

Past, present, and future research on self-service merchandising: A co-word and text mining approach

STRUCTURED ABSTRACT

Purpose: This study aims to discern emerging trends and provide a longitudinal perspective on merchandising research by identifying relationships between merchandising-related subdomains/themes.

Design/methodology/approach: We sourced 657 merchandising-related articles published since 1960, from the Scopus database and 425 from Web of Science. After processing and normalizing the data, we performed co-word and thematic network analyses. Taking a text mining approach, we used topic modeling to identify a set of coherent topics characterized by the keywords of the articles.

Findings: We identified the following merchandising-related themes: branding, retail, consumer, behavior, modeling, textile and clothing industry, and visual merchandising. Although visual merchandising was the first type of merchandising to be used in-store, only recently has it become an emerging topic in the academic literature. There has been a further trend over the last decade to understand the adoption of simulation technology, such as computer-aided design, particularly in supply chain management in the clothing industry. These and other findings contribute to our discussion of the merchandising concept, approached from an evolutionary perspective.

Research limitations/implications: The conclusions of the study hold implications at the intersection of merchandising, sectors, new technologies, research methodologies, and merchandising-practitioner education. Research trends suggest that, in the future, virtual reality and augmented reality using neuroscientific methods will be applied to the e-merchandising context.

Practical implications: The different dimensions of merchandising can be used to leverage store managers' decision-making process toward an integrated store-management strategy. In particular, by adopting loyalty merchandising tactics, the store can generate emotional attachment among consumers, who will perceive its value and services as unique, thanks to merchandising items designed specifically with that aim in mind.

The stimulation of unplanned purchases, the strategic location of products and duration of each merchandising activity in the store, the digitalization of merchandising, and the application of findings from neuroscience studies are some of the most relevant practical applications.

Originality/value: The study provides the first-ever longitudinal review of the state of the art in merchandising research, taking a holistic perspective of this field of knowledge spanning a 60-year period. The work makes a valuable contribution to the development of the marketing discipline.

1. INTRODUCTION

1.1. Motivation and problem-definition

As the marketing discipline is continuously evolving (Kumar, 2015), the literature uses a growing number of terms to refer to the various commercialization activities (Halpern-Felsher, 2019) that have developed over time. These include concepts such as distribution decisions, product management, communication, price actions, experiential marketing, business-to-consumer (B2C), and merchandising, among many others. In particular, retail merchandising is one of the oldest business practices in human history, but the term “merchandising” has changed significantly over the years in terms of its conceptualization and composition.

In practical terms, there are now several new phenomena linked to merchandising, such as the use of learning-based technologies at the point of sale (POS). These technologies enable firms to dispense with salespeople and till points in self-service establishments, albeit only large companies such as Amazon Go have fully embraced them to date. Such new services and technologies have also given rise to e-merchandising or the in-store use of mobile technologies (Hogberg *et al.*, 2019) and virtual reality (VR) and augmented reality (AR) applications (Wedel *et al.*, 2020), among other developments (Krasonikolakis *et al.*, 2018).

Yet, despite such advances in the extant literature, there remains an important lacuna: a clear conceptualization and examination of one of the primary in-store marketing tools, self-service merchandising. We seek to address this lacuna with the present study by providing a bibliometric analysis of the extant literature associated with self-service merchandising, to contribute to the theoretical development of this topic. With this analysis, we also aim to help develop future scholarship that may contribute to better explain the impact of the aforementioned factors identified by authors such as Kaur and Kaur (2015).

1.2. Contributions

The lack of awareness and recognition (among both academics and professionals) of in-store marketing’s reinvention is due largely to a generalized misconception of what merchandising is and does. Regarding the existing body of knowledge of the marketing discipline in general, the study by Kumar (2015), which was based on a review of publications since 1996, predicted advances in the conceptual understanding of marketing that will, in the coming years, expand the knowledge base. In our analysis, however, none of the published scholarly articles we consulted debate or exhaustively review the merchandising specialization, despite

its being a fundamental marketing activity among retailers and manufacturers alike. Another consequence of this generalized lack of awareness—reflected in our analysis of keywords, abstracts, and titles from the literature—is that actions that form part of the merchandising toolkit are not always recognized (named) as such. Furthermore, there are some terms that authors use interchangeably when a more precise, judicious choice of words would help avoid unhelpful overlaps with notions from other related fields. Hence, merchandising activities need to be accurately distinguished from—and correctly integrated with—those of other commercial functions. Therefore, new knowledge and insights are called-for among scholars and marketing professionals alike to support this integration (Kumar, 2015). In this sense, our first contribution to the extant literature is an assessment of the state of the art in merchandising scholarship, which contributes to the development of the wider marketing discipline as a whole.

Furthermore, despite the importance of merchandising in the marketing realm, no study to date has applied the *bibliometric* approach to this field of study. We identified only one article (Lima *et al.*, 2018) that reviews the literature dealing with a very specific aspect: “visual merchandising”. That work, which covers the period 2010–2016, describes the authors’ content analysis of the scientific output related to the use of visual merchandising techniques in fashion retail associated with the “consumer experience”. In contrast to Lima *et al.* (2019), the present study adopts a broad conceptual perspective on merchandising (in the strict context of retail outlets) and employs a much longer timeframe. In terms of methodology, our next contribution consists of the first-ever article on merchandising that uses science-mapping analysis, which is a powerful bibliometric technique that enables the conceptual structure of a particular field of research to be studied (Cobo *et al.*, 2013). We combined this with text mining to uncover the unstructured ontology and conceptual insights (Kumar *et al.*, 2020). We selected this particular bibliometric approach for our analysis as it maps the keywords, the relationships between them, and the citations generated by articles published in a given timeframe (Evren and Kozak, 2014). Such maps provide a visual representation of the relationships and overlaps among research areas or topics and convey additional meanings and interpretations of these interrelationships (Garfield, 1994).

By meticulously tracking the scope and volume of scholarly articles over the decades, this study also makes a much-needed contribution to the extant *theoretical* knowledge through a valuable evolutionary (longitudinal) synthesis of both merchandising theory and practice and generated quantitative data that illuminate the relationships between merchandising and other

commercial functions. On a practical level, our study highlights those themes that have attracted the most scholarly interest in merchandising over the years and discerns the main research trends and their likely future direction.

1.3. Research aims and structure

The aims of the study are: (1) to examine the (self-service) merchandising concept and its evolution over time, via in-depth review and classification of the extant literature specifically dealing with this topic; (2) to identify the structure of the relationships between previous and current themes over the period 1960–2018, applying a bibliometric methodology comprising co-word analysis and text mining; and (3) to discuss how merchandising praxis has evolved in line within developments in the marketing discipline.

The structure of the article is as follows. Section 2 presents a literature review on the origins, evolution, and conceptualization of merchandising. Section 3 introduces our methodological approach. Section 4 outlines the main findings, including the most frequent keywords, the sources (publications) identified, the most prolific authors, and the results of our thematic analyses. This section also examines the relationships between the themes identified, including visual representations of the trajectory of merchandising research and our assessment of future trends. Section 5 is devoted to a discussion of our findings. Finally, Section 6 sets out the theoretical and practical contributions of our study and its implications for future research at the intersection of merchandising, sectors, new technologies, research methodologies, and practitioner education, and offers suggestions for future research.

2. BACKGROUND AND RESEARCH FOCUS

2.1. Origins and evolution of the practice of merchandising

Merchants have practiced merchandising for millennia. As early as 600 B.C., the Greeks distributed their surplus production to consumers via small urban retail shops. The shop-fronts advertised the merchandise using signs and symbols, while, inside, niches in the walls displayed goods, grouped into sections (Griffith, 1935). These early merchants even organized their products intentionally to attract customers: the biggest catch of the day at the front of the display, the ripest and most fragrant fruit on top, and so on (VM Central, 2014).

This small-scale form of selling products directly over the counter—where goods were simply displayed in shop windows and the seller’s sales pitch was crucial—remained unchanged for millennia, with virtually no innovation. But centuries of practice have enabled us to almost perfect the art of selling thanks to conceptual and practical advances such as self-service,

department stores, communication technologies, segmentation techniques, and the rise of databases, among others.

The self-service concept appeared in the early 1960s in the majority of western countries. Its arrival constituted a major revolution in retail distribution, with products presented directly to the customer (using shelves, display stands, or baskets) and the application of in-store marketing techniques—that is, “self-service merchandising”. In this new type of sales context, the role of the seller became irrelevant for many everyday consumer products. This is because, in self-service stores, consumers are willing to take on the job of serving themselves in a liberating and autonomous act, which increases the probability of making a sale (Du Gay, 2004).

In the mid-1970s, European retailers began to take an interest in how manufacturers presented their products. Packaging design, in particular, acquired a critical role in selling merchandise in self-service stores, and related terms such as “blister packaging” and “shrink-wrapping” eventually found their way into the lexicon of the modern distribution system (Wexter Box, 2005). Since the 1980s, the notion of “experiential marketing” has also influenced store layouts and store atmosphere (Holbrook and Hirschman, 1982). In that decade, SMEs worldwide were already beginning to use merchandising as a tool not only to attract but also retain customers. Over time, the more advanced businesses came to understand that the primary goal of merchandising is to design and control the stimuli that consumers receive from their various touchpoints and interactions with the firm. They also started to provide superior (more novel and pleasant) in-store experiences to add experiential benefits to their main product/service offer (Pine and Gilmore, 1999; Schmitt, 1999).

Recently, new applications such as VR or AR, along with mobile devices, have been widely used in the retail sector to help increase purchase intentions and revenues (Caboni and Hagberg, 2019; Wedel *et al.*, 2020). In light of the theory of uses and gratifications, Lima *et al.*'s (2018) review shows that the use of VR applications strengthens consumer self-confidence, enhances consumer relationships with the brand, and promotes online buying behavior. In particular, the adoption of VR tools is transforming bricks-and-mortar retailing, with stores becoming more like showrooms, and facilitating both planned and unplanned purchases. It does so by enabling customers to locate products in the store through reverse image-search (for instance, via mobile apps such as those of IKEA or Home Depot). These applications create new types of consumer interfaces, such as smart dressing rooms, simulated

shelves, virtual walk-throughs, demonstrations, virtual product displays, or interactive virtual shelf talkers (Wedel *et al.*, 2020).

2.2. Conceptualization of merchandising

The term “merchandising”, referring to in-store marketing, derives from the French *merchandise* (goods) + *ing* (the English suffix that indicates action or movement). The underlying notion of the merchandising concept is, therefore, the movement of goods toward the consumer.

According to the business dictionary of *L’Académie des Sciences Commerciales* (2018), merchandising is an aspect of marketing “that covers the studies and techniques employed by both distributors and producers (separately or jointly) to increase in-store profitability and product sales by continuously adapting the product range to the needs of the market and by presenting products effectively”. In this definition, merchandising is anything but passive—rather, it is based on the active presentation of products and services, manipulating a range of factors to create appeal: physical location of products in-store, the dividing-up of the stock into units suitable for customers, packaging and presentation, exhibitions, shop fittings and decor, and so on.

The *American Marketing Association* (AMA) states that the term “merchandising” has various meanings and is much less frequently used than “marketing” or “sales”. The two most common meanings are: a) promotional activities undertaken by manufacturers in retail outlets, such as installing special stands to display their products; and b) the management and decision-making of retailers vis-à-vis products or lines.

In the scientific literature, “merchandising” is sometimes used as a synonym for the commercialization of products and services in the more general sense of sales. Some English terms that express the sense of in-store marketing are “retail merchandising”, “self-service merchandising”, or “point-of-sale marketing”. This is because “the physicality of the store includes merchandise, in-store promotion and the issues of location, environment and atmosphere” (Davies and Ward, 2005: 506).

In an exhaustive review of the relevant literature, we identified three main terms used synonymously to refer to (retail) self-service merchandising: merchandising *per se*, in-store marketing, and POS marketing. We therefore ensured our query covered all the actions associated with these three terms; and this approach, in turn, captured an even wider variety of terms used by scholars when referring to merchandising activities (see Figure 1).

Figure 1. Antecedents and consequences of POS merchandising functions

[FIGURE 1 ABOUT HERE]

Source: The authors

In the first textbox (from left to right in Figure 1), we can see that certain “golden rules” of merchandising determine how products should be positioned on shelves to attract potential buyers—for example, by identifying the various product families, which are often grouped into multi-level structures (Bianchi-Aguiar *et al.*, 2018). The second textbox highlights that in-store marketing encompasses all the in-store activities that retailers undertake to engage with customers and involve them with the goods and services on offer (Roggeveen and Grewal, 2018). The latter authors distinguished between eight in-store marketing factors, four of which can be considered conventional (store atmosphere, merchandise, the service experience, and in-store sampling) and four “emerging” (the use of orchestrated omnichannel approaches, digital displays/signage, mobile technologies, and robotics).

Third, there are many actions designed to achieve effective POS marketing, from product placement, signage, and displays, to the use of the latest technologies to bring the product closer to the buyer (Synek, 2018). Lavack and Toth (2006) and Pollay (2007) found an equivalence between POS marketing and retail merchandising. These concepts largely relate to the communications aspects of in-store signage and displays (Pollay, 2007) and, more specifically, to the advertising function (Teletov *et al.*, 2014). They must therefore fulfill the five basic functions of advertising: attract attention, arouse interest, create desire, build trust, and drive direct action (Pollay, 2007).

“Visual merchandising” is also now widely used. It may be a modern concept, but it was applied in practice long before there was a set of terms to describe it (VM Central, 2014). This concept embraces terms such as store design, merchandise, and merchandising cues (Kim, Shin, and Koo, 2008), and it encompasses many marketing actions (as shown in Figure 1), including interior displays, atmosphere, lighting, aromas, music, color and signage (Balgaonkar *et al.*, 2014), window-dressing (Abreu and Lopes, 2010), and packaging and product design (Barros *et al.*, 2018; Hurley *et al.*, 2017).

The present study traces the conceptual evolution of “self-service merchandising” or “in-store

marketing” and identifies established trends (both in this knowledge field and other related marketing fields) and future trends likely to develop in publications addressing the topic. To achieve this, we adopted a bibliometric approach using keywords extracted from two well-known databases: Scopus and Web of Science (WoS). As noted earlier, we based the query on three terms associated interchangeably with this activity: “merchandising”, “in-store marketing”, and “point-of-sale marketing”.

2.3. Bibliometrics and co-word analysis

The earliest definition of bibliometrics is “the application of mathematics and statistical methods to books and other media of communication” (Groos and Pritchard, 1969). Bibliometric analysis examines a complete corpus of research in a given area from an objective, quantitative perspective, assessing the scientific quality (Merigó *et al.*, 2015; Kumar *et al.*, 2020). This approach avoids the biases induced by a researcher’s participation in that assessment and represents a holistic view of the academic community in question (Kumar *et al.*, 2019, 2020; Nerur *et al.*, 2008).

Bibliometric analysis has been used in disciplines and fields as diverse as management information systems (Culnan, 1986), strategic management (Ronda-Pupo and Guerras-Martín, 2012; Nerur *et al.*, 2008), business ethics (Calabretta *et al.*, 2011; Talukdar, 2011), business models (Coombes and Nicholson, 2013), key-account management (Kumar *et al.*, 2019), business-to-business (B2B) marketing (Kumar *et al.*, 2020 [digital mediation in B2B]; Backhaus *et al.*, 2011), financial marketing (Muñoz-Leiva *et al.*, 2013), hospitality (Rodríguez-López *et al.*, 2020), and integrated marketing communications (Muñoz-Leiva *et al.*, 2015).

Bibliometrics uses a wide range of techniques: author and document co-citation analysis, co-word analysis, and textual analysis (Glanzel, 2015), using multivariate methods (e.g. Kumar *et al.*, 2019, 2020; see next subsection). Occasionally, these techniques are combined with other approaches such as content analysis (e.g. Ronda-Pupo and Guerras-Martín, 2012) and other tools, such as specific clustering software (e.g. Muñoz-Leiva *et al.*, 2015) or text mining (e.g. Kumar *et al.*, 2019, 2020). In document co-citation analyses, the seminal documents with the most impact within the research field are identified, and the matrix of co-citation frequencies between document pairs is analyzed (Small, 1973).

Keywords are the terms that characterize a study’s main ideas and provide indications of the research trend that the authors are following (Garfield, 1990). “Co-word analysis” is a

relational technique (Callon *et al.*, 1995) as it measures the co-occurrence of keywords extracted from each document, from which matrices of co-occurrences are constructed and similarity measures calculated. A group of French bibliometric scientists (Callon *et al.*, 1983) proposed co-word analysis in the early 1980s; it was subsequently implemented by Turner *et al.* (1988) and Callon *et al.* (1991) and, since then, has been successfully applied in different scientific disciplines (e.g. Cambrosio *et al.*, 1993; Lee and Jeong, 2008; Muñoz-Leiva *et al.*, 2015). Generally, co-word studies are carried out by exploring the co-occurrence and co-absence of keywords that appear in the titles or abstracts of manuscripts.

Bibliometric co-word analysis is one of the most suitable methods for identifying trends and emerging issues in a given scientific field. As it is a particularly powerful tool when combined with other complementary techniques such as cluster analysis (Keupp *et al.*, 2012), its use is becoming mainstream within the management studies field (Baker *et al.*, 2020).

Lima *et al.*'s (2018) article investigates the scientific production related to the use of “visual merchandising” techniques in fashion retail associated with “consumer experience” from a sample of 32 articles indexed in WoS, Scopus, EBSCO, Spell, and Scielo. The findings of their study, which has a very specific focus, indicate a) the most widely-researched visual merchandising variables, and b) theoretical gaps of potential interest to researchers, such as those related to online retail and the relationship between visual merchandising and the purchase experience.

To date, merchandising has either been approached by scholars solely in the context of broader marketing literature analyses (e.g. Chan *et al.*, 2017) or it is often not mentioned as an explicit term even in studies that do, in fact, address this topic. This can happen, for example, when a published study focuses on a particular component of merchandising (such as in-store presentation) as a single independent variable. A further phenomenon is that of possible bias in the authors' selection of articles to cite in their articles (Lima *et al.*, 2018). Our bibliometric approach to the study of self-service merchandising using co-word analysis resolves these issues. In the next section, we describe our methodology in detail.

3. METHODOLOGY

3.1. Data-processing overview

Our bibliometric approach employed the co-word analysis method proposed by Cobo (2011) and is similar to that used in other studies, such as Yang *et al.* (2012). This methodology comprises the following stages:

1. **Data recovery:** different bibliographic databases can be used at this stage. We opted for Web of Science (WoS) and Scopus.
2. **Data processing:** incorrect or duplicate data are detected and eliminated.
3. **Data extraction:** here the researcher focuses on the unit of analysis, which may include the volume of documents and citations, authors, and keywords.
4. **Normalization:** bibliometric indices are calculated—such as the measure of similarity (Van Eck and Waltman, 2009) and the equivalence index or Jackard index (Cobo *et al.*, 2012a).
5. **Mapping:** science maps can be constructed through multidimensional scaling (White and McCain, 1998; Kumar, 2020), principal component analysis, and cluster analysis (Börner *et al.*, 2003; Keupp *et al.*, 2012; Kumar *et al.*, 2019, 2020 [hierarchical cluster analysis]). Co-occurrence (or co-word) analysis is applied here. Co-word analysis considers words as knowledge fragments (Callon *et al.*, 1991); and the frequency with which they appear in a text highlights topics within a given field of research. The resulting thematic networks are given the name of the keyword most central to the cluster.
6. **Analysis:** the thematic network is analyzed, with statistical techniques showing the degrees of relationship or overlap between the groups. Longitudinal analyses can show the structural evolution of research fields (Cobo *et al.*, 2012b). In our study, as in other previous applications (e.g. White *et al.*, 2017; Kumar *et al.*, 2020), to complement thematic network analysis we also conducted text mining via topic modeling, which consists of identifying coherent topics characterized by relevant words (Cortez *et al.*, 2018).
7. **Visualization:** different techniques and software types (e.g. Pajek or VOSviewer) are used to represent the full science maps and the results of the analyses (such as clustering or partitions).

3.2. Data recovery

We used two well-established databases, Scopus and WoS. The former offers a much wider geographical scope and range of languages and includes a greater number of professional journals than the latter, which enables the researcher to conduct significant transnational comparisons (Delgado and Repiso, 2013). Vieira *et al.*'s (2009) review showed that Scopus provides better coverage of social sciences and human–computer interaction literature and is well-balanced in terms of subject areas and editors. These advantages formed the basis for our

decision to opt initially for Scopus. On the other hand, WoS (managed by Clarivate Analysis) offers better retrospective coverage of the subject area (Montero-Díaz *et al.*, 2018) and is geared more toward the English language. Alvarez-Marín (2017) explained the importance of the WoS-based bibliometric analysis, as its database includes more than 8,400 scientific journals across more than 170 different disciplines, separated into three citation indices: science, social sciences, and humanities (Waltman, 2016). Meho and Yang (2007) suggested that using Scopus and WoS together provides a more accurate and comprehensive picture of authors' scholarly impact. Following the recommendations of this literature, we carried out an exhaustive search via both databases, using the same query.

We downloaded a total of 1,437 document references from the Scopus database, and 1,135 references from WoS, including their keywords, abstracts, and citation measures. Of this total, 66 and 145, respectively, were available in open access format. Scopus, owned by Elsevier, is a bibliographic database containing abstracts and academic journal article citations. More than 90% of the titles are peer-reviewed journals from the four primary research areas (scientific, technical, medical, and social sciences). We chose journal articles as our units of analysis because the academic community acknowledges these publications to be the most advanced and up-to-date knowledge sources, widely used in literature reviews in the marketing field (and, more generally, management studies) (e.g. Leone *et al.*, 2012). The list of journals we included in our study can be consulted via this link: <http://webcim.ugr.es/polls/merch/journals.xlsx>.

By tracing the evolution of the aforementioned three terms that scholars use to refer to POS merchandising, we were able to specify the keywords that could function well as queries. For this, we drew on Davies and Ward's (2005) contention that a store's physicality includes merchandise, in-store promotion, location, environment, and atmosphere. Hence, by using "merchandising", "in-store marketing", and "point-of-sale marketing", we ensured that we covered the entire spectrum of articles focused on retail merchandising. Our query in both bibliographic databases was as follows:

#Query: TS= ("merchandising" OR "in-store marketing" OR "point-of-sale marketing")

where the field TS refers to a search based on the "topic" ('topic' = 'title' + 'keyword' + 'abstract'), refined by document type (article, proceedings, review, or other).

In bibliometric studies such as this, a large percentage of documents refer to research questions arising from other disciplines, either because of the polysemic nature of the terms

used or, occasionally, because they are given as examples in the abstract. In our content review, we therefore removed terms derived from: engineering (e.g. highly technical terms associated with commercial equipment); publications where the meaning of “merchandising” referred to the mass/external marketing of products or services beyond store settings (e.g. wooden products in the State of Virginia or Austria); licensed rights/contracts for brands and cartoon/fictional characters; business performance studies, where merchandising was analyzed only peripherally or as a possible application; and applied studies for students on merchandising courses, among others. We included within the scope of the study those publications dealing with (among others) the topics highlighted in Figure 1 (see subsection 2.2).

The timeframe for our study was 1960–2018, covering a total of 657 valid articles on the topic of “merchandising” from Scopus, and 425 from WoS (Figure 2). We observed that, for the 20-year period 1994–2013, Scopus featured more merchandising-related articles than WoS. However, in the other two periods, both databases presented a similar number of articles.

Figure 2. Number of “merchandising” articles per year in Scopus and WoS, 1960–2018

[FIGURE 2 ABOUT HERE]

Source: The authors

3.3. Data processing

Before conducting the co-word analysis, we performed a normalization process to merge plural and singular forms (e.g. “brand”/“brands”) and to convert acronyms into their full forms. We also undertook a semantic search to group together words written in different ways (keeping the meanings unchanged). Principally, these affected words spelled differently in American and British English, such as behavior vs. behaviour, and those that can be hyphenated or unhyphenated (e.g. eye tracking/eye-tracking). We processed a total of 1,853 keywords in Scopus and 2,541 in WoS.

3.4. Tabulations and data-weighting

The third stage of the analysis involved a simple count of the number of keywords, authors, and their associated citations, or sources, which we then aggregated in different tables. Given that citation rates are affected by the age of the article in question, to address this effect we

calculated the average citation rates per year—that is, the overall number of citations divided by the number of years (column ‘C/Y’) since the article was published (Yan and Ding, 2010; Kumar and Polonsky, 2017). This approach has been applied in previous marketing-related citation analyses (e.g. Kumar and Polonsky, 2017; Kumar, 2016; Polonsky *et al.*, 2013).

Turning to author impact, this can be assessed by applying a weighting process to allocate authorship and citations to individual authors, using a weighted number of articles (WNA column), weighted citation count (WCC), and weighted citation count per year (WCY). The formulae used to calculate these metrics appear are shown in Table 2. If an author was involved in multiple works, we aggregated the citations for that individual, but if an article was co-authored by three authors, the citation for each author represented one-third of the total (Kumar and Polonsky, 2017). If one of the three authors had published another single-author article, his or her total authorship contribution was 1.33 (weighted citation). We calculated the sum of the author-wise weighted counts following a method similar to that used in recent marketing studies (e.g. Chan *et al.*, 2012; Kumar *et al.*, 2019, 2020). We also calculated the ranking (‘rankX’) for each key indicator (number of documents and WCY) of the author table.

3.5. Longitudinal approach

As to the length of the periods, as is normal in co-word analyses from a longitudinal perspective, we made the first period the longest, to arrive at a sufficient number of published works; we then divided the remaining years into two further periods covering 10 years or so, to give us a significant volume of documents and also to take into account major milestones in the development of the discipline.

Thus, the present study examines three sets of data, for the periods 1960–1999, 2000–2009, and 2010–2018 (covering 40 years, 10 years, and 9 years, respectively). Our criteria for generating the network and reducing the data were: keywords that appeared in more than 1 document for the period 1960–1999, more than 3 documents (2 in WoS) in 2000–2009, and more than 3 documents in 2010–2018; and with minimum co-occurrence values of 1, 2 (1 in WoS), and 2, respectively. For our bibliometric quality indicators, we used the *h*-index of the keyword and the average and the sum of citations received up to the date when the data were retrieved. The number of articles for each period is shown in Figure 2.

3.6. Software used for co-word analysis

We conducted the co-word analysis using SciMAT (Cobo *et al.*, 2012b; Sci²s, 2011) and

VOSviewer (Van Eck and Waltman, 2007) software based on science maps. SciMAT is an open-source (GPLv3) software program designed by the Sci²s research group at the University of Granada (Cobo *et al.*, 2012b). This software analyzes the content of publications and extracts the research topics that have attracted the interest of the international academic community. It is designed to import data exclusively from WoS (e.g. Martínez-Sánchez *et al.*, 2017; He *et al.*, 2019) and Scopus (e.g. Saito and Strehlau, 2018; Venkatraman *et al.*, 2018).

Cobo *et al.* (2018) argue that SciMAT is a powerful tool that integrates the majority of the advantages of the available science-mapping software tools. It provides 1) the modules necessary for all the science-mapping workflow steps, from data acquisition and pre-processing to visualization and interpretation of results; 2) methods to build most bibliometric networks, similarity measures to normalize them and build the maps using clustering algorithms, and various visualization techniques useful for interpreting output; and 3) a wide range of pre-processing tools for detecting duplicate and misspelled items, time slicing, data reduction, and network pre-processing, among other functions; and 4) it enriches the maps with bibliometric measures based on citation indicators, such as the number of citations or documents published. Meanwhile, VOSviewer collects bibliographic data and provides co-authorship and keyword co-occurrence maps (Martínez-López *et al.*, 2017).

3.7. Text mining and topic modeling

Recently, scholars have extended their use of text mining approaches to analyze academic literature from the social sciences (Moro *et al.*, 2019; Amado *et al.*, 2018). Text mining consists of analyzing unstructured data in the form of text to reveal insightful patterns with which to uncover latent knowledge about a given subject (Fan *et al.*, 2006). This analysis comprises several tasks such as sentiment analysis, text categorization (e.g. discerning whether an email is spam), and text summarization. Within automated literature analysis, one of the most useful and interesting functions is topic modeling, which involves collating the published articles into a smaller set of coherent topics characterized by relevant words (Cortez *et al.*, 2018).

One of the most widely-adopted topic modeling techniques is latent Dirichlet allocation (LDA), a generative statistical model that identifies topics based on words collected in a corpus of documents (Blei *et al.*, 2003). In this study, we adopted LDA to identify new topics of words, based on all of the keywords from all of the articles derived from WoS and Scopus. Our approach was similar to that taken in the study by Canito *et al.* (2018), as we used the

statistical open-source tool “R” and the “tm” and “topicmodels” packages to conduct the experiments. To determine the most appropriate number of topics to be generated, which is one of the required inputs to the LDA model, we employed the “ldatuning” package.

4. RESULTS

4.1. The most prolific keywords, authors, and journals

4.1.1. Primary keywords associated with merchandising

In this section, we present the keywords, authors, and journals that appeared most frequently in our search. In the Scopus database, the words most commonly associated with MERCHANDISING are: this search term itself, which appears as a keyword 129 times (see Table 1), followed by MARKETING¹ (104), RETAIL/ING (103), SALES (61), CLOTHING INDUSTRY (48), BRANDING (36), FASHION (34), VISUAL MERCHANDISING (33), DESIGN (33), COMPANY INFORMATION (27), COMMERCE (26), PACKAGING (25), ADVERTISING (24), ARTICLE (i.e. product) (24), ECONOMICS (24), HUMAN (23), CONSUMER BEHAVIOR (22), UNITED STATES (22), ELECTRONIC COMMERCE (22), and INTERNET (21). These words appeared in over 20 journals. Other, less frequent, terms can be grouped into another heterogeneous set of keywords, including: RETAIL STORES, TOBACCO, CUSTOMER SATISFACTION, COMPUTER SIMULATION, CONSUMER RESEARCH, PURCHASING, COLOR, MANAGEMENT, and BUSINESS STRATEGY. In general terms, these are keywords that describe the various points of interest, points of view, and contexts surrounding the theme of merchandising. In particular, we observed here a significant number of studies dealing with the clothing or fashion sector, the tobacco industry, and e-commerce. According to Scopus, the most-cited topics by year were TOBACCO (3.1 citations per year—C/Y), WOMENSWEAR (2.5), FEMALE (2.2), RETAIL STORES (2.9), VISUAL MERCHANDISING (1.9), and COMMERCIAL PHENOMENA (1.8).

In the WoS database, MERCHANDISING is most commonly associated with MERCHANDISING (53), VISUAL MERCHANDISING (38), BEHAVIOR (33), IMPACT (30), RETAIL(ING) (23), and MODEL/S (22). Other keywords appearing in this source, albeit less frequently, include CONSUMER, CHOICE, IN-STORE MARKETING, RETAIL/ING, MARKETING, and BRAND. Also with a notable presence is the theme of CONSUMPTION, both from the end-consumer point of view and from the wider economic

¹ The topics or themes appear in CAPITALS.

perspective. In this database, the most-cited themes by year are the EYE-TRACKING method (7.3 C/Y), ATTENTION (6.5), RETAILER (6.3), and SALES (4.0).

We analyze the three time-periods in depth in sub-section 4.2. We show the strategic diagram for each period, along with the main themes, according to the corresponding thematic network.

[TABLE 1 ABOUT HERE]

4.1.2. Most prolific authors

Table 2 outlines the impact of authors who published articles relevant to the merchandising domain. The most prolific author among the 1,145 in Scopus is the journalist and editor J. Ryan (11 articles), who had numerous works published in 2010 and 2011 on design and visual merchandising in the UK and other countries. But his position falls to the lowest when citations are considered and weighted by the number of authors and the age of the article (0.0 weighted citations per year—WCY). He is followed by Professor G. I. Kunz of Iowa State University (6 articles, and 1.0 WCY), who made significant contributions to merchandising theory and practice, and J. Lee of the IBM T.J. Watson Research Center (5, and 1.8, respectively), who wrote about clickstream data in online stores. A large number of authors published a small number of articles (one or two each) in the field.

D. Grewal of Babson College (6, and 2.9, respectively) and J. Nordfalt of the University of Bath (5, and 2.7, respectively) are the most prolific authors in WoS. Roggeveen (4, and 0.0, respectively), Nordfalt, and Grewal worked together on three articles and Roggeveen and Grewal appear alone in a fourth article. J. Bercik (4, and 0.1, respectively) and S. J. Hoch (4, and 8.1, respectively) published a fourth article. However, Hoch is the author most cited over the two databases based on unweighted and weighted metrics (Scopus: 7.4 C/Y, and 12.5 WCY; WoS: 6.9 C/Y, and 8.1 WCY).

[TABLE 2 ABOUT HERE]

4.1.3. Journals that have published the most articles dealing with merchandising

The Scopus-indexed journals that featured the greatest number of articles dealing with “merchandising” are: *Drapers* (27), *International Journal of Retail and Distribution*

Management (26), *Apparel* (15), *Journal of Fashion Marketing and Management* (15), *Clothing and Textiles Research Journal* (13), and *TextilWirtschaft* (10). *Drapers*² is both a journal and a business website specializing in the fashion retail sector. *Apparel* and *TextilWirtschaft* are also aimed at manufacturing and retail executives working in fashion. Other, more academic, journals are the *Journal of Global Fashion Marketing* and the *Journal of Retailing* (both with 9 publications—the latter included in Scopus from 1994 onward for this topic).

In the case of WoS, the following journals were particularly prominent: *Journal of Retailing* (25 relevant articles published from 1960 onward), *International Journal of Retail & Distribution Management* (18), *Journal of Fashion Marketing and Management* (10), *Journal of Global Fashion Marketing* (10), *Journal of Retailing and Consumer Services* (10), *International Review of Retail Distribution and Consumer Research* (8), *Journal of Marketing* (8), *Marketing Science* (8), *Tobacco Control* (8), *European Journal of Marketing* (7), *Shopper Marketing and The Role of In-Store Marketing* (7).

For articles on visual merchandising, Lima *et al.*'s (2018) study shows that the primary journals were *Journal of Global Fashion Marketing*, *International Journal of Retail & Distribution Management*, *Procedia-Social and Behavioral Sciences*, and *Journal of Retailing and Consumer Services*—also noted by Choo and Yoon (2015) in their review of studies dealing with visual merchandising in the last two decades.

4.2. The conceptual evolution of merchandising

To analyze the conceptual evolution of the most frequently-recurring themes addressed in the merchandising literature, we present here a strategic diagram for each of the three periods under study. Note that the area of the spheres is proportional to the number of citations of the published documents corresponding to each cluster (or topic). As the bibliographical databases use different methodologies, they produce different—but complementary—results that broaden the findings of the study.

While the first article on visual merchandising appeared in the late 1990s (Lawrie, 1998), it has been principally discussed in the current decade. ARTICLES, CLOTHING INDUSTRY, and TEXTILES AND CLOTHING were other recurring themes in articles published in the subsequent two periods, while the most recent period, in particular, includes the theme of

² *Drapers* was founded in 1887 as *Drapers Record*, and covered the fashion retail sector. Originally targeted at women, it now addresses the interests of the entire sector, from supply chain management to technology, including digital trends.

DISPLAYS in VISUAL MERCHANDISING. The cluster RETAIL began to appear in a large number of highly-cited documents during the second period and, more recently, has been associated with the MARKETING discipline in general and MERCHANDISING in particular. The application of merchandising principles to ELECTRONIC COMMERCE/SHOPPING has been a prominent theme since 2000. The clusters of DECISION-MAKING, ELECTRONIC COMMERCE, VISUAL MERCHANDISING, and SALES are repeated in the same periods in both databases.

Figure 3. Evolutionary map, by number of citations for each theme, in Scopus (a) and WoS (b)

[FIGURE 3 ABOUT HERE]

1960–1999

A total of 133 articles were published between 1960 and 1999 on merchandising-related issues (in-store marketing). The first studies, dealing with the commercialization of dairy products and brands in the sector, were published in the 1960s. Other articles dealt with the evaluation and modeling of brand preferences and the effect of display stands in supermarkets. These early experiments focused on how to control pricing, and the quality and location of display areas, to isolate the effect of brand preference on consumer purchasing. Some of the articles reviewed personal sales techniques.

In the 1970s, researchers conducted studies on the themes of store lighting, barcode system design, food product packaging, and computer-aided product design and packaging. The 1980s saw a range of studies published on, among other topics: how to display different cuts of meat; again, merchandising in the dairy industry; descriptions of the first large-scale regional shopping centers (e.g. Northgate, on the outskirts of Seattle); analyses of the effect of price-fixing; the visual effect of packaging with adhesive labels on blister packs; and ways of measuring return on investment in stock. There were also developments during the 1980s on a theory of merchandising based on environmental psychology (such as the effect of physical environments on human conduct, and emotional responses to merchandising stimuli).

More articles were published in the 1990s, mainly from the second half of the decade, covering a more diverse range of themes. Here, for example, we find studies on: major

stadiums and shopping centers; types of stock; stock planning and management (position of product categories in sales areas and families of products on shelves); how to present products most effectively; diversification of the non-foodstuffs product offer; POS promotions; regulation and advertising in tobacconist shops and tobacco vending machines; and, from the second half of the decade, the effect of store atmosphere on emotion and the shopping experience.

To analyze this period in conceptual and aggregated form, we produced a strategic diagram (Figure 4) for both databases. We consider themes related to DECISION-MAKING, in both databases, and in-store ORGANIZATION of space and products, in Scopus, to be motor themes for the period (with 5 citations of the relevant documents). Note their strategic position (upper right-hand quadrant), with high centrality and density. In WoS, BRANDING is a motor theme. The terms FASHION and HUMAN also appeared in a few articles. The position of MANAGEMENT AND ORGANIZATION (strategic merchandising) and MARKETING points to very strong external links to other themes, both presenting a relatively large number of instances and citations. These themes were important for our structuring of the research field.

We found that DESIGN and CONSUMER PRODUCTS (in Scopus) and BRAND CHOICE and MOTIVATION (in WoS) showed strength in their internal links or development (density) among the keywords that describe the research topic (Scopus having more citations). In Scopus, INFORMATION about the COMPANY under study and actions taken by manufacturers regarding PACKAGING, and in WoS, PERFORMANCE (and perhaps PROMOTIONS, which sits on the axis) are emerging themes, as verified *a posteriori* in the subsequent periods. COMPANY INFORMATION appeared in 62.9% of the Scopus articles in the second period (2000–2009) and in 22.2% in the third (2010–2018). We found the keyword PACKAGING in 61.3% of the articles in the second period and in 12.9% in the third. In WoS, PROMOTIONS appears later, linked to DECISION-MAKING (second period) and PURCHASING (third period). PERFORMANCE appears linked to IMPACT. The analysis of EFFECTIVENESS is a theme that disappeared in later periods.

Our search revealed that DECISION- MAKING, as a theme, was developed at the end of this first period by a research group that comparatively analyzed the performance and competitiveness of service companies (from the British Isles) operating in various related fields (product design, consultancy, advertising, market research, and so on). The theme of ORGANIZATION—as indicated by its centrality—was linked to a wide range of topics.

These include *relationships*,³ *uncertainty*, and *organization* of the distribution channel, but all from the perspective of the theory of transaction costs. MARKETING, ORGANIZATION AND MANAGEMENT, RETAIL, SALES, and BEHAVIOR are all transversal, or general, themes that failed to develop strongly in subsequent periods, except for RETAIL and SALES in the second period.

Figure 4. Strategic diagrams based on number of citations and documents published [in brackets] in Scopus (a) and WoS (b), 1960–1999

[FIGURE 4 ABOUT HERE]

2000–2009

From 2000, the number of publications dealing with merchandising-related issues increased, as did the diversity of topics addressed. Among other themes, we found articles dealing with: the personal meaning of consumption; fashion merchandising; co-creation in design (in collaboration with clients); the design of personalized items; private labels in the *retail* sector; product category management and its effect on prices and store performance; space management; the effect of promotions on prices, including discounted and loss-leader products; display initiatives (posters, display stands, screens, and so on); in-store customer flow; and case studies on firms taking particular approaches to merchandising (e.g. Marks & Spencer, Matalan, H&M, and Zara). The relationship between manufacturers, retailers, and consumers was affected by the arrival of new technologies in this period. Consequently, several studies were published (among other subjects) on: CAD; e-merchandising; how to display products on websites (e.g. Romero *et al.*, 2009) and how to generate loyalty using ICTs; manufacturers' brand strategies in their online businesses; customer relationship management applications; and radio frequency identification (RFID) systems or labels.

Figure 5 shows the strategic diagrams for this second period. The Scopus database analysis showed that ARTICLES and MEN'S CLOTHING attracted significant attention in merchandising studies. Indeed, they constitute motor themes for this discipline (having strong centrality and high density). We found that ARTICLES is a generic term applied to the study of loss-leader products and especially cigarette consumption (five out of the seven articles

³ Highlighted *in italics* are words that appear in a co-word analysis thematic network.

alluding to ARTICLES dealt with this latter theme). ARTICLES as a keyword attracted multiple citations (319) in this period. We also consider the RETAIL sector itself to be a motor theme, although, again, it is close to the basic themes quadrant. In WoS, SHELF SPACE assigned in-store is another motor theme: some studies applied artificial neural networks in their analyses.

ELECTRONIC COMMERCE and, within this, CONSUMER SATISFACTION, are important marketing research topics, but, according to the Scopus database, they have not been sufficiently developed in the merchandising field. We found them to have weaker internal links with their co-occurring keywords and they can be considered basic/general and transversal themes in virtual merchandising studies.

However, e-commerce is a more developed theme in the articles retrieved from WoS, similar to RETAIL STORES. In the case of Scopus, the topic of COMPUTER SIMULATIONS (CAD, 3D technologies, VR, and so on) is well developed (internally), although it presented insignificant (in relative terms) external relations. The ARTICLE AND PULP INDUSTRY was examined in studies dealing with die-cutting companies, sector trends, and solutions (such as RFID) applicable to the sub-sector. These topics are highly specialized and peripheral and, therefore, of only marginal importance to the merchandising field.

The CLOTHING INDUSTRY remained a marginal, barely developed topic in this second period (together with CONSUMER SATISFACTION, as already noted), presenting low density and centrality. As will be shown in the next period, this theme is now considered to be in decline. FASHION (RETAIL) was a theme linked to the keyword *visual merchandising* in 2000–2009. *Visual merchandising* became a basic, or transversal, theme in the third period.

Figure 5. Strategic diagrams based on number of citations and documents published [in brackets] in Scopus (a) and WoS (b), 2000–2009

[FIGURE 5 ABOUT HERE]

2010–2018

In the present decade, we found studies similar to those in the previous decade, with a large number of articles on: visual merchandising, in general; window-dressing; packaging design and product design (for example, in textiles and clothing); product presentation techniques;

cross-selling; VR and AR applied in-store; co-merchandising (between manufacturer and retailer); tools for creating planograms; experiments to improve the shopping experience; virtual merchandising; RFID; and the effect of environmental variables on purchasing behavior.

Figure 6 shows two strategic diagrams covering 2010–2018. First, we can observe how SOCIO-ECONOMIC FACTORS, once again ARTICLES, PSYCHOLOGY, and STATISTICS AND NUMERICAL DATA all constituted well-developed motor themes in Scopus. A detailed analysis of the works showed that research into FACTORS, or subject classification variables, was undertaken into organic food consumption, the in-store marketing of tobacco, and meat consumption in the retail sector. The term ARTICLES retains the privileged position it occupied in previous years, but in this decade it ceases to focus almost exclusively on the tobacco sector (in WoS, studies into adolescents' electronic cigarette and tobacco consumption also present this privileged position). Furthermore, the papers alluding to ARTICLES expanded their perspective on this term to cover innovative merchandising strategies and discounts on beverages and food (e.g. veal). Other areas, such as visual merchandising, consumption of organic foods, and consumer education strategies in food and drink purchasing, were addressed within the fundamentals of PSYCHOLOGY. Approximately half of the documents dealing with STATISTICS AND NUMERICAL DATA referred to tobacco merchandising activities. This keyword indicates that, over the next few years, works of a more quantitative nature will be produced. In WoS, we observed that CONSUMER CHOICE, IMPACT, STORE, and MODEL(ING) were well-developed motor themes. CONSUMER CHOICE, for example, is an area linked to studies of the *behavior of visual attention* focused on the *assortment* presented in *shelf spaces*, through *eye-tracking* technology.

Also in this third period, MARKETING and MERCHANDISING appear in Scopus as general and transversal themes referenced in articles on other topics (although they are specifically included as keywords in the works analyzed); in particular, MARKETING reappears in the fourth quadrant. In the case of WoS, PURCHASING, CONSUMER, and VISUAL MERCHANDISING become general themes. COMPANY INFORMATION in Scopus has a peripheral and highly specialized profile, albeit with only marginal importance to merchandising (low centrality). In WoS, FUNCTIONAL NEAR-INFRARED SPECTROSCOPY (fNIRS) appears in the high-density, low centrality quadrant. This methodology has been linked to keywords such as *brain* and *signals*, specifically in studies on

visual merchandising displays in fashion stores. Two other studies focused on more specific issues, such as the use of VIRTUAL DRESSING ROOMS.

The themes DISPLAYS, DECISION-MAKING, TEXTILES (AND CLOTHING), and VISUAL MERCHANDISING are still marginal and scarcely cited in this period. It is predicted that, over time, they will become extinct, or emerging in some cases. The number of works dealing with DECISION-MAKING increased relative to the second period, and it is therefore considered an emerging topic. The CLOTHING INDUSTRY theme has declined in importance in both quantitative (number of documents) and qualitative (citations) terms compared to the second period.

The first article in the search to reference VISUAL MERCHANDISING dates back to 1998, and the second to 2002. The first, by Lawrie (1998), analyzed the role of in-store advertising (posters and advertising displays) in the clothing sector. Other subsequent works analyzed: the grouping and overlap of similar products; the linearity of displays; the use of accessories; product density; and the application of visual merchandising to the e-commerce context. A recent study (Widyastuti, 2018) analyzed the role of virtual merchandising, store atmosphere, and private labels in impulse buying. In summary, 11.8% of the works dealing with visual merchandising were published in the second period and 85.3% in the third period; therefore, it can be considered an emerging theme.

The keyword SALES (store or brand), while the main or secondary focus of most works, appears in an intermediate position in terms of centrality, density, and quality (by number of citations). It can therefore be placed in the ‘developed themes’ quadrant; but, in the case of WoS, it may constitute a declining theme. However, CONSUMPTION, linked to *nutrition-education in supermarkets*, is an emerging theme, as are *omnichannel* BRANDING and *sales promotion*. MERCHANDISING focused on the physical *point-of-sale*, and *e-commerce* via *neuromarketing* methodologies are also emerging themes for the years to come.

Figure 6. Strategic diagrams based on the number of citations and documents published [in brackets], in Scopus (a) and WoS (b), 2010–2018

[FIGURE 6 ABOUT HERE]

4.3. Analysis of the most frequent themes: Thematic networks

Table 3 shows the themes most frequently covered in each of the three periods (based on at least seven articles, for the first period, and at least ten for the second and third) and those that appear in two different periods (e.g. COMPANY INFORMATION), including their associated thematic networks (see Figures 7, 8, and 9). We did not analyze MERCHANDISING, as it is the central topic of the present study, but it presents relatively strong relationships with the other topics. These networks show the relationships between keywords and themes for each period, which indicates the trajectory of evolution of the most-studied merchandising-related topics. We found no theme to be present in more than any two periods, although some appeared as keywords in related themes.

[TABLE 3 ABOUT HERE]

We then applied a more central and dense theme-selection process based on the “minimum total link strength” in Scopus and WoS results (30/65, 6/13, and 15/7 in periods 1, 2, and 3, respectively), together with a partition process (using VOSviewer) for each period. This gave us the complete thematic networks (Figures 7, 8, and 9) for each period, featuring a similar number of vertices or themes (25, 30, and 24, respectively) generating different groups of themes (5/3, 5/5, and 4/7, respectively). We applied the Fruchterman-Reingold (2D) network layout algorithm for VOSviewer.

Turning to the Scopus data, according to the position of MARKETING (lower right-hand quadrant—see Figures 4 and 6), it is a basic theme (high centrality and low density) in the first and third periods. Originally, the basic principles of the discipline were adopted to study the *purchasing process* in retail, *fashion*, and its relationship to the *Media* and *Economics* in general. In the second period, MARKETING is linked to *sales*, again the (industrial) *Economy*, and customer satisfaction. In the last period, retail MARKETING was applied to the study of the *food industry* and, in particular, food handling, under *controlled studies*.

As a basic, transversal theme, ORGANIZATION AND MANAGEMENT—that is, “strategic merchandising”—was linked from the outset (the early 1990s) to empirical studies associated with different *articles*, *standards*, and, to a lesser extent, *food service*. In the later periods, strategic merchandising did not receive sufficient interest to constitute a theme in its own right. In the first period, the motor themes ORGANIZATION and DECISION-MAKING

were closely related to an extremely wide range of issues, due to their high centrality. These issues can be arranged into three groups: first, specific sectors such as the *food industry* (in particular, the use of *animals*); second, *time factors*; and, finally, topics that began to be addressed in the context of organizational computer systems, such as *software* and *computer program*. All of these developments, taken as a whole, explain why, in the 1990s, COMPANY INFORMATION emerged as a theme (see Figure 7).

HUMAN was a motor theme from the first period related to topics corresponding to different market segments, such as *children* and *adolescents*, as well as *articles* and *licensing* of certain articles, and *tobacco*.

In the case of WoS, DECISION-MAKING is a theme linked to the study of BEHAVIOR, *strategy*, *knowledge*, *information*, *judgment*, and *alternatives*. In turn, BEHAVIOR is associated with the FUTURE, which is linked to the *choice models* approach, via *non-linear regressions* (and the analysis of *autocorrelation* or *random effects*) and *heterogeneity*. We observed that the third motor theme, FEATURES, appears to be linked to the study of the relationships between retailers and manufacturers in the *channel*. In particular, the research examined whether the former are gaining *power* relative to the latter, analyzing the effects of merchandising activities (e.g. short-term price discounts, better shelf space, advertising, etc.) or applying game theories (e.g. *Nash equilibrium*).

Figure 7. Whole thematic networks for Scopus (a) and WoS (b), 1960–1999

[FIGURE 7 ABOUT HERE]

We found that the RETAIL sales motor theme (present in most articles) in the second period (2000–2009), according to Scopus, was strongly connected to MERCHANDISING, which is to be expected. Also connected (albeit to a lesser extent) were *fashion*, *company information*, *womenswear*, and *menswear* (see Figure 8).

The CLOTHING INDUSTRY is an emerging theme that, in this period, is related to COMPUTER SIMULATION and *software*, because (as mentioned earlier) simulation software programs began to be applied to the supply chain of this specific sector. CLOTHING INDUSTRY is also related to *fashion*, *textile industry*, and *sales*. The study of COMPUTER SIMULATION is a developing topic linked to various *software programs*, such as *CAD*, and

even to supply chain management in the *clothing* sector—in particular, referring to the texture of garments.

In this second period, ARTICLE (a motor theme related to HUMAN in the previous period), appears once again related to HUMAN. ARTICLE is of special relevance to themes such as *commerce* and *advertisement* in the *United States*, and to *tobacco*, which generated relationships with *commercial phenomena* themes. CUSTOMER SATISFACTION, a little-considered topic in this period, is related to *sales*, *marketing*, and *economics*, due to the interest in *satisfaction* as a strategic marketing variable that improves company profitability. We found that *packaging* became an emerging theme in the second period because of the use of cellulose in its manufacture (while its future trajectory was uncertain in the first period). It is now related exclusively to the ARTICLE AND PULP INDUSTRY.

According to WoS data, the SALES motor theme plays an active role in *competitiveness*, and some *empirical analyses* focus on its *determinants*, among which we find *shelf space*. ELECTRONIC SHOPPING is a peripheral topic related to *consumer* and/or *behavior* and *electronic marketplaces* and, to a lesser extent, TRUST, via the study of the *information* offered on a *website*. RETAIL STORES is related to the study of *slotting fees* (e.g. distributor margins and *visual attention* via *eye-tracking* methodologies).

Figure 8. Whole thematic network for Scopus (a) and WoS (b), 2000–2009

[FIGURE 8 ABOUT HERE]

In the period 2010–2018, four motor themes contributed to the structuring of the research and generated four primary thematic sub-networks (see Figure 9). The first motor theme, STATISTICS AND NUMERICAL DATA, presents relatively high values for both centrality and density, thus being essential to the construction of the research field. It has been associated with keywords such as *demography and economic* issues, *human*, and *commercial phenomena* (e.g. *tobacco* sales). Second, SOCIOECONOMIC FACTORS presents less density than the other three motor themes and is related to meat consumption—particularly through keywords such as *consumer*, *animal*, *meat*, and *USA*. Third, PSYCHOLOGY generated a dense network in which we observed strong relationships between themes linked to various consumer groups, such as *adolescent*, *adult*, *female*, and *male*, and with

questionnaire and *commercial phenomena*. Finally, in this third period, ARTICLE presents stronger interactions, both with other topics and also with the three other motor themes.

COMPANY INFORMATION is an isolated theme that emerged in the first period, thanks to organizational *computer systems*, and continued in the second (linked to *retail*). By the third period, it had become a developing theme, albeit isolated in that it does not seem to be linked to other themes. As we saw earlier, of particular note in this third period is that the early motor theme DECISION-MAKING became a declining topic, losing density and presenting very few links to other themes.

Again, several CONSUMER CHOICE studies (a motor theme, according to WoS) used *eye-tracking* methodologies focused on the *visual attention* paid to the *assortment* in *retail stores*. The MODELS derived from these studies have interesting implications for VISUAL MERCHANDISING. Studies on STORES also focused on their *environment*, including the *technological* environment. Another motor theme is the IMPACT of *products/assortment* on PURCHASING behavior. The study of the TOBACCO sector is important, in particular, in terms of product consumption (such as menthol cigarettes), and the effect of promotions, advertising, and product placement at points-of-sale. There are *disparities* in these actions, many of which are targeted at youth markets.

Figure 9. Whole thematic network for Scopus (a) and WoS (b), 2010–2018

[FIGURE 9 ABOUT HERE]

4.4. Topics identified via text mining

Figure 10 shows the six topics computed through the LDA model and the five most relevant words per topic. This output strengthens and complements the results reflected in the thematic networks. First, as expected, MERCHANDISING is a dominant word within Topic 1, which includes words such as RETAIL, INFORMATION, AND MARKET, all of which are primary issues in the MERCHANDISING ecosystem. This finding confirms the relationships shown in Figures 7, 8, and 9. The second of the six topics covers mainly technological keywords under the MANAGEMENT umbrella. This is also reflected in the thematic networks of the period under study. However, when we summarized both WoS and Scopus and collapsed the three time periods in the topic model, the relevance of the technological

dimension became clearer in Topic 2 than in any of the others. Topic 3 emerges out of keywords related to the use of DATA and COMPUTER DESIGN for COMMERCE and SALES, and it reflects the trend identified for the period 2000–2009 (Figure 8). Topic 4 provides evidence of the importance of PRODUCT PACKAGING and DEVELOPMENT within MARKETING as they became mainstream (Wexter Box, 2005). Topic 5 captures the relevance of the FOOD and HEALTH industries in scholarly research. Finally, Topic 6 highlights the ANALYSIS of CONSUMER BEHAVIOR in response to VISUALLY appealing merchandising.

Figure 10. Topics identified via topic modeling

[FIGURE 10 ABOUT HERE]

5. DISCUSSION OF FINDINGS

Merchandising constitutes a dense field of study that is extensively related to many and varied aspects of marketing and covers an extremely long-time horizon. The purpose of this study was to assess the state of the art in the merchandising body of knowledge from a historical, longitudinal perspective covering the last 60 years, from the Scopus and WoS databases. While other studies thoroughly review various bodies of knowledge in the broader realm of management—such as Keupp *et al.* (2012) (strategic management of innovation) or Gaviria-Marin *et al.* (2019) (knowledge management)—this is the first study to provide a holistic bibliometric analysis within the specific field of retail merchandising.

Based on the sheer diversity of denominations we found in the merchandising literature (in terms of in-store or mass merchandising), this constitutes a very important conceptual gap, but the three expressions we selected for our query (“merchandising”, “in-store marketing” and “POS marketing”) captured all merchandising activities. We can therefore draw several conclusions regarding the structure of the relationships between merchandising themes. Four themes have been extensively studied at various points in the 60-year period under study: personal socio-economic variables, decision-making, the application of psychology, and the presentation of statistics and numerical data on product and service usage and consumption. Approximately half of the documents containing statistics and numerical data also reference merchandising activity in tobacco sales (and the major transformation that this sector has undergone in recent years). The remainder presents data on consumer demographics,

economic matters relating to the retail distribution sector, and merchandising issues. These results suggest that, in the years to come, studies of a more quantitative nature will be conducted in this field. In the second period, consumer e-shopping was a peripheral issue related to e-marketplaces and, to a lesser extent, trust toward the website, but these issues will contribute to the development of e-merchandising in the near future. Usage patterns of media and purchasing channels have significantly changed over the years. Specifically, customer preferences toward online channels have increased. This scenario has potential implications for ensuring organizational stability and resource allocation through these channels, as they can affect a firm's revenue and cost functions (Kumar, 2015).

Notably, in the last period, decision-making—which was initially a motor theme—is now in decline, losing density and lacking relationships with other themes. Studies examining consumer choice continue (and will continue) to be developed using eye-tracking methodologies applied to assortments in retail stores. Researchers have developed models from these studies with interesting implications for visual merchandising. Finally, a particularly striking finding was that the tobacco sector remains of significant scholarly interest regarding the consumption of new products and the effect of promotions, advertising, and POS product placement.

The text mining approach complemented our insights from the keywords by segmenting the extant literature into topics related to merchandising in general, the technological dimension, product packaging and development, the food and health industries (where merchandising is most developed), and consumer behavior analysis.

6. CONTRIBUTIONS OF THE STUDY AND FUTURE RESEARCH

This study provides a pioneering analysis based on an integrated approach to merchandising as a marketing tool, from conceptual, evolutionary, and thematic points of view. This integrated approach generates an important debate regarding the vital role played by merchandising in the growth of the marketing discipline and points to its continued evolution. The findings of the present study offer theoretical contributions and have implications for future research directions. They also provide the basis for a series of recommendations for researchers regarding future trends, and for professionals in the context of POS marketing.

6.1. Theoretical contributions

For marketing scholars, the results provide an opportunity to reconsider how the classical marketing function interfaces with other functions. From the theoretical perspective, the

marketing discipline constitutes a general, transversal theme that cuts across other topics in the current decade, while research into decision-making is a declining theme. New types of marketing have evolved out of the application of the classical approaches, such as shopper marketing (Wang and Lang, 2015), sensory marketing (Horska *et al.*, 2015; Jiménez-Marín *et al.*, 2019), experiential marketing, and relationship marketing.

Thus, the first major contribution of the present work is an assessment of the state of the art in merchandising scholarship which contributes to the development of the marketing discipline as a whole. Merchandising's place in the history of marketing is based on the fact that "generic/traditional" marketing, together with "experiential" marketing, "relational" marketing, and other new marketing paradigms (Horska *et al.*, 2015; Jiménez-Marín *et al.*, 2019, Wang and Lang, 2015), have given rise to several types of merchandising that are contributing to current marketing thought and will continue to do so in the future. In particular, merchandising has evolved around four key notions that have coexisted from the very beginning: visual merchandising, strategic merchandising, sensory merchandising, and loyalty merchandising (see Figure 11).

Figure 11. Evolution of merchandising

[FIGURE 11 ABOUT HERE]

Source: The authors

Based on our findings, we contend that these four types of merchandising have evolved in tandem with the aforementioned marketing paradigms and have become important drivers of them (see Figure 12). The "visual sales" or "visual merchandising" concept began to operate as the products themselves were forced to take on a more active role in the sales process (Zorrilla, 2002). Starting in the late 1950s, strategic merchandising emerged in line with traditional marketing; subsequently, sensory merchandising accompanied experiential marketing; and loyalty merchandising evolved with relationship marketing. "Strategic merchandising" (Palomares, 2011: 23–27) is based on a firm's continuous monitoring of all its actions to maximize profitability. Some authors have also recognized the importance that "sensory merchandising" or "seduction merchandising" (Salén, 1987: 106 *et seq.*, cited in Díez and Landa, 1996: 57; Martínez, 2005: 155–171; Nagyová *et al.*, 2017) and "loyalty

merchandising” (Martínez, 2005: 175) would go on to have in the future. Loyalty merchandising is a new and evolving concept. By taking this approach, the store seeks to make consumers perceive it as unique—and thus consider only that particular store when making purchasing decisions and recommendations.

Figure 12. Evolution of merchandising thought and the progression of shopping value

[FIGURE 12 ABOUT HERE]

Source: The authors, based on Pine and Gilmore (1999) and Hutton (1996)

In addition, in the 1980s, as a result of experiential marketing’s impact on store layouts and environments, there was a paradigm shift in the scholarship toward the “consumer experience” as opposed to the technical attributes of a product or service (Holbrook and Hirschman, 1982). This was a shift away from the classical “information processing”-based understanding of the consumer as merely an individual seeking to acquire a good/service as easily and efficiently as possible (utilitarian value). It is now understood that consumers are also pursuing personal enjoyment, pleasure, and recreation through acquiring or consuming goods or services (hedonic value). Out of this shift grew a new economic market concept, the “experience economy” (Pine and Gilmore, 1999). In turn, the experience economy led to a new marketing trend—“experience marketing” or “experiential marketing”—that has evolved way beyond traditional marketing (Hutton, 1996) (see Figure 12).

As well as changes related to the consumer, this trend also brought with it developments associated with the operating environment (for example, involving greater market competitiveness), new operational techniques and marketing tactics, general technological developments, a greater concern for quality within the firm and stronger market orientation, and the move from mass to individual marketing. These and other aspects all helped facilitate progress toward “relationship marketing” (Moliner and Callarisa, 1997).

Long-term relationships translate into loyalty; hence, loyalty merchandising uses some of the actions of relationship marketing to build the necessary climate of customer trust toward the store. Specifically, loyalty merchandising is based primarily on providing positive stimuli to customers through constant communication (Martínez, 2005).

As a result, the role of merchandising within the marketing sphere has evolved in line with the predictions of Pine and Gilmore (1999) and Hutton (1996), that is, toward greater customer orientation, an interest in customer emotions, and hedonism in the shopping experience.

The methodology applied in the present work—science mapping based on co-word analysis, which itself constitutes a novel and powerful contribution to the merchandising literature—provides insights into the deeper structures of the thematic relationships underlying the documents analyzed.

One particularly significant finding that this approach revealed was that the analytical methods we identified in the merchandising articles were primarily quantitative, with multivariate models or modeling—in particular, SEM modeling and linear and non-linear regressions—accounting for 23.3% of the total. Next in order of prominence were laboratory and field experiments (21.6%), more sophisticated technologies, such as eye-tracking (5.7%) and VR simulations (5.1%) (including mere descriptions of the method as applied to retail), and other more specific analytical tools such as content analyses (3.49%). As found in the literature (e.g. Lima *et al.*, 2018), quantitative causal experimental studies stand out as the most representative research methodology. We also identified other qualitative methods such as fieldwork observation (13.1%) applied to shelves, establishments, and customers (mainly of the non-participant-observation type); focus groups (5.1%); and in-depth interviews (4.6%), for example with merchandisers or brand representatives. Future studies should undertake more complex analyses that combine quantitative and qualitative approaches.

Another important contribution made by the present work is the longitudinal perspective it offers of the theoretical and practical knowledge of merchandising. From a theoretical point of view, new horizons for academic study have evolved, such as the growing interest in incorporating neuroscience techniques into the analysis of consumer responses to merchandising, methods to optimize in-store footfall (Singh *et al.*, 2014), and strategies to optimize buyers' responses in terms of their purchase decision-making styles (de Faultrier and Towers, 2011). Grewal *et al.* (2017) identify certain emerging areas of growing interest for further research, in their analysis of the future of the retail sector—such as VR, AR, artificial intelligence (AI), or the use of robots. Therefore, there are indications that, in the future, VR, AR, or AI research applying neuromarketing methodologies will be conducted in the e-merchandising context. Computer-based simulation is a topic that arose approximately a decade ago, featuring different programs, such as CAD, and supply chain management in the

clothing sector. Studies on consumption linked to in-store nutrition-education and on branding strategies and communications actions will become emerging themes.

6.2. Practical contributions

From a practical point of view, analytical marketing solutions based on Big Data may be beneficial for distribution companies in dealing with a wide range of issues. These might include providing marketers with “a more granular understanding of brand-purchase behavior and the impact of multiple marketing levers on in-store brand sales” (Harvey *et al.*, 2012: 339) and helping them to better identify customers who will respond positively to telemarketing campaigns (Moro *et al.*, 2014); building interactive reports for managers; and even revealing interesting trends based on what is being said about a given brand on social networks (Lacoste, 2016). More specifically, the application of Big Data for merchandising purposes has recently been analyzed by different researchers in the field of operations management (e.g. Choi *et al.*, 2018).

In light of the practical insights of the present study, managers of commercial establishments are recommended to take note of those merchandising activities that other firms are translating into sales growth and improved profitability. It is advisable to provide multisensory experiences (Jiménez-Marín *et al.*, 2019), employ visual merchandising to stimulate unplanned purchases (Ivan-Damir *et al.*, 2017), select merchandising stimuli such as strategic product placement, and strategically define the duration of the action (Garrido-Morgado and González-Benito, 2015).

A further contribution of this study is that its findings can point retail companies in the direction of certain studies dealing with the latest neuroscience technologies that are particularly relevant to merchandising—such as electroencephalography, magnetic resonance imaging, galvanic skin response, eye tracking, and electrocardiography (Krampe *et al.*, 2018; Liu *et al.*, 2018). Such techniques have been shown to help predict the likely success of certain merchandising actions at the point of sale. The results of these studies will help guide companies in their merchandising decision-making.

It is essential to address here the extension of merchandising practices to the digital environment, which requires clarification of its purpose and delimitation of functions. Visual merchandising in the digital context aims to communicate an enhanced store image to customers, to boost sales by presenting products in a more attractive way using images,

videos, and informative sections. In this sense, e-commerce and virtual store owners should gear their merchandising decisions to the careful classification of product categories and the incorporation of innovations that facilitate online ordering (Bonera and Corvi, 2014). Businesses that have transformed to a digital merchandising model have gained new customers and reached different audiences, and this success has been further boosted by the increase in online shopping brought about by the COVID-19 pandemic. This shift reinforces the need for companies to be up-to-speed with merchandising tools in the digital context, with a view to improving the web experience to meet the needs of users and make products available to more customers around the world. Our findings on developments in research relevant to e-merchandising, for example relating to trust toward the website, can contribute to firms' knowledge and understanding in this regard.

In this online context, merchandising should be based on three fundamental pillars: (1) the use of Big Data to optimize knowledge of the customer-base and create customization strategies (Harvey *et al.*, 2012); (2) the development of websites with clean designs that are user-friendly and responsive (Khakimdjanova and Park, 2005); and, (3) the improvement of the customer experience through innovations such as virtual reality (for product testing or demonstration purposes) (Yaoyuneyong *et al.*, 2014) or artificial intelligence (for identification and payment systems). Also noteworthy is the improvement of sales performance through mobile application technology, which facilitates and enhances the customer shopping experience while optimizing stock control, personnel management, and other aspects of business operations (Sarvani and Bhagat, 2020).

6.3. Future research directions

Several relevant research avenues derive from the intersection of merchandising, sectors, and new technologies and research methodologies. In a world overwhelmed with data, our findings suggest an apparent absence of studies taking advantage of data-based approaches to leverage merchandising. Despite the generalized need for data-driven solutions, the application of Big Data for merchandising purposes in operational management still requires intensive research.

The online context and the emergence of virtual changing rooms are likely to undergo major development as a result of the COVID-19 pandemic. Accordingly, e-merchandising will need to be leveraged to take advantage of virtual environments based on VR technology.

Furthermore, AI applications will be in greater demand, to take advantage of eye-tracking data collected through the ordinary cameras currently available in many mobile devices.

A further consequence of the continued COVID-19 outbreaks is that companies are having to switch physical stores to online channels in order to survive. Therefore, it will be interesting to understand how merchandising is keeping pace with this shift. A promising avenue for future research in this regard is highlighted in Lima *et al.*'s (2018) work. In the sample of studies they reviewed, these authors found no articles evaluating both online and physical environments together—a context that is emphasized by the current global pandemic. In addition, the online customer's journey, navigating through virtual stores while exposed to e-merchandising, promises to be an interesting path for further research, from both the practical and the scholarly perspective.

It would also be interesting to conduct a study on reading choice in the merchandising literature, centered exclusively on *academic* publications, based on click-through data sourced from the ELMAR (ELECTronic MARKeting) virtual academic community site, which presents tables of content postings on journals relevant to members. This resource provides reading-choice behavior (reader metrics) rather than citing behavior or attitudinal constructs (author metrics), both of which have been used in previous studies. Furthermore, it includes nearly all of the academic marketing journals, as well as leading journals from related areas. To conduct such a study would entail following the entire process proposed by Hofacker *et al.* (2009), which provides a level of utility or prestige to any given journal, based on reader preferences. Finally, it could also be insightful to apply other approaches based on multivariate exploratory techniques (factor analysis, clustering, or multidimensional scaling, for instance) to journal, institution, or author data. This would enable researchers to extract underlying knowledge and further enrich the previous results while paving the way for future research on merchandising practices within online stores.

For an even more exhaustive study, the scope of future bibliometric research should be extended to analyze the content of the “future research” sections of published articles, using text mining. This approach would provide additional insights into potential future avenues to develop—see, for example, Kumar *et al.*'s (2020) application of the text-mining approach to digital mediation in B2B marketing. Moreover, as the extant literature is far from exhaustive, further investigation needs to be conducted in each of the identified sub-domains or streams of research to better understand certain crucial aspects of merchandising (the latest motor themes), such as modeling of consumer behavior in-store, visual merchandising, consumer

education in food/drink purchasing, or applying some of the findings derived from neuroscience studies.

6.4. Limitations of the study

We encountered several difficulties due to the biases inherent in analyses of this type. First, we found the Scopus results to differ quite significantly from those of WoS, but our comparison of the databases enabled us to extract interesting complementary results. For example, we identified that, during the 20-year period 1994–2013, Scopus collected more works annually on merchandising than did WoS.

A particular limitation is that the accuracy of the bibliometric method we applied depends on the thresholds that researchers define as restrictions in the course of the data processing and the extraction of the structure of the sub-domains. Although we varied the thresholds extensively without identifying significant changes in the conceptual structures, the final solutions to these threshold issues are, inevitably, partially dependent on the technical decisions we made.

In the data-processing step, it is essential to be mindful of the subjective nature of the choice and grouping of words one way or another (Nerur *et al.*, 2008). However, the process of normalization of the keywords (merging plural and singular forms and converting acronyms into their full forms) helped mitigate this drawback.

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