40 years of sharing economy research: An intellectual and cognitive structures analysis

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Abstract

This study aims to analyze the intellectual and cognitive structures of the sharing economy as a field of research. Adopting an integrated bibliometric approach of citation, co-citation, and co-word analysis, this study analyzes 941 articles published on Web of Science from 1978 to 2019. Findings reveal that despite there being a latent concentration in citations distribution, the ascending and descending influence patterns discovered over time indicate a dynamic flow and healthy growth of the field. The analysis of the intellectual structure identifies four main areas of research, with hospitality and tourism being the most developed, and the journals about hospitality being the preferred channel for research into the sharing economy. Finally, for the cognitive structure analysis, in-depth strategic diagrams, thematic evolution, and trend analysis disclose some research gaps. Thus, we contribute to the sharing economy literature by inductively synthesizing, and organizing SE research, and by proposing future research directions.

Keywords: Sharing economy; Intellectual structure; Cognitive structure; Citation analysis; Co-citation analysis; Co-occurrence analysis

1. Introduction

Even though sharing may be not a new practice, the sharing economy (SE) is a recent phenomenon (Eckhardt et al., 2019; Hossain, 2020), boosted by the Internet and digital platforms (Belk, 2014; Sutherland and Jarrahi, 2018), that has received increased attention from academics, industry associations, practitioners, governments and individuals in the last five years (Curtis and Lehner, 2019). The SE has enabled the emergence of non-traditional business models in various traditional industries (Vaughan and Daverio, 2016); such as Airbnb (Accommodation), Uber (Transportation), VizEat (Food), Hopwork (Business Services) or Kiva (Finance). Furthermore, the appearance of the SE has generated disruptive innovation in those traditional sectors (Guttentag, 2015).

On a societal and economic level, the relevance of SE activities is undeniable, being a phenomenon of great economic relevance and impact with unquestionable growth. Various institutions (e.g., the European Commission, PriceWaterhouseCoopers, eMarketer) have analyzed the increasing use, transactions, and revenues of the services provided by the SE. According to eMarketer (2019), in 2018, 32% of U.S. Internet users participated in SE services, and this figure is expected to grow to 41% in 2022. As an example, eMarketer (2020) establishes that in 2019, Airbnb had 42.1 million adult users in the U.S. and it is estimated that by 2023, it will reach 48.1 million. Moreover, in 2019, U.S. home-sharing had 57.7 million adult users, and this is expected to reach 69.2 million by 2023. In a study to measure SE activity in Europe, Vaughan and Daverio (2016) estimated that collaboration platforms generated revenues of almost 4.5 billion dollars and facilitated 31 billion dollars of transactions within Europe in 2015. Similarly, the European Commission (2017) states that in 2016 there were around 323 SE-related platforms active in the European Union (+ Norway). Finally, across the world, according to estimations by Vaughan and Hawksworth, (2014), the SE generated revenues of around 15 billion dollars in 2013, and it is expected to reach around 335 billion dollars in 2025. This study

also argues that the traditional rental sectors generated 16 times more revenue (about $240 billion) than the SE sectors in 2013, but by 2025 it is estimated that both sectors will have similar revenues, which would mean 40% growth for the traditional sectors and more than 2000% growth for the SE sectors.

On the academic level, various higher education institutions have begun to offer subjects as part of their curriculums in one or more bachelor's and master's degrees (e.g., King's College London, Copenhagen Business School) or complementary courses (e.g., Stanford University) dedicated to the SE. On a theoretical level, the increased consideration from academics regarding the SE has led to the appearance of special issues in scientific journals, such as *Journal of Business Ethics*, *Entrepreneurship Theory and Practice*, *Journal of Business Research*, *Journal of Management Studies*, or *Journal of Cleaner Production*. Besides, publications in this field of study can be found in most of the FT Research rank journals.

All of this increasing relevance has meant that the literature on SE has spread very quickly, which has led to a certain complexity and contradiction when addressing this field (Acquier et al., 2017; Hossain, 2020). Moreover, as it has been more than 40 years since the first article on the SE appeared (i.e., Felson and Spaeth, 1978), and since this field, it is still searching for its own identity and definition, it is particularly necessary to study the intellectual and cognitive structures of the SE. By doing that, it will be possible to analyze the ascending and descending influence patterns of certain seminal works overtime, to identify focus areas of study, and to discover new potential avenues of research. Although recent review papers (e.g., Ertz and Leblanc-Proulx, 2018; Hossain, 2020) have been found in this field, to the extent of our knowledge, we can verify that there are no studies that conducted an exhaustive, extensive, and updated analysis from an empirical point of view on the health and intellectual and cognitive structures of this field. To this end, this study applied a combined use of three bibliometric techniques.

First, to study the health of the field, this research estimates the concentration/diversification of the distribution of citations and the ascending and descending influence patterns of the most relevant articles in various periods through citation analysis. Secondly, to analyze the intellectual structure, the broad thematic areas of this field will be recognized through a co-citation analysis, using the statistical techniques of cluster and multidimensional scale analysis. Finally, to explore the cognitive structure, the identification of past researched topics and future research trends would be revealed through a co-occurrence analysis.

Thus, this paper contributes to the SE literature by outlining the discipline's structure as we know it today. By reviewing 941 articles published in WoS from 1978 to 2019 on SE literature and by establishing the appropriate criteria, this study not only explores the underlying structure of this field, but we also ensure the replicability of this study, thereby responding to a recurring problem in the economics literature (Maniadis and Tufano, 2017). The findings show the latent concentration in the distribution of citations between articles and how newer publications (articles with an ascending pattern) are gradually replacing the older ones (articles with a descending pattern). It also discloses the existence of four main areas of research (hospitality and tourism, consumer behavior, business models, and sustainable impact) and reveals emerging research trends that can guide the development of this field.

2. Background to sharing economy research

While there is no single appropriate or agreed definition for the SE (Hossain, 2020; Sánchez-Pérez et al., 2020), it is described in the literature as a phenomenon for the promotion of more sustainable consumption practices that allow access to ownership of underutilized assets to enhance efficiency (Eckhardt et al., 2019). This lack of consensus on a definition probably stems from the fact that this field has been undergoing a rapid proliferation of studies coming from a variety of disciplines and about a diversity of industries (Laurenti et al., 2019), which has also caused the SE to be labeled with different names, such as collaborative consumption

(Barnes and Mattsson, 2016), collaborative economy (Felson and Spaeth, 1978), peer to peer exchange (Aloni, 2016), peer economy (Tussyadiah and Pesonen, 2016), access economy (Acquier et al., 2017), peer to peer sharing (Cheng, 2016), or legal access (Morewedge et al., 2020). Indeed, this growing interest in SE research from various points of view has meant that its nature and scope has continued to expand, which in turn has generated some controversy, confusion, and complexity surrounding its intellectual and cognitive structures (Acquier et al., 2017; Kraus et al., 2020). For these reasons it is necessary for review studies (e.g., systematic analyses, bibliometric analyses) to be carried out periodically to highlight progress and limitations, to stimulate reflections on future research, and to guide progress in the field.

3. Bibliometric analysis in the sharing economy

Bibliometrics allows the study of publication patterns within a research field by quantitatively analyzing empirical bibliographic data (DeBellis, 2009). It allows scholars to understand, organize, synthesize, and guide a research discipline (Vogel and Güttel, 2013). Cobo et al., (2011) argue that bibliometric analysis not only encompasses performance analysis based on scientific impact and the citations received by the articles but also that it should be accompanied by science mapping techniques to visualize the evolution of the intellectual and cognitive structures of a field.

An extensive literature review allowed us to identify up to ten review papers published between 2016 and 2020 on the SE; six bibliometric articles, two systematic reviews, and two literature reviews (see Table 1). Cheng (2016) presented the first review article on the SE, albeit focusing his analysis mainly on hospitality and tourism, and limiting his temporal search from 2010 to 2015. Similarly, other review papers (e.g., Curtis and Lehner, 2019; Ertz and Leblanc-Proulx, 2018) focused their work from the perspective of sustainability, intending to indicate collaborative practices that are consistent with sustainable development. Sutherland and Jarrahi (2018) also restrict their literature review, in their case, to the synthetization of the diverse

perspectives of technological mediation in the SE. In short, these works, by focusing on specific perspectives, do not address the entirety of this field of study.

Although Lima and Carlos-Filho (2019) and Filimonova et al. (2019) did study the field as a whole, adopting a bibliometric perspective, they oriented their work to the description and characterization of works and the main research agents (authors, countries, institutions), i.e. they presented mainly descriptive studies. Laurenti et al. (2019) presented a broad characterization of 453 articles published between 1978 and 2017 in the Scopus database; however they focused on classifying the articles according to the areas of knowledge, the economic sectors they represent, and the actors and types of exchange involved.

Another bibliometric work, presented by Marín-Anglada and Hernández-Lara (2019) focuses exclusively on citation analysis, leaving aside other complementary analysis techniques such as co-citation or co-word analysis. Hossain (2020) carried out a systematic review with a sample of 219 articles, but limits his search criteria to three-word pairs, "sharing economy", "collaborative consumption" and "collaborative economy". Finally, Kraus et al. (2020) in a more ambitious approach apply citation, co-citation, and co-word analyses to objectively explore patterns in the SE literature, but they restrict their search to "shar* economy" as the only research term and to articles published since 2013.

Beyond these ten review works, and as far as our knowledge extends, we can verify that there are no studies that conduct a study such as the one being pursued here, i.e. focused on identifying the intellectual and cognitive structures of the SE field, through a robust bibliometric study that applies complementary techniques such as citation, co-citation, and co-word analysis and with a wider spectrum in terms of time period and scope.

Author/s (year)	Title	Journal	Focus	Database/s	Study period	Keywords	Sample	Review type	Bibliometric method/s
Cheng (2016)	Sharing economy: A review and agenda for future research	International Journal of Hospitality Management	General + Tourism and Hospitality	EBSCOHost, Science Direct, and Google Scholar	2010-2015	"sharing economy", "collaborative economy/consumption"	66 articles	Bibliometric review	Co-citation and co-word analysis
Ertz, & Leblanc-Proulx (2018)	Sustainability in the collaborative economy: A bibliometric analysis reveals emerging interest	Journal of Cleaner Production	Sustainability	Scopus and Web of Science	2010-2017	"sharing economy", "collaborative economy", "collaborative consumption"	729 articles	Bibliometric review	Co-authorship and co-citation
Sutherland, & Jarrahi (2018)	The sharing economy and digital platforms: A review and research agenda	International Journal of Information Management	General + Digital Platforms	Web of Science	2008-2017	thirteen terms + hyphenated variations	435 articles	Literature review (qualitative)	----
Curtis, & Lehner (2019)	Defining the Sharing Economy for Sustainability	Sustainability	Definitions	Scopus and Web of Science	1978-May 2017	thirty-eight terms	151 articles	Literature review (qualitative)	----
Lima, & Carlos-Filho (2019)	Bibliometric analysis of scientific production on sharing economy	Revista de Gestão	General	Scopus and Google Scholar	1978-2016	"collaborative consumption", "sharing economy", "collaborative economy"	95 articles	Bibliometric review	Co-authorship, co-citation, bibliographic coupling, and co-word analysis
Marín-Anglada, & Hernandez-Lara (2019)	Research on sharing economy: why are some articles more cited than others?	Economic Research	General	Scopus	2012-2018	'sharing economy' and 'collaborative consumption'	212 articles	Systematic literature review	----
Laurenti et al. (2019)	Characterizing the Sharing Economy State of the Research: A Systematic Map	Sustainability	General	Scopus and Web of Science	1978-2017	"collaborative economy", "collaborative consumption", "sharing economy"	942 articles	Bibliometric review	Co-words analysis
Filimonova et al. (2019)	Trends in the Sharing Economy: Bibliometric Analysis	Book chapter	General	Web of Science	2010-2018	"sharing economy", "gig economy", "collaborative economy", "p2p economy", "pear-to-pear economy", "collaborative consumption"	1311 articles	Bibliometric review	Citation analysis
Hossain (2020)	Sharing economy: A comprehensive literature review	International Journal of Hospitality Management	General	Scopus and Web of Science	1978-April 2018	"sharing economy", "collaborative consumption", "collaborative economy"	219 articles	Systematic literature review	----
Kraus et al. (2020)	The sharing economy: a bibliometric analysis of the state-of-the-art	International Journal of Entrepreneurial Behavior & Research	General	Web of Science	2013-February 2020	"shar* economy"	326 articles	Bibliometric review	Citation analysis, co-citation analysis, and co-word analysis

156 **Table 1.** Previous review articles on SE literature

4. Method

4.1. Data collection

The Web of Science (WoS) database was chosen for the bibliometric analysis since it is considered to be the main and comprehensive database of academic papers and the one with the longest history as well as the one that contains the most prestigious academic journals, and since it is frequently used for bibliometric analyses due to its "friendliness" and compatibility with various software (Acedo et al., 2006; Mongeon & Paul-Hus, 2016). Through a literature review and based on the ten previous papers that carried out literature reviews on the SE, the following parameters were used to search for papers: *sharing economy*, *collaborative consumption*, *collaborative economy*, *peer to peer exchange*, *peer-to-peer exchange*, *P2P exchange*, *peer economy*, *access economy*, *peer to peer sharing*, *peer-to-peer sharing*, and *P2P sharing* within the main WoS collection, taking into account the Science Citation Index Expanded (SCI-Expanded), Social Sciences Citation Index (SSCI) and Arts & Humanities Citation Index (A&HCI).

The search was conducted in February 2020 and the study period selected was 1978 to 2019, since the first article included in WoS that contains the search parameter dates from 1978. We have decided not to limit our search to one or several specific discipline/s (WoS category/ies) due to three reasons; these are (1) the nature of the field, (2) the maturity of the field, and (3) the objective of the study. The SE is considered a multidisciplinary field since it is born from the connection and coexistence of diverse scientific areas to try to explain a single but complex phenomenon (Acquier et al., 2017; Laurenti et al., 2019; Sánchez-Pérez et al., 2020). Restricting its analysis to only one or even several disciplines will only bring partial and biased results. Additionally, even if the SE emerged academically in an investigation by Felson and Spaeth (1978), its take-off began about 10 years ago, and therefore it is still considered to be an immature field (Kraus et al., 2020; Sánchez-Pérez et al., 2020). Finally, our objective is oriented

to determining the scope and the cognitive and intellectual structures of the SE; without including the total sample of SE articles in our study it would not be possible to meet the set objective. Indeed, in the words of Kraus et al. (2020), it is necessary to carry out bibliometric works in the SE field that cover the total population of articles and we respond to this call in our research.

To ensure the quality of the papers analyzed, the search was limited to articles only, excluding review papers (to avoid duplication of documents), conference proceedings and papers to congresses, books, and book chapters, as suggested by previous articles (e.g., Cheng, 2016; Coombes and Nicholson, 2013). The use of WoS as a database and the stipulation of parameters for the inclusion and exclusion of articles ensure the reproducibility of this research (Maniadis and Tufano, 2017). Furthermore, the authors analyzed the titles, abstracts, and keywords of all the articles identified for relevancy to SE literature. Non-relevant articles were deleted from the sample (i.e., articles whose central content is not the study of the SE). The final sample consisted of 941 articles. Since this study uses citations from these articles for citation, co-citation, and co-occurrence analysis, citations received up to 31 December 2019 were included.

4.2. Analysis techniques and tools

For this research, we focus on three complementary bibliometric methods; namely, citation, co-citation, and co-word analysis (see Figure 1). In citation analysis, citations are used as a measure of influence. It is assumed that if an article is widely cited it is because several authors have considered it important for their research (Zupic and Čater, 2015). It seems likely that the most cited documents have a greater influence on the progress of a scientific field than the less cited (Ramos-Rodríguez and Ruíz-Navarro, 2004). Hence, citation analysis allows ascending and descending influence patterns of works overtime to be revealed and thus dynamically illustrate the transformations that have taken place within a scientific field (Köseoglu et al., 2015). Therefore, we have carried out first a document citation analysis (Zupic and Čater, 2015) with

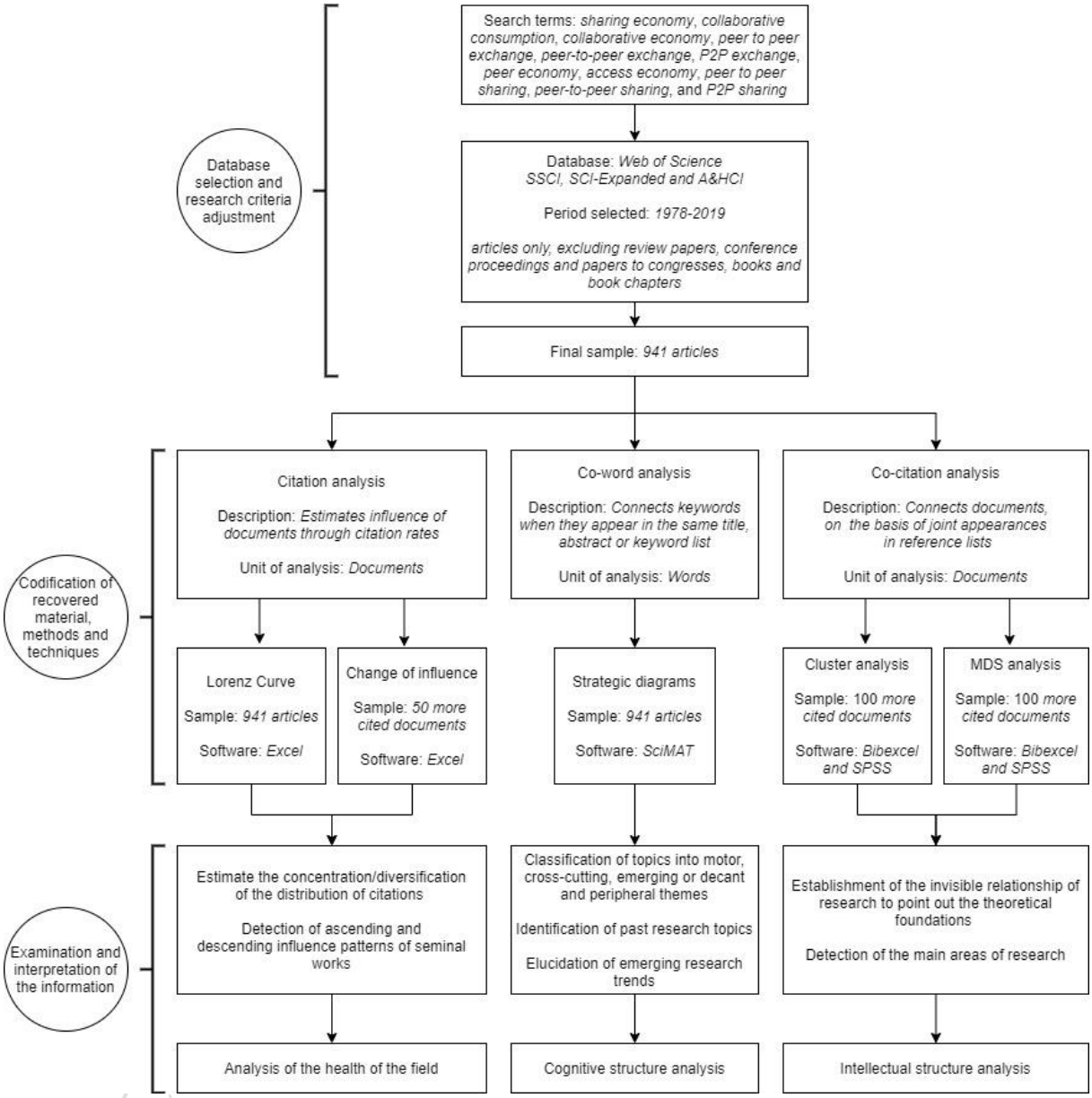
the citations extracted from WoS and the help of Microsoft Excel 2010. To analyze the concentration/diversification in the distribution of citations within this field, an adapted version of the Lorenz curve was plotted. For this purpose, all works in the sample (i.e., 941 articles) and the citations received by these works have been used. Additionally, to analyze the changes of influence that the main works in this field have undergone, this phenomenon has been graphically represented following the proposal of Ramos-Rodríguez and Ruíz-Navarro (2004). As suggested by previous works (e.g., Ramos-Rodríguez and Ruíz-Navarro, 2004; Shafique, 2013), the 50 most cited articles and the citations received by them in a certain period of time (2014-2019) were used.

Secondly, co-citation analysis enables the study of a network of references cited together (Small, 1980). The essential supposition is that co-citation groups disclose the core intellectual structure of a scientific field (Chen et al., 2010). Ramos-Rodríguez and Ruíz-Navarro (2004) postulate that this technique allows the identification of focus areas of study within a research field since the references represent the development and invisible relationships of the research field and point out its influences. As such, it enables the recognition of the structure and theoretical foundations, by revealing the affinity and proximity between publications (White and Griffith, 1981) since frequently cited documents exert an overall influence on a discipline (Culnan, 1986). Thus, a document co-citation analysis was carried out. Data calculation, refinement, and treatment of citations from WoS were carried out using the BibExcel program (Persson et al., 2009). Then, to obtain an automatic classification of documents, a hierarchical cluster analysis was executed using the Ward method, and then a non-hierarchical cluster analysis (Griffiths et al., 1984). Furthermore, as a confirmatory method, a multidimensional scale (MDS) analysis was carried out. SPSS software was used for both cluster and MDS analyses. For the co-citation analysis, following suggestions from previous works (e.g., Ramos-Rodríguez and Ruíz-Navarro, 2004) and taking into account the limitation of SPSS for MDS

analysis (it does not permit calculation of correlations matrices of greater dimensions than 100), the 100 most cited articles of our sample were taken into account (Stress<0.025).

Thirdly, co-word analysis allows the keywords used by authors to characterize their works to be examined, to establish relationships and build a conceptual structure of the main themes within a scientific field (Callon et al., 1983). The premise is that when keywords appear frequently in various documents, it means that the concepts behind those words are closely related (Zupic and Čater, 2015). The result is a semantic map that helps us to understand the cognitive structure of a field (Börner et al., 2005). The analysis of a series of such maps produced for different periods enables the changes in this conceptual space to be traced. In this way, associations and interactions between past research topics and emerging research trends can be identified (Callon et al., 1991). For the co-occurrence analysis, SciMAT software was used, as it helps to create scientific maps in a longitudinal framework (Cobo et al., 2012). SciMAT is a widely used tool that is both highly robust and efficient to carry out co-word analysis (see a review in Moral-Munoz et al., 2019). The main advantage of SciMAT is that it helps to identify which thematic areas have received the most attention from researchers within a specific field through the generation of strategic diagrams (Cobo et al., 2012); that is, it allows the evolution of research trends to be visualized over various periods by measuring the density and centrality of each theme (Cobo et al., 2015). Therefore, SciMAT's strategic diagrams are graphed in two dimensions with four quadrants. The themes that appear in the upper right quadrant are called motor themes because they have a high density and strong centrality. This means that these themes are well developed and relevant to the structure of a field. The lower right quadrant covers the basic, general, and cross-cutting themes, i.e. they are important but need to be further developed. The themes located in the lower-left quadrant represent themes that have low centrality and low density and are therefore mainly emerging or disappearing

256 themes. The themes in the upper left quadrant are marginal to the field because they have well-
257 developed internal links but irrelevant external links (Rodríguez-López et al., 2020).



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259 **Figure 1.** Design of the review strategy.

260 **5. Results**

261 *5.1. Performance analysis*

262 Figure 2 illustrates that the SE has been a topic of growing research interest over the last decade,
263 as it shows a steady increase in the number of articles published since 2012. While only 3% of
264 the total number of articles was published in the first thirty-five years (1978-2012) of research

on this topic, in the last three years (2017-2019) 84% were published. Figure 2 also illustrates that citations of articles have increased since 2012, although there is clearly a drop in citations of articles in 2018 and 2019, as these manuscripts have been exposed to fewer citations.

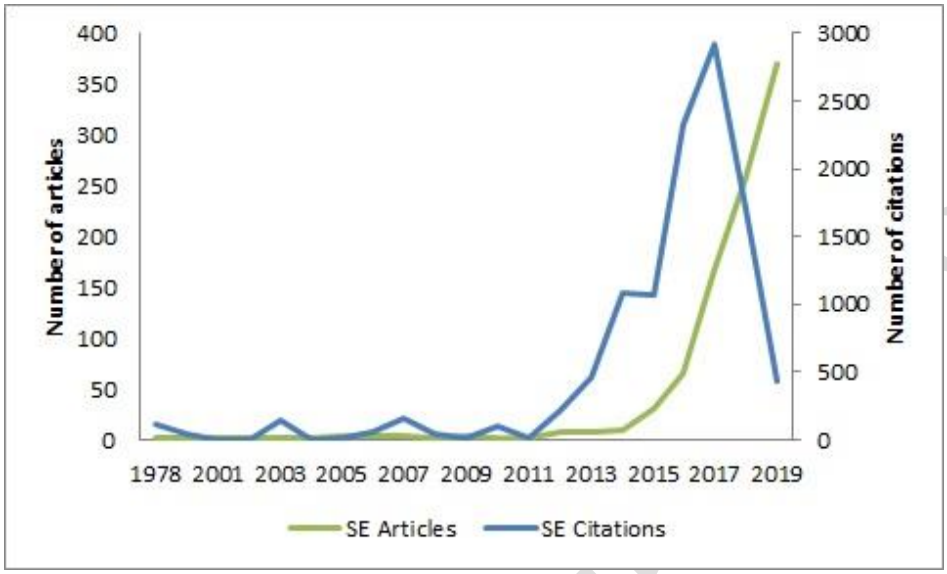


Figure 2. Evolution of published articles and citations from 1978 to 2019.

From 1978 to 2019, 368 journals were identified as indexed in the WoS database that have published at least one article on the SE field. Table 2 shows the ten most productive journals during the study period. The journal with the most articles is *Sustainability* with 74 articles, followed by the *Journal of Cleaner Production* with 47 and the *International Journal of Hospitality Management* with 38 articles. However, out of these 10 most productive journals the one with the most citations is the *Journal of Business Research* with 771 citations, followed by the *Journal of Cleaner Production* and the *Journal of Tourism Management* with 532 and 460 citations respectively. If we take into account the average number of citations per article (C/A), the *Journal of Business Research* is again at the top with 64.25 citations per article. It is worth noting that nine of the ten journals belong to the first quartile (in different categories) of the *Journal of Citation Report*; the only exception is *Sustainability*, which belongs to the second quartile. Another point to note is that of the ten journals, five are devoted to the hospitality and tourism industries, which reflects the importance of these in the development of the SE.

Journal	A	C	C/A	JCR quartile
Sustainability	74	173	2,34	Q2
Journal of Cleaner Production	47	532	11,32	Q1
International Journal of Hospitality Management	38	440	11,58	Q1
International Journal of Contemporary Hospitality Management	27	366	13,56	Q1
Technological Forecasting and Social Change	20	392	19,60	Q1
Current Issues in Tourism	14	75	5,36	Q1
Tourism Management	14	460	32,86	Q1
IEEE Access	13	15	1,15	Q1
Journal of Travel & Tourism Marketing	12	140	11,67	Q1
Journal of Business Research	12	771	64,25	Q1

Table 2. The 10 most productive journals in SE research from 1978 to 2019.
A: Total number of articles; C: Total number of citations; C/A: Average number of citations per article.

5.2. Citation analysis

Knowing that the main objective of citation analysis is to estimate the influence of articles through citation rates, it has been deemed appropriate to analyze the relative concentration/diversification in the distribution of citations among SE articles. Logic dictates that concentration will exist; however, it is necessary to discern how great it is. To this end, an adaptation of the Lorenz curve has been used, which allows us to graphically observe the relative distribution of a variable in a given domain (Fellman, 2011). In this case, and as can be seen in Figure 3, the horizontal axis represents the percentage of citations while the vertical axis represents the percentage of articles. As data for these axes, as of December 31, 2019, this field of study had 941 articles published in WoS, which had received a total of 10,916 citations.

At first glance, a pronounced concentration can be seen in the distribution of citations; for example, the 8 most cited articles on this subject have 2,289 citations. These 8 articles are Belk

(2014), Hamari et al. (2016), Martin (2016), Zervas et al. (2017), Ert et al. (2016), Cohen and Kietzmann (2014), Möhlmann (2015) and Hamari (2013). An analysis of the percentage of citations reveals that 40% of citations are concentrated in 29 articles, or 80% in 191 articles; leaving only 20% of citations for more than 750 articles. Nevertheless, it is important to emphasize that this field, being in an early stage of research, has many recent publications, which have not been exposed to citations for a long time.

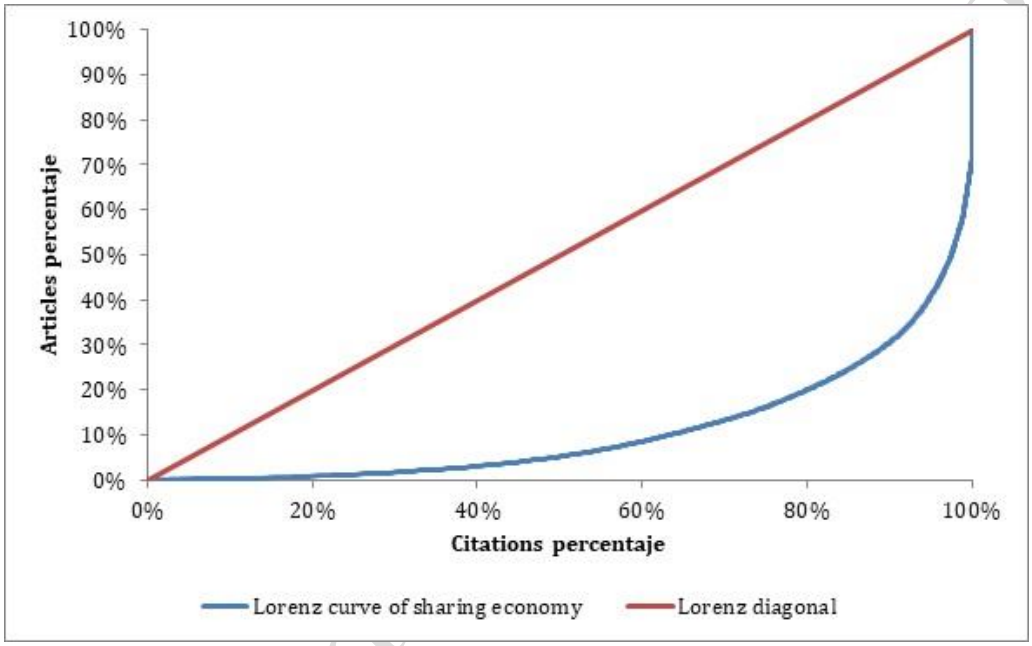


Figure 3. Lorenz curve on the relative distribution of citations over the article set.

However, to see the real influence of an article over time, it is not enough to analyze its total number of citations as it also is necessary to check if the presence of those citations is constant over time. That is why, following previous works (e.g., Shafique, 2013), the present study analyzes the change in influence that publications have undergone within a period of time. Taking as a sample the 50 most cited works in this field of study between 2014-2019 (since 2014 is the year in which the number of citations increases), the changes in the percentages of citation are analyzed to reveal the gains or losses of influence over the period under study and thus obtain a dynamic image of the transformations that have taken place within the discipline. Figure 4 shows the changes in the comparative citation percentages for the different sub-periods considered. The darkest band shows the percentage gain or loss of influence, from the first sub-

period (2014-2015) to the second (2016-2017), and the lightest band shows the percentage difference from the second sub-period (2016-2017) to the third (2018-2019).

All the papers analyzed in the study fit a limited number of patterns (White and McCain, 1998). One of the most common, known as up-up pattern, is that papers increase their influence from the first to the second sub-period and repeat the process from the second to the third. This, of course, indicates an ascending influence pattern throughout the study period; examples of works that exhibit this pattern are Hamari et al. (2016), Martin (2016), Cheng (2016), Tussyadiah and Pesonen (2016), and Zervas et al. (2017).

Another discernible pattern, known as up-down pattern, is the one that shows works with an ascending profile between the first and second sub-periods but descending towards the end of the period. This may indicate that the works in question reached and exceeded their maximum weight of influence during the period in question, and seems to suggest that those with the ascending pattern, mentioned above, have not yet reached that point. Some works that follow this pattern are Belk (2014), Hamari (2013), Heinrichs (2013), and Albinsson and Perera (2012).

Theoretically, other possible patterns would be that of works which lose influence at the beginning only to gain it later (down-up pattern), although there were no cases of this nor of another possible pattern which would be of works whose influence decreases in both the second and third sub-period (down-down pattern).

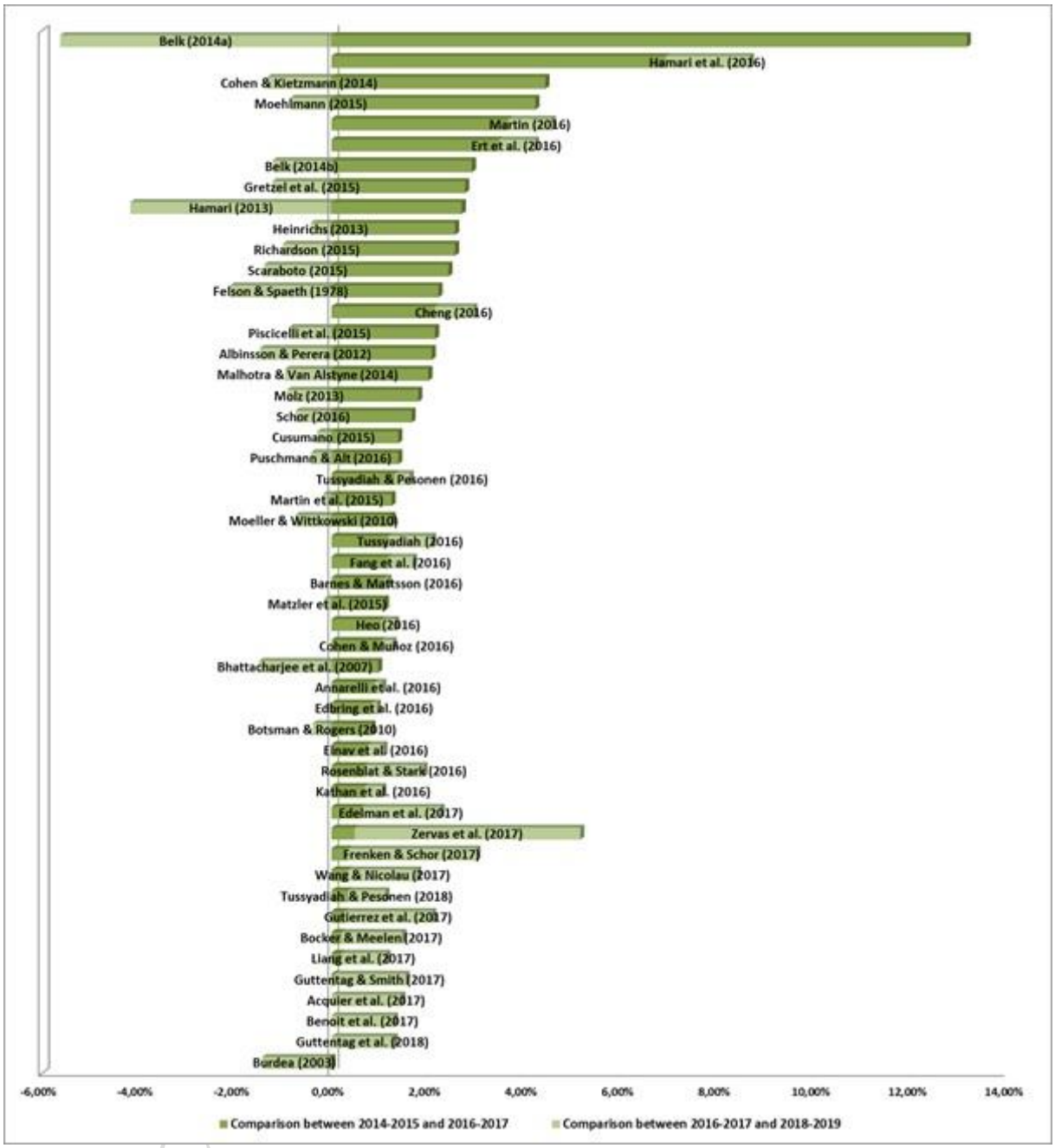


Figure 4. Changes in the influence of 50 most cited articles in SE research (2014–2019).

5.3. Co-citation analysis: detection of sub-fields of research

The application of the inter-group linkage cluster method has allowed the identification of four clusters of articles. A close examination of the articles included in each cluster has allowed us to characterize them. The clusters identified are (C1) Hospitality and Tourism, (C2) Consumer behavior, (C3) Business models, and (C4) Sustainable impact.

- Cluster 1 (Hospitality and Tourism), which is made up of 32 articles, and therefore is the bigger cluster, mainly consists of articles with strong ties to hospitality and tourism. The majority of articles are published in journals such as *International Journal of Hospitality Management*, *Annals of Tourism Research*, *Tourism Management*, and *Current Issues in Tourism*. This cluster, which encompasses studies that analyze the main platforms used for consumer accommodation (e.g. Airbnb and Couchsurfing), examines society's reputation and trust in these and analyze the impact of the SE in hospitality and tourism industries. Papers such as those presented by Guttentag (2015), Dredge and Gyimóthy (2015), and Cheng (2016) are the seminal ones within this cluster. These papers highlight the rise of the "informal" tourism accommodation sector (Guttentag, 2015), critically assess the implications of the SE for tourism industry systems (Dredge and Gyimóthy, 2015) and identify areas of focus for SE research in hospitality and tourism (Cheng, 2016).
- The second cluster (Consumer behavior), comprising 28 manuscripts, draws mainly on marketing and applied psychology theories to explain what leads consumers to choose the SE over traditional firms. It focuses mainly on consumer decision-making, anthropological aspects, and access to SE through new platforms. The main representative works of this cluster are the ones of Bardhi and Eckhardt (2012) and Belk (2014). These authors primarily evaluate the growth of SE by arguing that "*the old wisdom that we are what we own may need to be modified to consider forms of ownership and uses that do not imply ownership*" (Belk, 2014). The manuscripts of this cluster are mainly found in journals such as *Journal of Consumer Research*, *Journal of Marketing* and *Journal of Consumer Behaviour*.
- The third cluster (Business models) finds its roots in the SE as a non-traditional business model (e.g., Netflix and Zipcar). It addresses issues such as the relevance of the internet

in this type of business, the growth of car-sharing and ridesharing businesses, and the competition of SE businesses versus traditional ones. Important works include Möhlmann (2015) and Hamari et al. (2016), who empirically prove the importance of information and communication technologies (ICT) for the SE and highlight certain factors (usefulness, trust, cost savings, familiarity, service quality, and community membership) as factors that differentiate this type of non-traditional business model from traditional ones. This cluster encompasses 29 articles distributed mainly in journals such as *Journal of Business Research*, *Harvard Business Review*, *Business Horizons*, and *Research in Transportation Business & Management*.

- Finally, cluster 4, which has the least number of manuscripts (11 articles), focuses on the sustainable impact of the SE. Journals such as *Geoforum*, *Ecological Economics*, and *Journal of Cleaner Production* stand out in this cluster. This group of articles addresses issues such as the development of SE theory (what it is, its paradoxes, and its link to sustainability) and social, economic, and environmental impact. The papers presented by Cohen and Muñoz (2016) and Böcker and Meelen (2017) stand out as relevant. These primarily analyze how some exchange activities could generate more sustainable consumption and production and the relative importance of economic, social, and environmental motivations in the shared use of tools, transport, accommodation, cars, and catering.

To give greater robustness an MDS analysis has also been carried out. The MDS is a procedure by which maps are made from the correlation matrix of the elements analyzed to explore the structure underlying the entire set of elements. The MDS analysis, therefore, provides a graphic vision of the different clusters (Acedo et al., 2006). Employing the MDS analysis and through the identification of the works of each cluster (from cluster analysis) in the MDS map, we were able to graphically confirm the existence of the four main areas of focus research on SE

literature (see Figure 5). The green cluster encompasses the works of the hospitality and tourism cluster, the pink cluster those corresponding to consumer behavior, the blue cluster represents business models and the red cluster comprises those works focusing on sustainable impact.

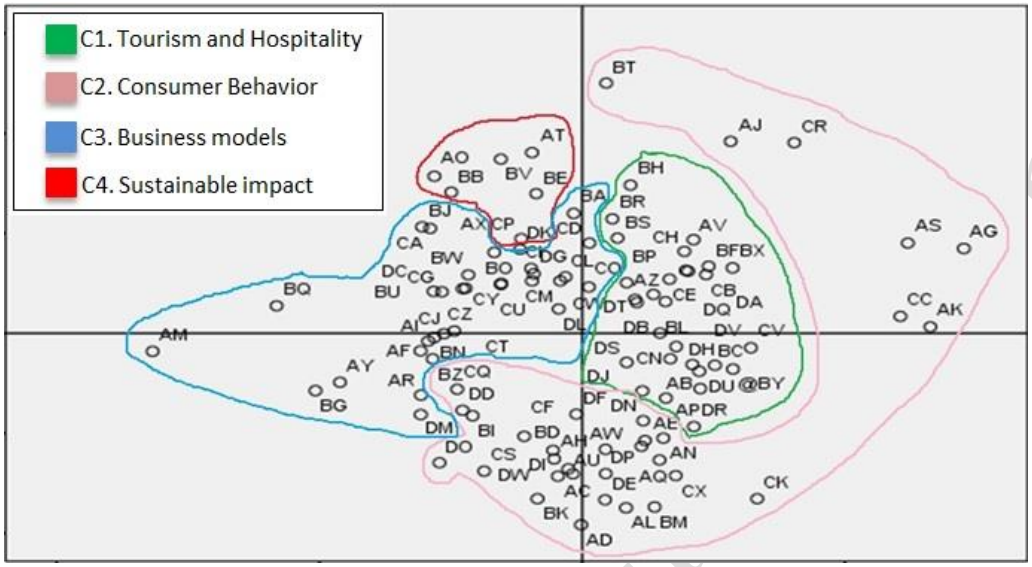


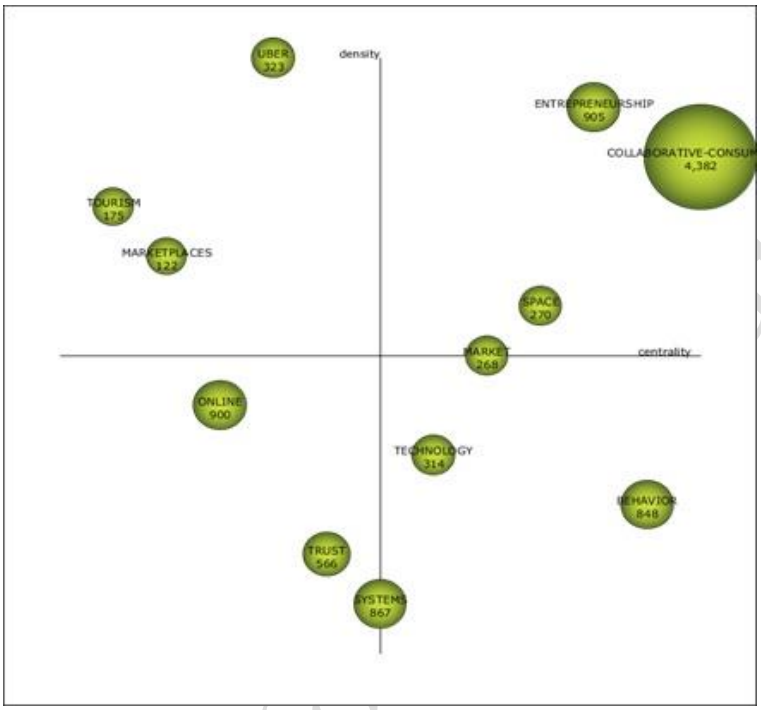
Figure 5. MDS MAP (clusters superimposed).

5.4. Content analysis from co-word

As mentioned above, for better analysis of SciMAT's strategic diagrams, research should be divided into at least two periods. Following the criteria of some previous studies (e.g., Cobo et al., 2015), which have analyzed recent emergency fields (as is the case of the SE), the first period has to be longer (1978-2016) than the second one (2017-2019), to obtain a first period of a reasonable size due to low productivity during the initial years. The main reason for the selection of these periods lies in the fact that the pattern of publications and citations dramatically increases from 2017 onwards, being a turning point in the scientific development of this field. Indeed, the publication trend from 2016 to 2017 reflects an increase of 257% and more articles were published just in 2017 than in the previous 38 years. The first period includes 147 documents, while the second period covers 795 manuscripts. Therefore, the first period could be defined as an incipient period and the second as a growth period. Figure 6 shows the strategic diagrams to analyze the most outstanding issues in the SE field for each period. As explained in the methodology section, based on the relevance of each research topic, these have

been classified into four categories. The size of the sphere is proportional to the number of publications associated with each research topic and includes in it the number of citations corresponding to each of them.

(a) Period 1978-2016



(b) Period 2017-2019

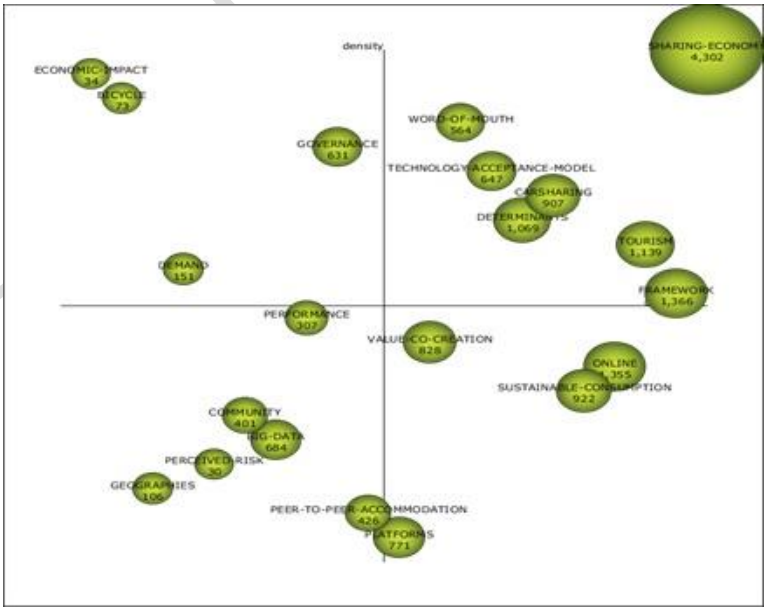


Figure 6. Strategic diagrams.

First period: During the period 1978-2016, research was mainly distributed across 12 main topics. Of those, seven relevant themes (four motor topics and three basic and transversal themes) could be identified due to their contribution to the growth of the field under study (Figure 6(a)); these are *entrepreneurship, collaborative consumption, market, space, technology, behavior*, and *systems*. Each theme is approached from several points of view, reflecting the increasing diversity of perspectives and the complex nature of the SE. For example, *collaborative consumption*, which is the motor theme with greater impact (4,382 citations and h-Index of 31, see Table 3), encompasses research on changes in consumer behavior, the connection to sustainability, and the transition of the community towards a collaborative system (cf. Barnes and Mattsson, 2016). Standing out within the *entrepreneurship* topic are viewpoints such as the entrepreneurship-innovation connection in creating value for SE, the rise of the circular economy, or the analysis of the industries where the creation of collaborative new ventures are most prominent (e.g., accommodation and tourism) (cf. Cheng, 2016).

Meanwhile, *space* is detected as another motor topic, referring to works that study the peculiarity of shared spaces, such as, co-working spaces, or P2P accommodation with communal spaces (cf. Tussyadiah and Pesonen, 2016). Finally, the last motor topic is *market*, studied mainly through the economic and social impact of SE activities on the market, such as the impact of Airbnb or Couchsurfing in the hospitality industry and their subsequent impact on hotel rates and consumer segmentation (cf. Dredge and Gyimóthy, 2015). As a basic topic, *behavior* stands out by receiving a great number of citations (848) and this can be explained by the huge interest of academics to understand not only the management perspective of the SE but also the consumer perspective (cf. Belk, 2014). *Technology* is placed as a basic topic, mainly analyzing the use of the internet and other technological supporting tools and features, while

448 *systems* is a basic theme highlighting the perspective of the P2P system for the SE (cf. Belk,
449 2014; Tussyadiah and Pesonen, 2016).
450 In addition, Figure 6(a) presents one emerging theme (*online*) and one declining topic (*trust*),
451 and three peripheral themes (*tourism*, *marketplaces*, and *Uber*). From those, it should be noted
452 that *online* and *trust* were mainly approached to study SE-related e-commerce and intentions
453 respectively (cf. Belk, 2014; Ert et al., 2016), and that *online* has received a greater number of
454 citations while attracting fewer documents than *trust*. Finally, *tourism* was an internally well-
455 developed, although peripheral, topic. It was researched from a great variety of points of view,
456 including tourism development, tourism marketing, tourist culture, and through the inherent
457 link between hospitality and tourism (cf. Cheng, 2016).
458 **Second period:** During the period 2017-2019, the research is characterized by thematic
459 diversification, and is distributed across twenty main topics. Accordingly, seven motor themes
460 and four basic topics were identified (Figure 6(b)). *Sharing economy* appears as the theme with
461 the greatest impact on the three criteria analyzed (see Table 3). Studies on these topics are
462 divided into various perspectives: customer satisfaction, innovation, sustainability, and trust.
463 This shows the complexity of the SE when studied from a wide variety of points of view
464 (Hossain, 2020). *Framework* is the topic with the second greatest impact on the three criteria.
465 It encompasses research related to business models, ecosystems, and innovation networks (cf.
466 Kumar et al., 2018). Two other relevant motor themes in this period are *determinants* and
467 *tourism*. Within the *determinants* theme, a great variety of attributes are studied that consumers
468 take into account when making decisions, such as hedonic price, real price, market, and hotels
469 vs. Peer-to-peer accommodation (cf. Wang and Nicolau, 2017). On the other hand, the *tourism*
470 topic, which has gained great relevance concerning the first period, highlights research areas
471 such as destinations, consumer perceptions, and second homes (cf. Hossain, 2020).
472

	Topic	Number of citations	Number of documents	h-Index
Period 1978-2016	Collaborative-consumption	4,382	62	31
	Entrepreneurship	905	22	14
	Online	900	9	7
	Systems	867	14	10
	Behavior	848	8	7
	Trust	566	15	11
	Uber	323	3	3
	Technology	314	7	6
	Space	270	7	7
	Market	268	8	6
	Tourism	175	5	4
	Marketplaces	122	5	4
Period 2017-2019	Sharing-economy	4,302	636	29
	Framework	1,366	246	21
	Online	1,355	181	18
	Tourism	1,139	141	19
	Determinants	1,069	118	18
	Sustainable-consumption	922	149	16
	Car-sharing	907	150	15
	Value-co-creation	828	115	16
	Platforms	771	120	15
	Big-data	684	98	15
	Technology-acceptance-model	647	93	14
	Governance	631	96	14
	Word-of-mouth	564	75	15
	Peer-to-peer-accommodation	426	104	13
	Community	401	72	12
	Performance	307	69	11
	Demand	151	25	7
	Geographies	106	18	8
	Bicycle	73	6	4
	Economic-impact	34	6	3
	Perceived-risk	30	18	3

Table 3. Performance of topics in the periods 1978–2016 and 2017–2019.

The other three motor themes in this period are *word-of-mouth*, *model of technology acceptance and car-sharing*. Within *word-of-mouth* a number of interesting viewpoints can be found such as perceived value and online consumer assessments, e-commerce usage, and brand value (cf. Liang et al., 2018). Within the theme *technology acceptance model*, perspectives such as consumer behavior and behavioral intent based on the theory of planned behavior are addressed (cf. Wang et al., 2020). Finally, *car-sharing* highlights customer experiences such as preferences and behavior for mobility and its impact (cf. Habibi et al., 2017). *Value-co-creation*, *sustainable consumption*, *online*, and *platforms* appear as incipient topics requiring further development. *Value-co-creation* research is focused on business models innovation, social practices, and social actors (cf. Camilleri and Neuhofer, 2017), while the *sustainable*

consumption topic concentrates on access-based consumption, people's attitudes, and the circular economy (cf. Böcker and Meelen, 2017). The *online* theme encompasses research on consumer satisfaction, virtual communities, reputation, and reciprocity. And the *platforms* topic analyzes the dual market strategies that exist in SE activities (cf. Sutherland and Jarrahi, 2018). In addition, Figure 6(b) shows six dilemma themes and four peripheral themes. The emerging or declining themes are *community, geographies, peer-to-peer accommodation, performance, big data,* and *perceived risk.* SciMAT allows not only the identification of themes by periods but also enables the observation of their evolution over time on a longitudinal map (see Figure 7). As can be seen, the thematic areas where the SE field is developing are entrepreneurship, collaborative consumption, space, market, trust, Uber, marketplaces, tourism, technology, behavior, systems, and online, while in the most contemporary period, new topics have appeared such as sharing economy, car-sharing, word-of-mouth, framework, technology acceptance model, performance, governance, sustainable consumption, value co-creation, big data, peer-to-peer accommodation, among others. Solid lines represent a thematic nexus between the linked themes, as they are part of the main element, while a dotted line means that the themes share elements that are not the main element (Cobo et al., 2012).

In general, research on the SE presents low cohesion between the two study periods, since there are only two thematic areas, tourism and online, that appear in both periods. It is also worth noting the evolution and name change of the thematic area from collaborative consumption to sharing economy, which confirms this term as an umbrella term, which encompasses collaborative consumption. Also, it can be seen that several topics have gained relevance over time. The tourism theme changed from being a peripheral theme in the first period to being a motor theme in the second period, indicating that it has gained relevance in the last three years within the SE. This further reinforces the fact that this industry is the most important in this field.

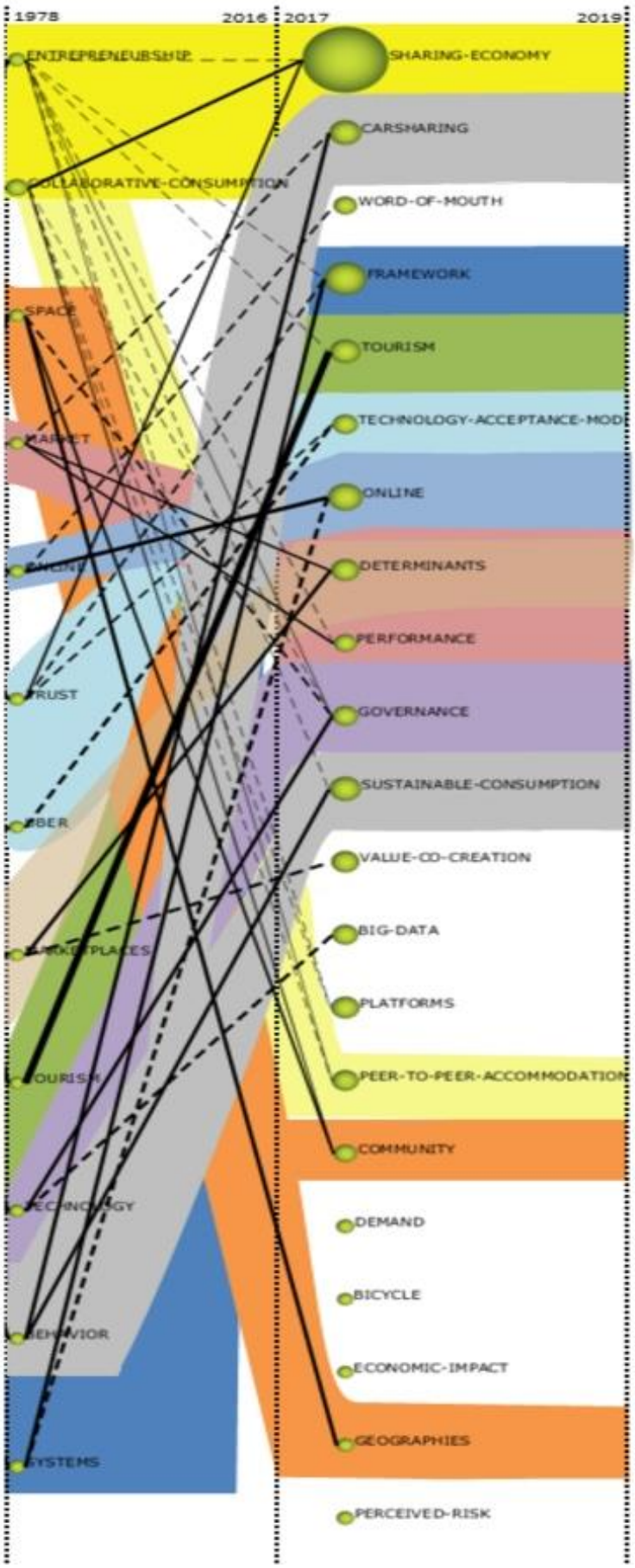


Figure 7. Longitudinal evolution map.

The online theme is another that has gained importance since it has progressed from being an emerging theme to being a basic and transversal theme within this field. The development of this topic can be understood as the confirmation of the technological nature of the SE with the emergence of digital tools and platforms (cf. Sutherland and Jarrahi, 2018; Perren and Kozinets, 2018). Likewise, sustainable consumption has appeared in the second period as the evolution of consumer behavior, demonstrating the increasing importance of this phenomenon within the SE literature. It is also worth noting the emergence of isolated themes that do not relate to any topic in the first period but appear directly in the second, such as demand, bicycle, economic impact, and perceived risk.

6. Discussion and implications for academic research

By assessing the importance of certain articles within this field with a citation analysis using an adaptation of the Lorenz curve, it could be argued that there is a great concentration in the distribution of citations within this field. Although this might indicate the existence of seminal works for the development of SE research, since citations in this scientific field are very concentrated in a small number of manuscripts, it could also show a skewed citation distribution that could mean an over-citation of these few manuscripts (Bertoli-Barsotti and Lando, 2019). However, by exploring the 50 most influential articles, it can be seen that, as is typical of "normal science" (Latour, 1987), newer publications present an ascending pattern, and are gradually replacing the older ones (descending pattern), which in turn reveals a healthy growth of the field (Shafique, 2013).

From a macro-perspective, thanks to the extensive analysis of 40 years of publication, this paper is not a review or 'synthesis' of the accumulated body of research, but an exploration into the development of the theoretical foundations of the SE as a scientific domain. As the frontiers of SE intersect with several disciplines -management, marketing, economy, law, sociology,

technology-, we can expect new insights, extending our knowledge of the SE concept. In particular, since interdisciplinarity is an approach increasingly seen as key to addressing complex problems (Breslin et al., 2020), further research should pay attention to the interdisciplinary nature of the articles published about SE. We extend this view by disclosing the core intellectual roots that serve as the foundation stones for SE research through a co-citation analysis in which we identify four main areas of research: hospitality and tourism, consumer behavior, business models, and sustainable impact.

Three of these, hospitality and tourism, business models, and consumer behavior could be considered as highly developed compared to the sustainable impact cluster. This shows that the study of this cluster has been limited and that it is still in an incipient stage (Laurenti et al., 2019). A further close examination of each cluster reveals the current focus of SE research lies in the importance of reputation, trust, and ICT for customers (Ert et al., 2016; Hamari et al., 2016), the impact of SE businesses (e.g., Airbnb) on traditional businesses (e.g., hotels) (Zervas et al., 2017), the influence sociological perspectives (Belk, 2014) on consumer decision-making (Bardhi and Eckhardt, 2012), and on the use of digital platforms (Sutherland and Jarrahi, 2018), the determinants of customer satisfaction (Möhlmann, 2015), and its link to sustainability (Böcker and Meelen, 2017). In any case, it is certainly worthwhile endeavoring to gain a deeper understanding of customers' sustainable consumption behavior in the SE, as this is an issue that still requires further development (Cohen and Muñoz, 2016).

Although the results show that these main areas are the dominant ones in the SE literature, it can be said that they are still unconnected streams of knowledge for which further work is required to link them in order to contribute to the development of the intellectual structure of this field.

This, in turn, will lead to the creation of an own identity for this field in general, and in hospitality and tourism in particular. Moreover, it is essential to conduct studies that connect

the four research areas by taking as a basis the hospitality and tourism perspective, since this is the main subfield within the SE literature. This could also have implications for the taxonomy of hospitality products with SE as own category by itself.

Several specific research directions deserve more attention. From a micro-perspective, the research focus should deepen the analysis of each of the four foundation stones.

Sub-field 1: Hospitality and tourism.

1. The applicability of conventional management principles in tourism and tourist behavior need to be examined in the context of SE (Hossain, 2020; Wang and Nicolau, 2017). In this vein, topics such as peer-to-peer accommodation, car-sharing, consumer demand, geographies, and tourism in general, have a high prominence in SE research.
2. Assessing the eWOM effects in the SE and their impact on the hospitality industry (Liang et al., 2018).
3. Analyzing the dyadic relationships in online hospitality and tourism platform networks by applying social network analysis (Chung, 2017).
4. Impact of the SE on the hospitality and tourism industry (Zervas et al., 2017).

Sub-field 2: Consumer behavior.

1. Given that issues related to consumer information, such as big-data, platforms, TAM, eWOM, or perceived risk are gaining increased relevance as they have an undeniable role as a growing data source for SE businesses (Xu et al., 2019), these are topics that require further attention in SE research considering the privacy concerns they generate among consumers (Bleier et al., 2020).
2. To delve into the theory of planned behavior in order to analyze how the risk perceived by the consumer influences the business of the SE (Hong et al., 2019).

Sub-field 3: Business models

1. Disentangling the dominant logic of the sharing economy as a business model, through its defining dimensions (Engelmann et al., 2020). Explicating the distinct skills, processes, procedures, organizational structures, decision rules disciplines, and performance that underlie the development of the SE (Kumar et al., 2018).
2. Examining the performance of governance mechanisms in the sharing economy (Eckhardt et al., 2019).

Sub-field 4: Sustainable impact.

1. Specific research is needed to explore the micro foundations (e.g., shared knowledge, value co-creation, sustainability), that have facilitated and enabled the development of sustainable behavior in the SE, with a temporality perspective (Teece, 2007). In particular, this exploration could be developed for SE to thrive in the New Normal (Ahlstrom et al., 2020).
2. Analyze the reasons that have led to the development of the SE. Specifically, to determine whether SE responds to an evolution in the mode of consumption, as suggested by Bardhi and Eckhardt (2012), is it the result of a sustainable consumer (Cohen and Muñoz, 2016), or is it just convenience (Böcker and Meelen, 2017).

Finally, as an extension of the bibliometric analysis, we firmly believe that applying other techniques, such as bibliographic coupling, co-authorship or evolved knowledge domain techniques could provide opportunities for a further understanding of the SE field by displaying the conceptual and social roots of the field (cf. Vogel and Gütel, 2012). Furthermore, it would be of interest to carry out a network analysis of authors to identify links and relationships (cf. Zupic and Čater, 2015). Additionally, an important task to complement this study could be a thematic analysis to uncover the ontology domain of the SE, i.e. inductively synthesizing and categorizing it into major themes and sub-themes (cf. Jones et al., 2011).

7. Conclusions

This study makes a significant theoretical contribution to the SE research field by extending the existing knowledge. The complementary use of citation, co-citation, and co-word analysis enabled us to carry out an empirical and inductive study of the SE literature to examine the health of this field, its intellectual and cognitive structures, patterns of influence, and to propose future research directions.

From a theoretical perspective, this study presents a comprehensive review of a significant number of WoS articles (941 in total, between 1978 and 2019) that complements existing reviews on the SE, extending the period of analysis and providing new avenues for research. In this regard, it should be noted that the most recent review studies in this field analyzed articles published up to 2018, but in 2019 alone, 370 articles were published on this topic (representing 40% of total articles). It was therefore necessary to present a more up-to-date review analysis. From an academic point of view, with this analysis, we help to bring clarity to the SE literature, by plotting a thematic evolution map to understand the longitudinal progression of the research field. We uncover the major areas of research and some prominent future research tendencies. From a methodological perspective, this manuscript highlights the complementary use of citations, co-citation, and co-word analysis to examine the underlying relationships of the intellectual and cognitive structure of a field of study. From a practical point of view, diverse interested agents (e.g., consumers, service providers, policymakers, SE new businesses, traditional companies) will benefit from the holistic insight of the evolution and current status of some aspects that are of their concern.

This study is not without some limitations. Firstly, this study examines only articles from academic journals indexed in the WoS database. Second, the keywords selection may directly condition the results, as the SE concept has evolved in recent years to the extent that different terms are associated with it. Third, it should be noted that the sample of articles used for this

study includes articles published up to the end of 2019.

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