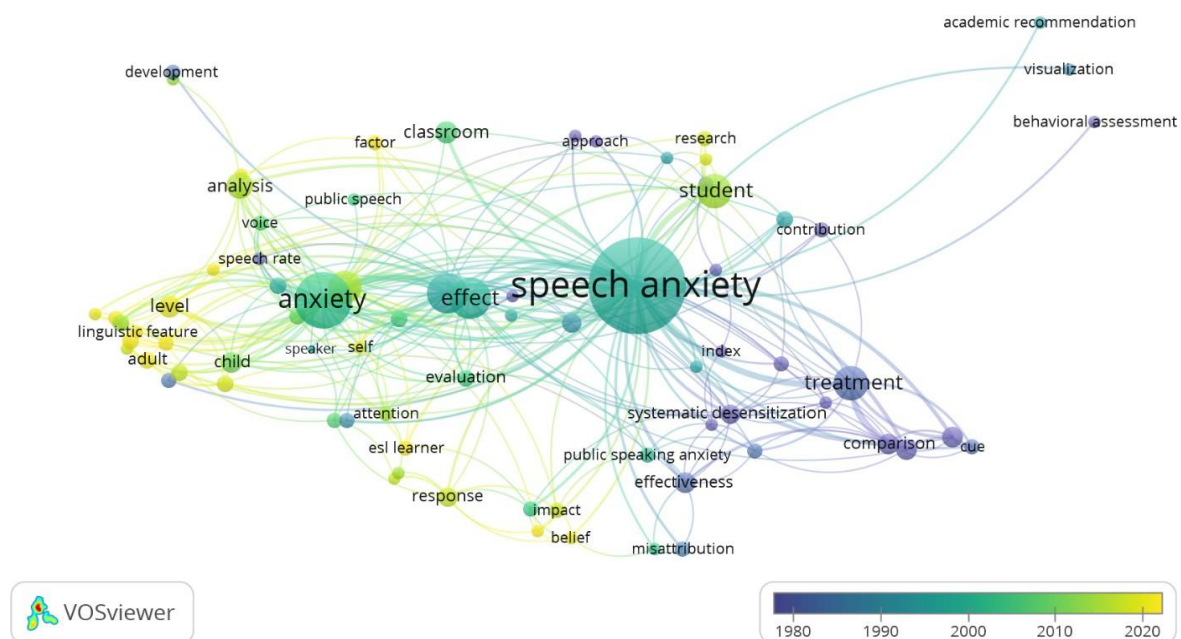


Figure 3. *Overlay Visualization of Terms on Speech Anxiety*

This overlay visualization maps the intellectual landscape of speech anxiety research from 1980 to 2020 using keyword co-occurrence network analysis, with the color gradient indicating temporal progression (blue = older, yellow/green = recent publications). Speech anxiety serves as the central node, underscoring its multidisciplinary significance. The network reveals five clusters reflecting research evolution, arranged chronologically from foundational to emerging themes: the foundational treatment and intervention cluster (blue) encompasses early clinical approaches such as systematic desensitization and behavioral therapy; the behavioral and assessment cluster (teal) bridges these clinical origins with educational domains through measurement frameworks; the student and classroom cluster (green) marks a shift toward applied educational

contexts and pedagogical interventions; the cognitive mechanisms cluster (light green) examines the underlying psychological processes of anxiety; and the linguistic and acoustic features cluster (yellow) represents the most recent frontier, investigating speech parameter changes and voice quality as objective anxiety markers. This temporal progression suggests a trajectory from isolated clinical pathology toward ecological, classroom-based, and mechanistically informed understandings of speech anxiety. Contemporary research increasingly integrates these domains through multimodal approaches: virtual reality interventions show promise in reducing anxiety in student populations, network analysis suggests that bridge symptoms may be useful intervention targets, and classroom management strategies emphasizing supportive environments appear to reduce anxiety across developmental stages.

Density Visualization of Terms

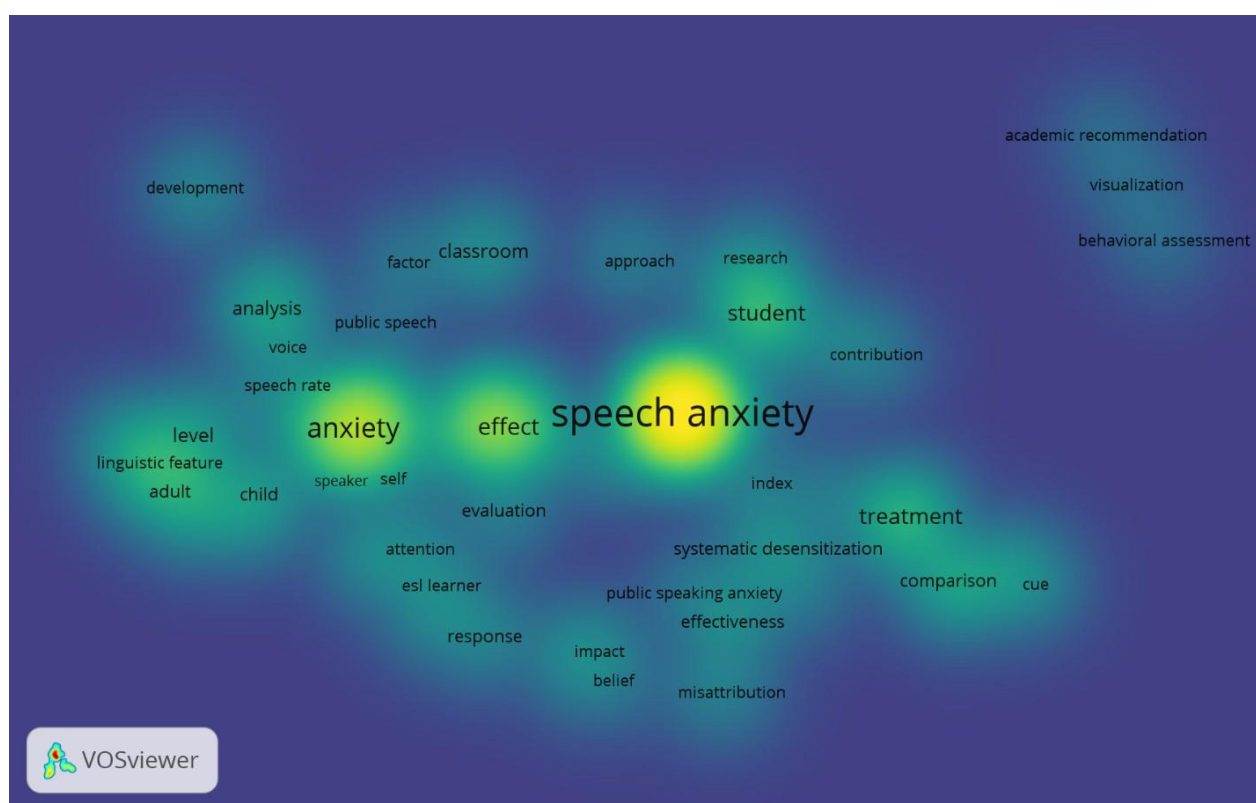


Figure 4. Density Visualization of Terms on Speech Anxiety

This density visualization illustrates the concentration and intensity of research activity across the speech anxiety literature landscape, with warmer colors (yellow) indicating research hotspots and cooler colors (blue/teal) representing lower-density peripheral areas. The visualization shows a highly concentrated core cluster around “speech anxiety,” “anxiety,” “effect,” and “evaluation,” indicating that these are well-established research domains with substantial publication volume and scholarly attention. The high density suggests a strong emphasis on measuring anxiety’s psychological impact and evaluating intervention outcomes, which serves as a theoretical anchor for the discipline. Extending from this core, secondary density peaks involving “student,” “classroom,” and “systematic desensitization” indicate that these foundational concepts are commonly linked to educational applications and behavioral treatments. This pattern suggests that the literature is structured around a stable axis of psychological assessment and pedagogical intervention, while more specialized topics remain peripheral to the dominant research focus.

Year of Publication of Articles

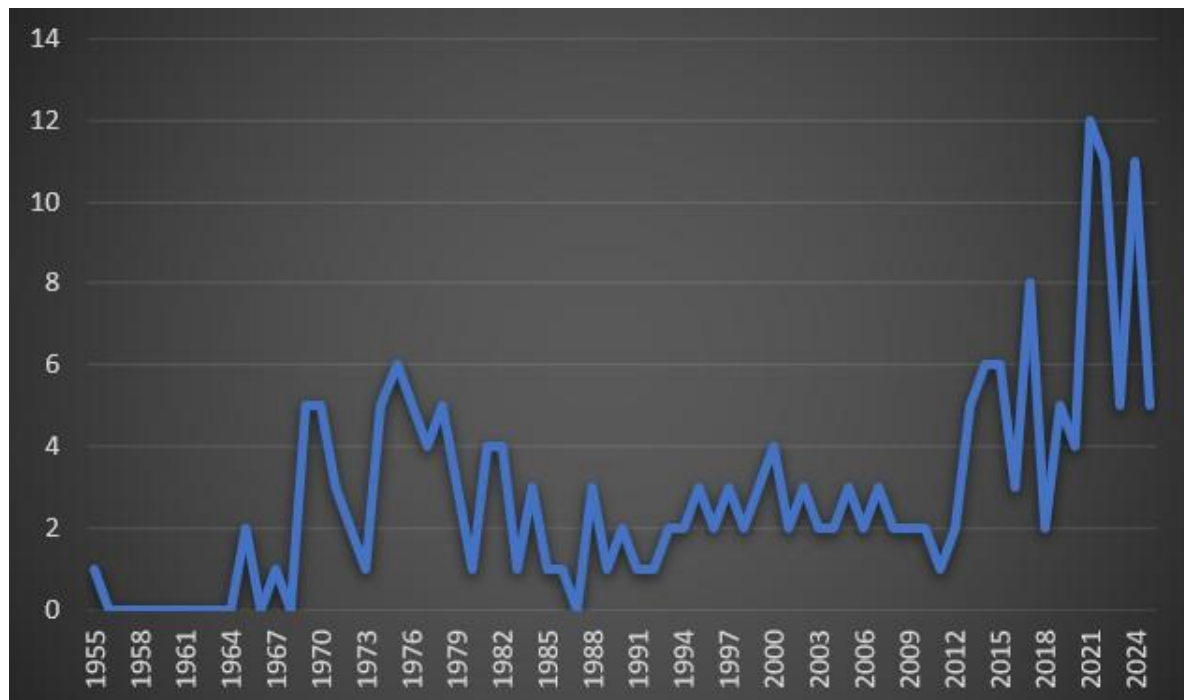


Figure 5. Year of Publication of Speech Anxiety Articles

The line graph illustrates the temporal distribution of research articles on speech anxiety from 1955 to 2025, revealing distinct patterns of publication and research evolution. Research in this domain was minimal prior to 2005, with sporadic publications averaging fewer than five articles annually. A marked surge in publications occurred between 2005 and 2013, peaking at 12 articles in 2011, reflecting the maturation of speech anxiety scholarship following seminal foundational work in the late 1980s and 1990s, particularly Horwitz's development of the Foreign Language Classroom Anxiety Scale (Horwitz, 2016; Yan & Horwitz, 2008) and communication apprehension frameworks (King & Smith, 2017). Following this peak, publications stabilized at moderate levels (2 to 6 articles per year) between 2013 and 2020, suggesting sustained rather than exponential growth during this consolidation phase. The post-2020 period exhibits fluctuating but generally lower publication counts, which may reflect a shift toward interdisciplinary and technology-enhanced approaches, including virtual reality exposure therapy (Lestiono & Lee, 2024), automatic speech recognition, and network-based anxiety models (Luo et al., 2025), rather than traditional descriptive competence studies. This trajectory indicates an evolution from foundational clinical and descriptive research toward intervention-focused, technologically integrated, and ecologically situated approaches to address speech anxiety across diverse learner populations (Lu, 2024; Zarin, 2025).

Ten Most-cited Articles

Table 1. Ten Most-cited Articles on Speech Anxiety

Rank	Articles	Citation s
1	Meichenbaum, D. H., Gilmore, J. B., & Fedoravicius, A. (1971). Group Insight versus Group Desensitization in Treating Speech Anxiety: <i>Journal of Consulting and Clinical Psychology</i> , 36(3), 410–421	448
2	Iverach, L., O'Brian, S., Jones, M., Block, S., Lincoln, M., Harrison, E., Hewat, S., Menzies, R. G., Packman, A., & Onslow, M. (2009). Prevalence of anxiety disorders among adults seeking speech therapy for stuttering. <i>Journal of Anxiety Disorders</i> , 23(7), 928–934.	415
3	Kasl, S. V., & Mahl, G. F. (1965). Relationship of disturbances and hesitations in spontaneous speech to anxiety. <i>Journal of Personality and Social Psychology</i> , 1(5), 425–433.	401
4	Savitsky, K., & Gilovich, T. (2003). The illusion of transparency and the alleviation of speech anxiety. <i>Journal of Experimental Social Psychology</i> , 39(6), 618–625.	230
5	Fremouw, W. J., & Zitter, R. E. (1978). A comparison of skills training and cognitive restructuring-relaxation for the treatment of speech anxiety. <i>Behavior Therapy</i> , 9(2), 248–259.	224
6	Natale, M., Entin, E., & Jaffe, J. (1979). Vocal interruptions in dyadic communication as a function of speech and social anxiety. <i>Journal of Personality and Social Psychology</i> , 37(6), 865–878.	217
7	Laukka, P., Linnman, C., Åhs, F., Pissiota, A., Frans, Ö., Faria, V., Michelgård, Å., & Fredrikson, M. (2008). In a nervous voice: Acoustic analysis and perception of anxiety in social phobics' speech. <i>Journal of Nonverbal Behavior</i> , 32(3), 195–214.	196
8	Ayres, J., & Hopf, T. S. (1985). Visualization: A means of reducing speech anxiety. <i>Communication Education</i> , 34(4), 318–323.	181
9	Mulac, A., & Sherman, A. R. (1974). Behavioral assessment of speech anxiety. <i>Quarterly Journal of Speech</i> , 60(2), 134–143.	173
10	Vrana, S. R., & Gross, D. (2004). Reactions to facial expressions: effects of social context and speech anxiety on responses to neutral, anger, and joy expressions. <i>Biological Psychology</i> , 66(1), 63–78.	161

The figure presents the ten most-cited articles on speech anxiety, highlighting foundational work on its assessment, correlates, and treatment. Overall, the citation pattern indicates that early clinical and experimental studies continue to have a significant influence, particularly those that introduced core treatment approaches and clarified the relationship between anxiety and observable speech behavior. The most-cited article, Meichenbaum et al. (1971), compares group insight and group desensitization, underscoring the centrality of behavioral and cognitive-behavioral interventions in managing speech anxiety. Similarly, Fremouw and Zitter (1978) show that skills training and cognitive restructuring-relaxation are effective treatments, reinforcing the dominance of skills-based and CBT-oriented approaches in the literature. Complementing these treatment-focused studies, Ayres and Hopf (1985) demonstrate that visualization can reduce speech anxiety, suggesting that imagery-based techniques provide an additional, less invasive means of intervention. Several highly cited works examine how anxiety manifests in speech and related behavior. Kasl and Mahl (1965) link disturbances and hesitations in spontaneous speech with anxiety, while Natale et al. (1979) show that vocal interruptions vary as a function of speech and social anxiety, indicating that anxiety reliably affects speech fluency and interaction patterns. Laukka et al. (2008) extend this line of work by showing that the acoustic features of speech in socially anxious individuals are perceptually detectable, thereby emphasizing that anxiety is encoded in voice quality itself.

The table also highlights research that situates speech anxiety within broader social and emotional contexts. Savitsky and Gilovich (2003) identify the "illusion of transparency," where speakers overestimate how much their anxiety is apparent to others, indicating a key cognitive bias that may sustain public-speaking fears. Vrana and Gross (2004) show that social context and speech anxiety modulate reactions to others' facial expressions, suggesting bidirectional links between anxiety and social information processing. In addition, Iverach et al. (2009) document elevated rates of anxiety disorders among adults seeking stuttering therapy, demonstrating that speech-related problems often co-occur with broader psychopathology and are not isolated performance issues. Finally, Mulac and Sherman (1974) provide an early behavioral assessment framework for speech anxiety, laying the foundations for measurement that support later treatment and experimental research.



Collectively, the citation pattern indicates that the most influential research on speech anxiety has focused on (a) developing and evaluating behavioral and cognitive-behavioral interventions (Mweichenbaum et al., 1971; Fremouw & Zitter, 1978; Ayres & Hopf, 1985), (b) identifying behavioral and acoustic markers of anxiety in speech (Kasl & Mahl, 1965; Natale et al., 1979; Laukka et al., 2008; Mulac & Sherman, 1974), and (c) embedding speech anxiety within broader cognitive, social, and clinical frameworks (Savitsky & Gilovich, 2003; Vrana & Gross, 2004; Iverach et al., 2009). This pattern suggests that the intellectual foundation of this field has historically been driven by rigorous experimental designs, clinically oriented interventions, and sustained efforts to link subjective anxiety with objectively observable speech behavior, thereby establishing a robust evidence base for contemporary educational applications.

Ethical Considerations

Although this study did not involve human participants, animals, or primary medical data, it adhered to ethical standards of research integrity and transparency. As a secondary analysis of publicly available bibliographic records, the study did not require ethics committee approval. All retrieved records were handled and reported objectively, without manipulation or bias, and the publication details, authors, and citation count of the included studies were recorded accurately to ensure faithful representation of the literature. The data-gathering workflow was documented to support transparency and reproducibility.

Conclusion

This study aimed to conduct a bibliometric analysis of speech anxiety research from 1955 to 2025 by mapping keyword co-occurrence, examining the temporal distribution of publications, and identifying the ten most-cited articles in the field. The analysis suggests that research has gradually shifted from early clinical and treatment-focused investigations toward educational, classroom-based, and multimodal approaches, with a strong thematic focus on anxiety, treatment, students, and classroom contexts, alongside emerging work on the acoustic, linguistic, and behavioral assessment of speech anxiety. The most influential articles predominantly address behavioral and cognitive-behavioral interventions, behavioral and acoustic markers of anxiety, and the relationship between speech anxiety and broader social or clinical concerns. The bibliometric patterns also indicate that, although the field has expanded, classroom-centered and pedagogically integrated studies remain comparatively limited. In particular, the keyword structure and publication trends suggest that the long-term evaluation of classroom-based interventions and the use of anxiety-reduction strategies in authentic instructional settings remain underdeveloped. These findings imply a need for future research to examine how collaborative learning, peer interaction, and technology-enhanced instruction may contribute to sustained communicative confidence. Based on the observed research trajectory, future studies may benefit from longitudinal, classroom-centered designs that explore emerging educational technologies, including virtual reality, as tools for developing anxiety-sensitive pedagogies that support both learner well-being and speaking proficiency across diverse academic environments.

Recommendations

Based on the bibliometric patterns identified in this study, future research on speech anxiety should prioritize longitudinal, classroom-based investigations that evaluate the sustained effects of anxiety-reduction strategies in authentic learning contexts. Researchers should also examine how pedagogical approaches such as collaborative learning, peer-supported speaking tasks, and technology-enhanced instruction, including virtual reality and other immersive tools, influence learner confidence, speaking performance, and anxiety regulation over time. In addition, future studies should strengthen methodological comparability by using standardized keyword sets, transparent data-cleaning procedures, and consistent citation-tracking protocols to improve the reliability of bibliometric mapping in this field. Finally, scholars may extend the present analysis by conducting co-citation, co-authorship, and country-level mapping to clarify further the intellectual structure and collaboration patterns of speech anxiety research.

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