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# **Research output performance of Dyscalculia: A Bibliometric Analysis**

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## **Abstract**

This research paper presents a Bibliometric analysis on Dyscalculia research publications published during 2011-2020 in Web of Science. The result has pointed out the merits and weaknesses of the journal which can be helpful for its further development. Total publications during the study period (2011-2020) were 560 articles on dyscalculia, distributed in 12 document types and eight languages, published by 1406 authors with 14768 cited references 591 organizations, and 51 countries. The 560 articles are scattered in 226 journals in which Journal of Frontiers in Psychology (49), was the most published and ranked first ( $IF_{2020}=2.067$ ). This study determines that there are many top papers originated from journals with the highest Impact Factor and higher rank in the Web of Science category. The result reveals that the publications are not fit into Bradford's law of scatterings.

**Keywords:** Bibliometric, Dyscalculia, Degree of Collaboration, Doubling time, Citation.

## **Introduction**

Mathematical skills are progressively important for individuals who need to succeed in today's technologically-oriented society. Researchers found that persons with mathematical inability have manifested persistent problems in applying the basic methods of arithmetic. These problems are not simply owing to low intelligence or inadequate training where such traits are often associated with impairment in the processing of numbers and quantities. The gender ratio of sufferers is approximately even, with a trend towards a higher prevalence among girls (Lewis, and Fisher, 2016). When Dyscalculia is not documented as such, undesirable school experiences and recurrent lack of success in mathematical errands generate fears of failure as well as shrank self-esteem. Dyscalculia displays high comorbidity with reading and/or spelling disorder (dyslexia; ca. 30–40%) as well as with attention-deficit/hyperactivity disorder (ADHD; ca. 10–20%) (Schuchardt, et al., 2015). Without specific intervention, Dyscalculia often leads to scholastic failure and school absenteeism (Salzer and Heine 2016). Journal articles show the final output of research productivity in the particular area which helps to get insight into the topic. The present study attempts to calculate the publications on Dyscalculia and focused on different Bibliometric parameters.

## **Literature Review**

Dyslexia is a learning disorder characterized by a diminished ability to comprehend written and printed words or phrases despite intact vision. A quantitative literature analysis was carried out by Ram (2018) who assessed the global research trends of learning disorder of dyslexia for 50 years from 1967 to 2016 retrieved from Scopus and found that 13455 articles were on Dyslexia with an annual growth rate of 6 percent. Out of ninety-eight countries, the USA shared the highest contribution and analysis also showed that most of the significant research areas are centered towards psychology, learning ability, and linguistics.

Contributions of longitudinal studies to the knowledge of developmental dyscalculia were analyzed by Mazzocco and Rasanen (2013) who revealed that it is important to attend the stability of mathematical performance over time as a facet of dyscalculia, as the mathematical difficulties modify with development, and individual variation in cognitive profiles and learning paths observed in children with mathematical difficulties connect differences between dyscalculic and non-dyscalculic subgroups. External factors also contribute to performance

paths, and uneven performance profiles were noticed among many students whose trouble with mathematics arises later or reduces over time.

Research on mathematical learning disability showed that 5–8% of students have a Mathematical Learning Disability (MLD), there was great variability in the classification methods used, and most researchers focused on elementary students engaged in basic arithmetic calculation. It was identified that there is a need for more research that could address more complex mathematics (Lewis and Fisher, 2016).

Indrani and Murugan (2018) analyzed the mapping of authorship patterns and collaborative research on fossil fuels publications indexed in A & HCI and SCI-Expanded. It was observed from their result that the majority of h-index in terms of authors, as well as research output, was higher in the year 2010 and lower in 1991.

Gupta et al. (2018) conducted a study on the scientometric assessment of global publications output during 2007-16. He examined 493 global Dysgraphia research papers indexed in the Scopus database for ten years from 2007 to 2016. These publications had registered an annual average growth rate of 4.02% and citation impact per paper at an average of 7.90%. Results also revealed that around 26 significant keywords have been identified from the literature, which dealt with possible trends in dyscalculia computing research during 2007-2016.

Narzary and Murugan (2017) studied authorship patterns & collaboration in the ETRI journal published in ETRI from the period 2010 to 2016. For this study, the data has been downloaded from the web of science database and covered several aspects such as document type, year-wise distribution of the publication, authors productivity, authorship pattern, etc., also including various methods like relative growth rate, doubling time, average authors per paper, exponential growth rate, degree of collaboration.

Learning disabilities in the field of Scientometrics showed a sluggish improvement during 2007- 2016 which revealed from 9160 articles (84.7%) out of fifteen journals (Vijayalakshmi and Swaminathan, 2019). Countries-wise analysis specified that 41.1% of the literature were published in the USA and Univ Texas Austin was the most productive institution in the field of Scientometrics with 224 documents (2.1%). The priority of the problem of Dyscalculia remains underestimated as compared to dyslexia and other systemic psychopedagogical problems of childhood (Ermolova et al. 2016).

Indrani and Murugan, (2021) analyzed the literature on growth and development in fossil fuels in India. Data were collected from Web of Science between 1989 and 2016 and found 943 research output with its h-index 73. The average citations per item, the total sum of times cited, citing articles, without self-citations were 28.63, 26,997, 21,694, and 21,324 respectively. It was found that there are no such studies in the area of 'Fossil fuels research in India' during the study period.

Narzary and Murugan, (2018) analyzed the colorectal cancer research published by Indian researchers in the web of science database for the period of 12 years (2005- 2016) and revealed that there was an increasing trend in total CRC research publications and the majority of the publications were in the form of articles. Total citations and average citation per paper in India showed an increasing trend except in 2009 and 2012. An increasing trend could also be observed in the case of international collaborative works between India and the rest of the world. India's highest collaborating country was the USA with 15.6% of the total collaborative works. The country-wise distribution and year-wise contributions showed that 50% of world CRC research comes from three countries viz. The USA, China, and Japan. "Council of Scientific & Industrial Research" (CSIR) tops the list with (133) funding's as per the records.

Balasubramani and Murugan (2011) applied a scientometric method to quantitatively analyze the research articles in remote sensing from the year 1975 to 2010. The authors identified various factors such as cited references, number of papers published, productive authors, country-wise publications, number of institutions involved in the research, most preferred language, a most preferred journal by the scientist, etc. in a detailed manner. 1,188 articles were published and 30,654 references were cited during their study period. The research results showed that the number of publications per annum was 38.07.

### **Objectives of the study**

The present study has been undertaken with the following objectives:

- ❖ To analyze the year wise Distribution of Publication, Relative Growth Rate (RGR), Doubling Time of publications
- ❖ To observe Degree of Collaboration in Dyscalculia
- ❖ To find out the most preferred journals for publication by authors

- ❖ To identify the types of documents published
- ❖ To calculate the Language-wise research output
- ❖ To find out the most prolific authors in the field of Dyscalculia
- ❖ To determine the network of institutions and nations
- ❖ To ascertain the highly cited papers

## Methodology

The present study aimed at analyzing the research output of researchers within the field of 'Dyscalculia'. Records for the research were collected from Web of Science (Clarivate Analytics) during 2011-2020 with 560 papers including 12 document types on Dyscalculia. This study includes analysis of articles by authors & numbers, affiliation, journal, country, type of communication. Impact Factor for journal and h-index of the author was the alternative metrics for measurement. The data of the study were analysed by using visualization software, Bibexcel, HistCite, VOSviewer, and MS-Excel were used for calculations and data processing.

## Data Analysis and Interpretation

### Relative Growth Rate and Doubling Time

The Relative Growth Rate and Doubling Time model is applied to examine the relative growth rate of research publications (Mahapatra, 1985).

- a) **Relative Growth Rate:** Relative growth rate is the increase in the number of publications or pages per unit of time, and it can be calculated with the following equations.

$$R(1 - 2) = \frac{W1 - W2}{T2 - T1}$$

- b) **Doubling Time (DT)**

The equation indicates that there is a direct relationship between relative growth rate and doubling time. If the number of publications of a subject doubles during a given period, then the difference between the logarithms of the numbers at the beginning and end of this period must be the logarithms of the number 2. If we use natural logarithms, this difference has a value of 0.693.

Thus, the corresponding doubling time for publications can be calculated by the following equations, suggested by Mahapatra(1985).

$$\text{Doubling Time (DT)} = \frac{0.693}{R}$$

Where, DT = Doubling time, R = Relative growth rate

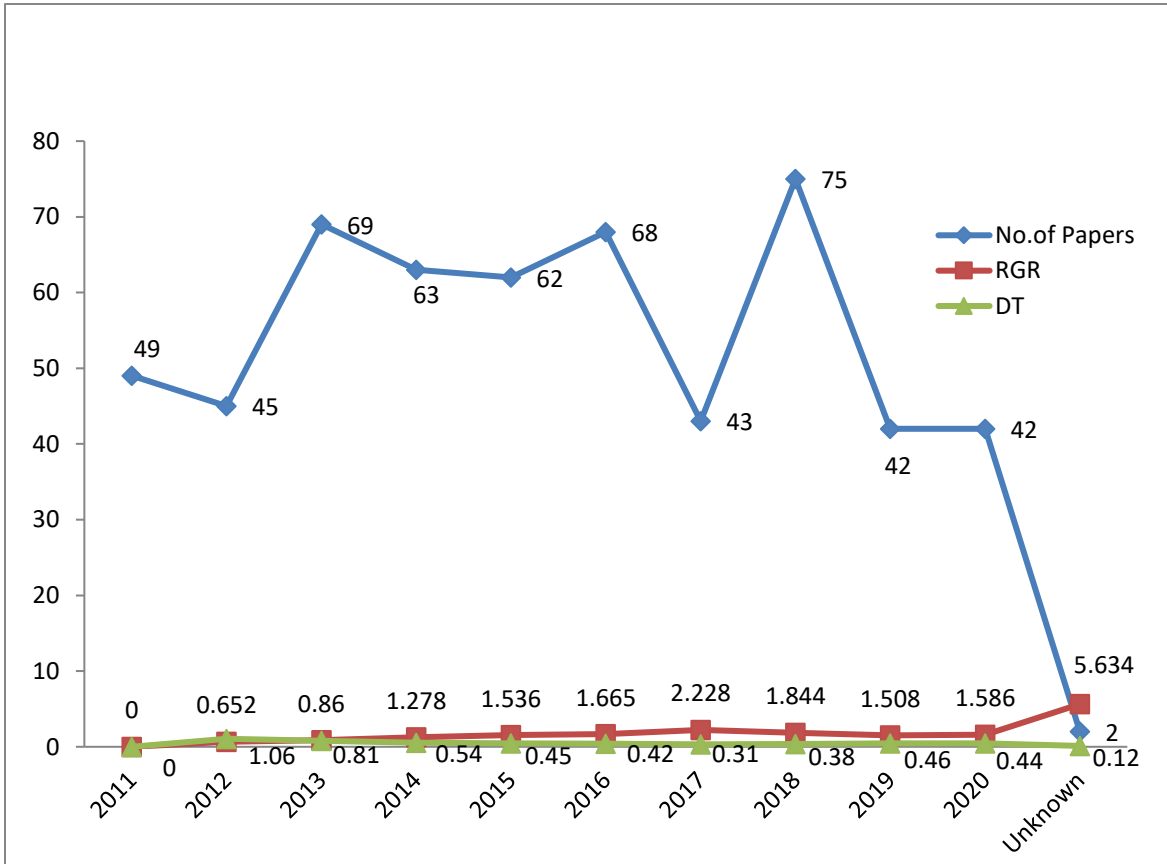
The doubling time for publication output of Dyscalculia is in increasing and decreasing trend over the past 10 years, since it is increasing and then decreasing for a couple of years and vice-versa.

**Table 1 Year-wise output of publications, Relative Growth Rate and Doubling Time**

Year	No. of Papers	%	Cumulative Papers	W1	W2	RGR (W2-W1)	Mean	DT (0.693/RGR)	Mean
2011	49	8.75	49	0	3.891	0	1.65	0	0.656
2012	45	8.04	94	3.891	4.543	0.652		1.06	
2013	69	12.32	163	4.234	5.094	0.86		0.81	
2014	63	11.25	226	4.143	5.421	1.278		0.54	
2015	62	11.07	288	4.127	5.663	1.536		0.45	
2016	68	12.14	356	4.22	5.875	1.665		0.42	
2017	43	7.68	399	3.761	5.989	2.228	2.56	0.31	0.342
2018	75	13.39	474	4.317	6.161	1.844		0.38	
2019	42	7.50	516	4.738	6.246	1.508		0.46	
2020	42	7.50	558	4.738	6.324	1.586		0.44	
Unknown	2	0.36	560	0.693	6.327	5.634		0.12	

Table 1 and Figure.1 shows a significant increase in publication started from 2011 with 49 publications and 2018 was the most productive year with 75 (13.39%) publications followed by 2013 with 69 (12.32%) and 2016 with 68 (12.14%) publications respectively. The publications output of the last ten years depicts the relative growth rate (RGR) mean and mean doubling time (DT) of the publications in the area of Dyscalculia during the study period. It is observed that the relative growth rate (RGR) is increased from 0.652 in the year 2012 to 1.586 in the year 2020 for the study period and the mean relative growth rate was found to be 1.647. At the same time, the doubling time of the publications gradually decreased from 1.06 in the year

2012 to 0.44 in the year 2020 and the mean doubling time of the publications was found to be 0.342 for the given period. It is inferred from the above discussion that the relative growth rate of the publication is gradually increased while doubling time of the publication is gradually decreased.



**Figure 1**

**Year-wise output of publications, Relative Growth Rate and Doubling Time**

**Degree of Collaboration (DC)**

The degree of collaboration of authors year-wise is shown in Table 2. The extent of degree of collaboration in Dyscalculia research has been measured with the help of a formula devised by K.Subramanian,

$$DC = \frac{Nm}{Nm + Ns}$$



**Table 2 Degree of Collaboration in Dyscalculia**

Year	Single	Two	Three	Four	Five	>Five	Total	More than one Author(Nm)	Degree of Collaboration DC=(Nm/Nm+NS)
2011	6	16	12	10	1	4	49	43	0.88
2012	4	8	9	14	6	4	45	41	0.91
2013	6	14	14	9	15	11	69	63	0.91
2014	4	16	13	9	9	9	60	56	0.93
2015	7	12	16	9	8	10	62	55	0.89
2016	16	19	6	7	11	9	68	52	0.76
2017	5	5	11	10	6	6	43	38	0.88
2018	3	20	9	18	9	15	74	71	0.96
2019	2	9	8	13	5	9	46	44	0.96
2020	3	8	7	6	7	13	44	41	0.93
<b>Total</b>	<b>56</b>	<b>127</b>	<b>105</b>	<b>105</b>	<b>77</b>	<b>90</b>	<b>560</b>	<b>504</b>	<b>0.90</b>

Table 2 shows that the observed degree of collaboration in Dyscalculia during the period 2011-2020 lies from the range of 0.88 in 2011 to 0.93 in 2020. The study revealed that multiple authors produced 90% of publication in the field of Dyscalculia during 2011-2020. Hence the study concludes that out of 560 publications multiple authors contributed to the maximum i.e.504 (90%), and single authors contributed to the minimum i.e. 56 (10%).

**Table 3 Most preferred journals for publishing by authors**

Source Title	No. of publications	%	Rank	Citations	Impact factor 2020
Frontiers in Psychology	49	8.75	1	570	2.067
Journal of Learning Disabilities	27	4.82	2	620	2.144
Research in Developmental Disabilities	27	4.82	2	262	2.04
Developmental Science	16	2.86	3	483	3.722
Plos One	14	2.50	4	284	2.740
Journal of Experimental Child Psychology	14	2.50	4	580	2.301

Frontiers in Human Neuroscience	13	2.32	5	198	2.673
Neuroimage	11	1.96	6	361	5.902
Learning and Individual Differences	10	1.79	7	246	1.916
Cortex	9	1.61	8	281	0.440

From the above Table 3, it is inferred that there were 560 articles published in 226 different journals. Among which *Frontiers in Psychology* (IF<sub>2020</sub> =2.067) ranked first with 49 (8.75%) articles on Dyscalculia. *Journal of Learning Disabilities* (IF<sub>2020</sub> = 2.144) and *Research in Developmental Disabilities* (IF<sub>2020</sub> =2.04) ranked second with 27 (4.82%) articles published on the subject, followed by *Developmental Science* (IF<sub>2020</sub> =3.722) with 16 (2.86%) articles. These three journals that appeared to be the most preferred are also listed in the above table. Moreover, *Neuroimage* ranked sixth with 11 articles had the highest impact factor (IF<sub>2020</sub> =5.902). *Journal of Learning Disabilities* ranked 2<sup>nd</sup> with 620 citations, followed by *Journal of Experimental Child Psychology* with 580 and *Frontiers in Psychology* with 570 citations. All the 10 journals were contributed with more than nine publications to the total world publications during the study period.

**Table 4 Language-wise research output**

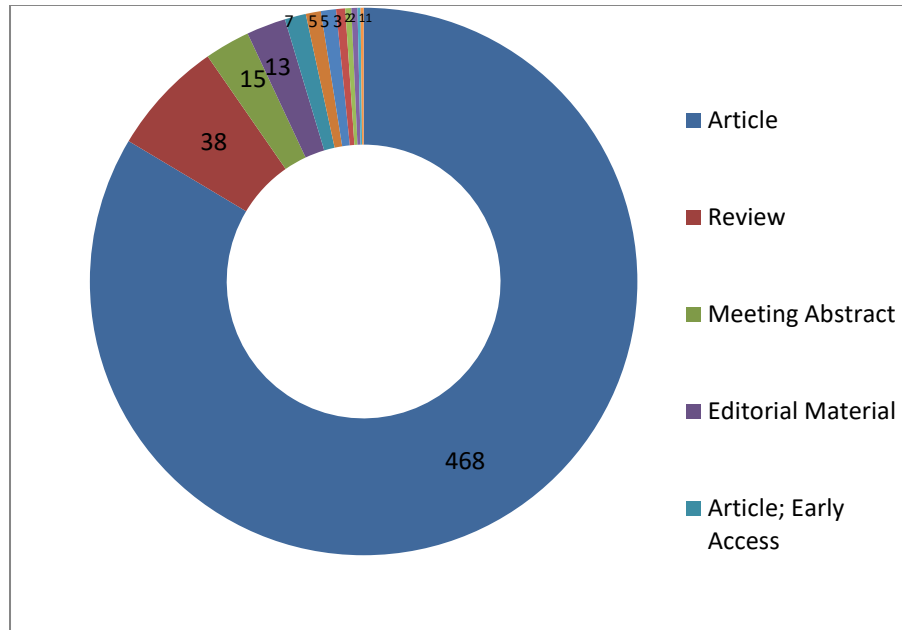
S.No	Language	No. of publications	%
1	English	516	92.14
2	German	29	5.18
3	Spanish	6	1.07
4	French	5	0.89
5	Russian	1	0.18
6	Portuguese	1	0.18
7	Dutch	1	0.18
8	Hungarian	1	0.18
	<b>Total</b>	<b>560</b>	<b>100</b>

Table 4 indicates that document analysis by language-wise on Dyscalculia. It is observed that the English Language was the highly preferred language for writing documents on Dyscalculia i.e.516 (92.14%) documents.

**Table 5 Types of documents published**

<b>S.No</b>	<b>Types of Documents</b>	<b>No. of publications</b>	<b>Percentage</b>
1	Article	468	83.57
2	Review	38	6.79
3	Meeting Abstract	15	2.68
4	Editorial Material	13	2.32
5	Article; Early Access	7	1.25
6	Review; Book Chapter	5	0.89
7	Letter	5	0.89
8	Correction	3	0.54
9	Article; Proceedings Paper	2	0.36
10	Book Review	2	0.36
11	Article; Book Chapter	1	0.18
12	News Item	1	0.18
	<b>Total</b>	<b>560</b>	<b>100</b>

Table 5 and Figure 2 show the types of documents published during the study period (2011-2020). There were 560 publications related to Dyscalculia research in the database, including 12 document types 468 (83.57%) journal articles, review 38 (6.79%) and other documents types like meeting abstract, article; early access, review; book chapter, letter, correction, article; proceedings paper and others were 54 (9.64%).



**Figure 2** Goughnut diagram showing the types of documents published

**Table 6** Most prolific authors in the field of Dyscalculia

S.No	Author	No. of publications	Percentage	Total citations	ACPP*	h-index
1	De Smedt B	21	3.75	587	27.95	10
2	Von Aster M	19	3.39	442	23.26	8
3	Kucian K	18	3.21	404	22.44	7
4	Ansari D	15	2.68	629	41.93	10
5	Desoete A	13	2.32	321	24.69	10
6	Noel MP	12	2.14	316	26.33	9
7	Menon V	12	2.14	378	31.50	9
8	Anobile G	11	1.96	212	19.27	7
9	Ghesquiere P	1	1.96	120	10.91	6
10	Burr DC	10	1.79	212	21.20	7
11	De Visscher A	10	1.79	146	14.60	7
12	Szucs D	9	1.61	445	49.44	8
13	Ashkenazi S	9	1.61	309	34.33	8
14	Moll K	8	1.43	370	46.25	7
15	Devine A	6	1.07	363	60.50	6

\*ACPP-Average Citation Per Paper

Table 6 shows the contribution of the most prolific authors in the field of Dyscalculia. It is observed that De Smedt B had contributed the highest number of articles i.e. 21 (3.75%) publications having total citations of 587 with an ACPP of 27.95 citations for his research work.

Second-highest number of publications i.e. 19 (3.39%) having total citations of 442 with an ACPP of 23.26 citation was contrived by Von Aster M and then third-highest number of publications i.e. 18 (3.21%) having total citations of 404 with an ACPP of 22.44 by Kucian K. Top three authors, on the qualitative parameter h-index, were De Smedt B (h-index = 10), the Von Aster M (h-index = 8) and Kucian K (h-index = 7). The remaining researchers also significantly contributed to the field. It can be concluded that De Smedt B, Ansari D, and Desoete A M have emerged as the highest number of h-index = 10 in the field of Dyscalculia at the global level.

**Table 7 Contribution of top-10 institutions in 560 papers**

S. No	Name of Institution	No. of Publications	%	Rank	TC	ACPP	Country
1	University in Leuven	23	4.11	1	824	35.83	Belgium
2	Stanford University	23	4.11	1	464	20.17	California
3	UCL –University College London	19	3.39	2	833	43.84	England
4	University of Padua	19	3.39	2	353	18.58	Italy
5	University Catholique de Louvain	17	3.04	3	354	20.82	Belgium
6	University Western Ontario	16	2.86	4	631	39.44	Canada
7	University Zurich	15	2.68	5	342	22.80	Switzerland
8	University Cambridge	13	2.32	6	499	38.38	England
9	University Florence	13	2.32	6	213	16.38	Italy
10	University Ghent	13	2.32	6	321	24.69	Belgium

Table 7 presents the contribution of different institutions on Dyscalculia. Of these top ten institutions which are ranked by total articles, three are from Belgium, two each from England and Italy, whereas California, Canada and Switzerland have one institution each. University in Leuven and Stanford University has the maximum number of articles (4.11%) followed by University College London and University of Padua (3.39%) and University Catholique de Louvain, Belgium (3.04%). On the parameter of citation impact, University College London, England has accumulated the most number of citations (833 citations) with an ACPP of 43.84 citations, followed by University in Leuven, Belgium (824 citations) with an ACPP of 35.83

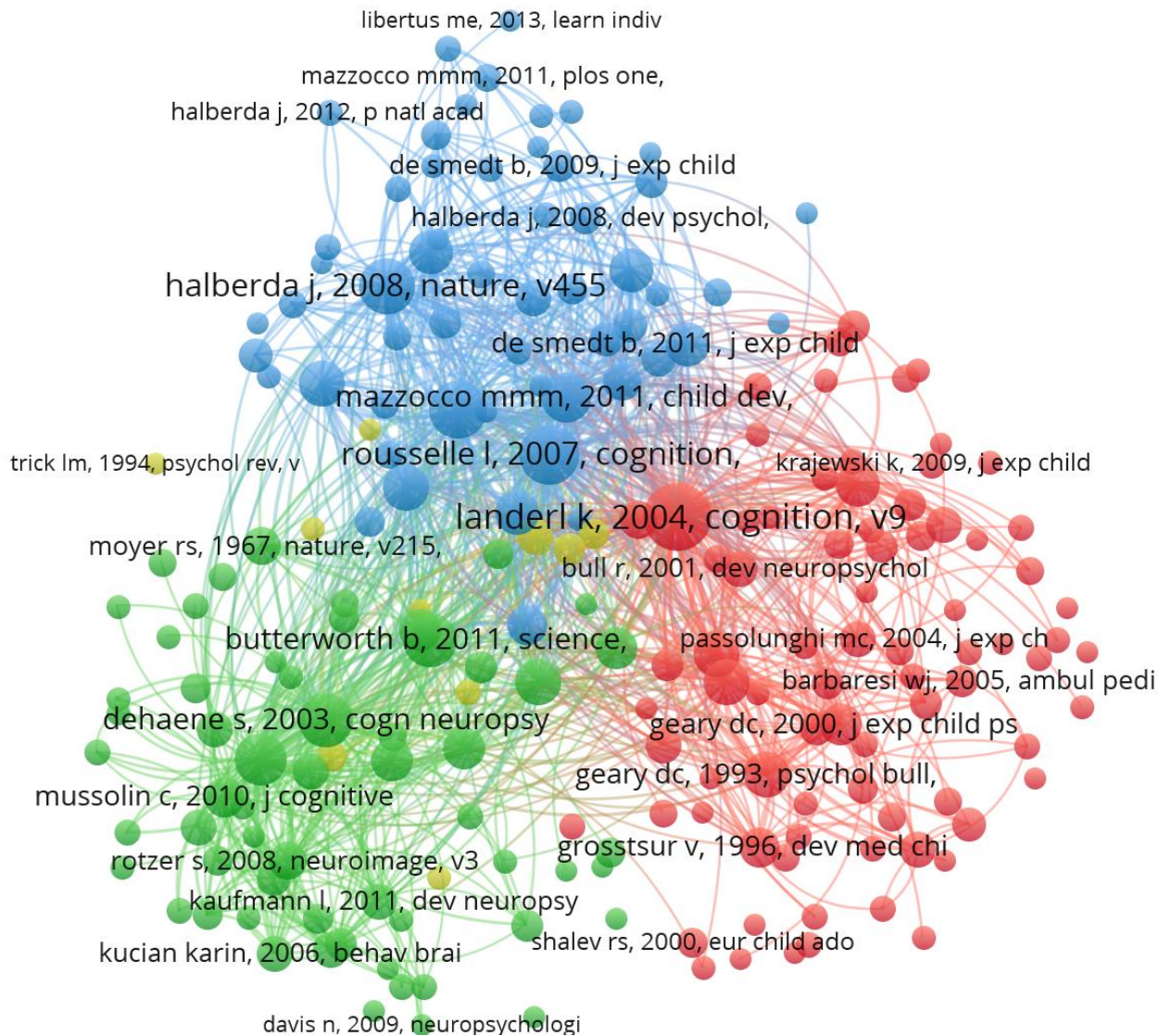


			learning disabilities: A comparison of symbolic vs non-symbolic number magnitude processing			
3	Piazza M	2010	Developmental trajectory of number acuity reveals a severe impairment in developmental dyscalculia	<i>Cognition</i> , 116(1), pp.33-41.	136	3285
4	Halberda J	2008	Individual differences in nonverbal estimation ability predict maths achievement.	<i>Nature</i> , v455, pp.665-669.	121	2772
5	Butterworth B	2011	Dyscalculia: from brain to education	<i>Science</i> , 332(6033), pp.1049-1053.	117	2175
6	Dehaene S	2003	Three parietal circuits for number processing	<i>Cognitive neuropsychology</i> , 20 (3-6), pp.487-506.	117	2693
7	Price Gr	2007	Impaired parietal magnitude processing in developmental dyscalculia	<i>Current Biology</i> , 17(24), pp.R1042-R1043.	108	2671
8	Mazzocco M MM	2011	Impaired acuity of the approximate number system underlies mathematical learning disability (dyscalculia)	<i>Child Development</i> , 82(4), pp.1224-1237.	101	2524
9	Geary Dc	2004	Mathematics and learning disabilities	<i>Journal of learning disabilities</i> , 37(1), pp.4-15.	87	2068
10	Geary Dc	1993	Mathematical disabilities: cognitive, neuropsychological, and genetic components	<i>Psychological bulletin</i> , 114(2), pp.345.	84	2063
11	Von Aster Mg	2007	Number development and developmental dyscalculia.	<i>Developmental medicine &amp; child neurology</i> , 49(11), pp.868-873.	84	1831
12	Landerl K	2009	Dyslexia and dyscalculia: Two learning disorders with different cognitive profiles	<i>Journal of experimental child psychology</i> , 103(3), pp.309-324.	83	1952
13	Mussolin C	2010	Symbolic and non symbolic number comparison in children with and without dyscalculia	<i>Cognition</i> , 115(1), pp.10-25.	82	2209
14	Feigenson L	2004	Core systems of number	<i>Trends in cognitive sciences</i> , 8(7), pp.307-314.	81	2050

15	Geary Dc	2007	Cognitive mechanisms underlying achievement deficits in children with mathematical learning disability	<i>Child development</i> , 78(4), pp.1343-1359.	76	2002
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The analysis of Table 8 on the visualization of co-citation with the cited references analysis unit is obtained with research documents and the result showed that Landerl K, (2004) scored the highest citations (180) with 3999 links, Rousselle L, (2007) occupied the second position with 143 citations and 3810 links. A third position was occupied by Piazza M, (2010) with 136 citations and 3285 links. The top three cited authors published their papers in *Cognition* journal. The top four citation scorer was Halberda J (2010) published the paper in *Nature* and scored 121 citations with 2772 links. The first and twelfth highly cited articles were published by the same authors and in these two articles, the authors provide a comprehensive analysis of different periods in 2004 and 2009, respectively, and point out the future research directions. The top 15 highly-cited documents in the co-citation network are presented in Table 8.





**Figure 4 Co-citation and Cited references visualization generated by VOSviewer**

The size of each node in Figure. 4 denotes the citation frequency of the corresponding article. Co-citation and cited references network map with 204 nodes and 4 clusters, the biggest nodes represented the more influential institutions in this field. The distance and thickness of links represented the degree of cooperation among the cited references.

**Table 9 Distribution of articles by zones (Bradford's Law)**

<b>Zone</b>	<b>No. of journals</b>	<b>No. of articles</b>	<b>Percent of articles</b>
1	10	190	33.93
2	45	181	32.32
3	175	189	33.75

Bradford's Law of Scattering is a bibliometric law formulated by Samuel Clement Bradford and coined by BC Vickery. Bradford's Law of Scattering indicates three productive zones where the number of journals published increases from one zone to the next according to the expression  $1:n:n^2:n^3 \dots$ . Accordingly, considering this expression in the present study, the total 560 articles are divided into three zones as presented in Table 9. The first zone contained only 10 journals with 190 (33.93%) articles. The second zone contained 45 journals with 181 (32.32%) articles. The third zone contained 175 journals. The number of journals in these zones should meet the ratio.  $1: n: n^2$ . The relationship of each zone in the present study is 10:45:175. This does not fit well into the expected Bradford's distribution.

## **Conclusion**

This study has highlighted various factors such as the year-wise distribution of the publication, Relative Growth Rate (RGR), Doubling time of publication, types of documents, degrees of collaboration, journal wise distribution of the publication, Bradford's law, etc. This study has proven to be a useful tool in the assessment of Research output on Dyscalculia (2011-2020).

Results of this study revealed that a total number of 560 contributions related to Dyscalculia were published during this period. The majority of the articles (92.14%) were in the English language. Therefore, it can be stated that the dominant language of the global publications in Dyscalculia is English. The results show that out of 560 publications in the field of Dyscalculia, 174 (31.07%) articles were written by the top fifteen authors of this field.

The observed degree of Collaboration in Dyscalculia during the period 2011-2020 lies from the range of 0.88 in 2011 to 0.93 in 2020. The study revealed that multiple authors produced 90% of publications in the field of Dyscalculia during 2011-2020. Hence it is

concluded that out of 560 publications multiple authors contribute the highest i.e. 504 (90%) and the lowest by single authors i.e. 56 (10%) only. Among the most productive Institutions, University in Leuven and Stanford University have a maximum number of articles (4.11%) followed by University College London and University of Padua (3.39%). The data does not fit into Bradford's law regarding the core journals. The future of the research needs to give a scientific definition of learning disabilities in mathematics, consummate the assessment system, explore the causes and defects, expand the areas of research and conduct comprehensive intervention research.

## References

1. Anandhalli, G. B. (2021). Cloud computing technology: A scientometric assessment of global level research output based on the Scopus database. *Library Philosophy and Practice (ejournal)*, 4737.
2. Balasubramani, R., & Murugan, C. (2011). Mapping of Tapioca (Sago) research in India: A scientometric analysis. *Library Philosophy and Practice*, 1.
3. Bradford, S. C. (1934). Sources of information on specific subjects. *Engineering*, 137, 85-86.
4. Costa, D. F., Carvalho, F. D. M., & Moreira, B. C. D. M. (2019). Behavioral economics and behavioral finance: A bibliometric analysis of the scientific fields. *Journal of Economic Surveys*, 33(1), 3-24.
5. Dhawan, S. M., Gupta, B. M., & Gupta, R. (2018). Supercomputing: A scientometric assessment of global publications output during 2007–16. *COLLNET Journal of Scientometrics and Information Management*, 12(2), 197-213.
6. Ermolova, T. V., Ponomareva, V. V., & Florova, N. B. (2016). Dyscalculia in children as a systemic problem of education. *Journal of Modern Foreign Psychology*, 5(3), 7-27.
7. Gomes, T. R. H., Fernando, M. H., & Regnia, C. M. (2018). Global trends in nanomedicine research on triple negative breast cancer: A bibliometric analysis. *Int J Nanomedicine*, 13, 2321-2336.
8. Gupta, R., Gupta, B. M., Garg, A. K., & Bansal, J. (2018). Dysgraphia: A scientometric assessment of global publications output during 2007-16. *International Journal of Library Information Network and Knowledge*, 3(1), 103-117.

9. Indrani, M., & Murugan, C. (2021). Research output on Fossil Fuels publications in India: A bibliometric study. *Library Philosophy and Practice*, 1-15.
10. Joshua, V., & Sivaprakasam, S. (2020). Coronavirus: Bibliometric analysis of scientific publications from 1968 to 2020. *Medical journal of the Islamic Republic of Iran*, 34, 64.
11. Kalimuthu, K., Jayabal, R., & Baby, K. (2018). Publication productivity of bharathiar university, Tamil Nadu: A bibliometric studies. *Journal of Current Trends in Library and Information Science: International Refereed Journal*, 5(1), 5-11.
12. Lawrence, D. W., Sharma, B., Griffiths, R. R., & Carhart-Harris, R. (2021). Trends in the Top-Cited Articles on Classic Psychedelics. *Journal of Psychoactive Drugs*, 1-16.
13. Lewis, K. E., & Fisher, M. B. (2016). Taking stock of 40 years of research on mathematical learning disability: Methodological issues and future directions. *Journal for Research in Mathematics Education*, 47(4), 338-371.
14. Mahapatra, M. (1985, July). On the validity of the theory of exponential growth of scientific literature. In *Proceedings of the 15th IASLIC Conference, Bangalore* (pp. 61-70).
15. Mazzocco, M. M., & Rasanen, P. (2013). Contributions of longitudinal studies to evolving definitions and knowledge of developmental dyscalculia. *Trends in Neuroscience and Education*, 2(2), 65-73.
16. Murugan, C. (2017). Research productivity on nephrology output during 2007-2016: A bibliometric study. *Library Philosophy and Practice (e-journal)*. 1624, 1-19. <https://digitalcommons.unl.edu/libphilprac/1624>
17. Murugan, C., & Balasubramani, R. (2012). Scientometric mapping of remote sensing research output: A global perspective. *Library Philosophy and Practice*, 1.
18. Narzary, R & Murugan, C. (2018). Mapping of colorectal cancer research output with a focus on India. *Library Philosophy and Practice*,
19. Narzary, R, and Murugan, C. (2017). Authorship pattern & collaboration in ETRI Journal: A scientometric study. *International Journal of Research –Granthaalayah*, 5 (7), 608-622
20. Ram, S. (2018). Word Blindness” (Dyslexia): A bibliometric analysis of global research in last fifty years. *DESIDOC Journal of Library & Information Technology*, 38(4), 286-294, DOI : 10.14429/djlit.38.4.12791

21. Salzer, C., & Heine, J. H. (2016). Students' skipping behaviour on truancy items and (school) subjects and its relation to test performance in PISA 2012. *International journal of educational development*, 46, 103-113.
22. Schuchardt, K., Fischbach, A., Balke-Melcher, C., & Maehler, C. (2015). The comorbidity of learning difficulties and ADHD symptoms in primary-school-age children. *Zeitschrift fur Kinder-und Jugendpsychiatrie und Psychotherapie*, 43(3), 185-193.
23. Senel, E. (2020). The Last Three Decades of Contact Dermatitis: A Bibliometric Analysis of Global Publications on Contact Dermatitis. *Journal of the Dermatology Nurses' Association*, 12(5), 223-231.
24. Subramanyam, K. (1983). Bibliometric studies of research collaboration: A review. *Journal of information Science*, 6(1), 33-38.
25. Vijayalakshmi, M., & Swaminathan, S. (2017). A scientometric analysis of learning disabilities. *Journal of Current Trends in Education and Research*, 9(1), 1-8.