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# International comparative research in early childhood education: A systematic and thematic review

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***Abstract:*** *Recent years have witnessed a surge of interest in international comparative (IC) research within the realm of early childhood education (ECE), spurred by a series of influential IC reports published by international agencies and organizations in the early 2000s. These landmark studies, coupled with global endeavours to enhance the well-being of young children amid a backdrop of increasing societal changes, have catapulted IC research to the forefront of early childhood education. In response to the growing popularity and significance of IC research in ECE, there emerged a pressing need for comprehensive literature reviews that could consolidate the intellectual structures of the field and guide future initiatives. To address this demand, this study conducted a systematic review of academic publications on IC research in ECE from 2001 to 2022, utilizing bibliometric visualization tools. Through rigorous statistical, citation, and co-citation analyses, we identified the publication trend, leading researchers, major collaborative networks, and influential works within the field. Furthermore, our thematic review of these studies revealed key research areas driving IC research in ECE. Based on these insights, the study presents recommendations for future research directions.*

***Keywords:*** *International comparative research, early childhood education, systematic review, thematic review, bibliometric visualization*

## Introduction

International comparative (IC) research that examines variations on the same matter across national boundaries has a prominent place in early childhood education (ECE). As early as in 1959, in the 25th Anniversary Meeting of the Society for Research in Child Development, Anmrson and Anderson stated that childhood studies were shifting towards investigating identical problems in two or more countries for comparative purposes. For them and others in the meeting, these attempts would "come down with increasing force within the next generation as international and internal competition for a place in the sun is intensified" (Sigel, 1959, p.198).

RESEARCH Volume 09 Issue
ISSN: 2639-5274, 2096-5168

The adoption of the World Declaration on Education for All (EFA) in 1990 and subsequent affirmation of the expanded version of basic education in the Dakar Framework for Action on EFA in 2000 opened a new page in the development of IC research in ECE. Their purpose was to identify international differences in order to create equity and sustainability in children's education (Hagglund & Samuelsson, 2009). In 1998, the Organisation for Economic Co-operation and Development (OECD) initiated an extensive review of early childhood education and care across twelve countries. This work led to the publication of a comparative report, entitled Starting Strong: Early Childhood Education and Care (2001). For the past 20 years, five further OECD reports were released and many countries were included. According to Moss et al. (2016), "Starting Strong, as it was called, was a landmark in the comparative study of early childhood education and care" (p.343).

While OECD projects played a crucial role in stimulating IC studies in ECE, it is essential to recognize the broader international initiatives, particularly the work of UNESCO. UNESCO has been a supporting partner of the World Council of Comparative Education Societies since 1970 and has undertaken significant projects, including surveys on teachers in pre-primary education in low and middle-income countries. Noteworthy IC investigations in ECE also include a series of studies conducted by the International Association for the Evaluation of Educational Achievement (IEA), which focused on large-scale comparative research on early childhood policies and systems.

Contingent with the rise of attentions to young children and the influence of increasingly globalized condition on early childhood services, international commitments and investments in early childhood education have sparked interests in IC research among individuals, small groups and non-governmental organizations, resulting in a growing and ever-expanding body of literature (Bakker & Vliet, 2021). While research flourishes, some scholars might find it difficult to make sense of the intellectual structure of the field, thus using the information effectively. The real value of IC research for the field was brought into question when it became apparent that it was being conducted on a wide range of topics. Adding complexity to this issue, methodological problems were identified, due to, for example, the difficulty of achieving equivalence in comparison (Guevara, 2022). According to Cooke (2016), there is a pressing need for scholars to analyse existing knowledge in IC research to shed new light on dominant concerns and themes and provide guidance for emerging syntheses. This is particularly important when considering the impact of Covid-19 pandemic on early childhood education, and the need for comparative perspectives to develop effective strategies for addressing this global crisis (Toran et al., 2021). For these reasons, the current review aims to 1) analyse the dynamics of IC research in ECE; 2) identify topical interests in the field; 3) highlight potential future research directions.

RESEARCH Volume 09 Issue
ISSN: 2639-5274, 2096-5168

An initial search and analysis of extant reviews of literature on IC research in ECE was undertaken in order to ensure the value and contribution of the current study to the field (Torraco, 2005). A great number of literature reviews were located on ECE but no publication was found to have examined IC studies, leaving a significant gap in knowledge about the state of the literature in this field.

**Methodology**

With the application of the bibliometric analysis softwares VOSviewer and Citespace, this systematic review preforms a visual analysis of extant IC research in ECE. Traditional literature reviews tend to rely on researchers' subjective selection of articles without considering their research impact and thus potentially omitting some influential publications and resulting in less meaningful results (Linnenluecke et al., 2020). Through the use of computerized tools, this bibliometric study conducts a quantitative analysis to examine the progress and production of the field over 22 years. The review began in 2001 due to the significant impact of OCED's first publication on IC research in ECE, which became available in that year.

Bibliometric analysis focuses on the publications that are heavily cited by others and takes the view that these publications are foundations of a research field and important indicators of the field development (Chen & Song, 2017). By means of citation and co-citation analyses, bibliometric review identifies these studies and "the underlying patterns of relationships between articles" (Wang et al., 2017, p.668). According to Van Nunen et al. (2018), bibliometric reviews enable researchers to examine five aspects: 1) research productivity of individual researchers; 2) influential work; 3) co-citation and co-authorship patterns; 4) knowledge structure. Therefore, the purpose of this review is to examine the state of IC research in ECE, providing an analysis of the influential work, cooperation situation and knowledge structure of the field and suggesting directions for future studies.

***Data collection***

Initial data collection took place in the core collection of ISI Web of Science database (WoS), following a three-step method. First, a Boolean search was performed using a combination of the key words: ('early childhood' OR 'ece' OR 'preschool' OR 'kindergarten' OR 'early care and education') AND ('cross-nation*' or "cross-country" or 'internation*' or 'inter-nation*' or 'cross cultur*' or 'cross nation*' or 'cross

RESEARCH Volume 09 Issue
ISSN: 2639-5274, 2096-5168

country' or 'comparative') AND ('research' OR 'stud*'). 43622 publications were retrieved. The results were then filtered by years (2001-2022), document type (articles), language (English), and research areas (social sciences other topics, sociology, social issues, communication, educational research, cultural studies, and family studies). Research areas were selected after a pilot process in which all the 100 areas were individually tested for the relevance of their available literature. This filtering process trimmed the results to 6658 articles.

The second step involved a manual process of data selection. Researchers screened titles, abstracts and key words of the articles. The first 100 articles were reviewed by both to iteratively establish a shared understanding of the inclusion and exclusion criterion. The remaining work was then distributed equally. Decisions were made for the screening criteria. Excluded articles were non-comparative studies; studies irrelevant to education, comparative research in a single country and cross-country or international research in school contexts. After removing irrelevant publications from the data set, 381 articles were identified.

The third step was "citation expansion" (Chen et al., 2014, p.709) that focused on the collection of additional publications. All the sources that have cited the core dataset of the 381 articles were traced. It is understood that "even if an article does not contain any of the query terms in the topic search, if it cites at least one article in the core set, it becomes reasonable to assume that it maybe thematically relevant to the subject matter underlying the core dataset" (p.710). This citation expansion in the WoS database extracted 9740 publications. Their titles, key words and abstracts were screened and eventually 245 extra articles were merged into the core data set. Finally, a corpus of 626 articles were extracted for the bibliometric analysis. The expansion of citations is an important improvement on bibliometric techniques and is particularly useful in retrieving articles with low citation rates, especially those published in the most recent years.

**Statistical and citation analysis: Key metadata**

The study uses statistical and citation counts to identify key metadata within the literature, including developmental trends in publications and leading authors.

***Developmental trends in publications***

Trends in publications are important indicators of the growth of a research field. Figure 1 shows the developmental trends in IC research from 2001 to 2022, including the output quantity and number of citations each year. The figure indicates a steady growth of publications from six to 42 in the period of 2001-

2013 with a slight drop to 37 in 2014 but a quick rise in 2015 to 51, then a fall again to 39 in 2015. In the period from 2015 to 2019, the amount of research grew steadily. In the most recent two years, IC research increases dramatically to 58 in 2020 and in 2022, 31 articles are published. For the number of citations, there are five significant increases in the years of 2003, 2007, 2008, 2010 and 2013. This is accompanied by sharp drops in 2002, 2004, 2009, 2011 and from 2014 the downtrend continued.

The two curved lines parallel in the years of 2001 to 2007, demonstrating similar patterns of acceleration and deceleration but this trend stops in 2008 when the publication and citation numbers have a significant mismatch and this is the same in 2011 and 2012. The uptrend pattern for both numbers is demonstrated in 2013 but soon stops in 2014. There is a considerable difference from 2016 to 2020 with publications noticeably rising and citations gradually dropping. 2015 stands out as a remarkable year, with an upward trend in publications but a decline in citations. It is possible to infer that due to the recent publications, latest articles are not yet actively cited. The quantity of citations might increase in the near future. The results also imply that numbers of publication and citation do not necessarily correlate and production is not always equivalent to research impact.

RESEARCH
Volume 09 Issue
ISSN: 2639-5274, 2096-5168

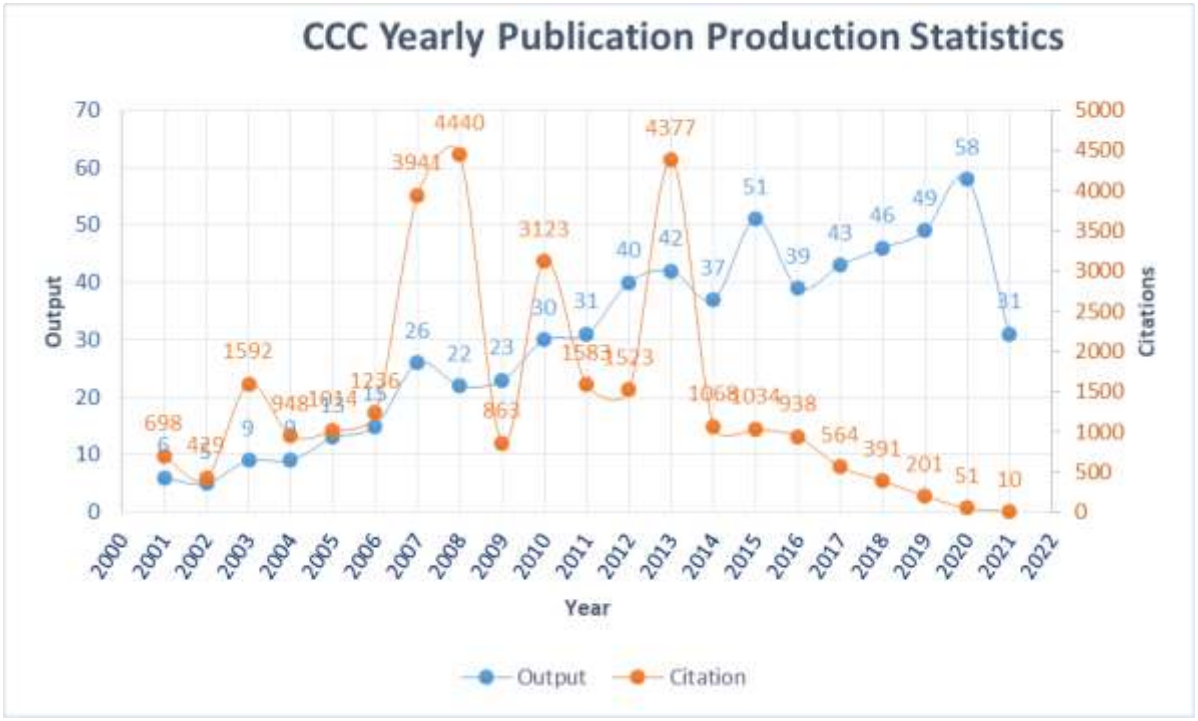



**Figure 1**. CCC yearly publication trends.

***Leading authors***

Leading authors are presented in Table 1. Authors are ranked by the number of their output. Values such as LC/local citation, GC/global citation, GC per output, weight score and H-index are presented to illustrate the authors' academic influences in the IC research community and their individual research contributions. Other information such as authors' affiliation and research area are also included.

ISSN: 2639-5274, 2096-5168

| *Rank* | *Author Name* | *Author Affiliation* | *Output* | *LC* | *GC* | *GC/output* | *weighted score* | *H-index* | *Research area* |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Wang Q | Cornell Uni USA | 20 | 102 | 1528 | 76 | 12.56 | 26 | (Educational)Psychology |
| 2 | Keller H | Uni of Osnabrueck, Germany | 20 | 87 | 890 | 45 | 4.29 | 30 | (Educational)Psychology |
| 3 | Bornstein | National Institute | 13 | 35 | 641 | 49 | 2.20 | 66 | (Educational)Psychology |

**Table 1**. Leading authors

ISSN: 2639-5274, 2096-5168

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | MH | of Child Health and Human Development, USA | | | | | | | |
| 4 | Kartner J | Uni of Osnabrueck, Germany | 11 | 57 | 523 | 48 | 2.71 | 18 | (Educational)Psychology |
| 5 | Lamm B | Uni of Osnabrueck, Germany | 10 | 36 | 388 | 39 | 1.40 | 16 | (Educational)Psychology |
| 6 | Lansford JE | Duke Uni, USA | 10 | 17 | 354 | 35 | 1.67 | 48 | (Educational)Psychology |
| 7 | Yovsi RD | Uni of Osnabrueck, Germany | 9 | 20 | 574 | 64 | 1.61 | 20 | (Educational)Psychology |
| 8 | Deater-Deckard K | Uni Massachusetts,USA | 9 | 17 | 336 | 37 | 1.53 | 36 | (Educational)Psychology |
| 9 | Sadeh A | Tel Aviv Uni Israel | 8 | 19 | 585 | 73 | 2.20 | 54 | PEDIATRICS |
| 10 | Mindell JA | St Josephs Uni, USA | 8 | 16 | 585 | 73 | 2.20 | 37 | PEDIATRICS |
| 11 | Nielsen M | Uni Queensland, Australia | 7 | 9 | 168 | 24 | 1.73 | 26 | (Educational)Psychology |
| 12 | Fink G | Harvard Uni, USA | 7 | 5 | 427 | 61 | 1.29 | 25 | PEDIATRICS |
| 13 | Lee K | Univ Toronto, Canada | 7 | 42 | 682 | 97 | 1.13 | 16 | Education |
| 14 | Ezzati M | Uni London Imperial, England | 7 | 53 | 6240 | 891 | 1.06 | 100 | PEDIATRICS/NUTRITION DIETETICS |
| 15 | Chaudhary N | Uni Delhi, India | 6 | 37 | 364 | 61 | 1.02 | 16 | (Educational)Psychology |
| 16 | Martorell R | Emory Uni, USA | 6 | 37 | 3813 | 636 | 0.53 | 70 | PEDIATRICS |
| 17 | Koletzko B | Uni Munich, Germany | 6 | 1 | 140 | 23 | 0.52 | 64 | PEDIATRICS/NUTRITION DIETETICS |
| 18 | Dodge KA | Duke Uni, USA | 6 | 6 | 1063 | 177 | 0.43 | 108 | (Educational)Psychology |

In this table, LC means the number of times a publication is cited by other publications in the local collection, namely the corpus of 625 articles. GC represents the total number of citations of a publication in the Web of Science database. GC per output is the global citation count of each publication. Weighted score is the calculation of the authorship of total publications. A sole author receives a score 1, and an author with one co-author gets ½ etc. H-index is the measurement of the citation impact of an author's publications.

The main question asked in this analysis is whether the most prolific author makes the most research impact. Among all the authors on the list, Wang Q is the most prolific author with the highest numbers of publication (20), LC (102) and weighted score (12.56), followed by Keller H. However, neither of them has the greatest GC and H-index score. When ranked by GC, Ezzati M has the highest count (6240). The results indicate that the most prolific authors have the greatest impact on the local early childhood community, but

not on the global scholarly community, suggesting that their influence is largely confined to the field. This may be due to the fact that Wang and Keller both published in early childhood education.

**Bibliometric analysis: Intellectual structure**

Bibliometric analyses were performed through a combined use of VOSviewer and Citespace to synthesize patterns of knowledge production within the IC intellectual structure. VOSviewer and Citespace are both quantitative visualization tools but they have distinctive strengths. VOSviewer is primarily focused on mapping networks (Hernández-Torrano and Ibrayeva, 2020), while Citespace is designed to visualize emerging trends (Chen et al., 2014). By utilizing both tools in the analysis, the study seeks to uncover the intellectual structure of the field. This sets out this review apart from others, as most bibliometric analyses tend to rely on a single analytical tool.

***Cooperation analysis***

*Author cooperation*

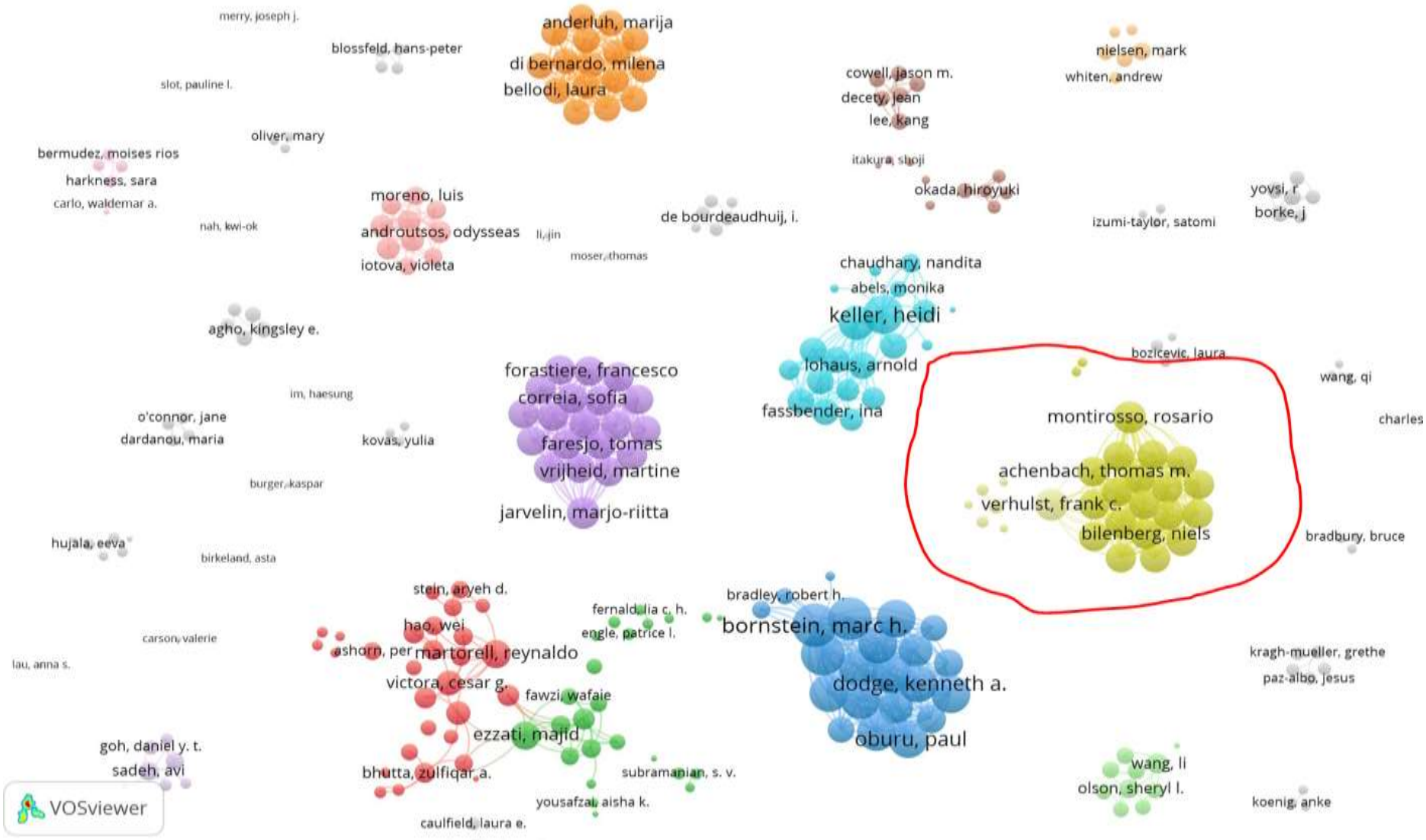
Based on the 625 publications that were contributed by 2574 different authors, authors' cooperation network was mapped via VOSviewer (Figure 2). A threshold value of two was used. 404 authors met the threshold and were included in the analysis because they published more than two articles together. In this network, link indicates the number of people that an author cooperates with and the link strength is determined by the times of cooperation the author has made. Each link has a strength. This is represented by a positive numerical value. For example, author A cooperated with author B and C so author A has two cooperation links. If author A cooperated with Author B three times, and with Author C four times, Author A's link strength is seven. The visualization was developed based on the authors' link strength.

RESEARCH Volume 09 Issue
ISSN: 2639-5274, 2096-5168

The analysis generated 70 clusters, 2004 cooperation links and 4127 link strengths. As shown in Figure 2, Each author has a node and the size of the node reflects the number of publications of the author. Lines that connect them represent their cooperation links while the various colours indicate their collaboration clusters. Based on these links and clusters, some academic relations are revealed in the network. Among all, Verbuist had the most links and highest link strength, and formed the most actively collaborated research cluster (yellow cluster in Figure 2). Table 2 presents the top 15 authors by their link strength values.

A different result was reached when the collaborative patterns were analysed according to authors' publications. Table 2.1 lists the most productive authors' link strength. Keller had 17 articles and her link strength is 65. Wang also published 17 articles (11 listed under Wang Qi and 6 under Wang Q) on a total link strength of five. While Keller's academic background could not be verified, further analysis of Wang's profile reveals her Chinese heritage. Having completed her undergraduate studies in China before moving to the USA in 2000, Wang's bicultural background may have contributed to her ability to produce sole-authored publications. However, due to the nature of IC research, most authors collaborate with individuals from other countries. These findings suggest that research output might not be the result of research collaboration. For example, Verbuist's team of ten researchers collaborated closely, resulting in a high link strength. However, they only produced five publications together.

RESEARCH
Volume 09 Issue 02
ISSN: 2639-5274, 2096-5168



RESEARCH
Volume 09 Issue 02
ISSN: 2639-5274, 2096-5168

**Figure 2**. Authors' cooperation network in IC research in ECS.

**Table 2.** Top 15 authors by the link strength values.

| Author | Documents | Citations | Total link strength |
|---|---|---|---|
| keller, heidi | 17 | 507 | 65 |
| bornstein, marc h. | 12 | 481 | 81 |
| wang, qi | 11 | 609 | 4 |
| lansford, jennifer e. | 10 | 354 | 80 |
| deater-deckard, kirby | 9 | 336 | 78 |
| lamm, bettina | 9 | 214 | 52 |
| kaertner, joscha | 9 | 314 | 22 |
| sadeh, avi | 8 | 585 | 17 |
| ezzati, majid | 7 | 6240 | 34 |
| nielsen, mark | 7 | 168 | 14 |
| yovsi, relindis d. | 6 | 191 | 29 |
| mindell, jodi a. | 6 | 463 | 15 |
| wang, q | 6 | 900 | 1 |
| verhulst, frank c. | 5 | 335 | 101 |
| montirosso, rosario | 5 | 319 | 100 |

RESEARCH Volume 09 Is
ISSN: 2639-5274, 2096-5168

**Table 2.1.** The most productive authors' link strength.

| Author | Documents | Citations | Total link strength |
|---|---|---|---|
| verhulst, frank c. | 5 | 335 | 101 |
| montirosso, rosario | 5 | 319 | 100 |
| achenbach, thomas m. | 3 | 311 | 95 |
| bilenberg, niels | 3 | 311 | 95 |
| bjarnadottir, gudrun | 3 | 311 | 95 |
| dias, pedro | 3 | 311 | 95 |
| dobrean, anca | 3 | 311 | 95 |
| doepfner, manfred | 3 | 311 | 95 |
| esmaeili, elaheh mohammad | 3 | 311 | 95 |
| frigerio, alessandra | 3 | 311 | 95 |
| ivanova, masha y. | 3 | 311 | 95 |
| jusiene, roma | 3 | 311 | 95 |
| kristensen, solvejg | 3 | 311 | 95 |
| lecannelier, felipe | 3 | 311 | 95 |
| leung, patrick w. l. | 3 | 311 | 95 |

*Country cooperation*

Country cooperation was mapped using VOCviewer based on a full count of the co-authorship network. The minimum document threshold was set at 5. This means that a country with over five publications was included. From the 94 countries in which IC research was produced, 74 met the threshold. In Figure 3, each node denotes a country, and the size of the node is determined by the number of publications produced. Through the use of eight different colours, nodes are grouped to clusters because they are strongly linked in certain areas of research.

RESEARCH Volume 09 Iss
ISSN: 2639-5274, 2096-5168

A total of 2386 link strength was identified. Table 3 presents the top 15 collaborative countries by their link strength values. USA had 543 total link strength with 329 publications, followed by England and then China. The results suggest that cooperation with other countries had a positive impact in most cases. However, this was not the case for Canada and Australia, where the impact was less pronounced. While Australia is ranked eighth by the value of link strength, it has the fifth most research output and citation counts. Canada is the tenth by the link strength but is the sixth most productive country and has the third most citation count. While the results show that author cooperation and research performance may be related in some cases, the data regarding cooperation with other countries is inconclusive. Therefore, we cannot draw a firm conclusion about the relationship between cooperation and research performance in this field. While cooperation contributes to the research performance in many cases, the remarkable diversity and multidisciplinary scope in relation to research topics, contexts and researcher capabilities creates IC a complicated field in the ECS.

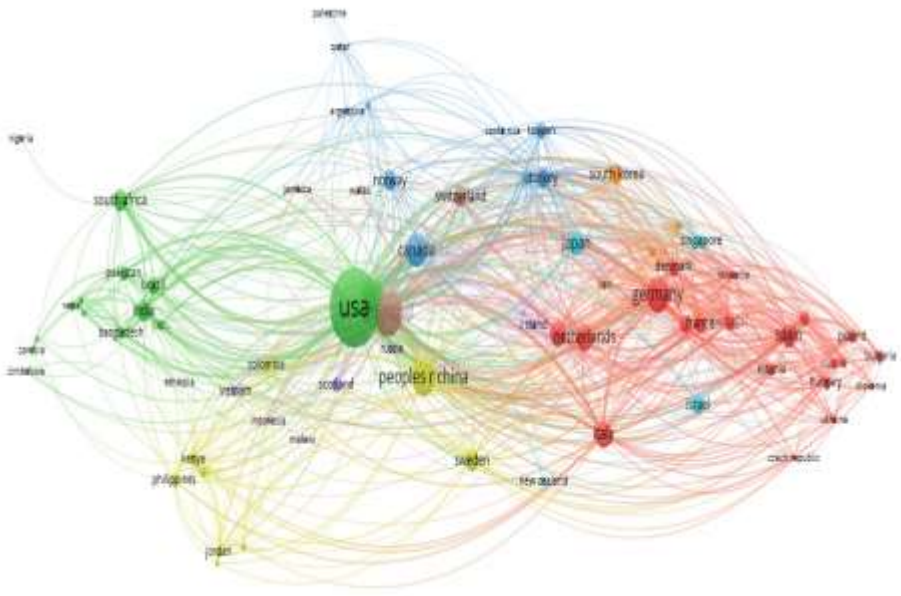



**Figure 3.** Country cooperation network**.**

**Table 3.** Top 15 collaborative countries.

RESEARCH Volume 09 Is
ISSN: 2639-5274, 2096-5168

| Country | Documents | Citations | Total link strength |
|---|---|---|---|
| usa | 329 | 22742 | 543 |
| england | 115 | 9867 | 275 |
| peoples r china | 83 | 3682 | 206 |
| germany | 71 | 2305 | 205 |
| italy | 38 | 948 | 168 |
| spain | 32 | 819 | 165 |
| netherlands | 38 | 1746 | 151 |
| australia | 60 | 1249 | 130 |
| finland | 35 | 859 | 130 |
| canada | 57 | 4192 | 115 |
| portugal | 16 | 520 | 114 |
| sweden | 27 | 589 | 109 |
| france | 20 | 619 | 104 |
| belgium | 16 | 807 | 101 |
| denmark | 17 | 515 | 98 |

***Co-citation analysis: Intellectual relationships and influential work***

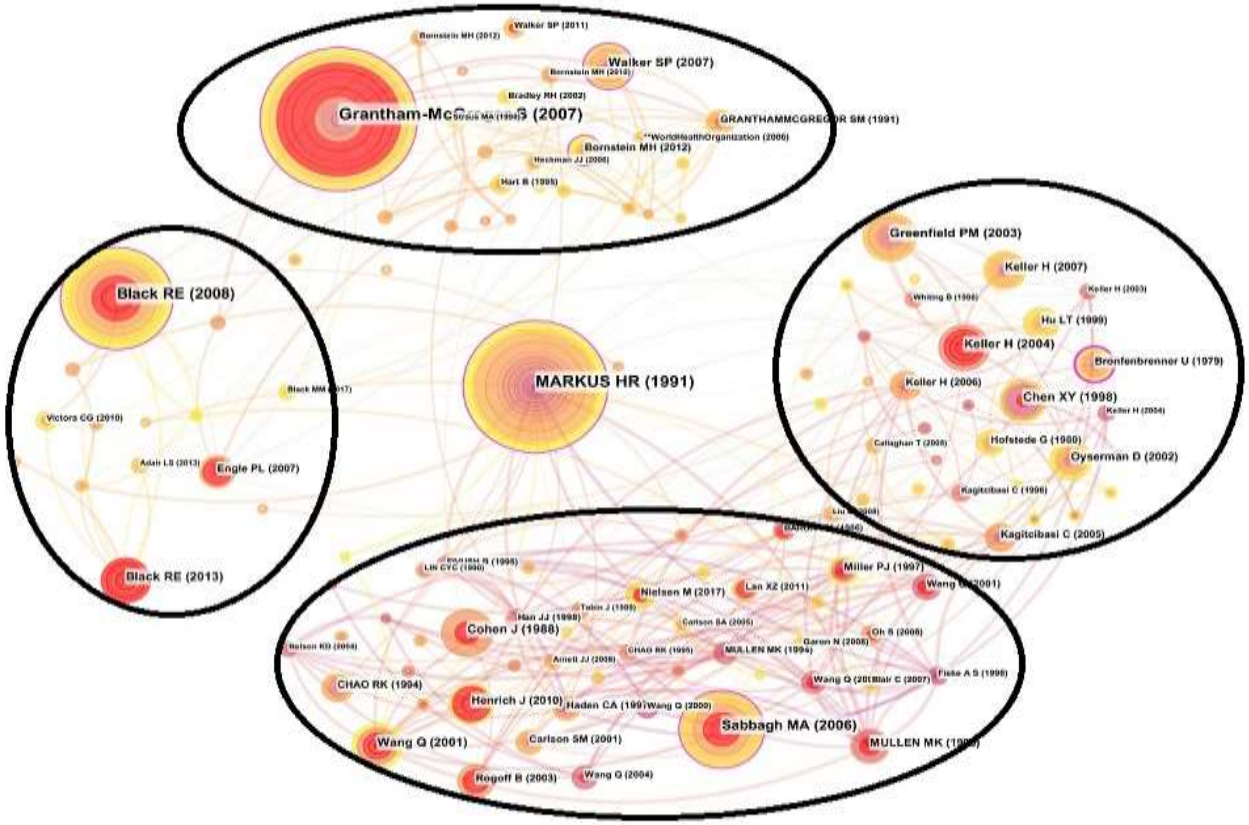
Co-citation analysis focuses on the construction of co-citation network. Underpinned by a belief that when two articles are cited together, they share a research interest, co-citation analysis in this study uses Citespace to explore how frequently two articles are cited together. By means of visualizing citation decisions, the analysis maps out intellectual relationships in the field (Linnenluecke et al., 2020; Wang et al., 2017).

In order to develop the network, an expanded dataset of cited references of the 625 articles was generated. This was influenced by the realization that an article's references were an essential aspect of its knowledge structure and fundamental parts of the co-citation network (Wang et al. 2017). A co-citation network of IC references from the expanded dataset of 38994 sources was generated. This network is depicted in Figure 4 using circled

clusters to visualize the connections among similar research areas. After applying the g-index of 10, 423 nodes and 1014 lines were identified. References with 10 or more citations were included in order to select those with high research impacts (Egghe, 2006).

Within the co-citation network, burst detection analysis was conducted using Kleinberg's burst detection algorithm. This technique was created to better understand the impact and significance of a reference over time and identify any sudden increase in attention. A reference that receives a high burst score is indicative of rapid interests, thereby a critical change in the field. According to Chen and Song (2017), leading researchers in bibliometric analysis, a reference with a score 3.0 or higher is considered a burst reference. Therefore, we have established the baseline score for such references as 3.0 or above. The burst score of a reference denotes the interests it has generated. The study identified 24 burst references, which are depicted in the figure as large red solid dots. For example, Black had two red solid dots both in 2008 and 2013. These indicate the burst effects of his studies. Markus (1991) received a large node due to high citations but there was no burst in his study therefore within his node, there was no red solid dot. Table 4 presents the burst references by the start of their burst years.

RESEARCH
Volume 09 Issue 02
ISSN: 2639-5274, 2096-5168



RESEARCH
Volume 09 Issue 02
ISSN: 2639-5274, 2096-5168

**Figure 4.** Co-citation network.

**Table 4.** Burst articles' reference list.

| |
|---|
| Mullen, M. K., & Yi, S. (1995). The cultural context of talk about the past: Implications for the development of autobiographical memory. *Cognitive Development, 10*(3), 407–419. |
| Wang, Q., & Leichtman, M. D. (2000). Same beginnings, different stories: A comparison of American and Chinese children's narratives. *Child Development, 71*(5), 1329–1346. |
| Wang, Q., Leichtman, M. D., & Davies, K. I. (2000). Sharing memories and telling stories: American and Chinese mothers and their 3-year-olds. *Memory, 8*(3), 159–178. |
| Chen, X. Y. Hastings, P. Rubin, K. Chen, H. Cen, G. Stewart, S. (1998). Child-rearing attitudes and behavioural inhibition in Chinese and Canadian toddlers: A cross-cultural study. *Developmental psychology, 34*(4), 677-687. |
| Wang, Q. (2001). Culture effects on adults' earliest childhood recollection and self-description: Implications for the relation between memory and the self. *Journal of Personality and Social Psychology, 81*(2), 220–233. |
| Wang, Q. (2004). The emergence of cultural self-constructs: Autobiographical memory and self-description in European American and Chinese children. *Developmental psychology, 40*(1), 3-15. |
| Wang, Q. (2001). "Did you have fun?" American and Chinese mother–child conversations about shared emotional experiences. *Cognitive Development 16* (2), 693-715. |
| Miller, P. J., Wiley, A. R., Fung, H., & Liang, C.-H. (1997). Personal storytelling as a medium of socialization in Chinese and American families. *Child Development, 68*(3), 557–568. |
| Keller, H. et al., (2004). Developmental consequences of early parenting experiences: self-recognition and self-regulation in three cultural communities. *Child Development, 75* (6), 1745-1760. |
| Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182. |
| Engle P. L et al. (2007). Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world. *Lancet, 369,* 229-242. |

| |
|---|
| Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford. |
| Cohen, J. (1988). *Statistical Power Analysis for the Behavioural Sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers. |
| Black R. E. et al. (2008). Maternal and child undernutrition: Global and regional exposures and health consequences. *Lancet, 371*, 243-260. |
| Sabbagh, M.A., et al. (2006) The development of executive functioning and theory of mind: A Comparison of Chinese and US Preschoolers. *Psychological Science, 17*, 74-81. |
| Oh, S., & Lewis, C. (2008). Korean preschoolers' advanced inhibitory control and its relation to other executive skills and mental state understanding. *Child Development, 79*(1), 80-89. |
| Grantham-McGregor, S. et al. (2007). Developmental potential in the first 5 years for children in developing countries. *Lancet, 369*, 60-70. |
| Lan, X. et al. (2001). Investigating the links between the subcomponents of executive function and academic achievement: A cross-cultural analysis of Chinese and American preschoolers. *Journal of Experimental Child Psychology*, 108, 677-692. |
| Black, R.E., et al. (2013) Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet, 382*, 427-451. |
| Henrich J, Heine SJ, Norenzayan A. (2010). The weirdest people in the world? *The Behavioural and Brain Sciences.* 33, 61–83. |
| Walker S. P. et al. (2011). Inequality in early childhood: Risk and protective factors for early child development. *Lancet, 378*, 1325-1338. |
| Tobin, J. et al. (2009). *Preschool in three cultures revisited: China, Japan, and the United States*. University of Chicago Press. |
| Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. |
| Nielsen, M. et al. (2017). The persistent sampling bias in developmental psychology: A call to action. *Journal of Experimental Child Psychology, 162*, 31-38. |


### *Current analysis 1: topical areas*

We conducted a thematic analysis of the burst studies and their citing sources to identify topical interests within the field. As previously mentioned, a sudden increase in citations of a particular study indicates a hot spot during a specific

period. This is particularly true when the sources that cite the study also receive a high number of citations themselves. We selected the citing sources using the following criteria: 1) being published within the burst period of the relevant studies; 2) having received 20 or more citations; 3) sharing the same focus as the burst study they cited. As a result, two burst studies (Rogoff, 2003; Tobin, 2009) were excluded, as their citing articles did not meet the required citation threshold.

Systematic reviews of the content of 140 articles (burst and citing sources) were performed to confirm underlying topics, which were then grouped into themes. To facilitate the process, a concept matrix was formulated to organize connections of the information as suggested by Webster and Watson (2002). The matrix listed the articles by title, year and author on the vertical axis, with research questions, design and key findings listed across the horizontal axis. Initially, the 24 burst studies were considered as potential topics but as the analysis progressed, the topics were defined through an iterative study of the content of the 140 articles. Recurrent topics in the final matrix were cross-checked by the researchers to reach a consensus on the coding of ambiguous items. Subsequently, the topics were categorized into themes, with each group of topics representing a distinct speciality or thematic concentration.

Results from the analyses suggest that IC research in ECE is interdisciplinary and the knowledge base in the field derives from the output of various topics. Five recurrent and interrelated themes seem to summarize the topical areas in the field (Figure 5), including: 1) children's learning and development; 2) children's health, wellbeing and disability; 3) parenting and family environment; 4) childhood risks; and 5) early childhood programs and pedagogies. Each theme is discussed in order of prevalence in the following section.

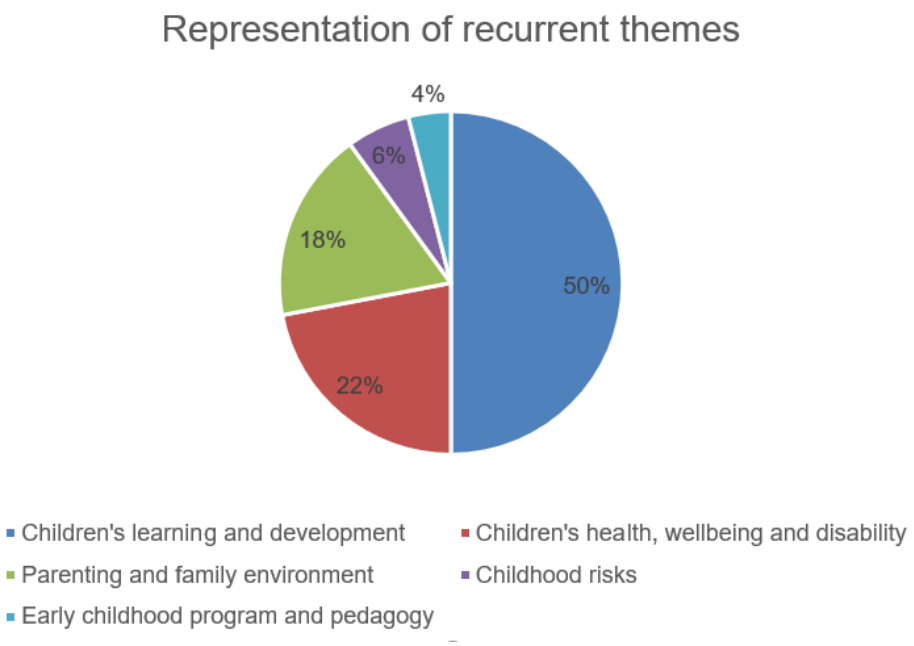



**Figure 5.** Recurrent themes.

*Children's learning and development*

The leading edge of the IC literature in the past 22 years lied in exploring children's learning and development across countries. The dominance of this theme was clearly established by the number of hot topics (n=68), representing 50% of the readings analysed. The average year of publications is 2006, with a range from 2001 to 2018, with 58 published before 2010. While there were no major peaks in the most recent decade, influential studies in this theme were still present. It is possible that the shorter timeframe did not allow enough time to accumulate a significant number of citations.

As identified in the publications, this theme was supported by seven topics, including general, physical, social, cognitive and emotional learning and

development, learning and development of bilingual children and children's own perspectives on their learning and development.

The largest topic within this theme was children's cognitive development (n=27). These investigations included cross-country analyses of various aspects of cognitive development, such as executive function and attention. Numerous countries were represented in these studies, with the US and China being the most frequently studied. The majority of the studies focused evaluating children's cognitive performance.

*Children's health, wellbeing and disabilities*

The second theme, comprising 30 publications and accounting for 22% of the total, focused on children's health and wellbeing. The key idea was that nutrition and feeding practices played an important role in children's health. Hot topics surfaced were children's food intake, with a particular emphasis on complementary feeding for infants and children's consumption of sugary or meat-based foods. These topics were closely linked to issues of malnutrition that encompassed both undernutrition and childhood obesity. All the contexts studied were in low and middle-income countries.

A shift was observed in the publications in recent years from a focus on children's body conditions towards general wellbeing that addressed supportive strategies and interventions. In addition, publications within this theme also addressed children's disabilities, exploring the characteristics and needs of disabilities and their implications for children's health and wellbeing. The common thread connecting these publications was the focus on intervention and prevention. This finding is consistent with Mitchell's (2013) assertion that

research involving children with disabilities is an attempt to identify supporting strategies.

*Parenting and family environment*

Parenting and family environment emerged as a prominent theme, with 24 articles (18%). Analysis identified five recurrent topics, including parental ethnotheories, parent child conversations, family socialization environment, family discipline and lesbian families.

Cultural variation in parent-child conversations was mentioned most frequently across the publications. These studies looked at how parents, in particular mothers talked to young children and the effects of these conversations on children's acquisition of certain knowledge, such as emotional responses.

With the increasing recognition of parental ethnotheory as a catalyst for parenting practices, parental ethnotheory was seen as a concept that attracted notable interest in IC research in the years between 2006 and 2009. These studies looked at parents' ethnotheories regarding childcare and parent sensitivity across cultural communities.

Family socialization environment was a third aspect of parenting and family environment included in the reviewed literature. Parents' socialization practices were central focus in this group of studies.

The topic of caregivers' discipline was also identified, with two articles addressing the conditions under which discipline is employed in the context of children's behavioural and learning difficulties. Unlike the previous theme, research in this area was conducted in many countries, including developed countries.

*Childhood risk*

Childhood risk was the fourth largest theme identified in the analysis with six studies (6%). The results indicated two types of risks: external (poverty, violence, maternal depression) and internal (stunting and wasting) and the risk factors were discussed for children from infancy to preschool years. Following the burst publication by Walker (2001) that discussed inequalities and childhood risks in the world's poorest countries, risk factors were further explained in five other influential publications, two of which generated citation bursts.

Working strategies to prevent or ameliorate the loss of developmental potentials of young children due to the exposure to various risks were explicitly discussed in Engle et al's study (2007) which generated citation bursts. Two risk factors, early childhood stunting and absolute poverty were highlighted in another burst publication by Gratham McGregor et al, which was also published in 2007. This study profiled risks as a key contributor to children's poor educational performances.

The same argument was made in other four influential studies. Working strategies were similarly proposed in these research agendas. Family-related risks, such as maternal depression, parents' marital dissatisfaction and work-family interference were the dominant focus in these studies.

*Early childhood programs and pedagogies*

The last theme within the literature centred on early childhood programs and pedagogies across countries, including the topics of 1) differences of early

childhood quality, 2) Western pedagogies in Asian preschools; 3) cultural narratives in textbooks; and 4) assessment tools in children's learning. Four publications were identified (4%), each focusing on one topic. While the studies received significant citations, they did not generate a burst of interest. Possible reasons for this include the recent publication of some of these studies (since 2012), and the theme not being considered as crucial as other topics such as children's development, health and interventions. Despite this, these studies provided the discourse and architecture to position early childhood programs and pedagogies as an effective means of child support, and an important focus in IC research.

### *Content analysis 2: future research directions*

The analysis of future directions explored the gaps in the five burst publications identified in 2014-2019 (Table 4) and their citing references from 2019-2022. The focus on future directions warrants the use of most recent influential studies because they are likely to impact IC research in the near future.

High-quality citing references were selected based on three criteria: 1) citing one of the five burst references; 2) demonstrating immediate impact measured by the TLC score; 3) using an IC method in early childhood studies. As a result, 33 citing references were identified (Table 5).

**Table 5.** Influential citing references.

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| Bornstein, et al. (2020). Mothers' parenting knowledge and its sources in five societies: Specificity in and across Argentina, Belgium, Italy, South Korea and the United States. International Journal of Behaviour Development, 44(2), 135-145. |
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| Kozloff et al. (2021). An investigation of children's empathic dispositions and behaviours across seven countries. Information of Child Development, DOI: 10.1002/icd.2251 |
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*Research contexts*

IC research in ECE is a dynamic and rapidly evolving field. In the past decades, there have been numerous efforts to improve the quality of young children's education in different countries. During the early 21st century, North America, Western Europe and some Northeast Asian countries dominated the research in this field. However, in recent years, studies in regions such as Latin America and Southeast Asia have increased. Despite this shift, it is important to note that children in small-scale societies face unique educational demands that require more attention.

In their investigation of risk and time preferences among children Amir et al. (2020) conducted a cross-country study that included participants from India, the United States, Argentina and forager-horticulturalist Shuar children in Amazonian Ecuador. Their study identified striking differences in risk and time

preferences across these diverse contexts, highlighting the importance of including not only children from market-integrated regions but also those experiencing an environmental shift such as industrialization or climate change. This point was echoed in another study by Amir et al. (2019), which called for increased attention to early childhood education in small-scale agriculture and artisanal industries.

While a culturally focused approach such as individual-collectivist analysis has been heavily adopted in IC research, Samek et al's (2020) study highlighted the limitation of this approach in a changing world. Their investigation into children's development of prosociality across 12 countries found that culture-level indicators were insufficient for capturing the complex interplay between individual experiences and cultural context. The authors suggested that IC research could benefit from a more nuanced analysis of life contexts, which take into account individual-level experiences and contextual factors such as migration and urbanization.

IC research has often focused on the influence of children's families on their learning and development. However, the definition of family has often been limited to parents, and there is a clear need for research initiatives that take a broader and more complex view of family structures. Furthermore, there is a critical need to include the direct voices of children themselves. By including children's perspectives, researchers can gain a deeper understanding of the nuanced ways in which family contexts influence children's development.

*Methodological directions*

The analysis identifies a need for more variability in research methods, particularly on children's health and wellbeing. While health-related studies have increasingly incorporated individual interviews and child observations, there has been a persistent lack of effort to seek qualitative information. Instead, most studies rely on demographic and health surveys, UNICEF multiple indicator cluster surveys, and primarily involve secondary analysis of existing representative data samples. This limited methodological approach can lead to a superficial understanding of complex issues. According to Aizawa (2019), the lack of "country-specific factors" (p.144) revealed a gap in evidence, suggesting the potential for a methodological approach that included more detailed circumstance factors that allowed researchers to define nuanced aspects in each participating country. More than ten years ago, Pereyra et al. (2011) highlighted the limitations of PISA comparisons, citing the lack of qualitative insights that account for context and history. This finding resonates with the current study, which support the need for more methodological diversity in IC research. due to the absence of qualitative judgements that emphasized context and history.

Standard instruments are a common practice in IC research to ensure consistency across countries. However, Carmiol et al. (2020) note that this approach overlooks the rich diversity within countries and can lead to overs-implications. To address this, they suggest that researchers can take an initial step to identify variations within national contexts before making cross-country comparisons. By doing so, we can ensure that research instruments and processes are comparable across higher levels of analysis.

Some research in IC studies has focused on measuring children's behaviours, but the use of measurement tools has been problematic. Broesch et al.

(2021), for example, assed child development in five countries using Melvin Konner's ethogram, which is a broad list of infant behaviours. However, they found that not all researchers were familiar with the list, indicating a need for such tools to be well understood by researchers in different contexts. According to Tanish et al. (2019), the strength of a measurement tool is its ability to identify key features of a diverse body of evidence. What is important in future research about the use of these tools is to "broaden the validation process to more samples of countries that differ in contexts and characteristics" (p.51).

Although longitudinal studies are a powerful tool for exploring children's growth and learning overtime, they have received limited attention in IC research. One possible reason for this is the logistical challenges of conducting follow-up studies in different contexts. Nevertheless, several researchers have highlighted the need for future IC studies to incorporate information about children's developmental trajectories, as this can provide valuable insights into the factors that shape early childhood development in diverse contexts.

*Conceptual underpinning*

Addressing the question of child learning and development involves the inclusion of conceptual basis. Recent IC researchers have acknowledged limitations of their studies in "making an account for both cross-cultural regularities and variation in the kinds of social worlds that infants [and young children] inhabit, due to the absence of theories or concepts" (Broesch, 2021, p.208). A critical need exists for IC researchers to develop explicit and age-specific paradigms of early childhood development that can accurately explain variables in children's learning (Cuartas et al., 2020). Sharing cultural and contextual experiences and insights among

researchers in different contexts is essential to conceptualize research in a way that addresses the issue of disparity (Guevara, 2022).

*Future topics*

The latest body of IC research in ECE has yield a wealth of insights into topics such as children's health and wellbeing, parenting, and the impact of various early childhood programs on developmental outcomes. These interests resonate with those in the past decades, providing an established as well as ongoing basis that could inform future research.

1. *Prenatal stage of children's learning and development*

The analysis reveals an emerging concept, 'prenatal stage of children's learning and development'. All the reviewed articles focus on children in infancy and childhood but in recognition of the critical role of prenatal stage in children's learning, there are calls for research that could shed light on the factors that influence children's learning and development before birth. The importance of IC research on prenatal and genetic factors in children's learning was evident in Aizawa's (2019) reflection on the limitation of their study on health inequality: "health inequality starts even at the prenatal stage and genetic factors are one such circumstance factor" (p.159). Future research into the prenatal and genetic influences on children's learning and growth is needed to explore variations before birth and then examine how they influence children's learning and growth at a later stage.

2. *Parents' access of information and resources*

A second direction for future IC research involves the need to investigate parents' access of information and resources across countries and how these variations influence their knowledge and practice. Such a topic emerged in a number of latest references (see Table 4. Beutel et al., 2019; Broesch et al., 2021). From the data analysed, parenting knowledge and practice appeared to be among the most frequently mentioned aspects of early childhood education. Concerning the ever-last interests in these topics, numerous types of information available in the world and the inequality of resources available to people, research that focuses on the contributing factors to parenting will lead the topics towards a timely direction from what they are currently taking.

3. *Multicomponent interventions*

As the population of young children from disadvantaged backgrounds grows, so too does awareness of the need for interventions. In 2020, 43% of the world children under five lived in families of poverty, poor health and inadequate stimulation (World Health Organization, 2021). Many interventions have been developed through the method of IC research. Broadly, these efforts are made for two outcomes: a child-level outcome and parent-level outcome. Previously, efforts to promote child well-being focused on supporting children or enhancing parenting skills. However, recent research suggests that a collaborative approach across various disciplines can lead to more significant and lasting benefits for children's learning environments (Jeong et al., 2021). This highlights the need for further investigation into multi-strategy interventions that support families, children and educational sectors (Sania et al., 2019).

4. *Behavioural variability in infants and the contributing factors*

Studies on infant development have demonstrated the intricate nature and diversity of early behaviours. Questions were raised about whether they were attributed to individual characteristic, environmental stimulation or both, and how to respond to the differences. The study of infant development leaves the room for continued interpretation and insight across countries. It allows for the development of nuanced variations of early behaviours that can be tailed to specific contexts and contribute to a broader understanding of the field. For example, Aime et al's (2019) research into infant activity level claims the significance of examining development in diverse countries to better understand the range of variation in infants' behaviours.

5. *Efficacy of early childhood programs for disadvantaged children and families*

Ever since the introduction of the head start initiative in 1965, early childhood programs have become an increasingly important means of improving child and parenting outcomes in disadvantaged families. The field of IC research has seen a great deal of research projects worldwide, with a commitment to develop effective early childhood programs. It is increasingly believed that improving early childhood approaches and modes of delivery in in disadvantaged countries could be beneficial. For this reason, a growing body of research has foregrounded a comparative approach that investigates the effect of Western programs in middle and low-income countries, with an expectation that disadvantaged countries learn from the West. Despite the importance of comparing early childhood programs in disadvantaged countries, there have been limited studies on this topic. Therefore, future research should focus on restructuring the comparison of such programmes,

drawing on relevant issues and strategies both within and across disadvantaged countries.

**Limitations**

As with all methods, bibliometric analysis is not without limitations. First, it is the computerized approach to data collection and analysis. The lack of authors' input is an issue. Second, the reliance on citations places limitation on the selection of publications. Authors may sometimes cite their own work or cite low-quality sources, and recent publications may not receive many citations (Holden et al., 2005).

To overcome these limitations, the current analysis combined a bibliometric process of literature search with an expert-based manual procedure. Researchers were both involved in the process of data searching, filtering and selection. To gather all important publications, the study followed a four-step process for data collection, which involved an initial search to identify a core dataset, citation expansion to create an expanded dataset, generating references for the expanded dataset, and identifying significant recent publications. According to Chen and Song (2017), a trustworthy systematic review relies on a comprehensive dataset of available research. By expanding the scope of the review, this study minimized the possibilities that important publications were overlooked.

Even so, it is still possible that some less highly cited but potentially important studies were excluded. The findings were also limited to studies presented in English. It is likely that IC publications were presented in other languages. It is noteworthy too that several types of publications such as books,

conference proceedings and dissertations did not meet the inclusion criteria, and this has also limited the scope of the analysis.

**Conclusion**

Recent years have witnessed a surge of interest in international comparative (IC) research within the realm of early childhood education, spurred by a series of influential IC reports published by international agencies and organizations in the early 2000s. These landmark studies, coupled with global endeavours to enhance the well-being of young children amid a backdrop of increasing societal changes, have catapulted IC research to the forefront of early childhood education.

In response to the significance of IC research in ECE, an application of bibliometric view in the current study enabled a rigorous examination of a complex field. Despite the limitations, this review has provided valuable insights into the existing knowledge of the field. By systematically synthesizing and analysing the IC publications, this study identified collaborative situations and revealed influential studies in the last 22 years.

The study findings have implications for the future development of the field, prompting a reconsideration of the topics, designs and concepts that have contributed to the proliferation of the literature to date. Future developments include enhanced diversity in terms of the research context and methodology, and the advancement of theoretical underpinnings. Using an international comparative approach to denaturalize the taken-for-granted perceptions about children whose lives are unknown to us is critical. Fuelled by rising attentions to children, transcending geographical regions, disciplines, and social and cultural

contexts, IC research has played an important role in ECE and will continue to do so in the future.

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