

Social Connectedness: A Bibliometric Analysis

Conexión Social: Un Análisis Bibliométrico

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Abstract

This study explores the scientific production on social connectedness (SC) through a bibliometric analysis of 94 articles obtained from the SCOPUS, Dialnet, and SciELO databases. SC is defined as a sense of belonging and closeness in interpersonal relationships, developed through internalized social experiences across various contexts. These studies examine productivity by author, researcher collaboration, research topics, and the geographic distribution of publications. The results indicate an increase in SC research since 2016, peaking in 2022, possibly linked to the COVID-19 pandemic and heightened attention to SC as a response to social isolation. Research is led by authors from the United States, with less participation from Australia and Europe, while Latin America shows scarce representation, revealing a regional gap in scientific production. SC is mainly associated with mental health and psychological well-being, while other areas, such as cognitive development and cultural differences, are less explored. Methodologically, half of the studies are correlational, with few experimental and longitudinal designs, limiting the understanding of SC's causal effects. It is concluded that the field requires greater methodological diversity, interdisciplinary collaboration, and regional representation to further explore the mechanisms underpinning SC and its impact on health and well-being across diverse contexts.

Keywords: Social Connectedness, Bibliometric Analysis, Productivity, Collaboration, Topic Analysis.

Resumen

Este estudio explora la producción científica sobre conexión social (CS) mediante un análisis bibliométrico de 94 artículos obtenidos de las bases de datos SCOPUS, Dialnet y SciELO. La CS se define como un sentimiento de pertenencia y cercanía en relaciones interpersonales, desarrollado a partir de experiencias sociales internalizadas en diversos contextos. Estos estudios examinan la productividad por autor, colaboración entre investigadores, temáticas y distribución geográfica de las publicaciones. Los resultados indican un aumento en la investigación sobre CS desde 2016, alcanzando su pico en 2022, posiblemente vinculado a la pandemia de COVID-19 y la mayor atención en la CS como respuesta al aislamiento social. La investigación está liderada por autores de Estados Unidos, con menor participación de Australia y Europa, mientras que América Latina muestra escasa representación, evidenciando una brecha regional en la producción científica. La CS se asocia principalmente con la salud mental y el bienestar psicológico, mientras que otras áreas, como el desarrollo cognitivo y las diferencias culturales, son menos exploradas. Metodológicamente, la mitad de los estudios son correlacionales, con escasos diseños experimentales y longitudinales, lo que limita la comprensión de los efectos causales de la CS. Se concluye que el campo requiere mayor diversidad metodológica, colaboración interdisciplinaria y representación regional para profundizar en los mecanismos de la CS y su impacto en la salud y el bienestar en distintos contextos.

Palabras clave: Conexión Social, Análisis Bibliométrico, Productividad, Colaboración, Análisis de Materia.

INTRODUCTION

Lee & Robbins (1995) define social connection (SC) as the internal sense of belonging that an individual may have in his or her relationships with others. This notion is based on the set of social experiences gradually internalized through interpersonal closeness in proximal and distal relationships with family, friends, peers, acquaintances, strangers, community, and society. Based on the literature on the psychology of the self, the aforementioned authors propose that people at early ages express and satisfy their need for belonging through identification and participation with the social world, gradually organizing cognitive representations of the self in relation to the other.

For his part, Stern (1997) postulates that early childhood relationships contribute significantly to the construction of a specific type of schema and representations by linking with others that persist into adulthood. In this sense, Kohut (1971) proposes that the *self* is gestated in infancy, a time when interaction with adults who can provide the child with functions that he or she is not yet able to control on his or her own is required. Thus, children gradually acquire control over their capacities to the extent that it is possible for them to become independent of the support provided by adults. This support, denominated by the author as *self object*, plays a fundamental role in the regulation of self-esteem, since it provides adequate experiences to maintain children's narcissism and promote their autonomy, generating at the same time failures and forgetfulness that enable an optimal frustration in the child, favoring the integration of an own *self* that makes the child independent in the future of those support figures (Kohut, 1971).

This author's theory is distinguished from other psychoanalytic postulates by shifting the focus away from the traditional models of drive (libido) and psychic structure (it, ego and superego), emphasizing the relationship between the self and the objects of the self, expressed as cognitive representations of other people and the actions they take toward the self (Kohut, 1977). In addition, through later clinical observations, Kohut proposes a need for the self, called the need for an alter ego or belongingness (Lee & Robbins, 1995), which is added to the needs for grandiosity and idealization that originally

composed the self as the organizing center of experience.

From the *psychology of the self*, people with high connectedness remain motivated to seek relationships despite the fact that their need for belonging has been satiated (Kohut, 1984; Lee & Robbins, 1995). In addition, those with high levels of connectedness are better able to manage their own needs and emotions through cognitive processes, which makes them prone to low self-esteem, anxiety, and depression (Kohut, 1984). Those with a high sense of connectedness are able to enter social situations and easily identify and participate with others. Likewise, sense of belonging, anticipated social support, and received emotional support are positively associated with meaning in life, whereas social exclusion reliably leads to loss of meaning (Stavrova & Luhmann, 2015). Conversely, subjects who possess low levels of connectedness show little ability to effectively manage their needs and feelings, and tend toward low self-esteem, anxiety, and depression (Lee & Robbins, 1995).

Studies on SC have increased in recent years, being a concept of great relevance nowadays, both in clinical intervention and research contexts, due to its impact on mental health and well-being in general (McNeil *et al.*, 2022; Morán *et al.*, 2022a; Vella *et al.*, 2023; Yelpaze *et al.*, 2021; Zhang *et al.*, 2021). Indeed, social disconnection, understood as isolation or low experienced social support, may increase the risk of mental health problems, such as depression (Chen *et al.*, 2020; McMahon *et al.*, 2022; Taylor *et al.*, 2020) anxiety (Faro *et al.*, 2019; Humphrey *et al.*, 2022; Santini *et al.*, 2020; Taylor *et al.*, 2020) and increased intensity of reactions to stress exposure, along with reduced coping capacity (Santini *et al.*, 2020). Social connectedness is even considered a positive predictor of resilience to stress in the face of trauma and disaster exposure (Humphrey *et al.*, 2022). Likewise, lack of social relationships has a strong negative impact on physical health, rivaling even the effect of risk factors such as smoking, blood pressure and obesity (Holt-Lunstad *et al.*, 2010).

Regarding the methodological perspective from which the SC construct has been approached, most studies used an empirical design of correlational scope (Hsu *et al.*, 2023; McMahon *et al.*, 2022; Muñoz-Martínez & Naismith, 2023; Soares *et al.*, 2022). These studies are used

to determine the extent to which the SC is related to other variables, which provides partial explanatory value, since, although it groups a certain class of phenomena, facilitating the manipulation of phenomena, it does not explain them (Cauas, 2015). Likewise, descriptive studies have been numerous (Mauss *et al.*, 2011; Morán *et al.*, 2022a; Sun *et al.*, 2021; Stinson *et al.*, 2022). This type of design has proven useful for characterizing the meaning of SC. While others have been less frequently chosen for the study of this construct, for example, experimental (Abakoumkin *et al.*, 2019) and instrumental designs (Morán *et al.*, 2022b).

The creation of scientific knowledge through current academic and research practices includes regulations that promote research (Bornmann, 2020) and allow the analysis of the regularities of scientific activity, favoring the improvement of research and scientific evaluation processes (Krauskopf & Vera, 1995). In this sense, bibliometric indicators are defined as numerical data on the phenomena of scientific activity related to the production, transmission and consumption of information that make it possible to quantify the number of publications, subjects in which they are published, languages and countries with more production, volume of authorship, among other aspects. In addition, they enable the synthesis of different bibliographic characteristics using a numerical value that facilitates comparison with documents, and studies their evolution over time (Sánchez *et al.*, 2015).

These indicators have not only promoted the increase of publications in scientific journals but also the development and application of bibliometric research evaluation tools and methods (Bornmann, 2020). Although bibliometric studies were found that address topics related to the construct, such as group cohesion (Oslé *et al.*, 2021) and social skills (Morán & Olaz, 2014), no bibliometric studies on SC have been reported despite the importance that this concept has gained nowadays. For this reason, the aim of this study is to analyze the international scientific production on SC through a bibliometric study,

Considering that social disconnection has a negative impact on physical and mental health, and that SC is associated with positive indicators such as resilience and sense of life, the present bibliometric analysis allows us to

organize and synthesize the existing knowledge on this construct. This could be useful to enrich its theoretical understanding and promote lines of research that address its relevance in clinical and public health contexts. Furthermore, given the absence of specific bibliometric studies on SC, this work contributes to fill a gap in the literature and to strengthen the discussions and applications of this construct in scientific and practical settings.

METHOD

Design

An ex post facto retrospective study was carried out with a historiographic and bibliometric approach (Montero & León, 2007). The analysis was based on three key indicators used in the evaluation of scientific activity: productivity, collaboration and thematic analysis (Acuña *et al.*, 2018; Morán & Olaz, 2014; Pavetti *et al.*, 2012). The first indicator, in this study, allowed us to know the most outstanding activity of authors and countries in the field and the temporal evolution of production. On the other hand, the collaboration index (CI) reported the level of openness or isolation within the specific scientific community (De Filippo & Fernandez, 2002). Finally, the subject analysis was used to present the topics of interest, populations studied and methodological designs used by the scientific community in SC studies (Pavetti *et al.*, 2012; Acuña *et al.*, 2018).

Sample

The sample consisted of 94 articles retrieved from the SCOPUS, Dialnet and SciELO databases. To be included, these had to be published in scientific journals, indexed in specific databases and written in Spanish, English or Portuguese. Papers outside the field of psychology and those that did not deal with the SC construct according to the definition of psychology of the self (Kohut, 1984; Lee & Robbins, 1995; Wolf, 1988) were excluded.

The sample conformation procedure consisted of a search and selection of documents, without applying temporal filters. In SCOPUS, the following search equation was used: TITLE (“social connectedness”) AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (SUBJAREA, “PSYC”))

AND (LIMIT-TO (SRCTYPE, "j")), which allowed filtering the results by academic journal articles, belonging to the subject area of Psychology, and by journal source type. This search yielded 211 initial documents, of which, after a reading of the titles and keywords, 15 that did not meet the inclusion criteria were discarded, leaving a total of 196 articles.

In Dialnet, separate searches were performed for social connection, social connectedness and *conexão social*, limiting the results to journal article document type. This search yielded 14 documents (seven for social connection and seven for social connectedness). In Redalyc, similar searches were carried out, but the results were null. On the other hand, in SciELO, specific filters were applied using the search equation: (ti:((ti:(Social Connectedness)))) OR (ti:(Social Connectedness)) OR (ti:(Conexão Social)), which made it possible to retrieve articles whose titles included the terms "Social Connectedness", "Social Connection" or "Conexão Social". This search yielded seven relevant articles.

Then, a screening process was carried out by reading abstracts. As a result, documents that did not conceptually fit the definition of SC according to the established criteria were eliminated. Thus, of the 217 articles obtained from the SCOPUS, Dialnet and SciELO databases, 123 were eliminated, resulting in a final list of 94 articles selected for the bibliometric study.

Procedure

The development of the study was structured in three stages, taking as a guide the procedure used in a work similar to this one (Acuña et al., 2018). In the first stage, the search and selection of articles was carried out. The second stage consisted of the creation of a database in Microsoft Excel, which included bibliographic variables (names and number of authors, year of publication, country, journal, language, database, name and type of institution), conceptual variables (article title, keywords, abstract, synthesis of results) and methodological variables (research approach and design, composition and sample size, types of analysis performed). The last stage focused on the analysis of bibliometric indicators.

Data analysis

First, productivity was examined by reporting the number of articles published per year. Next, productivity per author was quantified by calculating

the number of authors in all the documents, recording the frequency with which each researcher appeared as a signatory, and generating a table of frequencies. Then, an analysis of productivity by country was carried out, through the distribution of the articles published according to the most producing countries.

In the second place, the collaboration in the publications was addressed by calculating the number of signatures per paper, the number of studies for each number of signatures, and obtaining the CI. This made it possible to determine the average collaboration in the articles by dividing the total number of signatures by the number of publications. In addition, the temporal evolution of the CI was estimated, considering periods of five years, which made it possible to analyze changes and trends in scientific collaboration over time.

The documentary material collected was tabulated and coded in a data matrix prepared in Microsoft Excel. Subsequently, the data were statistically processed using the IBM SPSS Statistics 23 program. The results obtained were presented in tables and figures that allow visualization of the trends and patterns found in the analysis. Finally, a subject analysis focused on the review of the titles, abstracts and keywords of the articles. From these elements, the main terms associated with the SC construct were identified, which made it possible to generate emerging thematic categories. In addition, a detailed reading of the conceptual and methodological developments of the studies was conducted. In this analysis, the key elements of each article were examined, such as the sample, the instruments used to measure social connectedness, and the research design. In terms of methodological design, qualitative, quantitative and mixed approaches were differentiated, and each study was classified according to the type of research it conducted.

To organize and code the information extracted from the subject analysis, the Atlas.ti.9 software was used, which facilitated the classification of key themes and sub-themes. Through this program, a detailed qualitative report was structured on each of the emerging categories, which made it possible to identify not only the predominant approaches in SC research, but also the least explored areas and the most common methodological trends in the studies.

RESULTS

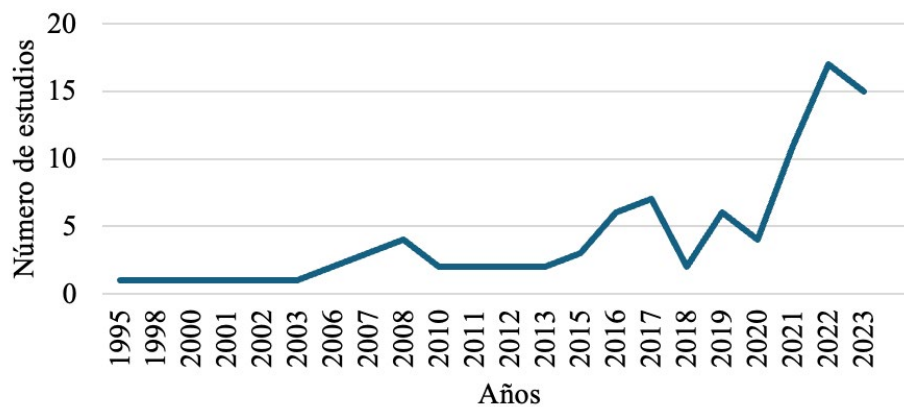
Productivity

The first study on SC based on the definition proposed by the psychology of the self was published in 1995 (Measuring Belongingness: The Social Connectedness and the Social Assurance

Scales, Lee & Robbins). Since then, the volume of publications remained constant until 2016, when there was a notable increase. However, the most significant increase occurred between the years 2020 and 2022, from four to 17 publications. It was also observed that the most productive year was 2022, with a total of 17 articles. The results are shown in Figure 1.

Figure 1

Temporal evolution of productivity



As shown in Table 1, 92.3% of a total of 298 authors participated in the writing of only one paper. In addition, 4.7% contributed two signatures, while 2.3% signed three times. It should be noted that only two authors subscribed to more than three articles.

Table 1

Distribution of authors by number of signatures

N.º de firmas	N.º de autores	%
1	275	92,3
2	14	4,7
3	7	2,3
4	1	0,3
10	1	0,3
Total	298	100

El investigador más prolífico en este campo, con un total de 10 artículos, es Richard M. Lee. Le sigue Eunju Yoon, con cuatro; mientras que Steven B. Robbins, Erdinc Duru, Daniel F. Hermens, Larisa T. McLoughlin, Seydi A. Satıcı, Xueting Zhang y Valeria E. Morán, cuentan con tres firmas cada uno. Resulta notable que el autor más productivo ha suscrito más del doble de trabajos en compa-

ración con quienes le siguen en la lista (ver Tabla 2); este investigador es, además, uno de los dos firmantes del primer artículo registrado sobre el tema.

Table 2

Most productive authors

Authors	N.º of articles
Lee, R.M.	10
Yoon, E.	4
Duru, E.	3
Hermens, D.F.	3
McLoughlin, L.T.	3
Morán, V.E.	3
Robbins, S.B.	3
Satici, S.A.	3
Zhang, X.	3
Beaudequin, D.	2
Curi, M.V.	2

Deniz, M.E.	2
Goedert, M.C.F.	2
Grieve, R.	2
Gross, J.J.	2
Jung, K.R.	2
Lagopoulos, J.	2
Mesagno, C.	2
Parker, M.	2
Rice, S.M.	2
Simcock, G.	2
Soares, A.K.S.	2
Wang, C.	2

To determine the most productive countries, the institutional affiliation of each author was considered. The United States was found to have published 37.9% of the papers on CS. If we add to this percentage the 16.5% from Australia, 2.9% from the United Kingdom, 1.9% from Canada and 1% from New Zealand Kingdom, the great influence of the scientific community of the Anglo-sphere is accentuated with 60.2% of the work carried out worldwide. On the other hand, Turkey and China stand out with 9.7% and 7.8% of the articles, respectively.

It should be noted that, of the entire LATAM region, only three countries (Argentina, Brazil and Colombia) have published studies on SC, which represent only 6.8% of the total number of studies carried out in the world. Table 3 shows the distribution of articles by country.

Table 3
Producing countries in the period 1995-2023 (n= 103)

Producing countries	N.º of articles	%
Estados Unidos	39	37,9
Australia	17	16,5
Turquía	10	9,7
China	8	7,8

Argentina	3	2,9
Brasil	3	2,9
Reino Unido	3	2,9
Taiwán	3	2,9
Canadá	2	1,9
Italia	2	1,9
Alemania	1	1
Austria	1	1
Colombia	1	1
Corea del Sur	1	1
Filipinas	1	1
Irlanda	1	1
Malasia	1	1
Nueva Zelanda	1	1
Países Bajos	1	1
Pakistán	1	1
Portugal	1	1
República de Corea	1	1
Suecia	1	1
Total	103	100

Collaboration

The data in Table 4 show that most of the articles were co-authored. More specifically, 58.6% involved the collaboration of two or three authors; 24.5% received four or five signatures, and about 14% involved more than five. It is noteworthy that only three papers (out of a total of 94) were signed by one author.

Table 4
Distribution of papers by number of signatures

N.º de authors	N.º de articles	%
1	3	3,2
2	26	27,7
3	29	30,9
4	11	11,7
5	12	12,8

6	5	5,3
7	3	3,2
8	4	4,3
9	1	1,1
Total	94	100

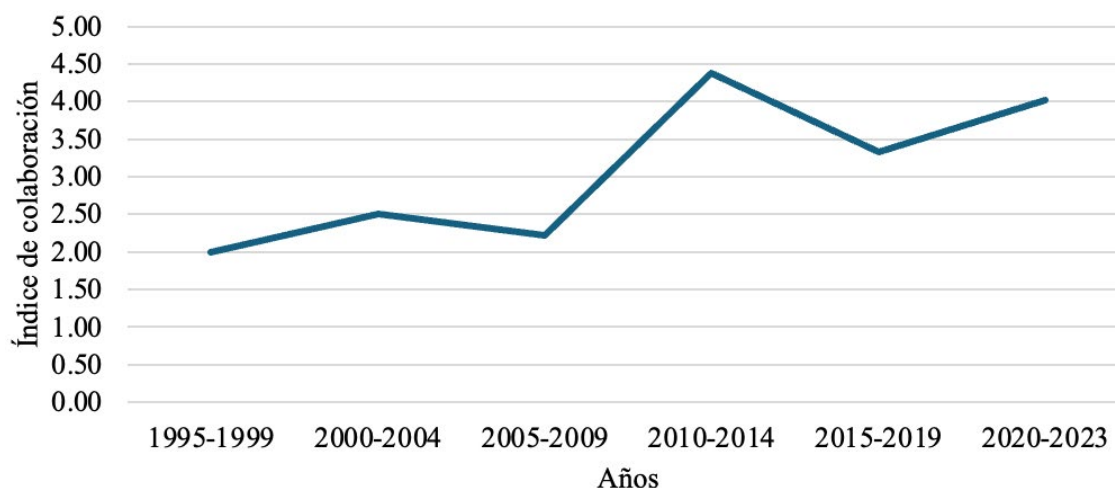
The inter-author CI, calculated from 338 signatures registered in 94 papers, was 3.60. This value suggests that, on average, about four researchers collaborated on each paper. Figure 2 shows the temporal evolution of this index, which exhibits an irregular pattern with periods

of increase and decrease. Despite this variability, a progressive trend towards collaboration can be perceived since the first publication.

The number of signatures per article experienced a slight increase from the first to the second period, followed by a decrease leading to a value similar to the initial one in the third period. This indicates that collaboration among authors remained stable during the first 15 years. However, between the years 2010 and 2014, there was a significant increase in the index, which reached a value close to double the previous period. In the subsequent five years (2015-2019), there was a slight decrease, and finally, in the last four, a progressive growth.

Figure 2

Temporal evolution of the Collaboration Index every five years



Subject Matter Analysis

Table 5 shows the 20 *keywords* most frequently mentioned in the articles. The analysis of the abstracts identified 193 different terms. It should be noted that, as shown in Table 5, some of them were grouped together because they have

similar meanings, for example, *Mental health and Psychological health*. In addition, words referring to sociodemographic and cultural data, populations or units of analysis, study methodology, data analysis strategies, countries, theoretical perspectives and fields of application of psychology were excluded from the list.

Table 5
Most frequent keywords

Keywords	Frequency
Social connectedness	71
Depression; Depressive disorder; Major depression	23
Social support	20
Human/Interpersonal relations	18
Mental/Psychological health	17
Wellbeing; Psychological/Ontological wellbeing	15
Social behavior	13
COVID-19; Pandemic; Coronavirus	12
Social network	10
Loneliness	9
Social connection/s; Social connectivity; Social interaction	8
Self concept	7
Social distance	7
Affect	6
Anxiety	6
Crime; Crime victim	6
Life satisfaction	6
Self esteem	6

On the other hand, the thematic analysis of the abstracts revealed seven categories, which are presented in Figure 3. The broadest category focuses on the relationships between *social connectedness, mental health and psychological well-being*. This includes 55 studies exploring the impact of SC on psychological well-being, examining symptoms such as depression and anxiety in diverse groups and contexts.

In another order, the category *social connectedness, behaviors and traits*, comprises 41 articles that analyze the relationship between SC and traits such as extroversion, optimism and openness to experience; and/or explore the influence of SC on interpersonal and prosocial behaviors.

Within the group called *social connectedness in diverse contexts and populations*, there are 33 studies that examine how SC manifests itself in populations with distinctive characteristics and in diverse settings, such as immigrants, health professionals, homosexual men, ethnic minorities, homeless women, among others.

On the other hand, a set of 28 studies explores issues such as the impact of SC and internalized transphobia in transgender adults, as well as the modulating role of SC on interracial prejudice, among other topics. These studies were included in the category *social connectedness and cognitive processes*, which includes different but related constructs such as attitudes, beliefs, and perceptions.

In the category *social connectedness, emotions and subjective well-being*, 25 studies are grouped together that examine the relationships between SC and emotions such as anxiety, depression, anger and loneliness. These highlight the impact of SC on subjective well-being and positive affection. In addition, 13 studies were identified that explore the relationships between *social connectedness and cultural factors*, such as cultural intelligence, well-being of immigrants, adjustment of international students, mitigation of cultural adjustment difficulties and prejudice, and facilitation of interpersonal relationships in people from different cultures.

Finally, the category *measuring social connectedness* encompasses six studies that focus on adapting and/or validating the *Social Connectedness Scale-Revised* (SCS-R) in various populations, including research conducted in Italy, Argentina and Brazil. The scarcity of articles in this category indicates the prevalence of empirical versus instrumental studies in this field.

Figure 3
Distribution of articles by thematic category



Regarding the sample used in the study, of the total of 94 articles identified, 86 provided information in the abstract about the size and composition of the sample. Taking this into account, it was found that 30.2% of the investigations worked with *university students*, while 26.7% used *specific groups*, such as military veterans, Facebook users and internally displaced persons, among others.

On the other hand, the samples *comprising adults and the general population* accounted for 24.4% of the total, followed by *adolescents, young people and emerging adults*, which accounted for nearly 14%. A very small proportion of the articles (3.5%) addressed SC in the population of *older adults*, and only one was included in the category others, given that it was not composed of individuals, but of documents submitted for systematic review.

With respect to size, the quantitative studies included samples between 29 and 2,782 participants ($M = 431.5$), the qualitative studies between 11 and 184 ($M = 74.2$). It should be clarified that the distribution by gender was not analyzed, because only a few articles stated this in the abstract.

In relation to the types of studies and methodologies employed, it was found that, of the 94 articles, only one was of a theoretical nature (systematic review), while the remaining 93 presented empirical experiences. Of this group, 87 opted for a quantitative approach, and six selected the qualitative approach. Within the quantitative studies, only 12.6% followed an experimental design, while more than half (54%) adopted a correlational design (or *ex post facto*, according to the nomenclature proposed

by Montero & León, 2007). In addition, 23% employed a combination of correlational and descriptive designs. The least frequent among the quantitative studies were instrumental designs (8%) and descriptive designs using surveys (2.3%).

Regarding the qualitative empirical studies, five conducted a content analysis (four of them through thematic analysis and one that combined thematic and narrative analysis), and the remaining study was based on a group intervention to promote confidence and SC in a population of homeless women.

Finally, with respect to the temporal dimension, the vast majority (86.1%) were cross-sectional and about 14% were longitudinal. The classification of the documents according to the methodologies used is shown in Table 6.

Table 6
Distribution of articles according to the methodology used

Type of document	Frequency	%
Theoretical	1	1,1
Empirical	93	98,9
Total	94	100

Empirical research approaches	Frequency	%
Quantitative	1	1,1
Qualitative	93	98,9
Total	94	100

Empirical quantitative research designs	Frequency	%
Correlational (ex post facto)	47	54
Descriptive by survey	2	2,3
Descriptive and correlational	20	23,0
Experimental	11	12,6
Instrumental	7	8
Total	87	100

Types of qualitative empirical research	Frequency	%
Thematic analysis	4	66,7
Thematic and narrative analysis	1	16,7
Action research	1	16,7
Total	6	100

Time sequence	Frequency	%
Transversal	81	86,2
Longitudinal	13	13,8
Total	94	100

DISCUSSION

The bibliometric analysis conducted provides a comprehensive overview of the current state of SC research, identifying publication patterns, methodological approaches, thematic areas and relevant gaps in the literature. The results reveal a notable increase in the number of publications on SC since 2016, with a more pronounced increase

between 2020 and 2022. This increase may be related to a surge of interest in SC in response to the psychological consequences of social isolation and physical distancing associated with the COVID-19 pandemic (Chen et al., 2021; Wu et al., 2021). In other words, recognition of the impact of SC on mental health and well-being appears to have boosted scientific output on these topics, reflecting an increased awareness of the importance of social bonds on quality of life.

The profile of the authors shows a high dispersion in production, with 92.3% participating in a single work. This suggests that, although the field has grown, many researchers address the subject occasionally, without consolidating continuous lines of research. The prominence of Richard M. Lee as the most prolific researcher positions him as a reference in the subject, and the wide difference in the number of publications with respect to the rest of the authors highlights the need to strengthen more teams that can contribute in a sustained manner to the theoretical and empirical development of SC. In this sense, it is crucial to encourage collaboration and co-authorship among researchers to create more robust networks of scientific production. The evidence that 58.6% of the studies involved the participation of two or three authors, and that an average of four researchers collaborated on each paper indicates that, although collaboration is frequent, there is room to expand it to include interdisciplinary perspectives.

The geographical distribution of the publications reveals a preponderance of the United States, which has contributed 37.9% of the works, which is explained by the fact that it is the country corresponding to the institutional affiliation of the author with the greatest production. In contrast, production in Latin America is scarce, limited to only three countries (Argentina, Brazil and Colombia), which account for only 6.8% of the total. This disparity suggests a regional research gap, which is not only present in the field of SC, but is a trend observed in all disciplines and scientific thematic areas, a product of the lack of resources, funding or research policies in this region (Cepeda Ávila *et al.*, 2018). In response to this situation, it is important to consider and enhance the promotion of international collaboration and knowledge sharing between countries in different regions, in order to reduce this gap and provide a more global perspective on the SC.

The thematic analysis identified seven main categories, highlighting the broadness and diversity of SC research. The broadest category, addressing the relationship between SC, mental health, and psychological well-being, underscores interest in exploring how social bonds influence emotional well-being, as well as in the mediating or moderating role of SC on the impact of stressors, traumatic events, or chronic illness (Abubakar & Dimitrova, 2016; Arango *et al.*, 2016; Austin & Goodman, 2017; Çırak & Dost, 2022; Sheikh *et al.*, 2022). In turn, much of the studies included in this category examine how SC can act as both a protective and risk factor against various mental health conditions, such as depression, anxiety, and stress (Challands *et al.*, 2017; Chen *et al.*, 2020; Kavanagh *et al.*, 2017; Lee *et al.*, 2001, 2002; Lee & Robbins, 1998). These studies not only highlight the beneficial effects of maintaining meaningful and quality social relationships, but also evidence the adverse effects of social isolation and loneliness on emotional health (Rokach, 2019; Wolters *et al.*, 2023). In this sense, it is important to mention that the strong association between CS and the reduction of symptoms such as depression and anxiety evidenced in published studies highlights the need to develop specific interventions to strengthen social bonds in vulnerable populations.

One aspect to note is that the preponderance of studies in this area also suggests that, despite the diversity of contexts and populations studied, other facets of SC have received less attention. For example, the role of SC in cognitive development has been explored in a more limited way, yet growing evidence suggests that social interactions can influence specific cognitive functions (Kelly *et al.*, 2017; Kuiper *et al.*, 2016; Lara *et al.*, 2019). Social relationships provide an enriched environment for learning and cognitive stimulation, especially in childhood and adolescence, critical stages in brain development (Gago Galvagno & Elgier, 2018; Osher *et al.*, 2021; Rakesh *et al.*, 2024). However, there is a scarcity of studies that systematically examine how the quality of social interactions and, specifically SC, influence cognitive development throughout life.

In a similar way, the interaction of SC with cultural factors is another area that has been little addressed. It is possible to think that SC does not manifest itself in the same way across cultures, considering that cultural values, norms, and practices may influence how people connect

socially and the importance they attach to those connections (Chen *et al.*, 2018; Hecht & Shin, 2015; Lewis *et al.*, 2009). For example, in collectivistic societies, where the emphasis on social interdependence is higher, SC may have a different impact on well-being compared to individualistic societies, where autonomy and independence are more valued (Triandis, 2004). However, relatively few studies have specifically addressed how cultural differences modulate the effects of SC on well-being and other health outcomes. The lack of research in this area limits understanding of the mechanisms underlying SC and potential interventions that might be more effective in specific cultural contexts.

These gaps in the literature point to an opportunity for the development of future empirical studies that address these less explored dimensions of SC. On the one hand, longitudinal research could be designed to examine how SC contributes to cognitive development at different stages of life. On the other hand, cross-cultural research could explore how differences in cultural norms and values affect the relationship between SC and various psychological and health outcomes, which would help to develop more culturally sensitive and effective interventions.

The focus on the relationship among SC and personality traits, behaviors, and specific contexts indicates a tendency to investigate SC in relation to individual characteristics or specific behaviors in particular contexts (e.g., social interaction at work or in educational settings). This approach emphasizes the individualistic and situational perspective, where SC is analyzed as dependent on people's personal characteristics and immediate circumstances. This raises the need to adopt a broader perspective that considers SC in its social and structural dimension, i.e., how social, cultural, economic factors and societal structures influence people's ability to establish and maintain social relationships. For example, social inequality, public policies, cultural norms, and collective values are elements that can facilitate or constrain the CS in ways that cannot be fully captured by focusing only on the individual level (Wilkinson, 2006; Young, 2014).

Along these lines, the development of studies that explore SC throughout the life cycle is also proposed, especially in a context of global population aging (Gu *et al.*, 2021). The predominance of studies using samples of university students (30.2%) and specific groups

(26.7%) limits the ability to generalize the results to the general population. Indeed, the limited representation of studies on SC in older adults (3.5%) is noteworthy, despite the fact that this population faces a high risk of social isolation, and that the importance of ties at this stage has been extensively studied (Hajek *et al.*, 2023; Hülür & Macdonald, 2020; Teo *et al.*, 2023). In this sense, SC in more heterogeneous populations, remains an underexplored line of research, and much needed given that the diversity of samples and contexts is essential to understand variations in the SC and its impact on different population groups.

In terms of the methodologies employed, the prevalence of quantitative studies, particularly with correlational designs (54%), highlights the need to diversify methodological approaches to better understand the underlying processes of SC. Qualitative and experimental studies can provide a deeper understanding of individual experiences and causal mechanisms linking SC to various psychological and social consequences. The scarcity of longitudinal studies (14%) also represents a limitation, since cross-sectional designs, which predominate, do not allow us to establish causal relationships or observe changes over time. In another order, the least represented category in the thematic analysis was the measurement of SC, with only six studies dedicated to the validation of instruments, being mainly the *Social Connectedness Scale-Revised* (SCS-R, Lee *et al.*, 2001) the one with the largest number of validation studies in different contexts. Although there is some consensus on SC measurement instruments, the importance of extending their adaptations to non-Western contexts in order to capture SC in diverse populations is emphasized.

CONCLUSION

The results of this bibliometric analysis suggest that research on SC is growing, driven in part by interest in its relationship to mental health and well-being. However, it is clear that the field faces significant challenges, including the concentration of production in certain regions, the lack of diversity in the methodologies used, and the limited representation of certain population groups.

The bibliometric analysis carried out allows deriving recommendations for future researchers in the field. In the first place, it is suggested that interdisciplinary and international collaboration and co-authorship should be encouraged in order to strengthen scientific production networks, especially in regions with less representation, such as Latin America. It also identifies the need to diversify the methodologies used, integrating longitudinal designs, qualitative and experimental studies, to better understand the underlying processes and establish causal relationships. It is essential to broaden the scope of research into less explored areas, such as the impact of SC on cognitive development, cultural interactions and their influence on well-being, as well as its study throughout the life cycle, especially in diverse populations such as older adults and non-Western contexts. In addition, it is a priority to develop and validate measurement instruments that adequately capture the dimensions of SC in different cultures and contexts. These recommendations can guide future research to address the identified gaps and advance the comprehensive understanding of SC and its impact on mental health and well-being.

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