



# A BIBLIOMETRIC ANALYSIS OF COHESIVE SPEECH RESEARCH OF PRESCHOOLERS FROM 1970 TO 2020

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## Abstract

*Cohesive speech has commonly become regarded as one of the essential aspects of language development, especially for pre-schoolers. This study aimed to shed light on the cohesive speech of pre-schoolers (CSP) knowledge base. Three hundred ninety-five publications close related cohesive speech research of 5-6-year-old children were collected from the Scopus database. By using the bibliometric approach, the results showed the growth rate of publications over time from 1970 to 2020. In this period, the top five countries, the United States, the United Kingdom, Australia, Brazil and France, have published over 60% of total documents. Besides, four main interests of authors in this field were discovered: “language development”, “speech pathology outcomes”, “speech therapy”, “language intervention”. Among these themes, “speech pathology outcomes” was the most relevant one. Another finding, in recent years, scholars focused on aspects of autism spectrum disorder of pre-schoolers. More importantly, the achievements of this discipline have considerably made positive contributions to various fields both in terms of theory and practice, especially in language and linguistics, speech and hearing, psychology, and medicine. Overall, these studies highlight the need for many other studies, particularly relevant to pre-schooling when new generations should be better prepared to be happy in school by their future cognitive developments.*

**Keywords:** *language development, language intervention, speech pathology outcomes, speech therapy*

## Introduction

Language seemingly remains the great innovation of the humans, it is not because how it has changed human beings from primitive societies into civilized that we are living these days, and it is because how erudite of manifold complicated messages we have created and communicated to each other. Therefore, it can possibly be said that language is one the most advanced cultural tools created by people and makes people developed continuously. Especially, this creative

tool has many more important roles in the perspectives of linguistics and education because it is agreed by many teachers that a child could not have achieved the best results if he/she had been adroit of coherence in the ways of speech. However, despite being crucially developed and changed, coherence always remains important in expressions in any language. It is essential for effective communication, and it enables people to use languages to give a written or spoken text unity and purpose accurately. More meaningfully, it refers to common sense that a text or message is organized or logical by an understandable structure.

Significance to children development and cognition obtained in schooling or family education, varied authors have researched coherent speech to make this sector more important than ever. Regarding the ways in which the development of coherent speech in schools can be done by Ukrainian students expressing themselves independently and creatively orally, the findings suggest that these skills are often influenced by the contexts and by the students' proficiency in the Ukrainian language. These coherent speech abilities can be improved by the teacher (Trevoho & Zadorozhnyy, 2020). By the assistance of teachers in school, at senior preschool age and the development of coherent speech depend on what these children are taught in the family, and some principles of organizing speech therapy with specific psychological and pedagogical preparation that could be taken can usefully help pre-schoolers (Egorova, 2020). Besides, the children who are about to go to school need to be prepared to communicate in schooling. However, these speeches should be a contented, consistent, accurate, grammatical, and speaking environment, including friends, adults, and other community interactions. Coherent speech is also regarded as one of the kinds of competencies leading to the success of the children. That is even considered as a complex process in psychology and pedagogy to deal with negative aspects of speech consisting of semantic, lexical, and grammatical errors by illustration-based storytelling, making up riddles and fairy tales, describing personal experience, and etcetera that is named as the Theory of Inventive Problem Solving (Simkin & Gelikhova, 2019). Another way of making senior pre-schoolers better with their speeches in terms of qualitative characteristics, represented by simple and complex sentences, is Means of Project Activities (Kuznetsova, 2020).

This aspect of language has not been researched in the linguistics areas only, but it has been interested by many researchers of various disciplines, in the healthy domain, such as Homøe et al. (2013), Jones et al. (2005), Lieu et al. (2010), or in the ways of interdisciplinary between education and health, for example, Kingston et al. (2003), Broomfield & Dodd (2004), Lewis et al. (2006), Lohmander et al. (2012), Wang et al. (2013), Murray et al. (2012), etc. Coherence in speech, even, has been an object of research since 1970, but no previous research has summarized the literature of coherence speech of five or six-year-old-children. Thus, this paper aimed to review the research conducted on coherence speech in all fields published in academically journals and documents, primarily represented in areas relevant to research themes, including children, Cleft palate, Speech therapy, Intervention, Language, and Speech disorder by answering four research questions (RQs) as follows:

RQ1. What are the total publications and geographic distribution of published documents among countries in the CSP knowledge base?

RQ2. What authors have had the greatest relevance in CSP research, and what are they interested in?

RQ3. What documents and topics have had the greatest relevance in the CSP knowledge base?

RQ4. What are the latest topics in recent years in the CSP knowledge base?

## Research Methodology

### *General Background*

Bibliometrics was adapted to explore the most relevant authors, countries, documents, topics in the coherence speech of five to six-year-old pre-schoolers. This method is able to represent the researchers, journals, countries related to scientific subjects (Marti Parreño et al., 2016; Pham, 2021). Moreover, using science mapping determined the relationships among individual authors and documents (Small, 1999) related to coherence speech between 1970 and 2020.

### *Data Collection*

The bibliometrics method, proposed by (Pritchard et al, 1969), is referred to conduct this scholar. This approach is applied to review literature in many fields, including educational research. For example, (Hallinger & Chatpinyakoo, 2019), based on the bibliometrics method, it shows the intellectual structure of 1,459 Scopus-indexed documents and highlights the main research issues. Moreover, the bibliometrics method was conducted based on meta-data of a dataset (Madani & Weber, 2016). Thus, Scopus was referred to as a source to collect data. There were two reasons for this choice. Firstly, it is a popular source for the research community of bibliometrics method (Fetscherin & Heinrich, 2015). Secondly, Scopus's coverage of social sciences is broader than others in the same subject (Harzing & Alakangas, 2017).

The data were obtained through the extraction from Scopus and the eligibility of all the records. In the first step, the query was searched in the source in which the document information, including title, abstract and keywords, were concerned. All the terms which were used in the search represented the scope of this scholar: coherence issues, preschool, five or six-year-old. The initial search was:

TITLE-ABS-KEY(("Speech therapy" OR "language therapy" OR "language treatment" OR "speech treatment" OR "Coherence speech" OR "Speech coherence" OR "Consistent speech" ) AND ( preschool OR "5 years old" OR "6 years old" OR "5-6 years old" OR "5 to 6 years old"))

At the time of the search, 24h 14 February 2021, there were 3,179 variable records. To focus on the search gap, the parameters set of criteria was applied within the initial results, including:

Limitation of document type: Article

Limitation of language: English

Limitation of subjects: Medicine, Health professions, Social sciences, Arts and Humanities, Psychology

Exclude of the published year: 2021

After filtering, the number of datasets left 2,280 variable records, which were downloaded into an Excel file and used in the next step.

In the second step, 2,280 records were divided into all the research team members who had to read the title, abstract and full text of each document to check their eligibility. There were 1,885 excluded records whose content did not fit this scholar. For example, Prathanee et al. (2020) showed the model of speech therapy for children under 5-year-old with cleft palate in the Lao People's Democratic Republic. The final dataset had 395 valid records, which was analysed deeply in this paper.

### Data Analysis

The final dataset was transferred to the bibliometric software, including R statistic software and VOSviewer. To answer the RQs, the bibliometric analyses applied in this scholar were description statistics, coupling analysis, co-authorship analysis, co-occurrence keywords analysis. Description statistics was conducted in R, in which their calculations showed the most relevant authors, journals and countries based on the number of their documents and number of their citations. Moreover, documents coupling analysis was examined to explore the main topics of the knowledge base. Besides, co-authorship analysis and co-occurrence keywords analysis were conducted in VOSviewer. Co-authorship analysis showed the relationship between authors, countries. Co-occurrence keywords analysis demonstrated the frequency of words that appear in the keywords of documents (Zupic & Čater, 2015).

### Research Results

#### *The Total Publications and Geographic Distribution of Published Documents among Countries in the CSP Knowledge Base*

There were 395 publications of CSP knowledge base in the period between 1970 and 2020. Figure 1 showed the number of published articles over time. Overall, the growth rate of publications for the whole period was 6.92% per year. The first article in this field was the document of Hamlen (1970). In his document, Hamlen investigated factors that influence the final speech results of four to 19-year-old children after palatopharyngeal flap procedures. Based on the growth rate of publications, three stages were divided. The first stage, namely the formation stage, had 0% growth rate per year for 24 years from 1970 to 1993. There were 25 published documents related to the CSP area, approximately 6.32% in total. The second stage, namely the development stage, had 6.53% growth rate in 17 years from 1994 to 2010. There were 133 published documents at this time, approximately 33.67% in total. The third stage, namely the stabilization stage, had 1.24% growth rate in 10 years from 2011 to 2020. There were 237 published documents in this phase, approximately 60.00% in total. From these data, it is clear that the first publication was reported 50 years ago; however, this field just had the huge attention of the researcher community ten recent years. Moreover, the results demonstrated the small growth rate of published documents of CSP in the future.

**Figure 1**

*Number of Documents of CSP Knowledge Base between 1970 and 2020*

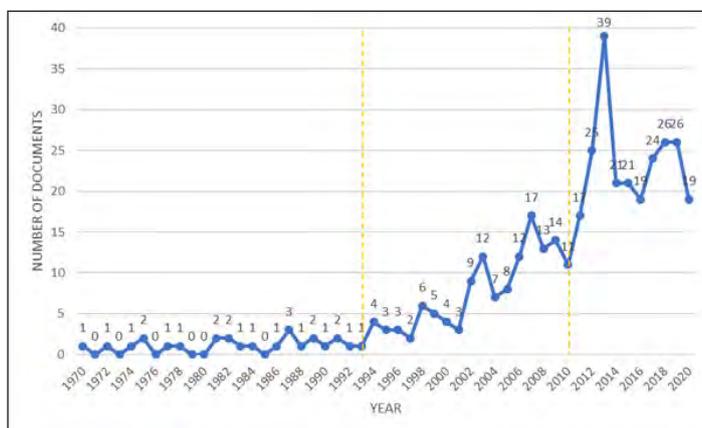
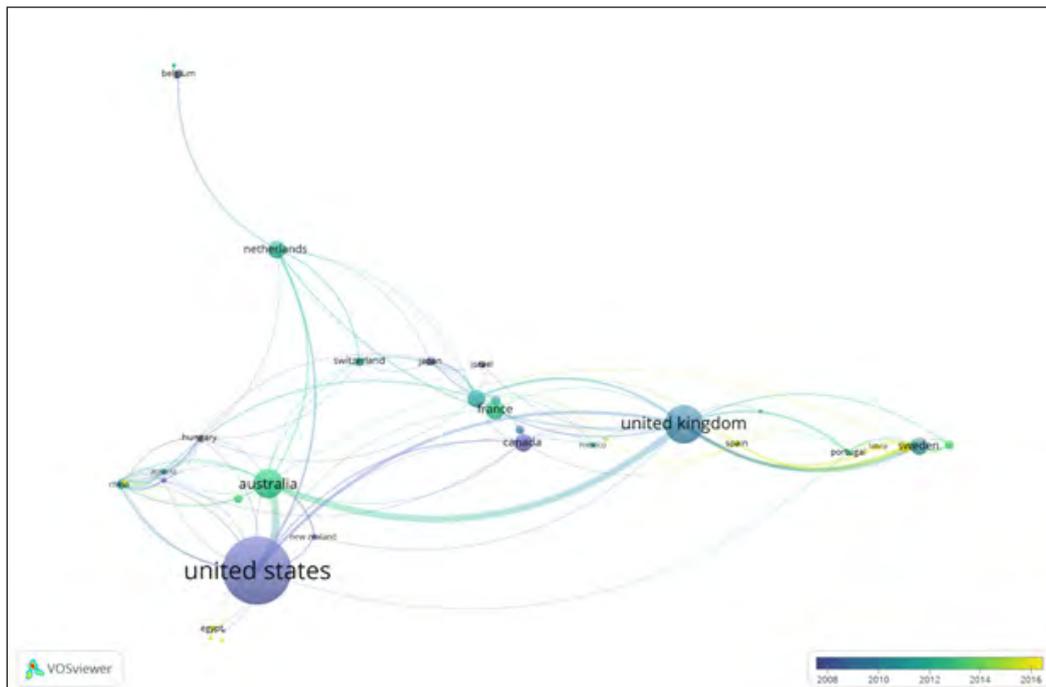


Figure 1 represented the collaborations of 42 countries in CSP. Based on the size of nodes, the United States was the lead country of the network (ranking: #1; number of publications: 136; number of citations: 3,647), following the United Kingdom (#2; 58; 1,957), Australia (#3; 38; 946), Brazil (#4; 28; 128) and France (#5; 20; 485). These countries published 257 documents, approximately 65.05% in the total publication of CSP, and they had 7,163 citations, approximately 65.08% in total citations of CSP. Based on the link strength among countries, the thickest link was the connection between the United States and Australia (nine documents). After that, the link strength between Australia and the United Kingdom was eight. The link strength of the others was lower than five. However, Brazil, a top-five country by the number of documents, did not have any research collaboration with others. It was clear that with the total number of publications, the collaborations among countries in this field were weak. Based on the colour of nodes, the United States, the United Kingdom, Sweden, Canada (blue nodes) were the traditional countries in the research area. On the other hand, Turkey, Egypt, Nepal, United Arab Emirates, Chile, Spain, New Caledonia, Denmark, Lithuania, Latvia (yellow nodes) were the new countries of the CSP research community. In the new group, Denmark was the most published country (eight documents), and New Caledonia and the United Arab Emirates were the latest countries that had a publication in 2020.

**Figure 2**  
*Country Collaborations Overtime Based on Authors' Affiliation (type of analysis: co-author, threshold: at least a document each country)*



*Note:* A node illustrated a country. The size of a node showed a positive ratio to the number of publications of a country. Colour of a node shows the average published time of all documents of a country. A link between two nodes pointed out a collaboration of authors between two countries. The strength of a link showed a positive number of collaboration of authors between two countries.

*The Greatest Relevant Authors in CSP Research and Their Interests*

The top 20 authors based on the number of documents and the number of citations were detailed in Table 1. Each author in the list had at least three documents in the CSP area. Anette Lohmander was the first ranking based on the number of publications with 11 documents and 208 citations. Following were Mark Onslow (ranking #2, 7 documents, 311 citations), Ann Packman (ranking #3, 7 documents, 310 citations), and they had the same affiliations, The University of Sydney, Australia. Based on the number of citations, Judith E. C. Lieu in St. Louis University School of Public Health, US, had the most citations in the CSP field. The top three authors in Table 1 had the citations' ranking as #16 (Anette Lohmander), #2 (Mark Onslow) and #3 (Ann Packman).

**Table 1**  
*Top 20 Authors Base on the Number of SCP Publications between 1970 and 2020*

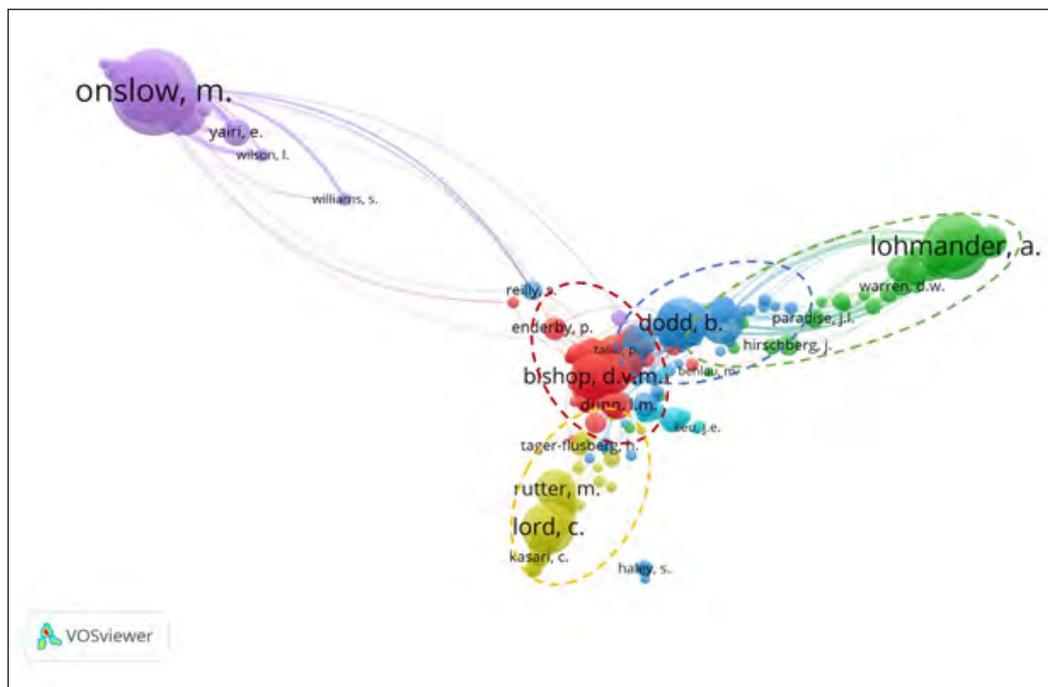
ID	Author	Affiliation	h_index	NP	TC	TC ranking	PY
1	Anette Lohmander	Karolinska Institute and Karolinska University Hospital, Sweden	7	11	208	16	2002
2	Mark Onslow	The University of Sydney, Australia	6	7	311	2	2003
3	Ann Packman	The University of Sydney, Australia	6	7	310	3	2003
4	Mark Johns	The University of Queensland, Australia	5	5	279	8	2003
5	Jill Nyberg	Karolinska University Hospital, Sweden	4	5	89	70	2014
6	Christina Persson	University Hospital, Sweden	3	5	77	95	2002
7	Elisabeth Willadsen	University of Copenhagen, Denmark	2	5	60	225	2017
8	Fernanda Dreux Miranda Fernandes	Universidade de São Paulo, Brazil	2	5	16	729	2007
9	Judith E. C. Lieu	St. Louis University School of Public Health, US	4	4	370	1	2010
10	Andrew Pickles	Kings College London, UK	4	4	305	4	2012
11	Tony Charman	Kings College London, UK	4	4	300	5	2011
12	Howlin P	Kings College London, UK	4	4	300	5	2011
13	Barbara A. Lewis	Case Western Reserve University, US	4	4	232	13	2000
14	Natalie Loundon	Hôpital Necker-Enfants-Malades, France	3	4	89	71	2000
15	Siena M. Goorhuis-Brouwer	University of Groningen, The Netherlands	3	4	45	326	2002
16	Bowornsilp Chowchuen	Khon Kaen University, Thailand	3	4	13	820	2011
17	Benjamas Prathanee	Khon Kaen University, Thailand	1	4	7	1023	2014
18	Márcia Keske-Soares	Federal University of Santa Maria, Brazil	1	4	4	1256	2012
19	Barbara Dodd	City University, UK	3	3	265	9	2004
20	Vicky Slonims	Guys and St Thomas University NHS Trust, UK	3	3	222	15	2012

Note: NP: number of publications; TC: total citations; TC ranking: ranking of author based on number of citations; PY: the published year of the first document of the author

The science mapping of author relationships was shown in Figure 3, whose connections were determined based on the authors' co-citations analysis. Three hundred nine authors were divided into six clusters. Four dominant ones, at least 50 authors, were figured out, including the red cluster (93 nodes), the green cluster (65 nodes), the blue cluster (64 nodes) and the orange cluster (50 nodes). Two smaller clusters were the purple one (21 nodes) and the grey one (16 nodes). Based on the research of authors, the main interest of each cluster was explored. The red cluster, which had 93 authors, 164 links and 1,915 link strength, focused on “language development” for pre-schoolers.

**Figure 3**

*Author Relationships Base on the Authors' Co-citation Analysis (number of the author: 309; co-citation threshold: at least ten times)*



Note: A node illustrated an author. The size of a node showed a positive ratio of the number of citations of an author. A link between two nodes pointed out their collaboration. The strength of a link showed a positive number of collaboration of authors.

### *The Most Relevant Documents and Topics in the CSP Knowledge Base*

A list of 20 publications based on the number of citations within the CSP field was detailed in Table 2. According to its data, (Kingston et al., 2003) was at the first ranking with eight local citations and 72 global citations. The following were (Lohmander et al., 2012) (#2, 6, 33) and (Jones et al., 2005) (#3, 5, 140). A ratio value between local citation and global citation of a publication determined its effect on its knowledge base and others. Therefore, all publications in Table 2 had less effect on the CSP field than their effect on others. Based on the documents' source, their scopes focused on Language and Linguistics, Speech and Hearing, Psychology, and Medicine, which closely related to this research area.

**Table 2**  
*Top 20 Most Relevant Documents in the CSP between 1970 and 2020*

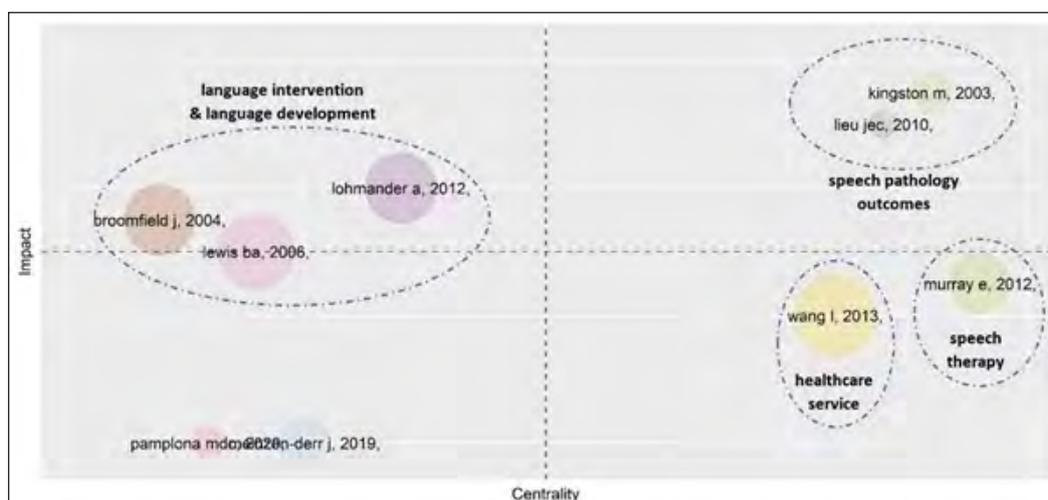
ID	Title	1st author, published year	Source	Scope of source	LC	GC	LC/GC ratio
1	Predicting treatment time with the Lidcombe program: Replication and meta-analysis	Kingston M, 2003	International Journal of Language & Communication Disorders	Language and Linguistics; Speech and Hearing;	8	72	0.111
2	Long-term, longitudinal follow-up of individuals with unilateral cleft lip and palate after the Gothenburg primary early veloplasty and delayed hard palate closure protocol: Speech outcome	Lohmander A, 2012	The Cleft Palate-Craniofacial Journal	Medicine; Dentistry	6	33	0.182
3	Randomized controlled trial of the Lidcombe programme of early stuttering intervention	Jones M, 2005	British Medical Journal	Medicine	5	140	0.036
4	Intervention for children with severe speech disorder: A comparison of two approaches	Crosbie S, 2005	International Journal of Language and Communication Disorders	Language and Linguistics; Speech and Hearing;	5	101	0.05
5	Speech production of pre-schoolers with cleft palate	Hardin-Jones MA, 2005	Cleft Palate-Craniofacial Journal	Medicine; Dentistry	4	88	0.045
6	A comparative trial of two modalities of speech intervention for compensatory articulation in cleft palate children, phonologic approach versus articulatory approach	Pamplona MC, 1999	International Journal of Pediatric Otorhinolaryngology	Medicine	4	59	0.068
7	Development of articulation before delayed hard-palate closure in children with cleft palate: A cross-sectional study	Noordhoff MS, 1987	Plastic and Reconstructive Surgery	Medicine	4	44	0.091
8	Velopharyngeal function from the age of three to eight years in cleft palate patients	Pulkkinen J, 2001	Folia Phoniatica et Logopaedica	Language and Linguistics; Speech and Hearing; Nursing	4	27	0.148
9	Unilateral hearing loss is associated with worse speech-language scores in children	Lieu JEC, 2010	Pediatrics	Medicine	3	174	0.017

10	Children with speech and language disability: Caseload characteristics	Broomfield J, 2004	International Journal of Language and Communication Disorders	Language and Linguistics; Speech and Hearing;	3	129	0.023
11	Longitudinal study of children with unilateral hearing loss	Lieu JEC, 2012	Laryngoscope	Medicine	3	119	0.025
12	Voice disorders in children	Hirschberg J, 1995	International Journal of Pediatric Otorhinolaryngology	Medicine	3	77	0.039
13	Management of dysphonia in children	Connelly A, 2009	Journal of Laryngology and Otology	Medicine	3	26	0.115
14	Academic outcomes in children with histories of speech sound disorders	Lewis BA, 2000	Journal of Communication Disorders	Language and Linguistics; Speech and Hearing; Nursing; Psychology	2	72	0.028
15	A randomized control trial to investigate the impact of the Lidcombe program on early stuttering in German-speaking preschoolers	Lattermann C, 2008	Journal of Fluency Disorders	Language and Linguistics; Speech and Hearing; Nursing; Psychology	2	53	0.038
16	Epidemiological study on vocal disorders in pediatric age	Angelillo N, 2008	Journal of Preventive Medicine and Hygiene	Medicine	2	51	0.039
17	Dimensions of early speech sound disorders: A factor analytic study	Lewis BA, 2006	Journal of Communication Disorders	Language and Linguistics; Speech and Hearing; Nursing; Psychology	2	46	0.043
18	Healthcare service use and costs for autism spectrum disorder: A comparison between Medicaid and private insurance	Wang L, 2013	Journal of Autism and Developmental Disorders	Psychology	2	45	0.044
19	Recast density and acquisition of novel irregular past tense verbs	Proctor-Williams K, 2007	Journal of Speech, Language, and Hearing Research	Language and Linguistics; Speech and Hearing; Medicine	2	44	0.045
20	Voice therapy in pediatric functional dysphonia: A prospective study	Trani M, 2007	International Journal of Pediatric Otorhinolaryngology	Medicine	2	37	0.054

Note: LC: local citation (number of citations within the final dataset); GC: global citation (number of citations in Scopus)

The most relevant topics based on the coupling analysis of documents were represented in Figure 4. The location of a cluster in the figure determined its impact and centrality in the CSP knowledge base. In this field, “speech pathology outcomes” was the most significant theme, which had a high impact and a high centrality. The most important documents of this theme were Kingston et al. (2003) and Lieu et al. (2010). Another important theme was “language intervention and language development” for pre-schoolers. The publications that represented this theme were Broomfield & Dodd (2004); Lewis et al. (2006); Lohmander et al. (2012). On the other hand, two less important themes that had CSP communication interest were “healthcare service” and “speech therapy”. Wang et al. (2013) and Murray et al. (2012) were the most relevant publication of these topics.

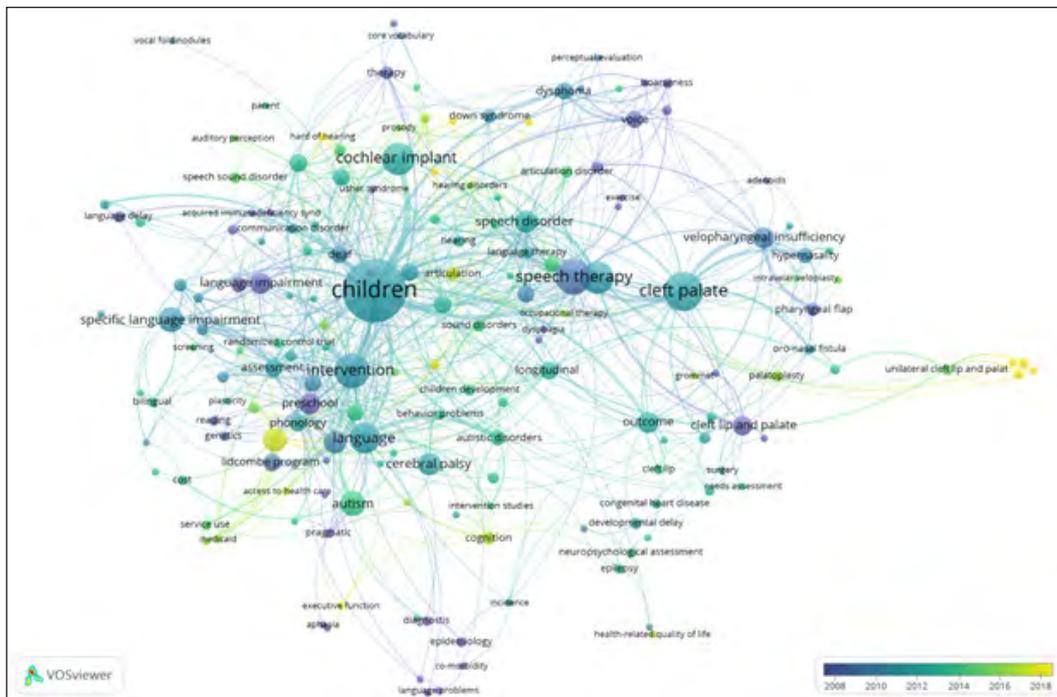
**Figure 4**  
*Most Relevant Topics in CSP area Bases on the Coupling Analysis of Documents (each cluster have at least 30 citations)*



*The Latest Topics in Recent Years in the CSP Knowledge Base*

All the relationships among authors’ keywords were demonstrated in Figure 5. The science mapping represented 171 authors’ keywords, 778 links and 1,008 link strength. Based on the size of nodes, the most relevant keywords were children (ranking #1, frequency: 53, total link strength: 139), cleft palate (#2, 25, 59), speech therapy (#3, 21, 48), intervention (#4, 21, 58), and speech (#5, 19, 61). These keywords were the traditional ones. Besides, according to the colour of nodes, some keywords appeared in the SCP area in recent years, which connected to the traditional one as the expanse of the research topics. They were “autism spectrum disorder” (occurrence: 12 times, total link strength: 26), “randomized controlled trial” (3, 10), “primary palatal repair” (3, 10), “hard of hearing” (2, 11), vocabulary (2, 9), “telepractice” (2, 7), cross-linguistic (2, 7), “consonant proficiency” (2, 6), “executive function” (2, 5). Within this knowledge base, there was a research related to the COVID-19 pandemic. Pamplona and Ysunza (2020) showed that telepractice could be a safe tool to improve the speech performance of children with cleft palate. They also recommended alternate modes of health care services should be studied and adapted in this context. Besides, Meinzen-Derr et al. (2019) had a pilot study that showed a significant increase in deaf/hard of hearing children’ mean length of utterance, the number of words spoken. In another pilot study, Padmanabha et al. (2019) proved home-based sensory interventions in autism spectrum disorder children are the feasible approach for developing countries.

**Figure 5**  
*Science Mapping of Keywords Base on the Co-occurrence Analysis of Authors' Keywords (number of keywords: 171, frequency of keyword: at least two times)*



*Note:* A node illustrated an author's keyword. The size of a node showed a positive ratio of the number of publications of a keyword. Colour of a node showed the average published time of all documents of a keyword. A link between two nodes pointed out a co-occurrence of keywords. The strength of a link showed a positive number of co-occurrence of keywords.

## Discussion

Based on the database that was used in this research, it seems that the total publications have not much in quantitative terms. This can be possible that most of these documents were published in advanced countries or Western nations, and they are all in English, and the total articles can be much more if they are collected from other areas and countries in the world. This shares the same tendency with the links among countries, though some developing countries and the countries far from Western have partially contributed to this research sector in recent years. The most interesting finding was that there is no country in Asia published in this discipline except Nepal. As mentioned in the introduction, there are possibly many more themes of this research topic published in other languages, and Russia is an example.

The authors have had the greatest relevance in CSP research, and what they are interested in are quite diverse. For example, Snowling et al. (2006) re-evaluated 71 young people who had a preschool history of speech language impairment; (Law et al., 2011) concerned communication skills of primary school-aged children who were raised in pronounced social disadvantage areas. The green clusters (65 authors; 100 links; 6,161 link strength) related to "speech pathology outcomes". According to Klintö et al. (2011), word naming is the most important speech material for speech judgement of children with cleft palate. Besides, del Carmen Pamplona and Ysunza (2020) pointed out the telepractice of speech and language pathology could improve the

speech performance of children with cleft palate. The blue cluster (64 authors; 304 links; 3,160 link strength) represented “speech therapy” issues. Thomas-Stonell et al. (2013), authors of this one, designed a questionnaire to measure the changes in communication skills. Moreover, Sices et al. (2007) determined the link between speech disorders and early literacy skills based on the Comorbid Language Impairment of preschool-age children. The last dominant cluster was orange one (50 authors; 56 links; 345 link strength), namely the “language intervention”. Following Homøe et al. (2013), the authors suggested using cochlear implants to increase the efficiency of treatment and rehabilitation for children in Greenland.

As can be seen from the documents mentioned above, documents and topics have had the greatest relevance in the CSP knowledge base, are conducted by mixed areas including language, linguistics, therapy. That document “Predicting treatment time with the Lidcombe program: Replication and meta-analysis” (Kingston et al., 2003) is just one example, and the title “Intervention for children with severe speech disorder: A comparison of two approaches” (Crosbie, 2005) is another one of special education perspective. The nine documents are classified into source of medicine (Angelillo, 2008; Connelly, 2009; Jones, 2005; Lieu, 2010; Lieu, 2012; Noordhoff, 1987; Pamplona, 1999; Hirschberg, 1995; Trani, 2007), but these research studies are partly studied by health combined with special education or linguistics features. The only one document researched into economical side of insurance provided for patients with autism spectrum disorder (Wang, 2013) is grouped in the psychology discipline.

The findings of this study indicate that health issues relevant to linguistic developments of the children are of interest by most researchers (Jones et al., 2005; Kingston et al., 2003; Lohmander et al., 2012) and these problems will affect many features in the ways of cohesive speeches. Children with speech disorders mentioned in these studies need certain types of therapy to make their speeches accurate and consistent. Whilst most research studies have been carried out on health sectors or therapies that are frequently used to intervene in language development for children regarding health assistance, and there have been few empirical investigations into linguistic ability of the scope that could help children to learn and other interactions in the school. This finding was unexpected and suggested that the database should be added more documents that will make the research domain become a better picture of researching into the cohesive speech of pre-schoolers.

## Conclusions

Over the five decades, the publications of CSP have experienced an upward trend, especially the numbers of documents that have dramatically come to light in the last decade and reached their highest in the years of 2012 and 2014. This article also provides an exciting opportunity to advance the knowledge of how important language development is to pre-schoolers both in cognitive development and in establishing the first important functions of expressing how these children think and say, what they think before schooling. More importantly, the findings provide some suggestions and implications or some actions that could be taken by educators/ teachers and parents to help children be who they are in their ages.

CSP cannot be regarded as a totally separate discipline or research these days because everything is connected to something else, and cohesive speech is not exceptional. Moreover, cohesive speech with both positive sides can be seen and studied in many scientific fields. This is why publications mentioned in this paper should be seen in the different perspectives of different domains or interdisciplinary and multidisciplinary. Besides, in view of all that has been mentioned so far, one may suppose that the information referred to in this research is limited by a database and in English only. These documents, therefore, are not represented in all the publications of the field in the scientific community in the global.

Above findings have a number of important implications for futuristic practice. That is, the need for further research into language developments of pre-schoolers separately because this domain and children cognition have been proved entwined, but opposite need for many more research studies of language developments of pre-schoolers should be carried out from the perspective of interdisciplinary approaches different from conventional ways that artificial intelligence is one of the good examples. That is, they should have more joint studies in this discipline conducted by varied scholars of different countries, and research results of these studies will represent knowledge of different cultures and languages, and even by doing in this way researchers can develop a global or regional network providing favourable conditions for those who have the same research interests of CSP.

### Declaration of Interest

Authors declare no competing interest.

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