*International Journal of Humanity Studies*
https://ejournal.usd.ac.id/index.php/IJHS
Sanata Dharma University, Yogyakarta, Indonesia

# NARRATIVE AT THE CORE, STORYTELLING AT THE MARGINS: A BIBLIOMETRIC ANALYSIS (2010-2025)

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https://doi.org/10.24071/ijhs.v10i1.1260
Received 2 June 2026; Revised 29 October 2026
Accepted 2 November 2026; Published 23 November 2026

## Abstract
Research on storytelling and children's language development has expanded substantially, yet its global intellectual structure remains unmapped. This study presents a bibliometric analysis of 405 Scopus-indexed publications (2010-2025) using Bibliometrix R to examine publication trends, influential contributions, geographic distribution, thematic structure, and intellectual evolution. A logistic growth model indicates continued expansion, with observed output equal to about 10% of the model's estimated carrying capacity, a parameter extrapolated beyond the observed period. The Journal of Speech, Language, and Hearing Research leads in citation impact, and U.S. affiliated authors account for most output and international collaboration links. Co-occurrence analysis reveals narrative as a boundary object, a term shared across clinical, developmental, and educational communities with fundamentally different theoretical meanings; under the selected mapping parameters, no cluster occupies the Motor Themes quadrant. Co-citation analysis identifies three intellectual pillars: speech-language pathology assessment, cross-linguistic narrative methodology, and bilingual language assessment. Critically, storytelling occupies a peripheral cluster, exposing a terminological divide that structurally separates clinical research from educational practice. These findings describe a field with high empirical output but limited integration across its research communities, and establish a structural diagnosis to guide future integrative research.

**Keywords:** bibliometric analysis, children's language development, language impairment, narrative, storytelling

## Introduction
Language is the foundation of children's cognitive, social, and academic development. Strong language skills in childhood are significantly correlated with long-term literacy success and academic achievement (Dickinson & Tabors, 2001; Hoff, 2013). On this basis, efforts to identify effective approaches in stimulating children's language development continue to be a priority research agenda globally. Among the various pedagogical strategies that have been researched, storytelling is considered the most natural and effective approach. Storytelling activities, both oral, visual, and digital, have been proven to be able to expand vocabulary, strengthen

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narrative understanding, and develop children's pragmatic competencies (Nicolopoulou et al., 2015; Ralli et al., 2021; Aisyah, 2025). Technological developments further expand the dimension of this research to the realm of digital storytelling, which is multimodal and cross-cultural (Kendrick et al., 2022; Kim et al., 2021; Krasova & Moroz, 2024)

Research on storytelling and children's language is spread across clinical, developmental, and educational fields, and bibliometric work on digital storytelling alone already spans several disciplines (Davis et al., 2025). A literature this large and dispersed is difficult to synthesize through narrative review, because no single review can read across all of its disciplinary venues. Bibliometric analysis suits this situation because it can systematically map the development of a field to identify trends, influential authors, collaboration patterns, and thematic structures that form the building or foundation of knowledge of a discipline (Aria & Cuccurullo, 2017; Donthu et al., 2021).

Several previous bibliometric studies have partially examined aspects related to storytelling and children's language. Avci and Kasimi (2023) and Özkaya (2022) found significant growth in digital storytelling research in language education, particularly on improving speaking skills and literacy. Guo (2022) maps the development of children's language acquisition research (1900-2021) and identifies an increase in narrative-based studies, while Xiao et al. (2023) confirm that story-based activities contribute greatly to children's early literacy. At a broader scope, León et al. (2024) show that narrative strategies dominate early language learning research, and La et al. (2021) affirm the role of storytelling in the development of preschoolers' expressive language skills. Furthermore, Helmi et al. (2025) associate storytelling with children's cognitive and language development, while Chen and Chen (2025) map narrative as a central element in children's literature research.

However, the studies are thematic and fragmented, each examining only one specific aspect without providing a comprehensive overview of the bibliometric landscape of storytelling research for integrative language development. There has not been a study that comprehensively maps the intellectual trajectory, global collaboration patterns, topic life cycle, and evolution of the conceptual structure of this field. This study aims to fill this gap by systematically mapping the intellectual, thematic, and geographic structure of research on storytelling and children's language development through a bibliometric analysis of Scopus-indexed publications from 2010 to 2025. Specifically, it examines publication growth and the field's estimated developmental trajectory; identifies influential documents and journals and the countries that produce and connect this research; maps established and emerging themes; and traces the intellectual and conceptual evolution of the field, using Bibliometrix in R (Aria & Cuccurullo, 2017). The study addresses four research questions:

RQ1. How has publication output on storytelling and children's language development grown since 2010, and what trajectory does a logistic growth model suggest?

RQ2. Which documents, journals, and countries have most shaped the field, and how are countries connected through collaboration?

RQ3. What thematic structure emerges from keyword co-occurrence and thematic mapping?

RQ4. How has the intellectual and conceptual structure of the field evolved, as traced through co-citation and historiographic analysis?

This research is expected to make a dual contribution: theoretically, providing a comprehensive map that complements previous bibliometric studies. Practically, guide researchers, educators, and policymakers in identifying gaps in priority research as well as the direction of developing evidence-based storytelling programs that are relevant to contemporary educational contexts.

## Method

### *Research design*

This study uses a bibliometric analysis approach, which is a data-based quantitative method to systematically map the development of a field of science through the measurement of scientific publications (Donthu et al., 2021). This approach was chosen because it can objectively analyze large bodies of bibliographic data, identify temporal trends, collaboration patterns, and thematic structures that cannot be captured through conventional narrative review (Zupic & Čater, 2015).

### *Data sources and search strategies*

Data were obtained from the Scopus database, accessed on March 3, 2026. Scopus was chosen over Web of Science because it indexes more journals, widening coverage of the language, linguistics, and education outlets relevant to this topic, and because its metadata are consistent and its exports are fully compatible with Bibliometrix (Mongeon & Paul-Hus, 2016). A single database avoids the deduplication and field-harmonization problems that arise when Scopus and Web of Science records are merged. Related bibliometric studies of storytelling and early literacy have also used Scopus (Davis et al., 2025; Xiao et al., 2023). The search was performed using the following search string:

> TITLE-ABS-KEY ( ( storytelling OR “digital storytelling” OR narrative ) AND ( “language development” OR “language acquisition” OR literacy OR vocabulary ) AND ( “early childhood” OR “young children” OR preschool OR kindergarten OR “primary school” OR “elementary school” ) ) AND PUBYEAR > 2009 AND PUBYEAR < 2026 AND ( LIMIT-TO ( DOCTYPE , “ar” ) OR LIMIT-TO ( DOCTYPE , “cp” ) ) AND ( LIMIT-TO ( LANGUAGE , “English” ) ) AND ( LIMIT-TO ( SUBJAREA , “ARTS” ) )

The search included the article’s title, abstract, and keywords. The query was first run without the year, document-type, language, and subject-area filters (n=1,805) to ensure complete initial identification. These filters, shown in the final string above, were then applied at the screening and eligibility stages (Figure 1).

### *PRISMA selection criteria and procedures*

The document selection followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines adapted for bibliometric research (Page et al., 2021). The selection process took place in four stages as presented in Figure 1.

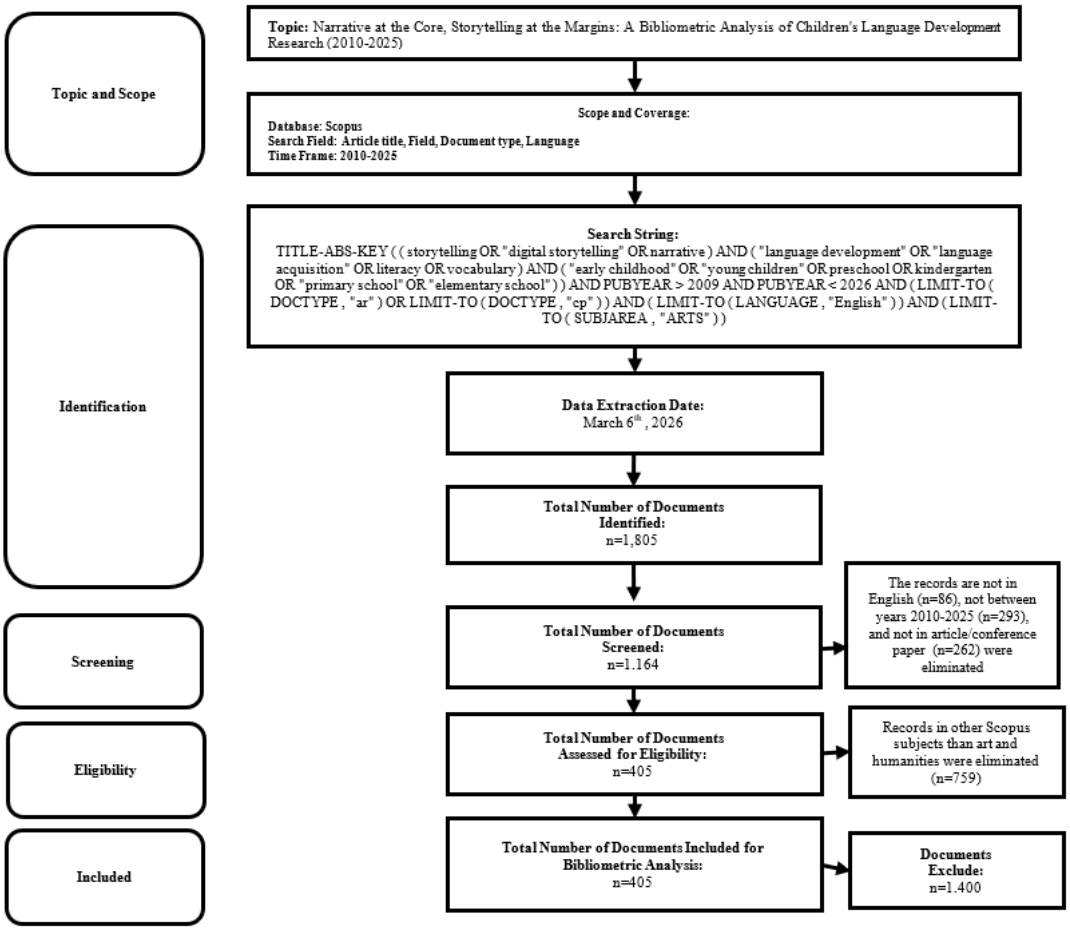



**Figure 1.** Data selection procedure following PRISMA. The PRISMA flowchart illustrates the document selection process from identification, screening, eligibility assessment, to final inclusion of 405 Scopus-indexed documents related to storytelling and children's language development research.

Inclusion criteria included: (1) journal articles and conference proceedings in English, (2) published in the range 2010-2025, and (3) classified in the Scopus subject area Arts and Humanities (SUBJAREA=ARTS), which includes the Language and Linguistics category. Because Scopus assigns a journal to every subject area that fits its scope, this filter also retains journals classified in other areas as well, such as the *Journal of Speech, Language, and Hearing Research*. The filter removed 759 records (Figure 1); its consequences are addressed in the limitations. Documents that do not meet any of these criteria are eliminated. The final dataset used in the analysis totaled 405 documents.

### *Analysis tools*

Bibliometric analysis was performed using the Bibliometrix package in the R environment (Aria & Cuccurullo, 2017), which was accessed through a web-based Biblioshiny interface. This package was chosen because it provides comprehensive analysis functions, ranging from descriptive statistics to network analysis to thematic mapping in one integrated platform. The data were imported in CSV format, which is exported directly from Scopus. Bibliometrix has been used in

comparable mapping studies, including Aria et al. (2020) for tracing three decades of research in *Social Indicators Research* and Xiao et al. (2023) who combined Biblioshiny with VOSviewer to map global preschool literacy research.

### *Analysis procedure*

The analysis was carried out in stages following four research questions that had been formulated. Each stage uses different analysis techniques as outlined in Table 1.

**Table 1.** Analysis techniques per research question

| RQ | Types of Analysis | Menu Biblioshiny | Output |
|---|---|---|---|
| 1 | Publication trends & life cycle | Overview→Annual Production; Appraisal→Life Cycle | Annual trend chart, logistics curve, Peak Year or table |
| 2 | Influential documents, journals & countries | Overview→Most Cited; Source Impact; Countries' Scientific Production; Countries' Collaboration World Map | Top 10 articles, h-index journal, Bradford's Law or table; country distribution and collaboration map |
| 3 | Thematic & keywords | Clustering→Co-word; Synthesis→Thematic Map | Keyword cluster, 4-quadrant thematic map, or table |
| 4 | Intellectual evolution | Clustering→Co-citation; Synthesis→Historiograph | A network of co-cites, historiographic maps or tables |

*Source: Adaptations of Aria & Cuccurullo (2017) and Donthu et al. (2021)*

Publication trend analysis used a logistic growth model to model the life cycle of research topics and project future trajectories (Aria et al., 2020). Network analysis included co-keywords and co-citations that are visualized using the VOSviewer layout algorithm integrated in Biblioshiny. The thematic map was constructed based on the values of centrality and density of keyword clusters, following a quadrant framework (Cobo et al., 2011).

## Findings and Discussion

### *Findings*

*Publication trends and life cycle of the research field (2010-2025)*

Annual publication output grew from 17 documents in 2010 to 30 in 2018 and reached its highest count in 2025 (56 documents; Figure 2), with a prominent surge in 2016 (+108% year-on-year) coinciding with the global mainstreaming of digital storytelling platforms and heightened policy emphasis on narrative-based early language intervention (Robin, 2016; Xiao et al., 2023). Logistic growth modeling (Figure 3; Figure 4) produced the parameters in Table 2, which indicate that the field is still expanding: the 405 documents retrieved so far amount to approximately 10% of the model's estimated carrying capacity (K=4,050 cumulative publications).

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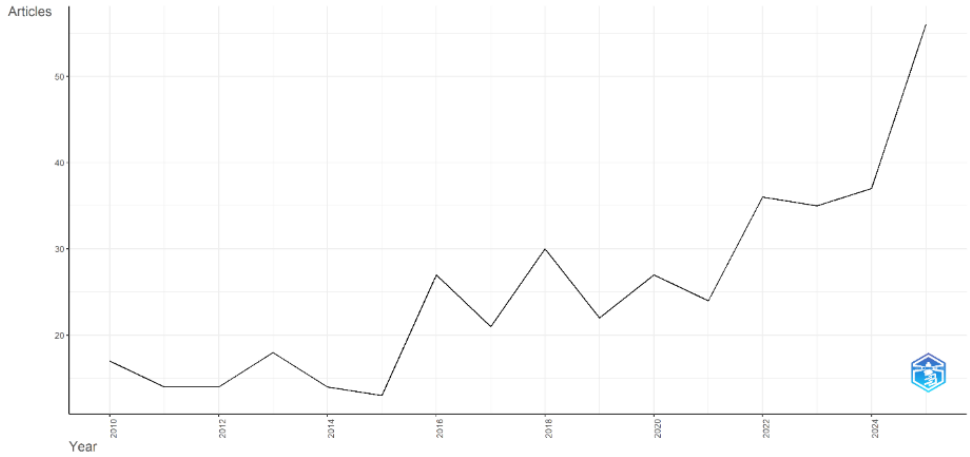



**Figure 2.** Annual scientific production on storytelling and children's language development. The line graph shows annual publication output on storytelling and children's language development research from 2010 to 2025, with a local peak in 2018 and the highest annual output in 2025.

To model the long-term trajectory of this research field, a logistic growth analysis was conducted using the *Bibliometrix* package in R. The logistic model fits cumulative publication data to the S-shaped growth function $P(t)=K / (1 + \exp(-b(t - t_0)))$, where K represents the carrying capacity, $t_0$ the inflection point, and b the growth rate parameter (Aria et al., 2020). Figures 3 and 4 display the fitted curves, and Table 2 reports the parameters.




**Figure 3.** Life cycle of an annual publication. The logistic growth model displays the annual publication life cycle of storytelling and children's language development research, indicating an ongoing expansion phase; the fitted inflection point (around 2044) lies beyond the observed period and is indicative only.

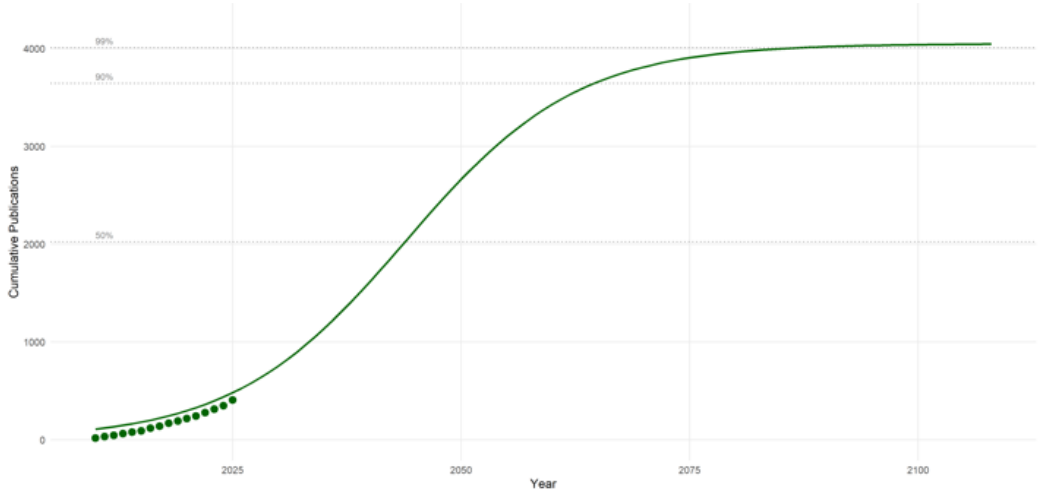



**Figure 4.** Life cycle of the cumulative growth curve. The S-shaped cumulative growth curve represents the projected long-term publication trajectory and saturation pattern of storytelling and children's language development research.

**Table 2.** Logistic growth model parameters for the research life cycle

| Parameter | Value | Interpretation |
|---|---|---|
| Carrying Capacity (K) | 4,050 | Estimated maximum cumulative publications over the entire life cycle |
| Inflection Point ($t_0$ / tm) | 2043.9 | Year of peak annual publication output (~108 articles/year), extrapolated beyond the observed period |
| Growth Duration ($\Delta t$) | 41.38 years | Duration of the main growth phase from emergence to near-saturation |
| $R^2$ (Model Fit) | 0.799 | ~80% of variance in annual publications explained by the logistic model (good fit) |
| RMSE | 5.02 | Average deviation of ~5 articles/year; acceptable relative to observed range |
| Current Phase | Expansion | Active growth phase; the extrapolated inflection (~2044) lies outside the observed window and is indicative only |

The model estimates a carrying capacity of K=4,050, and places the inflection point, the year of maximum annual output (~108 articles/year), at 2043.9. These parameters require caution. The observed series covers only the rising, pre-inflection part of the curve, so K and $t_0$ are extrapolated beyond the data and could shift considerably with small changes in recent annual counts. We therefore treat K, the 2044 inflection, and the 41.38-year growth duration as indicators of direction (sustained growth with no sign of saturation) rather than as forecasts, and report the ratio 405/4,050 ≈ 10% in that sense. The $R^2$ of 0.799 and RMSE of 5.02 indicate an acceptable fit within the observed years, which does not by itself validate the extrapolated parameters.

*Influential documents, sources, and geographic distribution*

Table 3 presents the ten most globally cited documents. Adams et al. (2012) lead with 179 total citations, recognized for its contributions to narrative assessment in children with language impairments. The most structurally significant finding involves Normalized Total Citations (NTC): Spencer and Petersen (2020) achieve

the highest NTC of 7.39 despite ranking ninth by raw count, indicating it is the most rapidly accruing citation impact in the dataset, signaling a field-wide shift toward *evidence-based narrative intervention*. Heilmann et al. (2010) and Paradis et al. (2013) also record high NTC values (4.18 and 4.13), reflecting sustained influence relative to their cohort peers. Six of the ten most cited documents appear in speech-language pathology journals, confirming that clinical narrative assessment constitutes the dominant knowledge cluster.

**Table 3.** Top 10 most globally cited documents

| Rank | Author (Year) | Journal | TC | TC/Year | NTC | DOI |
|---|---|---|---|---|---|---|
| 1 | Adams (2012) | *Int J Lang Commun Disord* | 179 | 11.93 | 3.83 | 10.1111/j.1460-6984.2011.00146.x |
| 2 | Heilmann (2010) | *Lang Speech Hear Serv Sch* | 162 | 9.53 | 4.18 | 10.1044/0161-1461(2009/09-0023) |
| 3 | Squires et al. (2014) | *Int J Lang Commun Disord* | 137 | 10.54 | 3.21 | 10.1111/1460-6984.12044 |
| 4 | Iluz-Cohen & Walters (2012) | *Bilingualism* | 136 | 9.07 | 2.91 | 10.1017/S1366728911000538 |
| 5 | Peña et al. (2014) | *J Speech Lang Hear Res* | 116 | 8.92 | 2.72 | 10.1044/2014_JSLHR-L-13-0151 |
| 6 | Boerma et al. (2016) | *Int J Lang Commun Disord* | 109 | 9.91 | 3.86 | 10.1111/1460-6984.12234 |
| 7 | Paradis (2013) | *J Speech Lang Hear Res* | 109 | 7.79 | 4.13 | 10.1044/1092-4388(2012/12-0050) |
| 8 | Thordardottir (2011) | *J Speech Lang Hear Res* | 102 | 6.38 | 3.13 | 10.1044/1092-4388(2010/09-0196) |
| 9 | Spencer & Petersen (2020) | *Lang Speech Hear Serv Sch* | 92 | 13.14 | 7.39 | 10.1044/2020_LSHSS-20-00015 |
| 10 | Pontier & Gort (2016) | *Int Multiling Res J* | 84 | 7.64 | 2.98 | 10.1080/19313152.2016.1150732 |

*Note: TC=Total Citations; TC/Year=Annual Citation Rate; NTC=Normalized Total Citations.*

Table 4 presents the ten most productive journals. *Language, Speech, and Hearing Services in Schools* leads by article count (44), while *Journal of Speech, Language, and Hearing Research* (JSLHR; 38 articles) and *International Journal of Language and Communication Disorders* (26 articles) follow. The presence of *Reading Teacher* (25 articles) and *Literacy* (14 articles) confirms that literacy education contributes a meaningful, if secondary, strand. *International Journal of Bilingualism* (10 articles) reflects growing scholarly interest in storytelling for bilingual children. This distribution is consistent with Bradford's Law of source concentration.

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**Table 4.** Top 10 most relevant sources by article count

| Rank | Journal Title | Articles | Disciplinary Focus |
|---|---|---|---|
| 1 | *Language, Speech, and Hearing Services in Schools* | 44 | Speech-Language Pathology / Education |
| 2 | *Journal of Speech, Language, and Hearing Research* | 38 | Speech-Language Sciences |
| 3 | *International Journal of Language and Communication Disorders* | 26 | Language & Communication |
| 4 | *Reading Teacher* | 25 | Literacy Education |
| 5 | *Journal of Child Language* | 21 | Child Language Development |
| 6 | *Clinical Linguistics and Phonetics* | 19 | Clinical Linguistics |
| 7 | *International Journal of Speech-Language Pathology* | 16 | Speech-Language Pathology |
| 8 | *Literacy* | 14 | Literacy Education |
| 9 | *International Journal of Bilingualism* | 10 | Bilingualism & Multilingualism |
| 10 | *First Language* | 9 | Language Acquisition |

Table 5 reports journal impact metrics. JSLHR leads in h-index (20), g-index (32), and m-index (1.176), the only journal to exceed m=1.0, a threshold associated with accelerating and highly influential research outlets (Aria & Cuccurullo, 2017). *International Journal of Language and Communication Disorders* achieves the highest citation-to-paper ratio from only 26 articles. By contrast, *Reading Teacher* records a lower h-index (8) and m-index (0.471) despite its volume, reflecting disciplinary citation norms in practitioner-oriented versus research-intensive journals (Donthu et al., 2021).

**Table 5.** Source impact metrics for top 10 journals

| Journal | h | g | m | TC | NP | 1st Year |
|---|---|---|---|---|---|---|
| *Journal of Speech, Language, and Hearing Research* | 20 | 32 | 1.176 | 1,087 | 38 | 2010 |
| *International Journal of Language and Communication Disorders* | 17 | 26 | 1.063 | 1,005 | 26 | 2011 |
| *Language, Speech, and Hearing Services in Schools* | 17 | 30 | 1.000 | 939 | 44 | 2010 |
| *International Journal of Speech-Language Pathology* | 10 | 16 | 0.588 | 319 | 16 | 2010 |
| *Journal of Child Language* | 10 | 16 | 0.714 | 287 | 21 | 2013 |
| *Clinical Linguistics and Phonetics* | 9 | 16 | 0.529 | 263 | 19 | 2010 |
| *Reading Teacher* | 8 | 17 | 0.471 | 312 | 25 | 2010 |
| *First Language* | 7 | 9 | 0.538 | 142 | 9 | 2014 |
| *International Journal of Bilingualism* | 7 | 10 | 0.467 | 194 | 10 | 2012 |
| *Literacy* | 7 | 11 | 0.538 | 130 | 14 | 2014 |

*Note: h=h-index; g=g-index; m=m-index; TC=Total Citations; NP=Number of Papers; 1st Year=First publication year in dataset.*

The USA leads country-level output (Table 6) with 319 articles (78.8%), forming an *Anglosphere core* with Canada (69), Australia (59), and the UK (47). Israel (35 articles) stands out as a productive non-English-speaking country. The near-absence of Sub-Saharan Africa, South and Southeast Asia, and Latin America

among author affiliations reflects a significant gap in who produces this research. These counts describe author affiliations, not the populations studied: a U.S.-affiliated article may report data from children in other countries or language communities.

Table 6. Country distribution of publications (top 10)

| Rank | Country | Freq. | % of N=405 |
|---|---|---|---|
| 1 | USA | 319 | 78.8% |
| 2 | Canada | 69 | 17.0% |
| 3 | Australia | 59 | 14.6% |
| 4 | UK | 47 | 11.6% |
| 5 | Israel | 35 | 8.6% |
| 6 | China | 26 | 6.4% |
| 7 | Germany | 23 | 5.7% |
| 8 | Spain | 22 | 5.4% |
| 9 | Sweden | 21 | 5.2% |
| 10 | Italy | 20 | 4.9% |

*Note: Frequency counts may exceed N=405 due to multi-country collaborations.*

Country-level collaboration (Figure 5) shows the USA as the most prominent country-level collaboration hub in the dataset, maintaining dense bilateral ties with Canada, the UK, Australia, and Israel, forming a coherent *Anglosphere cluster* underpinned by shared language and research funding structures (Moed, 2005). The near-complete absence of Sub-Saharan Africa, South Asia, and Latin America from this collaboration map reinforces the geographic gap noted above.

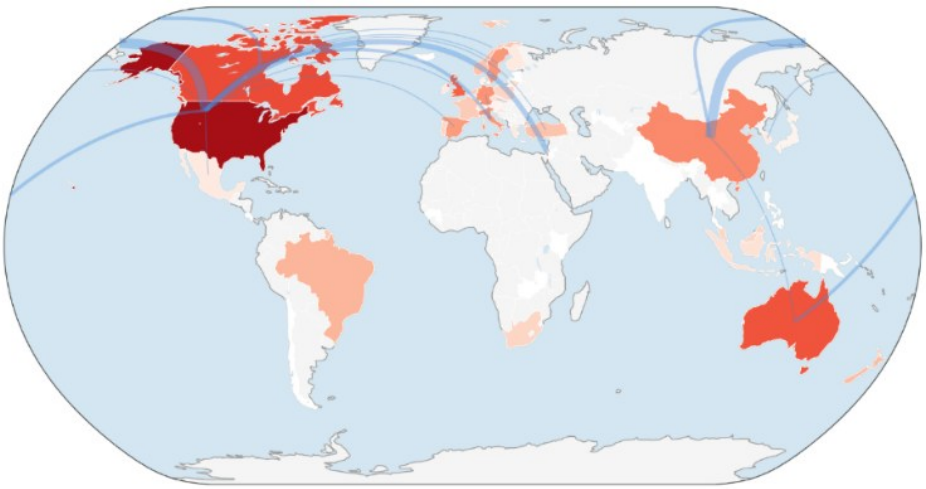


**Figure 5.** Countries' collaboration world map. The world map illustrates international research collaboration patterns in storytelling and children's language development studies, with the United States serving as the dominant collaboration hub.

*Thematic structure and keyword analysis*

Table 7 and Figure 6 report centrality metrics for the ten most prominent keywords, all in Cluster 1 (Red). *Narrative* dominates by a wide margin, with a betweenness of 342.269 and PageRank of 0.134, nearly three times the next keyword, *assessment* (123.565), confirming it as the field's primary conceptual

bridge across clinical, developmental, and educational communities. The co-clustering of *language impairment*, *developmental language disorder*, *bilingualism*, and *bilingual* within the same cluster confirms that clinical narrative assessment in diverse child populations is the field's most coherent research strand, aligned with the citation concentration observed in RQ2. The keywords *children* and *language* show zero betweenness; they are broad subject tags that co-occur widely but do not bridge distinct communities.

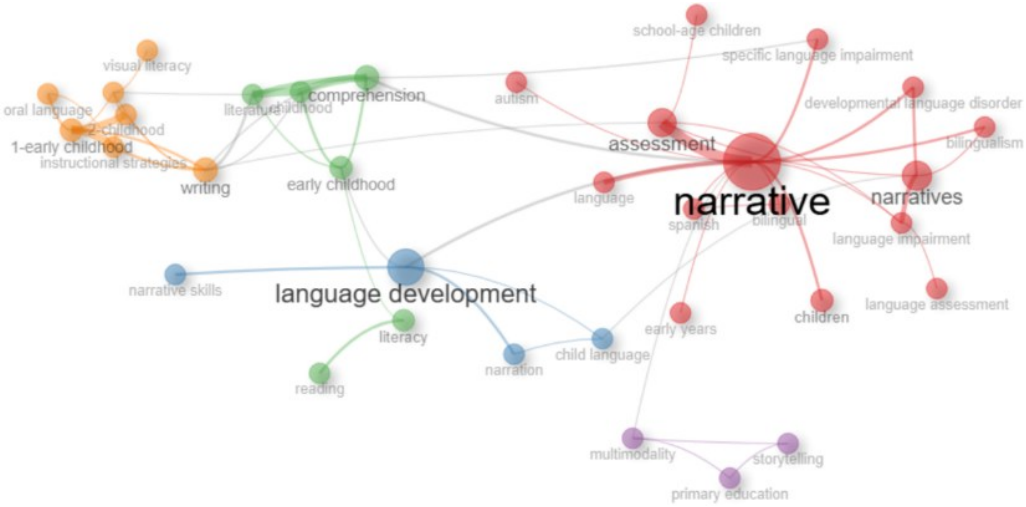



**Figure 6.** Keyword co-occurrence network (author keywords, N=405). The keyword co-occurrence network shows conceptual relationships among major research themes, with "narrative" functioning as the central connecting keyword.

**Table 7.** Centrality metrics for top 10 keywords (cluster 1-Red community)

| Keyword | Cluster | Betweenness | Closeness | PageRank | Network Role |
|---|---|---|---|---|---|
| *narrative* | 1 (Red) | 342.269 | 0.015 | 0.134 | Primary hub, dominant conceptual anchor |
| *assessment* | 1 (Red) | 123.565 | 0.013 | 0.046 | Secondary hub, clinical gateway |
| *narratives* | 1 (Red) | 19.699 | 0.011 | 0.044 | Core concept, variant of narrative |
| *language impairment* | 1 (Red) | 35.727 | 0.012 | 0.036 | Clinical anchor |
| *developmental language disorder* | 1 (Red) | 3.068 | 0.011 | 0.021 | Emerging clinical term |
| *bilingualism* | 1 (Red) | 2.045 | 0.011 | 0.019 | Linguistic context node |
| *bilingual* | 1 (Red) | 0.000 | 0.010 | 0.017 | Linguistic context node |
| *specific language impairment* | 1 (Red) | 0.000 | 0.012 | 0.017 | Clinical sub-concept |
| *language* | 1 (Red) | 0.000 | 0.010 | 0.016 | Foundational connector |
| *children* | 1 (Red) | 0.000 | 0.010 | 0.013 | Subject anchor |

*Note: Betweenness=bridging capacity between clusters; Closeness=information access efficiency; PageRank=influence weighted by connected nodes.*

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The five communities identified by the Louvain algorithm form a coherent intellectual architecture: the Red (narrative + clinical assessment) and Blue (language development) communities constitute the core axis; Green (comprehension + early childhood) and Orange (oral/visual literacy + instructional strategies) represent the educational periphery; and Purple (multimodality + storytelling + primary education) is notably isolated from the main network. This peripheral position of *storytelling*, the nominal focus of this study, reveals a critical lexical divide between clinical/research terminology (*narrative*) and educational or practitioner terminology (*storytelling*), with direct implications for knowledge transfer between research and practice.

Under the parameters used (top 250 merged keywords, minimum frequency of 2, Louvain clustering), the thematic map (Figure 7; Table 8) places no cluster in the Motor Themes quadrant. This is the study's most structurally significant pattern. *Narrative* sits on the upper-middle-right boundary, with high density but insufficient centrality to qualify as a Motor Theme. Because quadrant positions depend on these parameters, we read this result as a descriptive pattern of keyword centrality and density, not as direct evidence that the field lacks a theoretical framework. The two Niche Themes (*procedures*; *comprehension*) are mature but specialized sub-fields with limited cross-field influence. The *human* cluster anchors the field as a Basic Theme, while *speech* in the Emerging/Declining quadrant may reflect terminological displacement by *narrative* and *language* as preferred analytical units in contemporary scholarship. Future research integrating the clinical, developmental, and educational communities around a shared narrative framework could catalyze the emergence of a unified Motor Theme (Xiao et al., 2023).

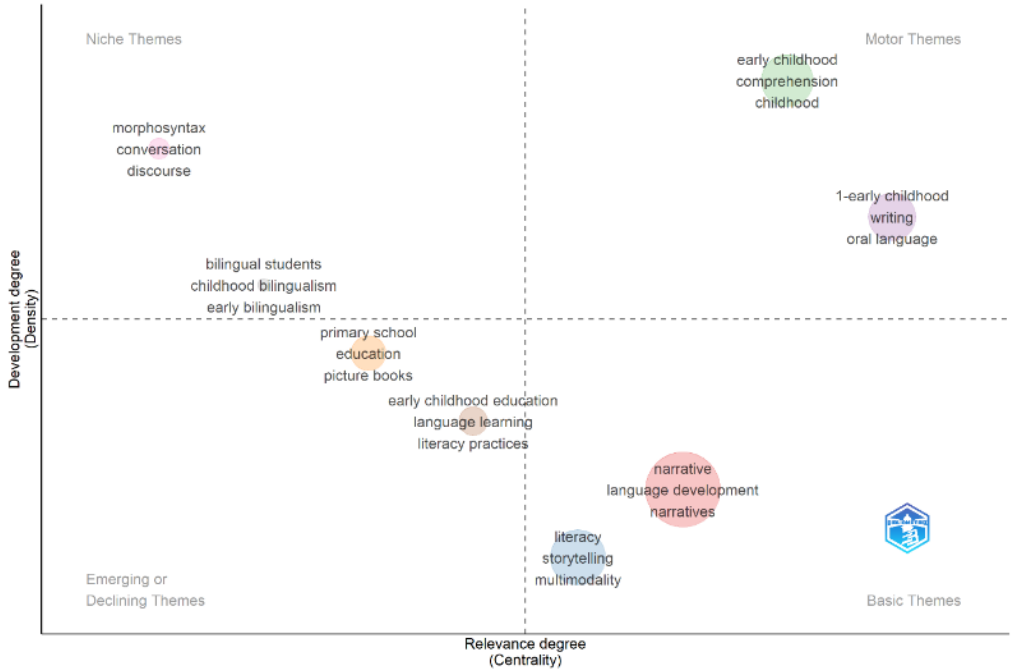



**Figure 7.** Thematic map. The four-quadrant thematic map categorizes research themes by centrality and density, showing narrative as a borderline motor theme and the absence of fully established motor themes.

**Table 8.** Thematic map: Cluster positions and interpretations

| Quadrant | Cluster | Keywords | Interpretation |
|---|---|---|---|
| Motor Themes (Upper-Right) | - | *None firmly established* | No cluster occupies this quadrant. Narrative is the closest contender, positioned on the upper-middle-right boundary. |
| Niche Themes (Upper-Left) | "procedures" (Orange) "comprehension" (Green) | *assessment, language therapy, procedures; comprehension, early childhood, writing* | Well-developed, internally coherent sub-fields. Clinical procedures/assessment tools (procedures) and comprehension-focused early literacy pedagogy (comprehension) are mature but specialized. |
| Basic Themes (Lower-Right) | "human" (Red) | *human, humans, preschool child* | Broad, foundational theme underpinning all research. High centrality but low internal density; the common subject thread (human child development) connects all communities. |
| Emerging/Declining (Lower-Left) | "speech" (Purple) | *speech, adult, adolescent* | Low centrality and density. Research on speech in adolescent/adult populations is less integrated into the network, either an emerging frontier or a declining sub-theme awaiting new methodological directions. |
| Borderline Motor (Upper-Middle-Right) | narrative (Light Blue) | *narrative, article, language* | Most pivotal cluster. High density and rising centrality; narrative is rapidly becoming the field's dominant intellectual core, with active recent publications (2016-2022) anchoring its growing influence. |

*Note: Analysis based on KW_Merged (top 250 keywords, minimum frequency=2), Louvain clustering.*

*Intellectual evolution and conceptual structure of the field*

The co-citation network identified three intellectual communities (Table 9; Figure 8). The Blue cluster (Gillam & Justice, Tomblin, Norbury, Whitehurst, Dickinson) is the largest and most central, constituting the broadest theoretical foundation in speech-language pathology assessment and DLD intervention. The Red cluster (Table 9) is the most internally dense, tracing a clear intellectual lineage from Mayer (1969) *Frog, Where Are You?* The standard cross-linguistic elicitation stimulus across dozens of languages, through Berman and Slobin (1994) Comparative framework to contemporary bilingual assessment by Bedore, Iglesias, and Gutierrez-Clellen. Heilmann et al. leads with a betweenness of 85.103, nearly three times that of Nockerts et al. (66.609), functioning as the cluster's primary conceptual bridge. The Green cluster bridges clinical and educational domains, with Schneider as the sole inter-cluster connector linking Green to Red.

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**Table 9.** Co-citation network: Top 10 most central references (cluster 1-Red)

| Reference | Cluster | Betweenness | Closeness | PageRank | Network Role |
|---|---|---|---|---|---|
| *Heilmann et al.* | 1 (Red) | 85.103 | 0.036 | 0.030 | Primary bridge-highest betweenness; narrative language sampling |
| *Nockerts et al.* | 1 (Red) | 66.609 | 0.036 | 0.028 | Bilingual assessment anchor |
| *Mayer (1969)* | 1 (Red) | 49.216 | 0.036 | 0.022 | Foundational stimulus-Frog Story paradigm |
| *Iglesias et al.* | 1 (Red) | 45.214 | 0.036 | 0.030 | Cultural-linguistic diversity in assessment |
| *Miller et al.* | 1 (Red) | 33.110 | 0.032 | 0.030 | Language sampling methodology |
| *Berman & Slobin* | 1 (Red) | 21.896 | 0.032 | 0.023 | Cross-linguistic narrative theory |
| *Bedore et al.* | 1 (Red) | 18.352 | 0.032 | 0.029 | Bilingual language impairment research |
| *Simon-Cereijido & G.-Clellen* | 1 (Red) | 17.471 | 0.035 | 0.023 | Bilingual narrative development |
| *Gutierrez-Clellen et al.* | 1 (Red) | 10.388 | 0.032 | 0.025 | Spanish-English bilingual assessment |
| *Restrepo et al.* | 1 (Red) | 2.309 | 0.029 | 0.015 | Spanish language impairment-peripheral node |

*Note: Betweenness=bridging capacity; Closeness=network reach; PageRank=influence weighted by co-cited neighbors.*

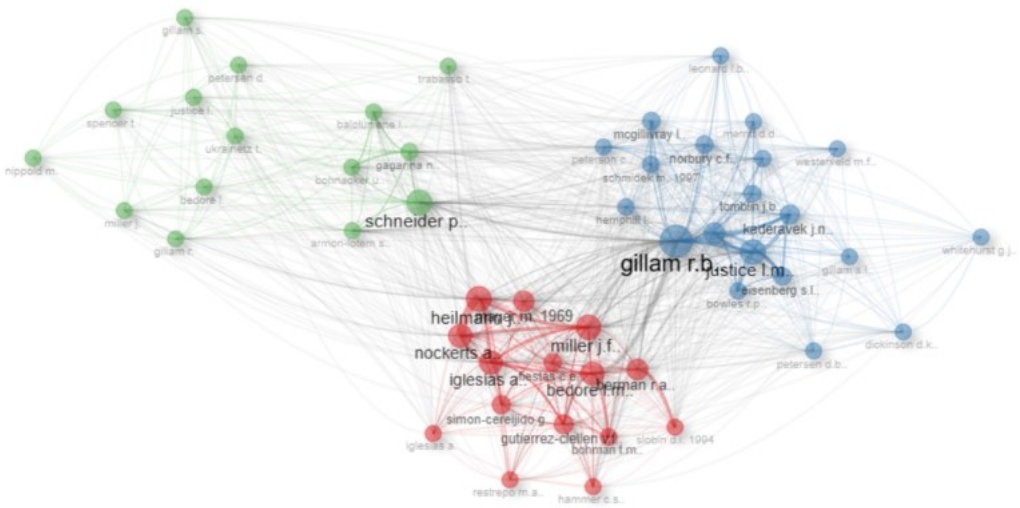



**Figure 8.** Co-Citation network. The co-citation network visualization displays three major intellectual communities in storytelling and children's language development research, including speech-language pathology, bilingual assessment, and literacy intervention studies.

**Table 10.** Three co-citation communities: Themes and key references

| Color | Community Theme | Key References | Research Focus | Bridge |
|---|---|---|---|---|
| Blue | Core SLP & Child Language Development | *Gillam & Justice, Kaderavek, Tomblin, Eisenberg, Norbury, Merritt, Whitehurst, Dickinson* | Largest and most central cluster. Theoretical and clinical foundations of speech-language pathology: assessment, diagnosis, and intervention for developmental language disorder (DLD/SLI). | - |
| Red | Bilingualism, Cultural-Linguistic Diversity & Assessment | *Heilmann, Nockerts, Miller, Iglesias, Bedore, Berman & Slobin, Gutierrez-Clellen, Simon-Cereijido, Mayer (1969)* | Narrative assessment and language development in bilingual/multilingual children. Anchored by Mayer's (1969) Frog Story paradigm and cross-linguistic theory (Berman & Slobin, 1994). | - |
| Green | Language Intervention & Literacy Applications | *Gillam S., Peterson, Justice, Spencer, Ukrainetz, Bedore, Miller, Nippold, Schneider* | Language intervention efficacy, literacy development, and applied assessment. Schneider serves as the inter-cluster bridge connecting Green ↔ Red communities. | Schneider (Green ↔ Red) |

The historiograph (Figure 9; Tables 11-12) traces the main citation cluster across three developmental phases. The Foundational Phase (2011-2013) established three interlocking pillars: Wellman et al. (2011) positioned narrative as a predictor of literacy; iluz-Cohen and Walters (2012; GCS=136) ) introduced bilingual narrative assessment for preschoolers; and Paradis et al. (2013; GCS=109) foregrounded the central methodological challenge of distinguishing language impairment from second-language acquisition in ELLs, a problem that recurs throughout the entire historiograph. The Diversification Phase (2014-2015) consolidated these pillars: Squires et al. (2014) emerged as the most locally cited paper in the dataset (LCS=26; GCS=137), while Peña et al. (2014) advanced dynamic assessment as an alternative diagnostic tool and Hipfner-Boucher et al. (2015) refined population-specific ELL narrative assessment. The Specialization Phase (2016-2017) brought greater cross-linguistic scope (Gagarina, 2016: Russian-German bilinguals)clinically actionable frameworks (Boerma et al., 2016; CS=109)and ecological validity improvements (Ebert & Pham, 2017).

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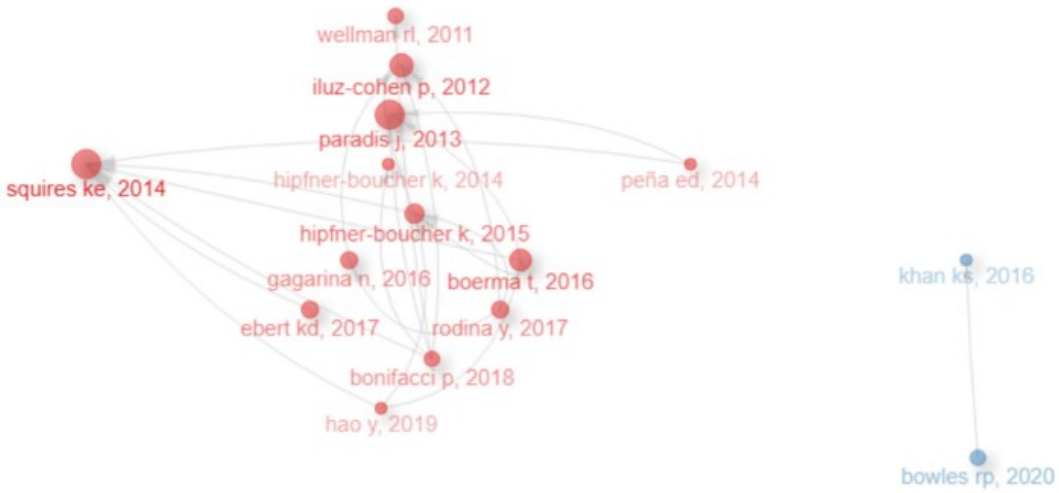



**Figure 9.** Historiograph of the main citation clusters. The historiographic citation map illustrates the chronological development of influential studies in storytelling and children's language development research from 2011 to 2020, including foundational, diversification, and specialization phases.

**Table 11.** Historiograph-main citation cluster: Key papers by Developmental Phase (2011-2017)

| Year | Author(s) | Journal | Core Topic | LCS | GCS | Phase |
|---|---|---|---|---|---|---|
| 2011 | Wellman et al. | *Lang Speech Hear Serv Sch* | Narrative ability & prediction of later literacy in children with speech sound disorders | 6 | 60 | Foundational |
| 2012 | Iluz-Cohen & Walters | *Bilingualism* | Narratives of bilingual preschool children with typical and impaired language | 14 | 136 | Foundational |
| 2013 | Paradis | *J Speech Lang Hear Res* | Discriminating language impairment in English-language learners from diverse backgrounds | 12 | 109 | Foundational |
| 2014 | Squires et al. | *Int J Lang Commun Disord* | Story retelling by bilingual children with language impairments and controls | 26 | 137 | Diversification |
| 2014 | Hipfner-Boucher et al. (a) | *First Language* | Oral language and phonological awareness in preschoolers | 5 | 50 | Diversification |
| 2014 | Peña et al. | *J Speech Lang Hear Res* | Dynamic assessment of narrative ability in English language learners | 5 | 116 | Diversification |
| 2015 | Hipfner-Boucher et al. (b) | *Int J Bilingualism* | Narrative abilities in ELL subgroups and monolingual peers | 9 | 56 | Diversification |
| 2016 | Gagarina et al. | *Appl Psycholinguist* | Narratives of Russian-German bilingual preschool and primary school bilinguals | 7 | 61 | Specialization |

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| Year | Author(s) | Journal | Core Topic | LCS | GCS | Phase |
|---|---|---|---|---|---|---|
| 2016 | Boerma et al. | *Int J Lang Commun Disord* | Narrative abilities of monolingual and bilingual children with/without language impairment | 12 | 109 | Specialization |
| 2017 | Ebert & Pham | *Lang Speech Hear Serv Sch* | Synthesizing language samples and standardized tests in bilingual assessment | 7 | 50 | Specialization |

*Note: LCS=Local Citation Score (within N=405 dataset); GCS=Global Citation Score (total Scopus citations). Phase colors: Blue=Foundational, Green=Diversification, Yellow=Specialization.*

**Table 12.** Historiograph - secondary citation cluster (2016-2020)

| Year | Author(s) | Journal | Core Topic |
|---|---|---|---|
| 2016 | Khan et al. | *J Speech Lang Hear Res* | Discriminating language impairment in ELLs from diverse first-language backgrounds |
| 2020 | Bowles et al. | *Lang Speech Hear Serv Sch* | Narrative comprehension in 4–7-year-old children with autism: weak central coherence account |

A secondary cluster, Khan et al. (2016) and Bowles et al. (2020), addresses overlapping diagnostic challenges in ELL and autism populations. Despite tackling the same core problem (identifying genuine language disorder against developmental and linguistic complexity), this cluster does not cite the main cluster, representing a structural gap. Dynamic assessment frameworks developed for bilingual ELLs (Peña et al., 2014) and cross-linguistic narrative tools (Gagarina, 2016) could substantially inform autism narrative assessment, a cross-pollination that future research should explicitly pursue.

## Discussion

The four research questions collectively reveal a field that is scientifically productive but structurally fragmented, clinically dominant, and geographically concentrated. The subsections below follow these themes rather than the order of the research questions, moving from field growth to the narrative-storytelling divide, which we discuss last because it bears most directly on research on children's language development.

### *Field growth and maturity*

Observed cumulative output (405 documents) equals approximately 10% of the logistic model's estimated carrying capacity (K=4,050). Because K and the inflection year are extrapolated beyond the observation window, this figure indicates continued expansion rather than a precise stage of maturity. This trajectory is broadly consistent with prior bibliometric studies that documented upward publication trends in related domains: Avci and Kasimi (2023) observed significant growth in digital storytelling research over the past decade, Özkaya (2022) similarly identified rapid expansion in digital storytelling scholarship, and Guo (2022) recorded a substantial increase in child language acquisition publications between 1900 and 2021. However, none of these prior studies applied logistic growth modeling to estimate field saturation or project a developmental life

cycle. The 2016 publication surge coincided with the global expansion of digital storytelling platforms (Robin, 2016), corroborating Özkaya's observation that digital technology adoption has been a primary driver of scholarly attention in this space. Annual output dipped from 27 documents in 2020 to 24 in 2021 and rose to 36 in 2022 (Figure 2). Xiao et al. (2023) reported that the pandemic slowed publication in preschool literacy research. Pandemic-related interest in home-based language activities may have contributed to the 2022 rebound, but our bibliometric data cannot test this mechanism, so we offer it as an interpretation rather than a finding.

*Clinical dominance and the narrative assessment paradigm*

Across RQ2, RQ3, and RQ4, the most cited documents, highest-impact journals, most central keywords, and most connected co-citation references all converge on narrative assessment for children with language disorders. This clinical orientation differs from what earlier storytelling bibliometrics reported. Avci and Kasimi (2023), working with Web of Science records on digital storytelling in language education, reported themes centered on education, technology, and literacy rather than on clinical assessment; the clinical orientation found here therefore appears specific to the Scopus corpus analyzed in this study. The present study adds an important nuance: Spencer and Petersen (2020) highest Normalized Total Citation score (NTC=7.39) signals that *evidence-based narrative intervention* has emerged as an equally powerful scholarly attractor, indicating a field-wide shift from diagnosis to treatment that was not visible in earlier reviews.

This clinical dominance, however, stands in notable contrast to findings from adjacent bibliometric studies focused on educational rather than clinical contexts. Xiao et al. (2023), in their analysis of global preschool literacy research, found that story-based activities were predominantly framed as pedagogical strategies for enhancing vocabulary and early literacy, not as diagnostic instruments. Similarly, Martínez León et al. (2024) reported that narrative and storytelling activities in early language learning research were most commonly associated with communicative competence and vocabulary development in typical populations. The divergence between these findings and the clinical framing dominant in the present dataset is not incidental; it is likely structural. It may reflect which disciplines publish in Scopus-indexed journals rather than education databases, and the Arts and Humanities filter used here, which excludes education journals indexed only under the social sciences. Both explanations call for cross-database replication. *Narrative* functions in Scopus-indexed research as the field's primary research object, dominant assessment tool, and emerging theoretical framework, a triple role that confers conceptual coherence but simultaneously narrows the field's scope relative to its educational potential. In Star and Griesemer's (1989) terms, *narrative* acts as a boundary object: flexible enough to serve clinical, developmental, and educational communities, yet stable enough to circulate among them. Its high betweenness in the co-word network (Table 7) is the bibliometric trace of this bridging role.

*Bilingualism as the field's defining sub-theme*

Bilingualism emerges as the field's most coherent and self-reinforcing sub-theme across every analytical dimension. The intellectual lineage from Mayer

(1969) through Berman and Slobin (1994) to Bedore, Iglesias, and Paradis constitutes a mature, recognizable scholarly achievement. This finding aligns with Guo's (2022) observation that bilingual and multilingual dimensions of child language acquisition have received growing scholarly attention globally, and with La et al. (2021) bibliometric analysis of preschool cohesive speech research, which identified narrative-based activities as central to expressive language development across linguistic contexts.

However, the present study reveals a representativeness gap that prior reviews did not foreground. Research production is concentrated in high-income, anglophone countries: 78.8% of the documents carry a U.S. affiliation (Table 6), and Global South affiliations are scarce. Affiliation and participant characteristics are different variables, so these figures do not show where, or with which children, the studies were conducted. Still, the most central co-cited references concern Spanish-English bilingual assessment and English-language learners (Table 9), which suggests an evidence base built on a narrow range of language pairs; verifying participant populations would require content analysis of study samples. Guo (2022), whose analysis spanned over a century of child language research, similarly noted the Anglo-American concentration of the field, but treated it as a historical artifact rather than an ongoing structural problem.' The data cannot show whether this concentration has changed over time, only that it persists in the 2010-2025 corpus, with anglophone countries at the center of the collaboration map (RQ2). If participant samples follow the same pattern, which future content analyses should verify, findings from such a narrow base cannot support universal claims about storytelling and language development.

*Structural fragmentation across research communities*

The co-word network, the thematic map, and the co-citation network (RQ3 and RQ4) point to a common pattern: few connectors link the field's research communities. *Narrative* is the main bridging keyword, Schneider is the only reference linking the Green and Red co-citation communities, and no cluster reaches the Motor Themes quadrant under the selected parameters. These indicators suggest that clinical assessment, developmental linguistics, and literacy education operate as largely parallel strands that share vocabulary more than frameworks, although bibliometric evidence alone cannot establish theoretical fragmentation. This pattern of disciplinary fragmentation is not unique to this domain. Chen and Chen (2025), in their bibliometric mapping of children's literature research, similarly identified thematic clustering without cross-community integration, particularly between literacy development and narrative cognition strands. Helmi et al. (2025), analyzing neuroscience and imagination processes in storytelling, likewise reported that cognitive-developmental and linguistic research communities operated with limited mutual citation, suggesting that fragmentation may be a structural feature of storytelling research broadly, not merely an artifact of the clinical orientation identified here.

The historiograph (RQ4) makes the cost of this fragmentation concrete: the main citation cluster and the secondary ELL/autism cluster address overlapping diagnostic problems without cross-referencing, forfeiting mutual methodological gains. This finding extends beyond what prior bibliometric studies have documented. Whereas Xiao et al. (2023) and Martínez León et al. (2024) noted

thematic diversity in their respective domains, neither analyzed whether these themes were intellectually connected or isolated. The present historiographic analysis demonstrates not only that parallel communities exist, but that their disconnection produces potentially missed opportunities for methodological cross-fertilization, dynamic assessment frameworks developed for bilingual ELLs that are not cited by autism narrative researchers addressing the same diagnostic challenge. Bridging these isolated communities is the field's most urgent structural need.

*The storytelling paradox: A terminological divide*

The peripheral status of *storytelling* in a field nominally devoted to it is this study's most practically consequential, and counterintuitive finding. The indexed research community overwhelmingly prefers *narrative*, while *storytelling* appears only in a small, weakly connected peripheral cluster. This finding stands in direct contrast to the practitioner-oriented and neuroscientific literature reviewed in prior studies. Ramalingam and Jiar (2022), in their analysis of speaking skills through the storytelling approach, employed *storytelling* as the primary conceptual term throughout, with no reference to *narrative* as a distinct construct. Helmi et al. (2025) similarly used *storytelling* as the organizing concept in their neuroscience and imagination analysis, positioning it as a cognitive-developmental activity rather than a clinical assessment tool. Heryani et al. (2024), in their systematic review on children's literature and literacy, likewise centered *storytelling* and *narrative* as interchangeable rather than distinct. The present data reveal that this interchangeability exists in practitioner-oriented and cognitive literature but not in the Scopus-indexed clinical and developmental linguistics corpus, where a clear disciplinary lexical boundary has formed.

This terminological divide has direct practical consequences. Educators and practitioners seeking research evidence for storytelling-based pedagogy must navigate a literature that does not use their terminology; conversely, researchers studying narrative under clinical frameworks may overlook the pedagogical innovations documented in practitioner literature indexed under *storytelling*, *digital storytelling*, or *oral storytelling*. The studies by Avci and Kasimi (2023) and Özkaya (2022), both conducted under the *digital storytelling* framing, are effectively invisible to scholars searching the Scopus literature under *narrative*, despite their high relevance. Resolving this divide through deliberate cross-database indexing, unified keyword frameworks, and interdisciplinary research designs is a prerequisite for productive knowledge integration across the clinical, educational, and cognitive communities that constitute this field's full intellectual landscape.

*Implications and limitations*

For researchers, integrating clinical narrative assessment with educational storytelling practice, applying bilingual dynamic assessment frameworks to underexplored populations (autism, low-resource multilingual contexts), and conducting cross-database bibliometric studies combining Scopus with ERIC and PsycINFO would directly address the documented structural gaps. For practitioners, the findings identify the most rapidly accumulating evidence base for narrative-based instruction, though most of it derives from bilingual and ELL contexts and may need cultural adaptation. For children's language development, the indexed

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evidence is strongest for narrative assessment and intervention with children who have language disorders or are learning English, and weakest for storytelling as everyday classroom practice with typically developing children. For policymakers, research funding targeting Sub-Saharan Africa, South and Southeast Asia, and Latin America, and incentivizing cross-regional collaboration, is needed to improve global representativeness. Five limitations apply: (1) restriction to Scopus may underrepresent non-English and grey literature; (2) the Arts and Humanities filter may exclude education and psychology journals, which could partly explain the clinical orientation of the dataset; (3) bibliometric analysis reveals structural patterns but cannot assess methodological quality or participant characteristics; (4) the logistic parameters are extrapolated beyond the observation window; and (5) thematic map positions depend on the selected parameters, and citation counts for 2024-2025 publications remain incomplete at the time of extraction.

## Conclusion

Three structural conclusions emerge from the convergence of six analytical perspectives. First, narrative is the field's dominant conceptual nucleus, anchoring co-citation networks, keyword co-occurrence, and citation impact, yet under the selected mapping parameters it does not reach the Motor Themes quadrant, a pattern suggesting a shared vocabulary without a fully integrated framework. Clinical, developmental, and linguistic communities each engage with narrative through distinct methodological traditions, producing parallel bodies of knowledge with minimal cross-referencing. Second, bilingualism constitutes the field's most internally coherent sub-theme, anchored by a recognizable scholarly lineage to contemporary assessment research, but research production is concentrated in institutions in high-income, anglophone countries, and author affiliations from the Global South are scarce. Third, storytelling, the field's nominal focus, appears only in a peripheral, weakly connected keyword cluster, revealing a terminological divide between clinical research (narrative) and educational practice (storytelling) that functions as a structural barrier to knowledge transfer. This study contributes three novel advances: (1) the first logistic life cycle model for this specific field, which indicates continued expansion (observed output ≈10% of the estimated carrying capacity) while treating its long-range parameters as indicative; (2) the first multi-level intellectual map integrating co-word, co-citation, and historiographic evidence into a unified structural diagnosis; and (3) the identification of the narrative–storytelling terminological divide as a theoretically significant construct, not a cosmetic labeling discrepancy, but a measurable structural barrier with consequences for interdisciplinary coherence and research-to-practice translation. Future research should expand cross-database bibliometric analyses, include underrepresented regions, and bridge clinical narrative assessment with digital storytelling pedagogy through longitudinal designs.

## Generative AI Statement

The authors used generative AI, namely Grammarly, ChatGPT, and Claude AI, for language editing and improving clarity. They were not used for data collection or bibliometric analysis, which were conducted with Bibliometrix and Biblioshiny in R. All results from generative AI have been carefully curated and edited by the authors, who take full responsibility for the content of this manuscript.

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**Author Contributions and Acknowledgments**

Ach Fauzi contributed to the conceptualization, methodology, data collection, bibliometric analysis, interpretation of findings, and writing and revision of the manuscript; Anelka Almayda Antarsyach contributed to data curation, interpretation of findings, and review and editing of the manuscript; Muhammad Albie Fathurrahman contributed to literature review, visualization, and review and editing of the manuscript; and Imam Hizbullah contributed to validation of the data and review and editing of the manuscript. This research received no specific funding from any public, commercial, or non-profit funding agency. The authors declare that they have no conflict of interest.

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