

Bibliometric analysis of entrepreneurial orientation

Bibliometric
analysis of EO

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Abstract

Purpose – The remarkable concept of entrepreneurial orientation (EO) has attracted scholars' attention for its relevance to a firm's performance. Based on bibliometric and distance-based visualization of similarities (VOS) analysis, the purpose of this paper is to outline a broad-spectrum perspective of the structure of research in EO across more than 20 years of publications, identifying the most prominent journals, authors and articles in this field.

Design/methodology/approach – The paper uses the Web of Science Core Collection and the VOS viewer software. The analysis searches for all the documents connected to EO available in the database from 1976 to 2017. The graphical visualization maps the bibliographic data using both bibliographic coupling and co-citation data.

Findings – *Entrepreneurship Theory and Practice Journal*, *Journal of Business Venturing* and *Family Business Review* are the most relevant journals in the field. Among the many important authors in the EO literature, key contributors are Lumpkin, Payne, Short, Covin, Dess and Wiklund. Three different streams of research are linked to the EO concept; strategy and entrepreneurship, family business and miscellaneous work in psychometrics, methods, marketing and knowledge/capability-based approaches to organizations.

Originality/value – This paper contributes to EO research by providing a global perspective on the concept's investigation, using bibliometric data and graphical networks.

Keywords Bibliometrics, Web of Science, Entrepreneurial orientation, Analytics, VOS network analysis

Paper type Research paper

1. Introduction

Entrepreneurial orientation (EO) is one of the most important concepts in the field of entrepreneurship (Wales *et al.*, 2011), and entrepreneurship is linked to healthy economic development of countries. Researchers in this field have identified it as an cultural orientation or strategic logic that permits the search for and exploitation of new business prospects, even those that do not include the launch of new initiatives (Lumpkin and Dess, 1996; Covin and Miles, 1999; Zahra *et al.*, 1999; Rauch *et al.*, 2009).

The organizational phenomena of EO can be understood as a dominant logic that permeates the organization at all levels (see Prahalad and Bettis, 1986), as manifested in attitudes and behaviors and a strategic position (George and Marino, 2011) that captures patterns and processes in three specific dimensions: innovativeness, proactiveness and risk taking (Wiklund and Shepherd, 2005). These concepts were defined by Lumpkin and Dess (1996) as follows: innovativeness is the will to introduce a new entry (new products, new services and new processes) through practices of experimentation and creative methods (Lumpkin and Dess, 1996); proactiveness refers to the independent action of an individual or team whose goal is to give birth to a business concept or vision and to carry it out until its end (Lumpkin and Dess, 1996); and risk taking means adopting measures based on a decision-making process without full knowledge about possible outcomes (Lumpkin and Dess, 1996).

Given its importance and proximity to innovation, organizational theory and strategy, research on EO has been continuously expanding for more than two decades (Covin and Lumpkin, 2011). Research on EO has largely considered its positive relationship with



performance, as highlighted in different meta-analyses (i.e. Rauch *et al.*, 2009; Saeed *et al.*, 2014). These studies note that some contingent variables moderate the relationship at two different levels. First, at a macroeconomic level, variables such as national culture, the regulatory environment, market size, the economic development and political stability of a country affect the relationship between EO and performance (Saeed *et al.*, 2014). Second, other features of the firm have also been explored as variables, such as the structure and size of the organization and its processes and resources (Rauch *et al.*, 2009). Nonetheless, this information does not give a complete overview of the structure of research on EO, and the influence and relevance of journals, authors, papers or institutions in the development of this subfield in entrepreneurship.

Analysis using bibliometric techniques can consider different levels of relevance for research in any field, incorporating the most important papers and journals in the investigation by combining useful information such as citations, the number of publications and other data that allow categorization according to the relevance to the discipline, making it possible to construct an overview.

To categorize all of the information coming from different studies, scholars in different disciplines have provided a general bibliometric perspective of fields related to EO, including innovation, management and entrepreneurship. In the innovation case, bibliometric analysis has been conducted from a general perspective (Fagerberg *et al.*, 2012) and from more specific perspectives, such as an overview of the most relevant papers (Shafique, 2013), journals (Durisin *et al.*, 2010; Thongpapanl, 2012), institutions (Fagerberg and Verspagen, 2009; Fagerberg *et al.*, 2012), countries (Must, 2006; Teixeira, 2014; Merigó *et al.*, 2015), continents (Toivanen and Ponomarev, 2011) and other related subjects (Watts *et al.*, 1998; Zhu and Guan, 2013; Sakata *et al.*, 2013).

Bibliometric procedures have also been applied to the management discipline in subjects such as strategy (Moed, 2000; Ramos-Rodriguez and Ruiz-Navarro, 2004; Nerur *et al.*, 2008; Vogel and Güttel, 2013), knowledge management (Ponzi, 2002; Gu, 2004; Zhang and Xu, 2008; Akhavan *et al.*, 2016), information management (Hanqing, 2009), technology management (Pilkington and Teichert, 2006), sales management (Johnson, 2006), operation and production management (Chang and Hsieh, 2008; Hsieh and Chang, 2009), program management (Artto *et al.*, 2009), supply chain management (Charvet *et al.*, 2008; Fahimnia *et al.*, 2015), HHRR (Fernandez-Alles and Ramos-Rodriguez, 2009), corporate sustainability (Schaltegger *et al.*, 2013), customer relationship management (Tsai, 2011) and even sports management (Shilbury, 2011). As in the case of innovation, bibliometric procedures have identified the most relevant researchers (Podsakoff *et al.*, 2008), institutions (Vogel, 2012), journals (Shilbury, 2011) and countries (Courtault *et al.*, 2010) in the field of management.

Entrepreneurship has been explored through bibliometrics at a general level (Luor *et al.*, 2014; Ferreira *et al.*, 2015) and at the knowledge structure level (Landström *et al.*, 2012, 2015), identifying the most important articles (Volery and Mazzarol, 2015), authors (Shane, 1997), journals (McElwee and Atherton, 2005; Wan *et al.*, 2009; Dos Santos *et al.*, 2011), institutions (Schildt *et al.*, 2006; Grimaldi *et al.*, 2011; Teixeira, 2011) and countries (Zhai *et al.*, 2014) to the field. In the same manner, bibliometric procedures have been utilized to explore more specific fields of entrepreneurship, such as technological entrepreneurship (Ferreira *et al.*, 2016), social entrepreneurship (Etemad and Lee, 2003; Sassmannshausen and Volkmann, 2013; Kraus *et al.*, 2014; Rey-Martí *et al.*, 2016), entrepreneurship in family business (López-Fernández *et al.*, 2016), international entrepreneurship (Kraus, 2011; Servantie *et al.*, 2016), national systems of entrepreneurship (Ács *et al.*, 2014) and the scales and indicators utilized to measure entrepreneurship (Kuskova *et al.*, 2011; Álvarez *et al.*, 2014).

Even when all of the aforementioned studies are related to the concept of EO, their focus does not allow for an independent perspective about our domain of interest. Moreover, because this subject includes a great variety of contributions and contributors to the entrepreneurship domains, no single published article provides a global vision on research

related specifically to this concept. Consequently, this paper aims to help close this gap by providing an overall perspective of the key contributions and contributors to EO research through the use of bibliometrics and visualization of similarities (VOS) based on distances techniques using the Web of Science database. The timeframe considered in our analyses starts from 1976, which is the year that the seminal article of Khandwalla: "Some top management styles, their context and performance" first mentioned the term "EO" in the context of culture inside a firm. All of the obtained information was organized and categorized according to its relevance to the EO research by articles, authors and journals.

Because the purpose of this paper is to provide an overview of the most prolific and prominent research related to the EO, we consider the Web of Science database that covers most world reputed management and entrepreneurship journals.

This paper is organized as follows. Section 2 provides a description of the methodology addressed; Section 3 presents the results of most prominent EO research at the articles level of analysis; Section 4 accounts for the most prolific and prominent researchers in the concept; and Section 5 provides some conclusions.

2. Methodology

Bibliometric analyses of citations and co-citations are based on purely quantitative approaches and are supported by the premise that citations are a valid and reliable indicator of scientific interaction between researchers and research institutions (Garfield, 1979; Kraus *et al.*, 2012). Thus, they can be used to determine both the relevance and impact of any author, publication or journal and the structure of the field of study addressed (Small, 1978).

The bibliometric analysis was based on the proposed procedures of Merigó *et al.* (2015), and the mapping techniques used the VOS approach based on the work of Van Eck and Waltman (2010), using the Web of Science database (Clarivate/Thomson Reuters), as the relevant information source. This database was chosen due to the prestige within the academic and scientific community of the journals indexed there and its adherence to key quality criteria that can be generalized to any revision process that covers some type of subject or area of specific knowledge (Torraco, 2005). The data search was limited to the main collection of Web of Science, which covers approximately 151 areas of research, grouping more than 12,000 journals and approximately 50m articles and other products of scientific publication to the date in which this search was developed. Although there are several databases with high prestige among the scientific community, such as Scopus or EBSCOhost, this research focused on the Web of Science database.

A basic search was made, limiting the request to the specific words: "EO" OR "EO*" OR "Orientación Emprendedora." This concrete and delimited exploration helped concentrate the results in the specific construct focus of this paper. By using this procedure until year 2017, 1,144 results were found across seven different publication categories and were grouped as follows: articles (1,062); reviews (68); proceedings papers (14); editorial materials (7); book chapters (2); meeting abstracts (4); book reviews (1); and corrections (2). To guide the results of the search toward the production of scientific knowledge in the topic of EO in the purest way as possible, only articles and reviews, totaling 1,130 documents, were considered for the analysis.

Analysis of the information was approached through two main complementary perspectives: first, H-index analysis of journals and articles, accompanied by a citation exploration; and second, mapping construction and analysis based on co-citation patterns.

The H-index is an important bibliometric instrument that is highly accepted by the academic community to measure the impact of scientific production (Hirsch, 2005). This index aims to measure the impact of the achievements in research production based on individual outcomes (Alonso *et al.*, 2009). The H-index is calculated as the number of publications that have received at least the same number of citations.

The analysis based on the VOS corresponds to a bibliometric mapping and clustering technique in which the distance between two items reflects the strength of the relation between them, with the shortest distance representing the strongest relationship and vice versa. The key difference between citation and co-citation analysis is that the former aims to identify the relevance of different authors or journals based on the number of times they are cited (Voeth *et al.*, 2006), whereas the latter aims to provide information on the internal structure of the field of research based on the relationship between authors and publications, quantifying proximity based on the similarity of the content of the publications analyzed (Kraus *et al.*, 2012) and the number of times they are cited together (Van Eck and Waltman, 2010). The software utilized in this analysis was the VOS viewer, version 1.6.4, developed by Van Eck and Waltman (2010).

VOS viewer has been a useful tool for creating, visualizing and exploring bibliometric maps of science (Van Eck and Waltman, 2010). For instance, mapping entire areas of research in full fields of study such as marketing (González-Valiente, 2014), strategic management (Maia *et al.*, 2015) and even in other sciences, such as clinical medicine (Alfonzo *et al.*, 2014; Xing *et al.*, 2018). One of its strengths is that it can map field structures at different levels of analysis such as journals (Van Leeuwen and Wouters, 2017; Merigó *et al.*, 2016; Kolle, 2016; Cancino *et al.*, 2017), geographical spaces, countries or continents (Lu and Wolfram, 2010), and even more detailed subjects or sub fields like new product development (Andrade-Valbuena and Merigo, 2018), green supply chain management (Mishra *et al.*, 2017), technology road mapping (Zhang *et al.*, 2013), fuzzy research (Blanco-Mesa *et al.*, 2016) among others. Moreover, specific constructs at the level of the firm as market orientation (Valenzuela-Fernández *et al.*, 2018), or social value (Fulgencio *et al.*, 2016) have been researched using this technique, highlighting its usefulness for outlining the literature on EO, purpose of this investigation.

The VOS analysis was completed using the fractional counting method, which fractionates each publication by the number of authors, giving the same proportion of authorship to each author.

3. Results and analysis

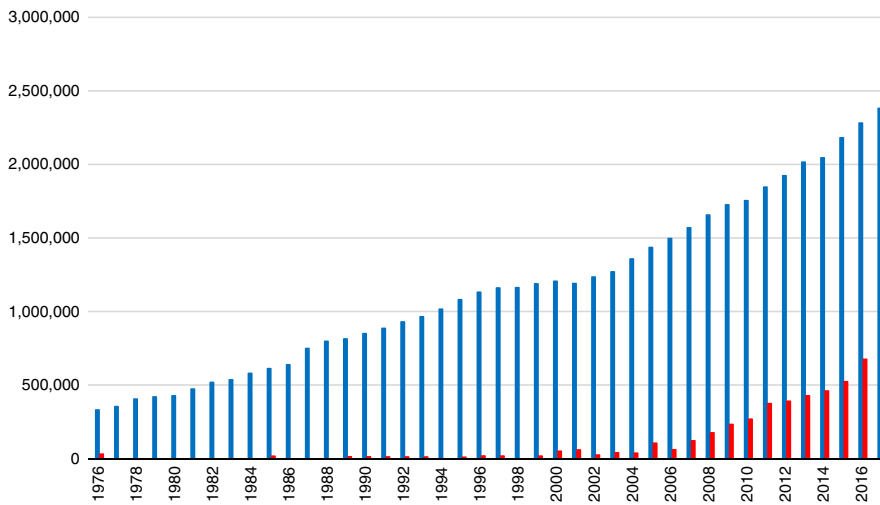
3.1 A general overview of EO research

The distribution of the intellectual production of EO over time is shown in Figure 1.

As shown in Figure 1, the number of publications related to EO has been constantly increasing, especially over the last ten years, during which nearly 94 percent of all of the analyzed material was published. Notably, in the last two years (2016 and 2017), the number of publications is already 35 percent greater than the number of publications from 2015 and 2014, which reflects the relevance that the concept of EO has been gathering among scholars.

Computing the H-index for the EO research yields a value of 58, which indicates that the same number of articles have received at least 58 citations. These data prompt a question about the citation structure of the articles that have been published about EO. Table I addresses this issue, showing the number of citations with the number of papers published per year.

Table I shows a construction of knowledge and learning based on the results of what can be called leaders of the field, with only one paper exceeding 500 citations and seven exceeding 250 citations, as has been verified in different areas of research such as biology or physics. This is consistent with the fact that despite the earlier publication by Khandwalla (1976), where he introduced the concept, EO research exploded after the year 2000. It can be argued that the triggers of this wave of research on EO were the two articles by Lumpkin and Dess (1996, 2001) where they redefine and measure the EO concept and link it to performance, both articles with the higher citation counts in the sample.



Notes: Total articles+reviews published in WoS per year. Blue bars indicate the number of papers published per year, and red bars indicate the ratio $(EO-TP/WoS-TP) \times 10^{11}$, where EO-TP is the total number of papers published related to EO and WoS-TP the number of papers published in WoS

Figure 1.
Total articles
published on
entrepreneurial
orientation by year

3.2 Most relevant journals in EO research

In the same way, we can explore the relative prominence and relevance of journals that publish articles referring to EO. Table II shows the ranking of the 100 most prominent journals in the research on EO indexed in the core collection of the Web of Science database, considering the H-index based on EO research. The second classification item corresponds to the number of papers published in EO, and the third classification item is the number of citations per EO articles. Moreover, we have included some other well-known bibliometric classification items such as the total number of papers published in each journal, the number of citations received in these papers, the general H-index, and the impact factor that the Web of Science database has calculated.

Table II shows that the most relevant journals for the investigation of the EO are *Entrepreneurship Theory and Practice* and the *Journal of Business Venturing*, for which the H-indexes based on OE (H-EO) are almost doubled compared to that of the third-ranked journal on the list, the *Family Business Review*. The preponderance of the *Entrepreneurship Theory and Practice Journal*, and the presence of others such as the *Entrepreneurship and Regional Development Journal* and the *International Entrepreneurship and Management Journal* were expected because they are very influential journals in the field of entrepreneurship, as can be verified by other H-indexes. This last journal actively engages with EO research, with nearly 8 percent of its publications devoted to this subject. The interdisciplinary nature of the concept of EO is evident by the presence of journals in the Top 100 ranking (like *Industrial Marketing Management*, *Journal of Business Research*, *Strategic Management Journal* or *Journal of World Business*) that do not directly include the scope of entrepreneurship in its publications. In addition, it is interesting to note that a considerable percentage of the journals in Table II are specialized publications for small businesses and family businesses, as noted by different meta-analyses on the topic concerning the positive impact of this strategy for these type of firms (see Rauch *et al.*, 2009; Saeed *et al.*, 2014).

| PY | ≥500 | ≥250 | ≥100 | ≥50 | ≥25 | ≥10 | ≥5 | ≥1 | TP | %P | %Acum. P. |
|------------|------|------|------|------|-------|-------|-------|-------|--------|--------|-----------|
| 1976 | – | – | – | – | 1 | 1 | 1 | 1 | 1 | 0.1 | 0.1 |
| 1977 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1978 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1979 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1980 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1981 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1982 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1983 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1984 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.1 |
| 1985 | – | – | – | 1 | 1 | 1 | 1 | 1 | 1 | 0.1 | 0.2 |
| 1986 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.2 |
| 1987 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.2 |
| 1988 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.2 |
| 1989 | – | – | – | – | – | 1 | 1 | 1 | 1 | 0.1 | 0.3 |
| 1990 | – | – | – | 1 | 1 | 1 | 1 | 1 | 1 | 0.1 | 0.4 |
| 1991 | – | – | – | – | – | 1 | 1 | 1 | 1 | 0.1 | 0.5 |
| 1992 | – | – | – | – | – | – | – | – | 1 | 0.1 | 0.5 |
| 1993 | – | – | – | – | 1 | 1 | 1 | 1 | 1 | 0.1 | 0.6 |
| 1994 | – | – | – | – | – | – | – | – | 0 | 0.0 | 0.6 |
| 1995 | – | – | – | – | 1 | 1 | 1 | 1 | 1 | 0.1 | 0.7 |
| 1996 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 0.2 | 0.9 |
| 1997 | – | – | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 0.2 | 1.1 |
| 1998 | – | – | – | – | – | – | – | – | 0 | 0.0 | 1.1 |
| 1999 | – | – | – | – | – | 1 | 2 | 2 | 2 | 0.2 | 1.3 |
| 2000 | – | – | 4 | 5 | 6 | 6 | 6 | 6 | 6 | 0.5 | 1.8 |
| 2001 | – | 2 | 4 | 5 | 6 | 7 | 7 | 7 | 7 | 0.6 | 2.5 |
| 2002 | – | – | – | – | 2 | 3 | 3 | 3 | 3 | 0.3 | 2.7 |
| 2003 | – | – | 1 | 1 | 3 | 4 | 4 | 5 | 5 | 0.5 | 3.2 |
| 2004 | – | 1 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 0.5 | 3.6 |
| 2005 | – | 2 | 4 | 8 | 11 | 13 | 13 | 14 | 15 | 1.4 | 5.0 |
| 2006 | – | – | 3 | 4 | 6 | 7 | 8 | 9 | 9 | 0.8 | 5.8 |
| 2007 | – | – | 3 | 7 | 13 | 16 | 18 | 19 | 19 | 1.7 | 7.5 |
| 2008 | – | – | 3 | 9 | 14 | 22 | 25 | 29 | 29 | 2.6 | 10.2 |
| 2009 | – | 1 | 3 | 13 | 20 | 28 | 34 | 39 | 40 | 3.6 | 13.8 |
| 2010 | – | – | – | 10 | 19 | 34 | 40 | 47 | 47 | 4.3 | 18.1 |
| 2011 | – | – | 1 | 3 | 21 | 38 | 48 | 62 | 69 | 6.3 | 24.4 |
| 2012 | – | – | 1 | 4 | 17 | 38 | 50 | 71 | 75 | 6.8 | 31.2 |
| 2013 | – | – | – | – | 4 | 31 | 46 | 79 | 86 | 7.8 | 39.0 |
| 2014 | – | – | – | – | 1 | 12 | 41 | 77 | 94 | 8.5 | 47.5 |
| 2015 | – | – | – | – | – | 3 | 11 | 74 | 114 | 10.4 | 57.9 |
| 2016 | – | – | – | – | – | – | 43 | 90 | 230 | 20.9 | 78.8 |
| 2017 | – | – | – | – | – | – | – | 31 | 233 | 21.2 | 100.0 |
| Total | 1 | 7 | 32 | 75 | 153 | 273 | 367 | 585 | 1,130 | 100.00 | – |
| Percentage | 0.10 | 0.90 | 4.10 | 9.60 | 19.50 | 34.80 | 46.80 | 74.50 | 100.00 | – | – |

Table I.
Citation structure of
the investigations
related to
entrepreneurial
orientation

Notes: PY, publication year; ≥100, ≥50, ≥25, ≥10, ≥5, ≥1 is the number of papers that has reached that threshold of citations; TP, total number of papers published in that year; %P, the percentage of papers that has been published in that year with respect to the total of papers published; %Acum. P., the accumulated percentage of papers published until that year

3.3 Most relevant articles in EO research

One of the most relevant features related to the use of bibliometric indicators is revealing the most important publications, or those that have had the greatest impact on research. To this end regarding EO, Table III is constructed. In this ranking, it is evident that the most reputed article in the field of the EO is by Lumpkin and Dess (1996).

| R | Journal | H-EO | TC-EO ^a | TP-EO | %EO/ TP | TP | TC | H | IF | T50 |
|----|--|------|--------------------|-------|------------|-------|---------|-----|-------|-----|
| 1 | <i>Entrepreneurship Theory and Practice</i> | 22 | 1,675 | 46 | 6.6 | 696 | 21,294 | 74 | 3.414 | 7 |
| 2 | <i>Journal of Business Venturing</i> | 20 | 2,245 | 26 | 2.5 | 1,038 | 53,306 | 113 | 4.204 | 0 |
| 3 | <i>Family Business Review</i> | 12 | 608 | 17 | 5.3 | 321 | 5,969 | 41 | 4.147 | 0 |
| 4 | <i>International Small Business Journal</i> | 12 | 339 | 30 | 4.4 | 686 | 6,157 | 35 | 2.215 | 2 |
| 5 | <i>Entrepreneurship and Regional Development</i> | 11 | 515 | 16 | 3.5 | 460 | 7,202 | 39 | 1.629 | 0 |
| 6 | <i>Journal of Small Business Management</i> | 10 | 461 | 38 | 4.8 | 799 | 13,617 | 54 | 1.937 | 3 |
| 7 | <i>Industrial Marketing Management</i> | 9 | 649 | 18 | 0.6 | 2,813 | 42,233 | 80 | 1.93 | 1 |
| 8 | <i>Journal of Business Research</i> | 9 | 521 | 38 | 0.8 | 5,048 | 77,473 | 105 | 2.129 | 2 |
| 9 | <i>Journal of World Business</i> | 9 | 473 | 15 | 1.8 | 813 | 17,435 | 61 | 2.811 | 0 |
| 10 | <i>Small Business Economics</i> | 9 | 388 | 15 | 1.0 | 1,507 | 27,155 | 72 | 1.795 | 0 |
| 11 | <i>Strategic Management Journal</i> | 8 | 1,238 | 10 | 0.4 | 2,435 | 248,748 | 232 | 3.38 | 0 |
| 12 | <i>Technovation</i> | 7 | 222 | 10 | 0.5 | 1,938 | 30,789 | 71 | 2.243 | 0 |
| 13 | <i>International Journal of Entrepreneurial Behaviour Research</i> | 7 | 119 | 22 | 10.1 | 217 | 966 | 15 | 1.863 | 0 |
| 14 | <i>British Journal of Management</i> | 6 | 169 | 9 | 1.2 | 734 | 13,343 | 51 | 2.188 | 0 |
| 15 | <i>Management Decision</i> | 6 | 160 | 19 | 1.5 | 1,279 | 7,701 | 37 | 1.134 | 0 |
| 16 | <i>International Entrepreneurship and Management Journal</i> | 6 | 149 | 20 | 7.5 | 265 | 1,488 | 19 | 0.659 | 0 |
| 17 | <i>International Business Review</i> | 6 | 140 | 15 | 1.8 | 828 | 8,399 | 39 | 1.669 | 0 |
| 18 | <i>Strategic Entrepreneurship Journal</i> | 6 | 138 | 6 | 2.8 | 214 | 3,562 | 31 | 1.8 | 0 |
| 19 | <i>Journal of Management Studies</i> | 6 | 110 | 6 | 0.2 | 2,513 | 70,293 | 119 | 4.131 | 0 |
| 20 | <i>Research Policy</i> | 5 | 321 | 8 | 0.3 | 3,030 | 121,241 | 159 | 3.47 | 0 |
| 21 | <i>International Marketing Review</i> | 5 | 169 | 9 | 1.3 | 687 | 8,526 | 42 | 1.588 | 0 |
| 22 | <i>Journal of Product Innovation Management</i> | 5 | 139 | 12 | 0.6 | 1,915 | 41,087 | 96 | 2.086 | 0 |
| 23 | <i>International Journal of Hospitality Management</i> | 5 | 80 | 7 | 0.6 | 1,219 | 23,624 | 67 | 3.445 | 0 |
| 24 | <i>Journal of Technology Transfer</i> | 5 | 64 | 10 | 1.9 | 530 | 6,882 | 38 | 2.932 | 0 |
| 25 | <i>Journal of Business Ethics</i> | 5 | 7 | 8 | 0.1 | 7,059 | 163,945 | 135 | 2.917 | 0 |
| 26 | <i>Academy of Management Review</i> | 4 | 2,594 | 5 | 0.2 | 2,295 | 335,790 | 292 | 8.855 | 1 |
| 27 | <i>Academy of Management Journal</i> | 4 | 746 | 4 | 0.1 | 2,812 | 378,988 | 311 | 6.7 | 3 |
| 28 | <i>Journal of Management</i> | 4 | 303 | 7 | 0.4 | 1,664 | 112,991 | 158 | 6.051 | 0 |
| 29 | <i>Journal of International Marketing</i> | 4 | 229 | 4 | 0.8 | 507 | 10,544 | 52 | 3.25 | 1 |
| 30 | <i>International Journal of Production Economics</i> | 4 | 81 | 6 | 0.1 | 5,972 | 144,644 | 125 | 4.407 | 0 |
| 31 | <i>Journal of Family Business Strategy</i> | 4 | 69 | 11 | 6.6 | 167 | 1,321 | 18 | 2.605 | 0 |
| 32 | <i>Service Industries Journal</i> | 4 | 65 | 9 | 0.5 | 1,803 | 11,886 | 36 | 0.776 | 0 |
| 33 | <i>International Journal of Technology Management</i> | 4 | 63 | 9 | 0.5 | 1,982 | 10,899 | 35 | 0.867 | 0 |
| 34 | <i>Asia Pacific Journal of Management</i> | 4 | 54 | 7 | 1.8 | 396 | 4,038 | 32 | 2.135 | 2 |
| 35 | <i>Journal of Business Industrial Marketing</i> | 4 | 39 | 9 | 1.2 | 733 | 6,500 | 31 | 1.833 | 0 |

Bibliometric analysis of EO

Table II.
100 most prominent journals in entrepreneurial orientation research

(continued)

| R | Journal | H-EO | TC-EO ^a | TP-EO | %EO/ TP | TP | TC | H | IF | T50 |
|----|--|------|--------------------|-------|------------|-------|--------|-----|-------|-----|
| 36 | <i>Baltic Journal of Management</i> | 4 | 39 | 7 | 2.9 | 242 | 1,140 | 16 | 1.149 | 0 |
| 37 | <i>Journal of Management Organization</i> | 4 | 9 | 9 | 1.6 | 554 | 2,918 | 21 | 1.189 | 0 |
| 38 | <i>Journal of Operations Management</i> | 3 | 173 | 3 | 0.4 | 783 | 61,505 | 135 | 4.899 | 0 |
| 39 | <i>R D Management</i> | 3 | 169 | 6 | 0.3 | 2,071 | 29,153 | 78 | 1.857 | 1 |
| 40 | <i>Journal of the Academy of Marketing Science</i> | 3 | 98 | 5 | 0.5 | 1,042 | 66,581 | 129 | 8.488 | 0 |
| 41 | <i>Technology Analysis Strategic Management</i> | 3 | 77 | 7 | 0.6 | 1,208 | 16,187 | 53 | 1.744 | 0 |
| 42 | <i>Human Resource Management</i> | 3 | 62 | 3 | 0.2 | 1,502 | 29,461 | 75 | 2.474 | 0 |
| 43 | <i>Supply Chain Management an International Journal</i> | 3 | 57 | 3 | 0.4 | 692 | 20,389 | 68 | 3.833 | 0 |
| 44 | <i>International Journal of Human Resource Management</i> | 3 | 42 | 3 | 0.1 | 2,410 | 42,016 | 77 | 2.425 | 0 |
| 45 | <i>Journal of International Management</i> | 3 | 39 | 4 | 1.1 | 351 | 6,631 | 41 | 2.298 | 0 |
| 46 | <i>European Journal of International Management</i> | 3 | 38 | 14 | 3.6 | 384 | 1,728 | 17 | 0.672 | 0 |
| 47 | <i>European Management Journal</i> | 3 | 38 | 7 | 1.7 | 419 | 2,233 | 18 | 1.437 | 0 |
| 48 | <i>European Journal of Marketing</i> | 3 | 38 | 4 | 0.3 | 1,548 | 14,148 | 46 | 1.088 | 0 |
| 49 | <i>Canadian Journal of Administrative Sciences Revue Canadienne Des Sciences De L Administration</i> | 3 | 34 | 6 | 0.9 | 679 | 5,628 | 38 | 0.674 | 0 |
| 50 | <i>Journal of Small Business and Enterprise Development</i> | 3 | 29 | 14 | 8.6 | 162 | 318 | 8 | – | 0 |
| 51 | <i>Innovation Management Policy Practice</i> | 3 | 28 | 4 | 1.2 | 336 | 1,777 | 19 | 0.915 | 0 |
| 52 | <i>Transformations in Business Economics</i> | 3 | 26 | 4 | 0.4 | 934 | 2,414 | 16 | 1.112 | 0 |
| 53 | <i>Journal of International Entrepreneurship</i> | 3 | 24 | 6 | 8.5 | 71 | 161 | 7 | – | 0 |
| 54 | <i>African Journal of Business Management</i> | 3 | 23 | 11 | 0.6 | 1,968 | 6,246 | 24 | 1.105 | 0 |
| 55 | <i>South African Journal of Business Management</i> | 3 | 22 | 8 | 2.8 | 290 | 683 | 10 | 0.277 | 0 |
| 56 | <i>Journal of Management and Organization</i> | 3 | 19 | 7 | 1.4 | 490 | 1,501 | 15 | 0.405 | 0 |
| 57 | <i>Decision Sciences</i> | 2 | 116 | 3 | 0.2 | 1,408 | 48,416 | 101 | 1.641 | 0 |
| 58 | <i>Review of Managerial Science</i> | 2 | 105 | 6 | 3.2 | 187 | 905 | 13 | 1.483 | 0 |
| 59 | <i>E M Ekonomie A Management</i> | 2 | 45 | 2 | 0.3 | 590 | 2,429 | 19 | 1.311 | 0 |
| 60 | <i>Technological Forecasting and Social Change</i> | 2 | 38 | 5 | 0.1 | 4,299 | 53,829 | 84 | 3.129 | 0 |
| 61 | <i>Entrepreneurial Business and Economics Review</i> | 2 | 30 | 7 | 5.1 | 136 | 169 | 6 | – | 0 |
| 62 | <i>Creativity and Innovation Management</i> | 2 | 30 | 6 | 2.0 | 300 | 2,572 | 24 | 1.553 | 0 |
| 63 | <i>Nonprofit and Voluntary Sector Quarterly</i> | 2 | 23 | 3 | 0.2 | 1,515 | 18,547 | 62 | 1.932 | 0 |
| 64 | <i>Sustainability</i> | 2 | 21 | 14 | 0.2 | 5,654 | 23,904 | 37 | 2.075 | 0 |
| 65 | <i>Industrial Management Data Systems</i> | 2 | 19 | 3 | 0.2 | 1,664 | 25,469 | 69 | 2.948 | 0 |

Table II.

(continued)

| R | Journal | H-EO | TC-EO ^a | TP-EO | %EO/ TP | TP | TC | H | IF | T50 |
|----|---|------|--------------------|-------|------------|-------|---------|-----|-------|-----|
| 66 | <i>Journal of Organizational Change Management</i> | 2 | 17 | 7 | 0.6 | 1,245 | 14,433 | 51 | 1.262 | 0 |
| 67 | <i>Journal of Cleaner Production</i> | 2 | 16 | 7 | 0.1 | 9,435 | 176,544 | 126 | 5.651 | 0 |
| 68 | <i>African Journal of Business Management</i> | 2 | 11 | 11 | 0.6 | 1,968 | 3,690 | 17 | 1.105 | 2 |
| 69 | <i>International Journal of Contemporary Hospitality Management</i> | 2 | 11 | 5 | 0.6 | 785 | 8,246 | 39 | 2.874 | 0 |
| 70 | <i>Asian Business Management</i> | 2 | 11 | 4 | 1.4 | 281 | 1,181 | 15 | 1.179 | 0 |
| 71 | <i>Journal for East European Management Studies</i> | 2 | 11 | 4 | 1.7 | 235 | 677 | 10 | 0.794 | 0 |
| 72 | <i>BRQ Business Research Quarterly</i> | 2 | 10 | 5 | 5.9 | 85 | 378 | 10 | 2.41 | 0 |
| 73 | <i>Long Range Planning</i> | 2 | 10 | 4 | 0.1 | 3,922 | 39,396 | 82 | 3.221 | 0 |
| 74 | <i>Asian Journal of Technology Innovation</i> | 2 | 9 | 3 | 1.2 | 251 | 785 | 9 | 0.845 | 0 |
| 75 | <i>Journal of Business Economics and Management</i> | 2 | 9 | 3 | 0.5 | 576 | 3,994 | 27 | 1.503 | 0 |
| 76 | <i>European Management Review</i> | 2 | 7 | 4 | 1.4 | 294 | 3,925 | 34 | 1.25 | 1 |
| 77 | <i>Baltic Journal of Economics</i> | 2 | 7 | 2 | 1.3 | 151 | 214 | 7 | 1 | 0 |
| 78 | <i>South African Journal of Industrial Engineering</i> | 2 | 6 | 3 | 0.6 | 517 | 697 | 9 | 0.409 | 0 |
| 79 | <i>International Journal of Entrepreneurial Venturing</i> | 2 | 5 | 5 | 8.5 | 59 | 43 | 3 | – | 0 |
| 80 | <i>Spanish Journal of Psychology</i> | 2 | 5 | 3 | 0.3 | 1,143 | 6,740 | 31 | 0.629 | 0 |
| 81 | <i>Academy of Management Annals</i> | 1 | 84 | 2 | 1.2 | 167 | 12,997 | 61 | 9.281 | 0 |
| 82 | <i>International Small Business Journal Researching Entrepreneurship</i> | 1 | 31 | 8 | 11.8 | 68 | 627 | 13 | 3.9 | 0 |
| 83 | <i>Rae Revista De Administracao De Empresas</i> | 1 | 13 | 5 | 1.1 | 473 | 825 | 9 | 0.404 | 0 |
| 84 | <i>Cuadernos De Economia Y Direccion De La Empresa</i> | 1 | 9 | 2 | 1.4 | 147 | 316 | 9 | 0.268 | 0 |
| 85 | <i>South African Journal of Economic and Management Sciences</i> | 1 | 7 | 3 | 0.6 | 493 | 900 | 11 | 0.505 | 0 |
| 86 | <i>Journal of Strategic Marketing</i> | 1 | 6 | 5 | 3.8 | 131 | 302 | 8 | – | 0 |
| 87 | <i>International Journal of Innovation Management</i> | 1 | 5 | 9 | 3.4 | 263 | 175 | 5 | – | 0 |
| 88 | <i>Management Research Review</i> | 1 | 5 | 6 | 2.9 | 208 | 367 | 7 | – | 0 |
| 89 | <i>World Journal of Entrepreneurship Management and Sustainable Development</i> | 1 | 5 | 4 | 5.8 | 69 | 84 | 4 | – | 0 |
| 90 | <i>Rbgn Revista Brasileira De Gestao De Negocios</i> | 1 | 4 | 3 | 0.9 | 319 | 301 | 6 | 0.278 | 0 |
| 91 | <i>Amfiteatru Economic</i> | 1 | 4 | 2 | 0.3 | 751 | 2,214 | 17 | 0.664 | 0 |
| 92 | <i>Journal of Enterprising Culture</i> | 1 | 3 | 3 | 6.0 | 50 | 33 | 3 | – | 0 |
| 93 | <i>Anthropologist</i> | 1 | 3 | 2 | 0.2 | 911 | 895 | 8 | 0.195 | |
| 94 | <i>Global Business Review</i> | 1 | 2 | 3 | 0.9 | 346 | 282 | 6 | – | 0 |
| 95 | <i>Jurnal Teknologi</i> | 1 | 2 | 3 | 0.1 | 3,022 | 1,067 | 7 | – | 0 |
| 96 | <i>Polish Journal of Management Studies</i> | 1 | 1 | 3 | 1.1 | 261 | 251 | 6 | – | 0 |

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analysis of EO

(continued)

Table II.

| R | Journal | H-EO | TC-EO ^a | TP-EO | %EO/ TP | TP | TC | H | IF | T50 |
|-----|---|------|--------------------|-------|------------|-----|-----|----|-------|-----|
| 97 | <i>African Journal of Economic and Management Studies</i> | 0 | 0 | 3 | 3.1 | 98 | 109 | 4 | – | 0 |
| 98 | <i>Academia Revista Latinoamericana De Administracion</i> | 0 | 0 | 2 | 0.8 | 255 | 316 | 8 | 0.617 | 0 |
| 99 | <i>Asia Pacific Journal of Marketing and Logistics</i> | 0 | 0 | 2 | 1.2 | 170 | 253 | 7 | 1.204 | 0 |
| 100 | <i>Economics Sociology</i> | 0 | 0 | 2 | 0.8 | 244 | 525 | 11 | – | |

Notes: R, ranking; H-EO, the H-index based on EO papers solely; TC-EO and TP-EO, the total number of citations and papers in EO, respectively, during the period 1990–2017; TP, TC, the total number of papers and journal citations during the period, respectively; %EO/TP, the ratio of all the publications compared to the EO publications; H and IF, the H-index and the impact factor reported by WoS; T50, the number of papers classified in the Top 50 of the ranking evidenced in Table V. ^aThe ranking is organized from high to low values, using the EO–H-index as its first classification item. The second classification item corresponds to the number of EO papers, and the third classification item is the number of citations per EO paper

Table II.

Another article of great relevance is by Rauch *et al.* (2009), which has the second highest number of citations per year.

Using the H-index, it is also possible to calculate the impact factor that EO articles have had on EO research based on both the number of citations and the number of articles published. The relevant impact factor can be observed in Table IV and is based on the ratio of the number of citations received by a publication of years ($t-1$) and ($t-2$) in year (t) with respect to the number of papers published that same year.

In general, it can be seen from Table III that the impact factor has remained high and exhibited signs of a growth trend. This can be explained by the inclusion of entrepreneurship in the research scope of different journals, the emergence of new journals during the indicated period and the increasing relevance of the subject in relation to other research areas such as marketing and international business, which allows more EO publications in the same year.

3.4 Most prolific and relevant researchers in EO

To provide a more holistic view of research on EO, this section aims to integrate the most active and relevant researchers of EO with findings from previous sections.

Table V presents the Top 30 ranking of the most prominent authors in EO, ordered by the EO H-index. Lumpkin, G.T. is the author who has had the greatest impact on EO research, as shown by analyzing the number of citations received in his publications, having collected approximately 31 percent of all citations made in EO publications. Other well-known authors within this list include Payne, Short, Covin and Wiklund. With respect to the institutions of these authors, there is not a very marked domain, except the country in which they are located. In this sense, the dominance of the USA as the place with the greater accumulation of EO researchers is apparent. It is also interesting to observe that universities from Sweden (Jonkoping University) and the UK (Loughborough University) have produced two researchers each in this ranking.

To monitor the influence of the authors' publications, the number of publications in the ten most prominent journals in EO research from Table III is quantified in Table VI. It should be noted that all of the most prominent authors on entrepreneurship research noted in Table V have published at least once in one of the ten most prominent journals in this subject. The most important authors in this list include Covin (nine articles), Lumpkin (eight articles), Wiklund, Chirico and Wales (seven articles), Dess (four articles).

| R | Journal | EO TC | Title | Author(s) | Year | Citations /year |
|----|-----------------|----------|---|---|------|--------------------|
| 1 | <i>AoMR</i> | 1,554 | Clarifying the entrepreneurial orientation construct and linking it to performance | Lumpkin, G.T.; Dess, G.G. | 1996 | 77.7 |
| 2 | <i>SMJ</i> | 496 | Internal capabilities, external networks, and performance: a study on technology-based ventures | Lee, C.; Lee, K.; Pennings, J.M. | 2001 | 33.1 |
| 3 | <i>JoBV</i> | 448 | Linking two dimensions of entrepreneurial orientation to firm performance: the moderating role of environment and industry life cycle | Lumpkin, G.T.; Dess, G.G. | 2001 | 29.9 |
| 4 | <i>SMJ</i> | 438 | Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses | Wiklund, J.; Shepherd, D. | 2003 | 33.7 |
| 5 | <i>JoBV</i> | 400 | Entrepreneurial orientation and small business performance: a configurational approach | Wiklund, J.; Shepherd, D. | 2005 | 36.4 |
| 6 | <i>JoM</i> | 357 | The effects of strategic orientations on technology- and market-based breakthrough innovations | Zhou, K.Z.; Yim, C.K.; Tse, D.K. | 2005 | 32.5 |
| 7 | <i>IMM</i> | 335 | Innovativeness: its antecedents and impact on business performance | Hult, G.T.M.; Hurley, R.F.; Knight, G.A. | 2004 | 27.9 |
| 8 | <i>ET&P</i> | 313 | Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future | Rauch, A.; Wiklund, J.; Lumpkin, G.; Frese, M. | 2009 | 44.7 |
| 9 | <i>RP</i> | 211 | Entrepreneurial orientation, technology transfer and spinoff performance of US universities | O'Shea, R.P.; Allen, T.J.; Chevalier, A.; Roche, F. | 2005 | 19.2 |
| 10 | <i>ET&P</i> | 209 | Strategic process effects on the entrepreneurial orientation-sales growth rate relationship | Covin, J.G.; Green, K.M.; Slevin, D.P. | 2006 | 20.9 |
| 11 | <i>AoMR</i> | 205 | Entrepreneurial orientation and new venture performance: the moderating role of intra- and extra-industry social capital | Stam, W.; Elfring, T. | 2008 | 25.6 |
| 12 | <i>JoBV</i> | 191 | The impact of network capabilities and entrepreneurial orientation on university spinoff performance | Walter, A.; Auer, M.; Ritter, T. | 2006 | 19.1 |
| 13 | <i>JoEM</i> | 178 | Environmental strategy and performance in small firms: a resource-based perspective | Aragon-Correa, J.A.; Hurtado-Torres, N.; Sharma, S.; Garcia-Morales, V.J. | 2008 | 22.3 |
| 14 | <i>JoM</i> | 159 | Enhancing entrepreneurial orientation research: operationalizing and measuring a key strategic decision-making process | Lyon, D.W.; Lumpkin, G.T.; Dess, G.D. | 2000 | 9.9 |
| 15 | <i>AoMJ</i> | 156 | Cultural diversity in management, firm performance, and the moderating role of entrepreneurial orientation dimensions | Richard, O.C.; Barnett, T.; Dwyer, S.; Chadwick, K. | 2004 | 13.0 |
| 16 | <i>FBR</i> | 154 | Entrepreneurial orientation, risk taking, and performance in family firms | Naldi, L.; Nordqvist, M.; Sjoberg, K.; Wiklund, J. | 2007 | 17.1 |
| 17 | <i>JoBV</i> | 153 | Culture and entrepreneurial potential: a nine country study of locus of control and innovativeness | Mueller, S.L.; Thomas, A.S. | 2001 | 10.2 |
| 18 | <i>E&RD</i> | 153 | Human capital, social capital, and innovation: a multi-country study | Dakhli, M.; De Clercq, D. | 2004 | 12.8 |

(continued)

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Table III.
Top 50 ranking
of the most important
publications in
EO research

| R | Journal | EO TC | Title | Author(s) | Year | Citations /year |
|----|-----------------|----------|---|---|------|--------------------|
| 19 | <i>JoIM</i> | 149 | Entrepreneurship and marketing strategy: the SME under globalization | Knight, G. | 2000 | 9.3 |
| 20 | <i>FBR</i> | 149 | Socioemotional wealth in family firms: theoretical dimensions, assessment approaches, and agenda for future research | Berrone, P.; Cruz, C.; Gomez-Mejia, L.R. | 2012 | 37.3 |
| 21 | <i>JoBV</i> | 148 | Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs | Rosenbusch, N.; Brinckmann, J.; Bausch, A. | 2011 | 29.6 |
| 22 | <i>JoBR</i> | 144 | The positive effect of a market orientation on business profitability: a balanced replication | Slater, S.F.; Narver, J.C. | 2000 | 9.0 |
| 23 | <i>SMJ</i> | 137 | An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behavior | Brown, T.E.; Davidsson, P.; Wiklund, J. | 2001 | 9.1 |
| 24 | <i>JoWB</i> | 135 | Culture, entrepreneurial orientation, and global competitiveness | Lee, S.M.; Peterson, S.J. | 2000 | 8.4 |
| 25 | <i>JoBV</i> | 128 | Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation | Knight, G.A. | 1997 | 6.7 |
| 26 | <i>AoME</i> | 126 | The role of entrepreneurial orientation in stimulating effective corporate entrepreneurship | Dess, G.G.; Lumpkin, G.T. | 2005 | 11.5 |
| 27 | <i>ET&P</i> | 120 | Entrepreneurial orientation, learning orientation, and firm performance | Wang, C.L. | 2008 | 15.0 |
| 28 | <i>JoBV</i> | 112 | Firm networks and firm development: the role of the relational mix | Lechner, C.; Dowling, M.; Welpe, I. | 2006 | 11.2 |
| 29 | <i>IMM</i> | 103 | Deconstructing the relationship between entrepreneurial orientation and business performance at the embryonic stage of firm growth | Hughes, M.; Morgan, R.E. | 2007 | 11.4 |
| 30 | <i>JoSBM</i> | 101 | The complementary effects of market orientation and entrepreneurial orientation on profitability in small businesses ^a | Baker, W.E.; Sinkula, J.M. | 2009 | 14.4 |
| 31 | <i>JoBV</i> | 101 | The effects of entrepreneurial orientation and marketing information on the performance of SMEs | Keh, H.T.; Nguyen, T.T.M.; Ng, H.P. | 2007 | 11.2 |
| 32 | <i>SBE</i> | 99 | Building an integrative model of small business growth | Wiklund, J.; Patzelt, H.; Shepherd, D.A. | 2009 | 14.1 |
| 33 | <i>ET&P</i> | 98 | Entrepreneurial orientation and growth of SMEs: a causal model | Moreno, A.M.; Casillas, J.C. | 2008 | 12.3 |
| 34 | <i>JoWB</i> | 97 | The drivers of the early internationalization of the firm | Zucchella, A.; Palamara, G.; Denicolai, S. | 2007 | 10.8 |
| 35 | <i>JoWB</i> | 96 | Firms' degree of born-globalness, international entrepreneurial orientation and export performance | Kuivalainen, O.; Sundqvist, S.; Servais, P. | 2007 | 10.7 |
| 36 | <i>JoM</i> | 92 | Research on organizational configurations: past accomplishments and future challenges | Short, J.C.; Payne, G.T.; Ketchen, D.J. | 2008 | 11.5 |
| 37 | <i>JoBR</i> | 90 | Just entrepreneurial enough: the moderating effect of entrepreneurship on the relationship between market orientation and performance | Bhuian, S.N.; Menguc, B.; Bell, S.J. | 2005 | 8.2 |
| 38 | <i>Tech.</i> | 88 | Drivers of innovativeness and performance for innovative SMEs in South Korea: mediation of learning orientation | Rhee, J.; Park, T.; Lee, D.H. | 2010 | 14.7 |

Table III.

(continued)

| R | Journal | EO TC | Title | Author(s) | Year | Citations /year |
|----|-----------------|----------|--|---|------|--------------------|
| 39 | <i>CB</i> | 83 | Mapping human and social dimensions of conservation opportunity for the scheduling of conservation action on private land | Knight, A.T.; Cowling, R.M.; Difford, M.; Campbell, B.M. | 2010 | 13.8 |
| 40 | <i>JoBR</i> | 80 | Entrepreneurial orientation of SMEs, product innovativeness, and performance | Avlonitis, G.J.; Salavou, H.E. | 2007 | 8.9 |
| 41 | <i>ET&P</i> | 78 | Entrepreneurial orientation theory and research: reflections on a needed construct | Covin, J.G.; Lumpkin, G.T. | 2011 | 15.6 |
| 42 | <i>JoBV</i> | 76 | Antecedents of international and domestic learning effort | Sapienza, H.J.; De Clercq, D.; Sandberg, W.R. | 2005 | 6.9 |
| 43 | <i>JoSBM</i> | 73 | Moderating effects of entrepreneurial orientation on market orientation-performance linkage: evidence from Chinese small firms | Li, Y.; Zhao, Y.B.; Tan, J.; Liu, Y. | 2008 | 9.1 |
| 44 | <i>AoMJ</i> | 72 | CEO personality, strategic flexibility, and firm performance: the case of the Indian business process outsourcing industry | Nadkarni, S.; Herrmann, P. | 2010 | 12.0 |
| 45 | <i>ET&P</i> | 71 | Exploring an inverted U-shape relationship between entrepreneurial orientation and performance in Chinese ventures | Tang, J.T.; Tang, Z.; Marino, L.D.; Zhang, Y.L.; Li, Q.W. | 2008 | 8.9 |
| 46 | <i>IMR</i> | 69 | Entrepreneurial, market, and learning orientations and international entrepreneurial business venture performance in South African firms | Kropp, F.; Lindsay, N.J.; Shoham, A. | 2006 | 6.9 |
| 47 | <i>R&DM</i> | 68 | Promoting innovation through the accumulation of intellectual capital, social capital, and entrepreneurial orientation | Wu, W.Y.; Chang, M.L.; Chen, C.W. | 2008 | 8.5 |
| 48 | <i>SBE</i> | 68 | The internationalization of small and medium-sized firms | De Clercq, D.; Sapienza, H.J.; Crijns, H. | 2005 | 6.2 |
| 49 | <i>ET&P</i> | 66 | Alternative knowledge strategies, competitive environment, and organizational performance in small manufacturing firms | Bierly, P.E.; Daly, P.S. | 2007 | 7.3 |
| 50 | <i>IJoPM</i> | 66 | The influence of business strategy on project portfolio management and its success – a conceptual framework | Meskendahl, S. | 2010 | 11.0 |

Notes: R, ranking; EO–TC, total number of citations of the EO published papers; *AMR*, *Academy of Management Review*; *SMJ*, *Strategic Management Journal*; *JBV*, *Journal of Business Venturing*; *JM*, *Journal of Marketing*; *IMM*, *Industrial Marketing Management*; *ET&P*, *Entrepreneurship Theory and Practice*; *RP*, *Research Policy*; *JEM*, *Journal of Environmental Management*; *AMJ*, *Academy of Management Journal*; *FBR*, *Family Business Review*; *E&RD*, *Entrepreneurship and Regional Development*; *JIM*, *Journal of International Marketing*; *JBR*, *Journal of Business Research*; *JWB*, *Journal of World Business*; *AME*, *Academy of Management Executive*; *JSBM*, *Journal of Small Business Management*; *SBE*, *Small Business Economics*; *Tech.*, *Technovation*; *CB*, *Conservation Biology*; *IMR*, *International Marketing Review*; *R&DM*, *R&D Management*; *IJPM*, *International Journal of Project Management*

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Table III.

Another interesting classification is made in Table VII, which provides a greater perspective on EO research. It cross-references the six most-quoted journals with the authors who have written on EO to verify the occurrence of their publications in them. The presence of great names that have arisen throughout EO research is evident in these journals. In this sense, *Entrepreneurship Theory and Practice* is the most-cited journal and brings together a large number of publications from several leading authors, thus indicating the high standards of selection and accuracy of these journals.

3.5 Mapping the structure of research on EO

Our analysis continues describing the structure of research on EO. This type of analysis makes it possible to describe and understand the patterns of relationships between articles, journals or authors which are publishing EO research. In particular, we analyzed both journals and authors' co-citations to understand EO research structure. As explained earlier, VOS viewer considers co-citation measures between journals (or authors) as measures of proximity, and develops bibliographic maps based on these measures.

The bibliographic data map included in Figure 2 is based on the co-citations of the Top 500 journals publishing EO research. In this analysis, the most prominent – and central – journals of the EO research structure are: *Strategic Management Journal* (6,011 co-citations), followed by the *Entrepreneurship Theory and Practice Journal* (5,261 co-citations) and the *Journal of Business Venturing* (4,261 co-citations), from 11,461 journals considered.

Overall, four distinct and clear clusters can be observed in Figure 2: the first includes strategy and entrepreneurship (gray items); the second includes marketing and innovation (blue items); the third considers international business (red items); and the fourth includes family businesses and governance journals (yellow items).

In the strategy and entrepreneurship cluster, the most relevant journals are the *Strategic Management Journal*, and *Entrepreneurship Theory and Practice*, with both having appeared in the ranking of the 100 most prominent journals in EO research. In general, it is clear from density analysis that the gray cluster is the most important for the development of research on the subject.

The strategy sub-cluster includes the *Academy of Management Review* and the *Academy of Management Journal* as new high-impact elements for OE research that were not highlighted when using the H-index approach, which is due to the large number of items that can be grouped and analyzed together under the bibliographic data map, compared to the H-index method. The sub-cluster for entrepreneurship includes the *Journal of Entrepreneurship Theory and Practice* and the *Journal of Business Venturing*, which is the second most prominent journal according to the H-index method.

The marketing and innovation cluster is the most dispersed of all since EO has been researched but related to different correlate variables and theoretical frameworks. In this cluster, popular journals within the scientific community include the *Journal of Marketing* and the *Journal of Marketing Research*, as well as the *Journal of Product Innovation Management and Technovation*, which are high-impact publications in the fields of marketing and innovation, respectively.

Regarding the international business clusters (blue items) and family businesses (yellow items), there is a greater convergence between their components because their subjects are quite central. For the first cluster, the *Journal of International Business Studies* has the greatest relevance on EO research and for the second cluster, two journals show the higher levels of research prominence on EO: the *Family Business Review* and *Family Business Research*, which show similarities in their contents, scope and presence.

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|--------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|
| EO-TP | 9 | 19 | 29 | 40 | 47 | 69 | 75 | 86 | 94 | 114 | 154 |
| EO-TC | 203 | 358 | 432 | 622 | 823 | 1,422 | 1,382 | 1,954 | 2,388 | 2,905 | 3,268 |
| EO-TP2 | 20 | 24 | 28 | 48 | 69 | 87 | 116 | 144 | 161 | 180 | 208 |
| EO-TC2 | 39 | 77 | 48 | 91 | 148 | 268 | 199 | 421 | 415 | 383 | 391 |
| EO-IF | 1.95 | 3.21 | 1.71 | 1.90 | 2.14 | 3.08 | 1.72 | 2.92 | 2.58 | 2.13 | 1.88 |

Table IV.
Impact factor of
EO during the
last ten years

Notes: EO-TP, total of papers published during the (*t*) year; EO-TC, total number of citations received in the (*t*–2) year; EO-TC2, total number of citations received in the year (*t*) from the papers published in the years (*t*–1) and (*t*–2); EO-IF, impact factor of EO in the year (*t*)

| R | Author | H-EO ^a | TP-EO | TC-EO | Country | Last institution registered | H | TP | TC | TP-EO5 | TC-EO5 | T50 |
|----|----------------|-------------------|-------|-------|-----------------|--|----|----|-------|--------|--------|-----|
| 1 | Lumpkin, G.T. | 13 | 13 | 4,021 | USA | University of Oklahoma – Norman | 22 | 37 | 4,129 | 5 | 160 | 6 |
| 2 | Payne, G.T. | 11 | 11 | 291 | USA | Texas Tech University | 14 | 32 | 613 | 9 | 147 | 1 |
| 3 | Short, J.C. | 11 | 10 | 323 | USA | University of Oklahoma | 19 | 38 | 1,081 | 7 | 152 | 1 |
| 4 | Covin, J. | 8 | 12 | 519 | USA | Indiana University Bloomington | 21 | 39 | 1,917 | 8 | 199 | 2 |
| 5 | Wiklund, J. | 8 | 9 | 1,616 | USA | Syracuse University | 21 | 33 | 1,273 | 3 | 75 | 6 |
| 6 | Chirico, F. | 7 | 9 | 142 | Sweden | Jonkoping University | 9 | 20 | 343 | 9 | 142 | 0 |
| 7 | Wales, W.J. | 6 | 14 | 233 | USA | State University of New York (SUNY) Albany | 13 | 14 | 172 | 162 | 162 | 0 |
| 8 | Kraus, S. | 6 | 12 | 102 | Liechtenstein | Univ Liechtenstein | 10 | 38 | 250 | 12 | 89 | 0 |
| 9 | De Clercq, D. | 6 | 10 | 370 | Canada | Brock University | 16 | 49 | 741 | 5 | 22 | 3 |
| 10 | Marino, L.D. | 6 | 9 | 212 | USA | University of Alabama | 6 | 8 | 179 | 3 | 39 | 1 |
| 11 | Nordqvist, M. | 6 | 6 | 322 | Sweden | Jonkoping University | 14 | 26 | 690 | 3 | 98 | 1 |
| 12 | Engelen, A. | 5 | 10 | 60 | Germany | Dortmund University of Technology | 12 | 31 | 348 | 9 | 46 | 0 |
| 13 | Frese, M. | 5 | 6 | 420 | Germany | University of Luneburg | 15 | 33 | 737 | 4 | 43 | 1 |
| 14 | Slevin, D.P. | 5 | 6 | 338 | USA | University of Pittsburgh | 6 | 7 | 193 | 2 | 18 | 1 |
| 15 | Casillas, J.C. | 5 | 6 | 267 | Spain | University of Seville | 10 | 15 | 356 | 2 | 12 | 1 |
| 16 | Hughes, M. | 5 | 6 | 225 | UK | Durham University | 11 | 21 | 400 | 4 | 85 | 1 |
| 17 | Miller, D. | 5 | 6 | 159 | Canada | University of Montreal | 20 | 53 | 1,249 | 6 | 159 | 0 |
| 18 | Moss, T.W. | 5 | 6 | 150 | USA | Syracuse University | 7 | 14 | 355 | 4 | 92 | 0 |
| 19 | Dess, G.G. | 5 | 5 | 1,190 | USA | University of Texas at Dallas | 26 | 40 | 6,863 | 1 | 1 | 9 |
| 20 | Brigham, K.H. | 5 | 5 | 205 | USA | Texas Tech University | 11 | 15 | 452 | 2 | 46 | 0 |
| 21 | Brettel, M. | 4 | 9 | 52 | Germany | Aachen University | 13 | 48 | 486 | 9 | 51 | 0 |
| 22 | Cadogan, J.W. | 4 | 8 | 126 | UK | Loughborough University | 12 | 25 | 311 | 6 | 61 | 0 |
| 23 | Dimitratos, P. | 4 | 8 | 63 | UK | University of Glasgow | 10 | 30 | 312 | 8 | 63 | 0 |
| 24 | Tang, Z. | 4 | 7 | 89 | USA | Rochester Institute of Technology | 6 | 11 | 161 | 5 | 46 | 1 |
| 25 | Eggers, F. | 4 | 7 | 50 | USA | Menlo College | 5 | 11 | 97 | 8 | 50 | 0 |
| 26 | Shepherd, D. | 4 | 6 | 975 | USA | Indiana University Bloomington | 29 | 70 | 1,803 | 3 | 37 | 3 |
| 27 | Wincent, J. | 3 | 7 | 58 | Sweden | Lulea University of Technology | 13 | 63 | 695 | 5 | 12 | 0 |
| 28 | Story, V.M. | 3 | 6 | 58 | UK | Loughborough University | 4 | 9 | 78 | 5 | 51 | 0 |
| 29 | Anokhin, S. | 3 | 6 | 53 | USA | Kent State University | 8 | 23 | 188 | 4 | 7 | 0 |
| 30 | Rauch, A. | 3 | 5 | 345 | The Netherlands | University of Groningen | 6 | 20 | 753 | 4 | 32 | 1 |

Notes: R, ranking; H-EO, the H-index based solely on EO papers; TC-EO and TP-EO, the total number of citations and papers, respectively, during the period 1990–2017; TP-EO5, TC-EO5, the total number of papers and citations in EO over the last five years; TP, TC, the total number of papers and citations of research in any given subject during the period, respectively; T50, the number of papers ranked in the Top 50 list in Table III. ^aThe ranking is organized from high to low values, using the EO H-index as its first classification item. The second classification item corresponds to the number of EO papers and the third classification item is the number of citations per EO paper

Table V.
Top 50 ranking of the
most prominent
researchers in
entrepreneurial
orientation

| R | Top 50 authors | ET&P | FBR | JBR | JBV | JSBM | ISBJ | E&RD | SBE | IMM | JWB | Total |
|----|----------------|------|-----|-----|-----|------|------|------|-----|-----|-----|-------|
| 1 | Covin, J. | 5 | | 2 | 1 | | | | | 1 | | 9 |
| 2 | Lumpkin, G.T. | 4 | 2 | | | | | 1 | 1 | | | 8 |
| 3 | Wiklund, J. | 2 | 1 | | 2 | | 1 | | 1 | | | 7 |
| 4 | Chirico, F. | 3 | 1 | | | 2 | 1 | | | | | 7 |
| 5 | Wales, W.J. | 2 | | 1 | | | 4 | | | | | 7 |
| 6 | Payne, G.T. | 1 | 5 | | | | | | | | | 6 |
| 7 | De Clercq, D. | 1 | | | 2 | | 1 | 1 | 1 | | | 6 |
| 8 | Marino, L.D. | 4 | | | 1 | | | | 1 | | | 6 |
| 9 | Nordqvist, M. | | 2 | | | 1 | 1 | 1 | 1 | | | 6 |
| 10 | Short, J.C. | 1 | 4 | | | | | | | | | 5 |
| 11 | Engelen, A. | 2 | | | | 2 | | | | | 1 | 5 |
| 12 | Casillas, J.C. | 2 | 1 | | | | 1 | 1 | | | | 5 |
| 13 | Miller, D. | 4 | 1 | | | | | | | | | 5 |
| 14 | Brettel, M. | | | | | 5 | | | | | | 5 |
| 15 | Shepherd, D. | 3 | | | 1 | | | | 1 | | | 5 |
| 16 | Story, V.M. | | | 2 | 1 | | 1 | | | 1 | | 5 |
| 17 | Frese, M. | 2 | | 1 | | | | 1 | | | | 4 |
| 18 | Slevin, D.P. | 2 | | 1 | 1 | | | | | | | 4 |
| 19 | Moss, T.W. | 1 | 1 | | | | | 1 | 1 | | | 4 |
| 20 | Cadogan, J.W. | | | 2 | 1 | | 1 | | | | | 4 |
| 21 | Tang, Z. | 2 | | | | 2 | | | | | | 4 |
| 22 | Anokhin, S. | | | 1 | 1 | 1 | 1 | | | | | 4 |
| 23 | Rauch, A. | 1 | | 1 | 1 | | | 1 | | | | 4 |
| 24 | Kraus, S. | | | 2 | | | | | | 1 | | 3 |
| 25 | Dess, G.G. | 1 | | | 2 | | | | | | | 3 |
| 26 | Brigham, K.H. | | 2 | | | | | 1 | | | | 3 |
| 27 | Wincent, J. | | | 1 | 1 | 1 | | | | | | 3 |
| 28 | Dimitratos, P. | 1 | | | | 1 | | | | | | 2 |
| 29 | Eggers, F. | | | 1 | | | | | | 1 | | 2 |
| 30 | Hughes, M. | | | | | | | | | 1 | | 1 |
| | Total | 44 | 20 | 15 | 15 | 15 | 12 | 8 | 7 | 5 | 1 | 142 |

Table VI.

Total number of papers published by the 30 most prominent researchers in EO in the ten most prominent journals in EO

Notes: R, ranking; *E&RD*, *Entrepreneurship and Regional Development*; *ET&P*, *Entrepreneurship Theory and Practice*; *FBR*, *Family Business Review*; *IMM*, *Industrial Marketing Management*; *ISBJ*, *International Small Business Journal*; *JBR*, *Journal of Business Research*; *JBV*, *Journal of Business Venturing*; *JSBM*, *Journal of Small Business Management*; *JWB*, *Journal of World Business*; *SBE*, *Small Business Economics*

A second analysis was performed using the first authors of each article or publication, and the fractional co-citation counts, authors instead of articles. Using authors, instead of journals, three different clusters of authors can be defined (see Figure 3): the gray cluster of authors in entrepreneurship and strategy; the yellow cluster of researchers in family businesses and small enterprises; and the green cluster of authors in more diverse subjects, including psychometrics, management and international business and marketing.

The most prominent authors of the gray cluster are already familiar names – Covin, Lumpkin and Dess – making indisputable their great contributions from the areas of entrepreneurship and strategy. However, it is also noteworthy, the presence of two other prominent authors in the strategy field: Zahra and Miller. Danny Miller is one of the most important authors regarding strategy types, and has several seminal papers on the origins on the drivers of entrepreneurship and innovation (Miller, 1983; Miller and Friesen, 1983). Another key author is Shaker A. Zahra, who has developed very important advances related to entrepreneurship, innovation and strategy (see e.g. Zahra *et al.*, 2006), although his core research has not been on the concept of EO itself.

| R | Author | JoBV | | ET&P | | SMJ | | FBR | | IMM | | JoWB | |
|----|----------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------------|-------|----------------|-------|--------|
| | | TP-EO | Author | TP-EO | Author | TP-EO | Author | TP-EO | Author | TP-EO | Author | TP-EO | Author |
| 1 | Tang, J.T. | 2 | Covin, J. | 5 | Patel, P.C. | 2 | Payne, G.T. | 5 | O'Cass, A. | 3 | Tang, J.T. | 2 | |
| 2 | Dess, G.G. | 2 | Lumpkin, G.T. | 4 | Parida, V. | 2 | Short, J.C. | 4 | Tsai, K.H. | 2 | Dess, G.G. | 2 | |
| 3 | De Clercq, D. | 2 | Marino, L.D. | 4 | Wiklund, J. | 2 | Zachary, M.A. | 3 | Gabrielsson, M. | 2 | De Clercq, D. | 2 | |
| 4 | Wiklund, J. | 2 | Miller, D. | 4 | Shepherd, D. | 1 | McKenny, A.F. | 3 | Hult, G.T.M. | 2 | Wiklund, J. | 2 | |
| 5 | Shepherd, D. | 1 | Chirico, F. | 3 | Zahra, S.A. | 1 | Nordqvist, M. | 2 | Covin, J. | 1 | Shepherd, D. | 1 | |
| 6 | Covin, J. | 1 | Shepherd, D. | 3 | Wales, W.J. | 1 | Naldi, L. | 2 | Eggers, F. | 1 | Covin, J. | 1 | |
| 7 | Marino, L.D. | 1 | Slevin, D.P. | 3 | Bansal, P. | 1 | Brigham, K.H. | 2 | Gonzalez-Padron, T. | 1 | Marino, L.D. | 1 | |
| 8 | Rauch, A. | 1 | Frese, M. | 3 | Brown, T.E. | 1 | Lumpkin, G.T. | 2 | Hughes, M. | 1 | Rauch, A. | 1 | |
| 9 | Slevin, D.P. | 1 | Wales, W.J. | 3 | Davidsson, P. | 1 | Wiklund, J. | 1 | Hurley, R.F. | 1 | Slevin, D.P. | 1 | |
| 10 | Nguyen, T.T.M. | 1 | Wiklund, J. | 3 | Foss, N.J. | 1 | Miller, D. | 1 | Calantone, R. | 1 | Nguyen, T.T.M. | 1 | |

Notes: R, ranking; JoBV, *Journal of Business Venturing*; ET&P, *Entrepreneurship Theory and Practice*; SMJ, *Strategic Management Journal*; AMR, *Academy of Management Review*; FBR, *Family Business Review*

Table VII.
EO authors with the
highest number of
publications in the
five most-cited
journals in EO

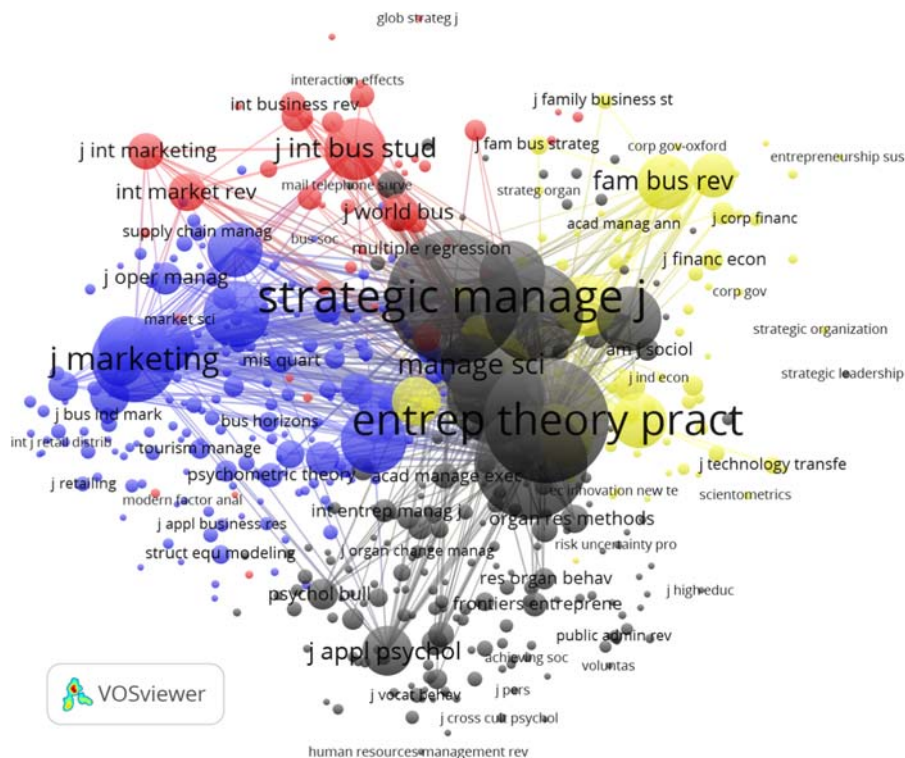


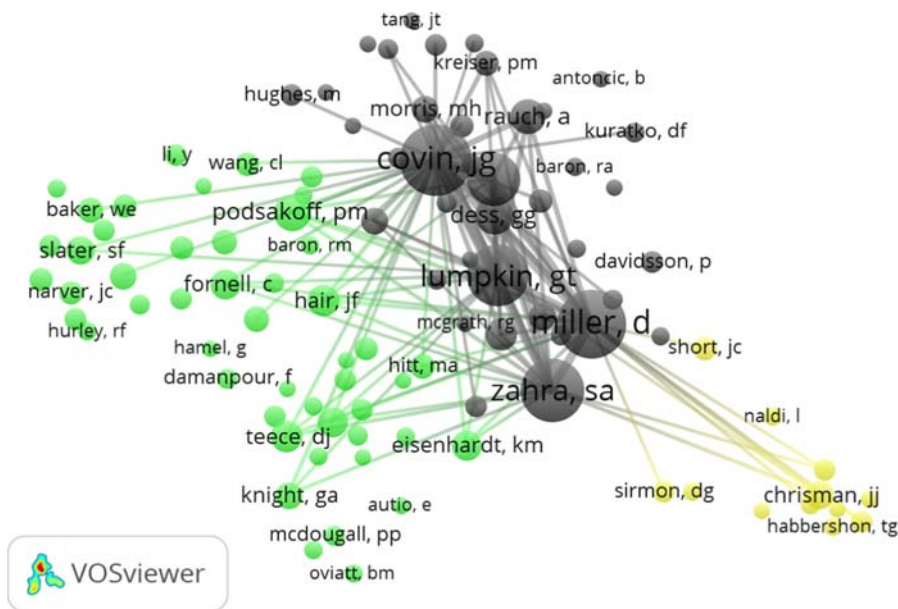
Figure 2.
Bibliographical data
map of journals
publishing
entrepreneurial
orientation research

Note: Bibliographical data map, based on co-citation fractional analysis of the authors on EO (1990–2017) – size-adjusted network visualization

With respect to the family business cluster (yellow), the most co-cited authors are Chrisman, J.J. and Sharma, P., who are prominent authors on the subject of family businesses related to the EO.

Finally, the green cluster indicates the great variety of topics related to EO research, although without much depth. The wide dispersion of the different topics and their lack of connections with each other reveal a cluster with weak and varied relations with different concepts and EO itself. Nonetheless, well-known researchers from different disciplines are recognizable: Narver and Slater the key authors from marketing and the market orientation concept, Podsakoff, Nunnally and Hair for psychometrics, scales and multivariate analysis; and Teece and Hamel seminal authors in the area of dynamic capabilities and dynamic competition.

This structural analysis suggests that EO research has been very multidisciplinary in nature, going beyond the entrepreneurship literature. EO has taken concepts and theoretical strength from sister literatures in strategy, innovation, marketing and organization theory. It is also interesting to notice that when looking at the EO research structure from the journals standpoint, the level of separation is clearer, and four distinct clusters emerge, mostly related to disciplinary distinctions. However, when looking at the relationships and co-citation patterns using first authors, clusters tend to be a little bit blurred, reducing to three, showing that authors tend to be more open in terms of their knowledge base. Journals sometimes reduce the opportunity to cross-fertilization of disciplines because in order to be published you need to include more literature published in those subdiscipline or particular journals.



Note: Bibliographic data map, based on co-citation analysis of the authors on EO (1990–2017)
– size-adjusted network visualization

Figure 3.
Bibliographical data
map of authors
publishing
entrepreneurial
orientation research

4. Conclusions, implications and future research directions

The use of bibliometric techniques and distance-based similarity visualization (VOS) based on information in the Web of Science database allowed us to present a general overview of the research in EO. This global exploration made it possible to recognize both contributions and key contributors in advancing knowledge about the concept of EO across more than 20 years of research. To this end, the most relevant journals, articles and authors for this research topic were identified. Also four different clusters can be identified that have studied EO: the strategy and entrepreneurship journals, the family business and governance/finance journals, the marketing and innovation journals and the international business journals. This is particularly interesting, showing that EO research has had an impact beyond entrepreneurship and management. The structure of the field using first authors co-citation patterns shows a three clusters structure: one most identified with strategy and entrepreneurship, one in the family and small business subfield and one with authors working from a more multidisciplinary perspective (marketing, strategy, innovation, psychometrics, etc.).

With regard to the number of papers and publications, the journals *Entrepreneurship Theory and Practice*, *Journal of Business Research*, *Journal of Small Business Management*, *International Small Business Journal* and *Journal of Business Venturing* published approximately 40 percent of all EO publications in the Top 30 ranking categorized by the EO H-index. Other journals stand out for gathering the largest number of citations, namely, the *Journal of Business Venturing*, *Entrepreneurship Theory and Practice*, *Strategic Management Journal*, *Academy of Management Review* and *Family Business Review*.

Based on the H-index and the number of publications, the five most important authors in the field of EO are Lumpkin, Payne, Shorts, Covin and Wiklund. One prolific author with more publications is Kraus, who is also representative of an institution outside the USA, unlike the five mentioned above.

Whereas the purpose of this review is to provide a general overview of the most prolific and prominent research with regards to EO, it is important to highlight some limitations that emerge by the nature and characteristics of the methodology utilized. First, the information presented here is restricted to the WoS database. Then, relevant work in journals included in other indexes (Scopus, SciELO, etc.) or conferences papers were not included in this paper. However, we believe that the study covers the most relevant journals of the fields of entrepreneurship and management, and therefore the papers covered are a representative sample of the stronger contributions on EO in the business literature.

Second, our results showing the prominence and relevance of particular authors and are based on two bibliometric approaches: H-index and citation explorations, and the VOS viewer mapping and clustering approach for co-citations. Also, when performing our analysis like the EO H-index and the co-citation counts for author consider just the first author. Additionally, our focus has been on research on EO, therefore, all conclusions regarding author and journal prominence can only be referred to this particular domain, and not the whole domain of entrepreneurship.

For example, the assignment of authorship when calculating the EO H-index was stipulated by granting full authorship per paper. Even though we tried to lessen this situation by using the VOS viewer approach, the results presented here should be taken with some caution.

Future research may include other databases like Scopus, SciELO or ESCI, in order to extend the generalizability of the results presented here. In fact, it will be interesting to check and explore research on EO in emerging journals (and nations), which are considered in SciELO, ESCI and other databases. Further research may apply bibliometric techniques to the analysis and study of the relationships of EO to dependent variables like new product performance, innovation or organizational performance including combined searches of those constructs in the databases.

On another and more general note, research on entrepreneurship is multidisciplinary in nature, and uses theories and approaches from different disciplines (as has been presented here, from strategy, marketing, innovation, etc.), it will also be interesting to explore the influence EO and entrepreneurship research has had on other disciplines using complementary techniques like bibliographic coupling.

Implications from this research for management can be observed in at least two directions. First, in the case of firms, managers should consider that EO seems to be a relevant cultural/organizational logic construct not just for new or small businesses, and for innovation purposed, but also for conquering markets, and reaching strategic objectives. Therefore, for managers, the measure and promotion of EO within their organizations can be very relevant, as has been stated in several related disciplines.

A second stream of implications is associated with the management of academic institutions in particular school of businesses or academic departments. Since EO research, and entrepreneurship research in general, uses theories and has applications in different business fields, those schools that would like to make a stronger impact in terms of research and applications in entrepreneurship, and EO in particular, need to foster multidisciplinary teams and collaboration across areas (strategy management, marketing, innovation, technology management, finance and governance).

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