

SENSORY MARKETING – A REVIEW AND RESEARCH AGENDA

Rachna Bhatia, BML Munjal University
Ruchi Garg, BML Munjal University
Ritu Chhikara, BML Munjal University
Aakanksha Kataria, Malviya National Institute of Technology
Vishal Talwar, BML Munjal University

ABSTRACT

The increased interest and extensive research in Sensory Marketing over the last few decades has created a need to synthesize extant literature. This study offers potential for enriching the area of sensory marketing by performing a scientific literature review. The paper presents a systematic and critical analysis of three decades of sensory marketing research using bibliometric analysis. This study reviews 172 relevant articles published between 1979-2020 to detail the domain. We use VOS viewer to present highly influential articles, authors, institutions, journals, and countries. Further, we present the co-citation analysis of journals, keyword co-occurrence analysis, and network analysis of countries. Network analysis divides the studies into five bibliographic clusters - cross-modality and consumer behavior, multi-sensory marketing and consumer behavior, touch and visual cues, olfactory sense and consumer behavior, and sensory marketing and emotions. Also, the integration of clusters proposes a conceptual framework. A comprehensive discussion on the cluster-wise future research direction is presented.

Keywords: Sensory Marketing, Senses, Consumer Behavior, Multi-Sensory Marketing, Sensory Marketing Strategies, Bibliometric Analysis.

INTRODUCTION

Marketers and advertisers have practiced Sensory Marketing (SM) considering the enormous impact on Consumer Behavior. Senses have been mentioned in all ancient texts and scriptures, across cultures, civilizations, and religions with detailed mention of the five senses called the *indriyas* - the sense organs, in the Hindu religious scriptures (Mamidi & Gupta, 2018). Buddhism also focuses on the power of the five senses- *dbang po* (Holba, 2019). Whether it is the ancient Greek civilization (Jennifer, 2017) or the Maya civilization, senses have found an extensive mention in their texts as a form of their communication with the outside world (Houston & Taube, 2000). Marx's writings have the concept of the 'Human Sense', which integrates all the five senses, with a stress on the multisensorial aspect (Mamidi & Gupta, 2018).

In the early 1990s, the practitioners started employing the use of multiple senses to create an impression on the audience. The global acceptance of the inculcation of the five senses had already started taking shape around that time. By the late 90s, it had taken the world of marketing and advertising by storm, quite evident from several advertisement campaigns of different brands like Kellogg's, PepsiCo, Coca Cola, Singapore Airlines, Nike etc. to elucidate sensory experiences and also in the making of several movies like "Senseless", "The five senses" etc.

The field of sensory marketing has caught the attention of researchers, and a significant spurt in publications in this field is seen over the last few years. Hence, the increasing interest of both the marketing and the academic community in sensory marketing. However, the field of sensory marketing is vast and highly varied, starting from studies focusing on senses and their integration (Krishna, 2012a); to the use of sensory marketing in advertising (Krishna et al., 2016); to the use of one sense to influence the other senses (Krishna & Morrin, 2008); and their interaction (Krishna, 2006) to its impact on consumer behavior (Helmefalk, 2019; Balaji et al., 2011) and so on.

This poses a challenge for researchers in this field. They find it difficult to get an objective review of sensory marketing literature under one umbrella. An ever-increasing number of publications makes it imperative that a meta-perspective be given to the field of sensory research. There is a dearth of studies that cover research in sensory marketing in a comprehensive way. This study tries to eliminate this significant gap in this field and address it by providing a comprehensive bibliometric analysis of the field of sensory marketing.

This study aims to answer the following questions:

RQ1: What is the current publication trend in the field of sensory marketing? Which are the most influential authors, articles, institutions, countries in this field?

RQ2: What is the intellectual structure of current research in the area? How could it be integrated to develop a conceptual framework?

RQ3: What kinds of research trends dominate broad sensory marketing research, and what are future areas of research on the subject?

This study presents a detailed analysis of the thematic clusters and has pointed out a cluster-wise potential agenda for future research. Further, the knowledge areas arrived at have provided the foundation for developing a conceptual framework that serves as a base for filling in potential gaps in literature.

The paper flows as follows. The first section discusses the research methodology that presents the data retrieval and screening process. Subsequently, the analysis and findings section present the results of co-citation and co-occurrence networks. It then discusses clusters emerging from bibliographic coupling analysis and proposes future research directions. The next section presents the conceptual framework based on cluster themes. Finally, the discussion section discusses theoretical and practical implications, along with limitations of the study.

METHODOLOGY

Systematic reviews can be approached in several ways (Paul & Criado, 2020). Theme based reviews (Mishra, Singh & Koles, 2020; Hao et al., 2019; Paul, Parthasarathy, & Gupta, 2017; Rana & Paul, 2017; Rosado-Serrano, Paul & Dikova, 2018), Theory-based reviews (Gilal, Zhang, Paul, & Gilal, 2019; Hassan, Shiu, & Parry, 2016), framework-based reviews (Paul & Benito, 2018; Paul & Rosado-Serrano, 2019), theory development reviews (Paul, 2019; Paul & Mas, 2019), hybrid reviews (Dabić et al., 2020), bibliometric analysis (Ruggeri, Orsi, & Corsi, 2019; Randhawa, Wilden, & Hohberger, 2016;), meta-analysis (Rana & Paul, 2019; Barrari et al., 2020).

This study employs bibliometric analysis. Systematic literature reviews based on bibliometric analysis are currently in rising trends (Kataria et al., 2020; Donthu, Kumar, Paul, Pattnaik, & Strong, 2020) for three reasons. First, bibliometric analysis is useful in reviewing and classifying the literature on any topic and provides structure to the state of knowledge

development in any specific research field through scientific mapping (Bartolini et al., 2019). Second, this technique helps complete retrospection by identifying patterns, research streams, macro themes, and sub-topics explored in the area. Third, it summarizes the trend (influential authors, articles, journals, and countries, etc.) on any topic under study and thus substantiates specific areas and sources of interest in the field (Bhukya, Paul, Kastanakis, & Robinson, 2021). Therefore, researchers and practitioners can synthesize various outputs and knowledge retrieved through diverse bibliometric techniques to signify research gaps and set directions for further research activities.

Search Strategy and Data Retrieval Process

A three-stage process was followed for data retrieval, selection, and analysis of the literature (Figure1).

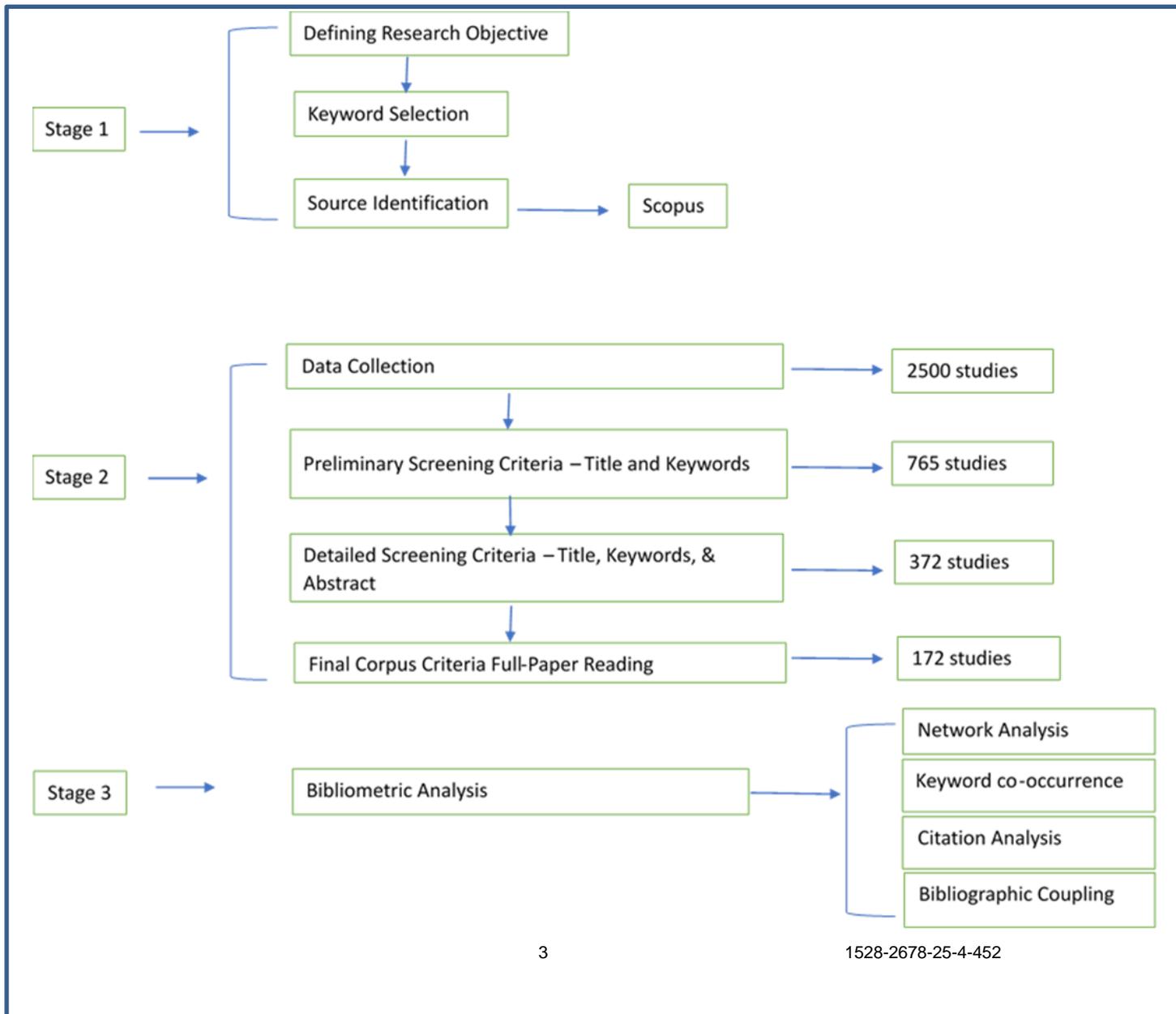


Figure 1 METHODOLOGY

The first stage defined the research objectives, followed by keyword selection using keywords such as Sensory Marketing, Sensory Perception, Multi-sensory, Sensory, Marketing, and individual senses like touch, sound, smell, taste, and sight, thus not limiting the keywords to 'sensory marketing' alone. This was followed by identifying the database for collecting articles. Scopus is broadly accepted worldwide as a reliable database for collecting articles for quantitative analyses (Guerrero-Baena et al., 2014; Durán-Sánchez et al., 2019; Valenzuela-Fernandez et al., 2019). We employed the Scopus database for sifting through the articles in the field of sensory marketing.

It is supposed to be the largest multi-disciplinary database of peer-reviewed literature in the field of social sciences (Norris & Oppenheim, 2007). Currently, Scopus has more than 78 million documents with over 1.7 billion cited references, though this is bound to change, given that it gets updated regularly. The database was retrieved in October 2020 and contained seminal articles from close to 40 years, starting 1979 until 2020. The concentration of the articles was more from 2010 onwards when some of the seminal work was done. The database extracted more than 2500 documents consisting of research articles, reviews, letters, and notes.

Research Method

After the initial extraction of documents basis, the keywords selected, which yielded 2500 documents, the next stage comprised eliminating irrelevant documents. The list had varied articles from different fields like psychology, marketing, food science, and studies relating to other aspects of life, hence, it required careful screening. The parameters for inclusion and exclusion of articles from Scopus are mentioned in Table 1.

| Table 1 | |
|---|---|
| INCLUSION AND EXCLUSION CRITERIA OF ARTICLES FROM SCOPUS | |
| Inclusion criteria | |
| Basis | Description |
| Source | Articles from peer-reviewed journals |
| Type of article | Empirical studies, review articles, meta-analytic studies |
| Language | English |
| Subject area | Business, management, marketing, social sciences |
| Exclusion criteria | |
| Basis | Description |
| Type of article | Comments, book reviews, book chapters, conference papers, reports |
| Keywords | Keywords used in a context different from the scope of this study |

Irrelevant articles were removed by examining the title and keywords, resulting in 762 documents. Further, a second screening was done by examining the title, keywords, and abstracts, bringing down the number to 371. Subsequently, for final screening, author keywords, abstracts, and full papers were reviewed manually, wherever necessary, to get the final corpus of 172 papers falling within the scope of the field of sensory marketing (Refer Figure 1).

The bibliographic data for this set of studies was collected from Scopus in the ‘.csv’ format. Data, such as total publications and citations, citations per paper and author, and the *h*-index was directly taken from the Scopus database. Scopus ids were used for tracking the citation and publication information of authors and their respective institutions and countries as the names of many authors and their institutions are present in multiple forms. The ‘.csv’ file was then run through as an input for the VOS viewer, used for clustering and generating network (.net) files. These files were used as an input for the software, which was then used to calculate network centralities for co-authorship networks and provide a visual representation of co-occurrence and co-authorship networks. Network analyses (including bibliographic couplings, co-citations, and co-authorships) and keyword analysis were performed to understand the research in sensory marketing. Keyword analysis helps in understanding the most prominent themes published in sensory marketing during the period under study.

Co-authorship analysis was conducted to understand the relationship between contributing authors, institutions, and countries. It also helps to understand the collaboration network, which can further deepen the understanding of a research field (Bhukya, Paul, Kastanakis, & Robinson, 2021; Randhawa et al., 2016). It measures the degree of connectivity between the collaborating authors, whereas the co-occurrence of keywords helps understand the conceptual structure of the research corpus.

Further, bibliographic coupling helps split articles into common themes and brings together similar articles into thematic clusters. The articles are brought together into communities basis the link strength between them. Based on the link strength, the VOS viewer constructs a relationship matrix for the articles under study.

ANALYSIS AND RESULTS

Trends in Sensory Marketing research

The chronological depiction of the work done in Sensory Marketing is presented in Figure 2 below.

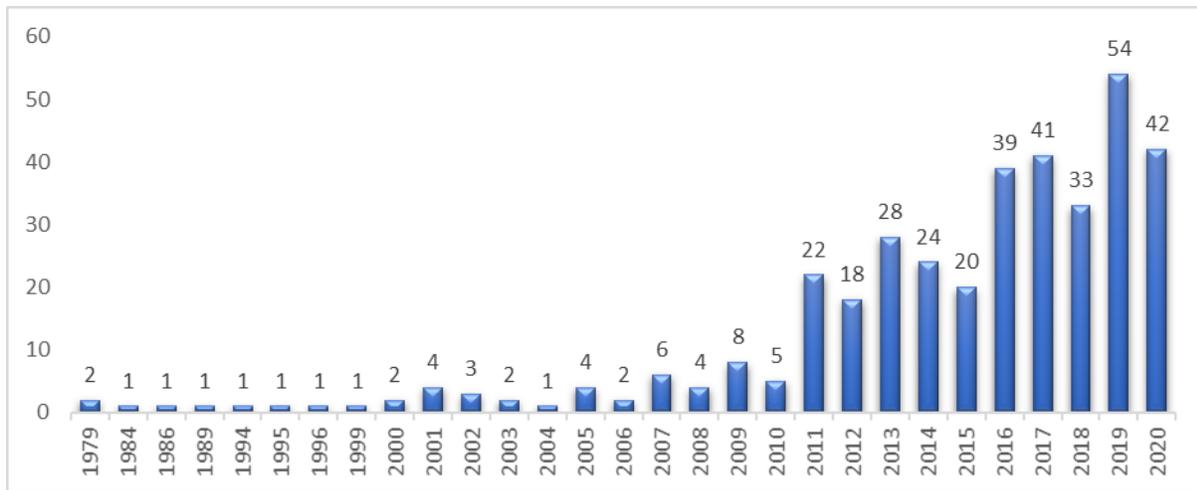


Figure 2
YEARLY DISTRIBUTION OF PUBLICATIONS

The figure presents how this field has evolved and captured the scholars' interest from 2011. It was during this time that some of the seminal work was published in this field. There was a significant spurt in publications in 2016, 2017, and 2019, simply because of the transition of the consumers' interest towards experiences and holistic absorption of sensory signals than just physical consumption of products. It seems 2020 was not as much the year of sensory marketing because of the onset of COVID-19, due to which the entire concentration of research was in other areas directly impacted by the same.

Research Outlets

This study identified the top 10 contributing journals to understand the most prominent journals in the field of Sensory Marketing (Refer to Table 2).

| S.No. | Name of the Journal | Publishing House | Number of Articles |
|-------|-------------------------------|------------------|--------------------|
| 1 | Psychology and Marketing | Wiley | 20 |
| 2 | Food quality and Preference | Elsevier | 18 |
| 3 | Journal of Sensory Studies | Wiley | 17 |
| 4 | European Journal of Marketing | Emerald | 10 |
| 5 | Journal of Business Research | Elsevier | 9 |
| 6 | Journal of Consumer Marketing | Emerald | 7 |

| | | | |
|----|---|---------|---|
| 7 | Journal of Consumer Psychology | Wiley | 7 |
| 8 | Journal of Marketing Research | Sage | 6 |
| 9 | Asia Pacific Journal of Marketing and Logistics | Emerald | 5 |
| 10 | British Food Journal | Emerald | 5 |

Psychology and Marketing journal has been the most significant contributor with 20 articles published; *Food Quality and Preference* closely follow it with a contribution of 18 articles; and *The Journal of Sensory Studies* with a total of 17 articles. Research in sensory marketing has been dominated by studies in food, obviously because food consumption involves stimulating all the five senses of the body. Further, consumer psychology is also studied closely with the senses, explaining studies have been done in this area.

Country-Perspective Overview

Table 3 investigates the top 10 countries publishing research in the field of SM.

| S.No. | Country | No. of Articles |
|-------|----------------|-----------------|
| 1. | United States | 105 |
| 2. | United Kingdom | 54 |
| 3. | Italy | 23 |
| 4. | Germany | 21 |
| 5. | France | 20 |
| 6. | Sweden | 16 |
| 7. | Australia | 14 |
| 8. | Canada | 14 |
| 9. | India | 13 |
| 10. | South Korea | 13 |

The US tops the list with 105 publications, and pioneering research comes from this country. Some of the seminal research in the US has paved the way for continuous research. Followed by a significant margin are the UK and other parts of Europe with a small contribution from Asian countries like India and South Korea.

The Geographical Extent Of The Investigation

Table 4 presents the leading papers based on their citations.

Table 4
TOP 10 PAPERS BY GLOBAL CITATIONS

| S.No. | Authors | Title | Year | No. of Citations |
|-------|---|--|------|------------------|
| 1 | Krishna A. | An integrative review of sensory marketing: Engaging the senses to affect perception, judgment and behavior | 2012 | 355 |
| 2 | Peck J., Wiggins J. | It just feels good: Customers' affective response to touch and its influence on persuasion | 2006 | 177 |
| 3 | Krishna, A; Morrin, M | Does Touch Affect Taste? The Perceptual Transfer of Product Container Haptic Cues | 2008 | 162 |
| 4 | Spence C., Puccinelli N.M., Grewal D., Roggeveen A.L. | Store atmospherics: A multisensory perspective | 2014 | 153 |
| 5 | Spence C., Gallace A. | Multisensory design: Reaching out to touch the consumer | 2011 | 151 |
| 6 | Hultén B. | Sensory marketing: The multi-sensory brand-experience concept | 2011 | 147 |
| 7 | Elder R.S., Krishna A. | The "visual depiction effect" in advertising: Facilitating embodied mental simulation through product orientation | 2012 | 145 |
| 8 | Spence C. | Managing sensory expectations concerning products and brands: Capitalizing on the potential of sound and shape symbolism | 2012 | 144 |
| 9 | Bruwer J., Saliba A., Miller B. | Consumer behaviour and sensory preference differences: implications for wine product marketing | 2011 | 123 |
| 10 | Krishna A., Schwarz N. | Sensory marketing, embodiment, and grounded cognition: A review and introduction | 2014 | 121 |

The highest cited paper with 355 citations by Krishna (2012) lays the foundation for research in sensory marketing. It talks about the integration of all senses to create perception, judgment, and behavior. The senses of touch and vision have dominated research in SM, majorly concerning store atmospherics, which makes the papers investigating the sense of touch by Peck and Wiggins with 177 citations and by Krishna with 162 citations, the next most popular publication. Most research is in offline marketing, though a slight transition towards online marketing is also seen.

Keyword Occurrence and Co-occurrence analysis of keywords

Keywords suggest popular research hotspots in the respective field. The purpose of analyzing keyword occurrences is to suggest the significant themes and ideas explored in the studies. Figure 3 shows the occurrences of the keywords with a minimum of 7 occurrences using the VOS viewer.

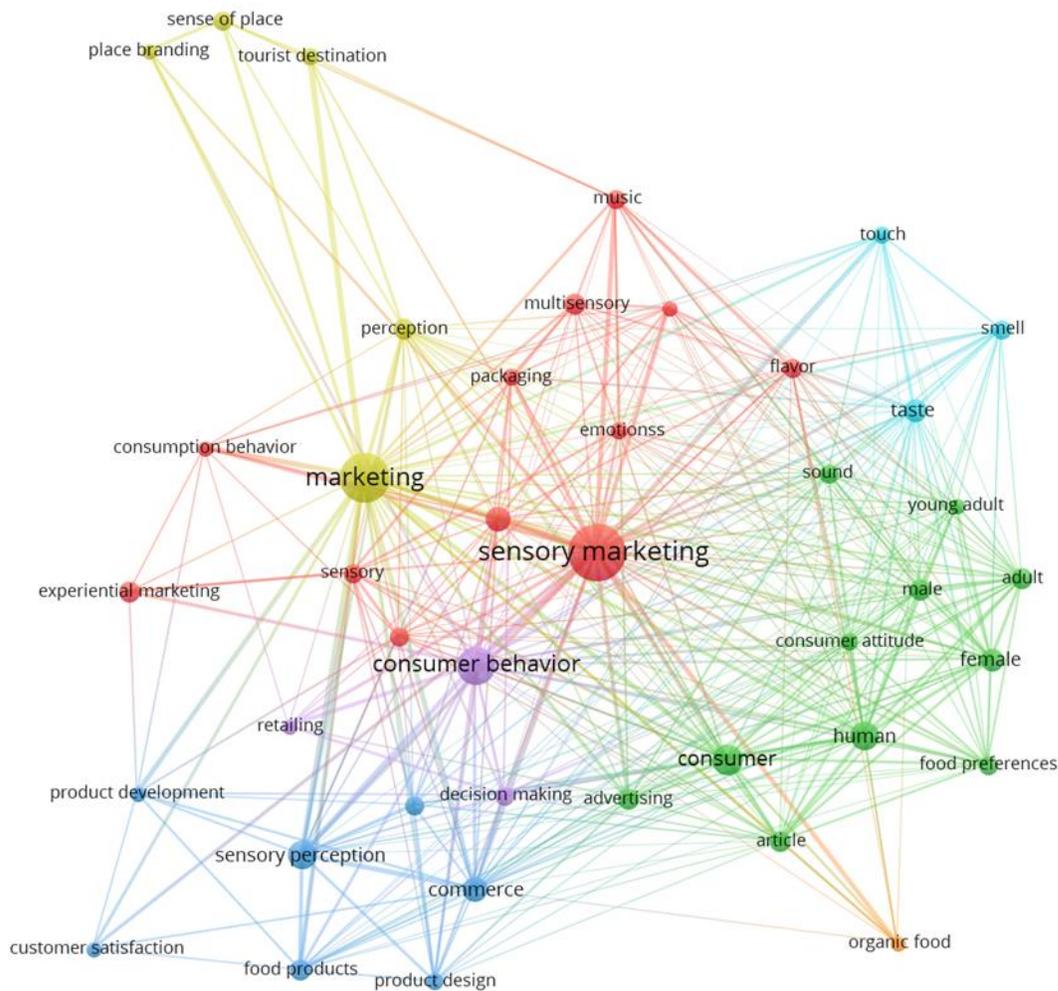


Figure 3
KEYWORD MINIMUM SEVEN OCCURRENCES

There were 42 keywords that crossed the minimum threshold. 13 keywords had more than 12 occurrences. *Sensory Marketing* is the most prominent keyword with 81 occurrences, followed closely by *Marketing* with 65 occurrences. *Consumer behavior*, *sensory perception*, *consumer* and *human*, are also emerging as important keywords with more than 20 occurrences. The highest link strength is seen in *Marketing*, signifying that it is the most used keyword. Interestingly, keywords like *place branding*, *tourist destination*, and *sense of place* are also emerging from *marketing* and *sensory marketing*, indicating that they have a co-occurrence.

Keyword progression from 2011-2020

Table 5 presents the progression of keywords over years.

| 2011-2015 | 2016-2020 |
|--------------------|-----------------------------|
| sensory perception | sensory marketing |
| consumer behavior | Music |
| Touch | Color |
| marketing | multi-sensory |
| packaging | Cross-modal correspondences |
| sensory | Sound |
| sensory | five senses |
| sound symbolism | Advertising |
| Smell | experiential marketing |
| | sensory experience |

| | |
|--|--|
| | Not existing in the following years |
| | Remaining popular in the following years |
| | New keywords in the following years |

Since keywords were not a part of the research paper format before 2003, the software could not collect keywords for the papers before that period. The threshold was set at a minimum of 5 occurrences. None of the keywords in the period 2003-2010 crossed that threshold. Hence, we analyze how keywords have progressed from 2011 onwards. Notably, ‘sensory perception’ and not ‘sensory marketing’ was the keyword with maximum occurrences of nine during 2011-2015. But a sudden shift to ‘sensory marketing’ was seen in the period 2016-2020, with ‘sensory perception’ not even crossing the threshold here. Clearly, this indicates that studies are conducted more precisely on sensory marketing than on other aspects during this time.

‘Consumer behavior’ shares the same number of occurrences, i.e., 9, during 2016-2020 but is again not seen in the following period. ‘Touch’, ‘smell’, and ‘sound’ are the keywords found in 2011-2015 taken over by ‘music’ and ‘color’ in the following years, though ‘sound’ remaining intact. Clearly, the sense of touch, smell and sound were more popular subjects of study for scholars in the beginning of the decade while gradually moving towards color i.e., the visual sense in the second half of the decade, with ‘sound’ still the subject of study during this period, too.

This might indicate that scholars are trying to re-explore subjects like the ‘visual’ sense that have already been worked upon a lot but had lost interest because the subjects were considered over-researched. Further, a transition towards ‘senses’, ‘multi-sensory’, ‘sensory experience’, ‘experiential marketing’ is observed during 2016-2020. This is seen in practice and in studies as well. We are moving towards an experiential way of living where consumption is all

about experiences and feeling with the senses than just a shopping activity. Newer words like ‘cross-modal correspondence’ and ‘advertising’ are new entrants during this second half, indicating that marketing with specific reference to advertising has been approached. Similarly, senses are being studied with respect to cross-modal correspondences, taking multiple senses at a time.

Country co-authorship analysis

Figure 4 shows the most influential countries and the state of collaboration between the authors belonging to them.

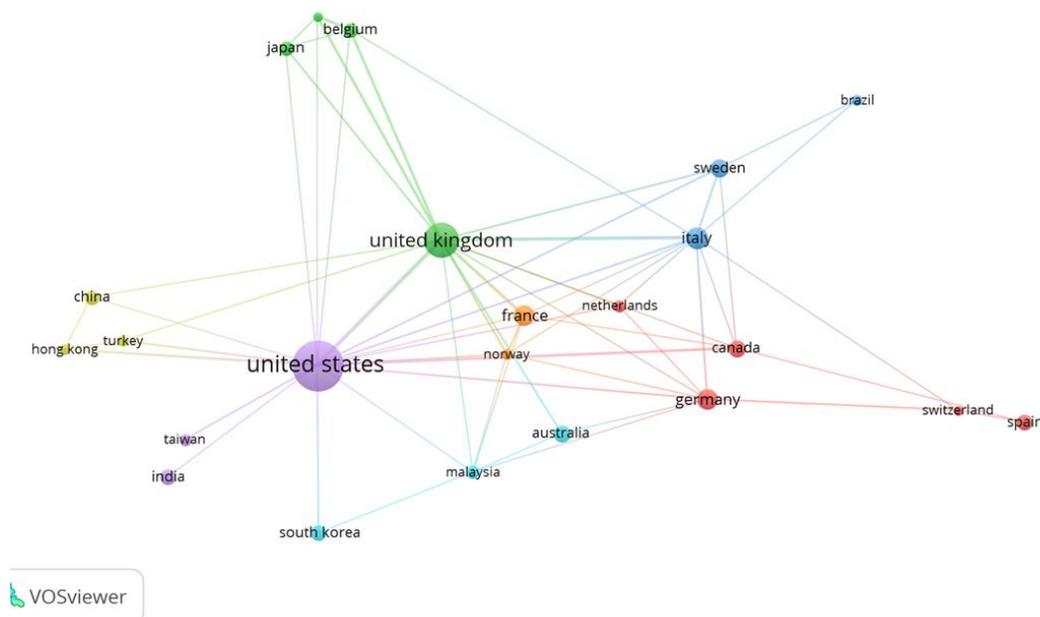


Figure 4
COUNTRIES CO-AUTHORSHIP NETWORK

The figure shows the strength of association between the countries. The minimum criterion was set to 5 documents. Twenty-five countries met the minimum criteria where the maximum number of documents were seen from the US with 105 documents and 4321 citations, followed by the UK with 54 documents and 1266 citations. The figure clearly shows that the most frequent collaboration has been between the US and UK scholars. A reasonable degree of collaboration also exists between authors from the UK and Italy. Countries like Hong Kong, Turkey, and China have seen collaborations with both the US and the UK, but Taiwan, India, and South Korea see co-authorships with only the US and not the UK. US and UK dominate at the

center with all other countries like Malaysia, Australia, Germany, Canada, etc. collaborating with either or both of them.

The Journal Co-Citation Analysis

The journal threshold was set to a minimum of 5 documents and 15 citations stating that the journal had to be cited at least 15 times in the corpus to fit the criteria. Figure 5 depicts the visualization of journal co-citation.

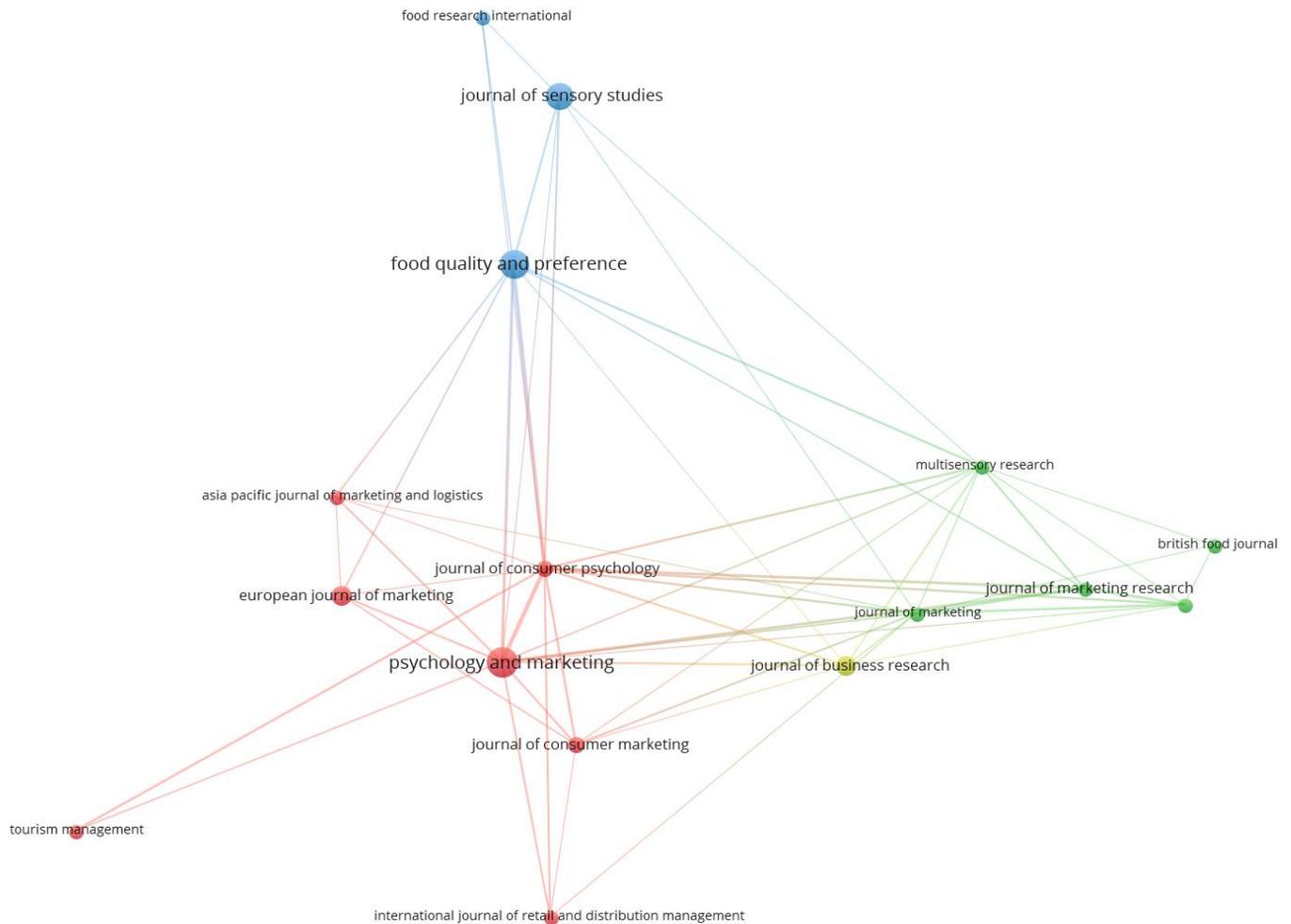


Figure 5
JOURNAL CO-CITATION ANALYSIS

With close competition from *Food Quality and Preference* with 18 documents cited 513 times, *Psychology and Marketing* find the most prominent place with 20 documents cited 468

times. Journal of sensory studies follows with 17 studies and 178 citations. A total of 15 journals have been depicted in the figure.

Mapping The Intellectual Structure Of Sm: Thematic Analysis And Future Research Directions

Bibliographic coupling of articles helps understand the commonalities in the content of research documents (Donthu, Kumar, Paul, Pattnaik, & Strong, 2020; Kessler, 1963; Patrício & Ferreira, 2020). Thus, a bibliographic couple gets formed when there are common references in two documents, and they unveil intellectual similarities. The software has identified five broad clusters based on the common themes of literature within the cluster. Figure 6 indicates the evolution of clusters indicating that research and development in all clusters till about 2009-2010 has been uniformly flattish with little scholarly interest.

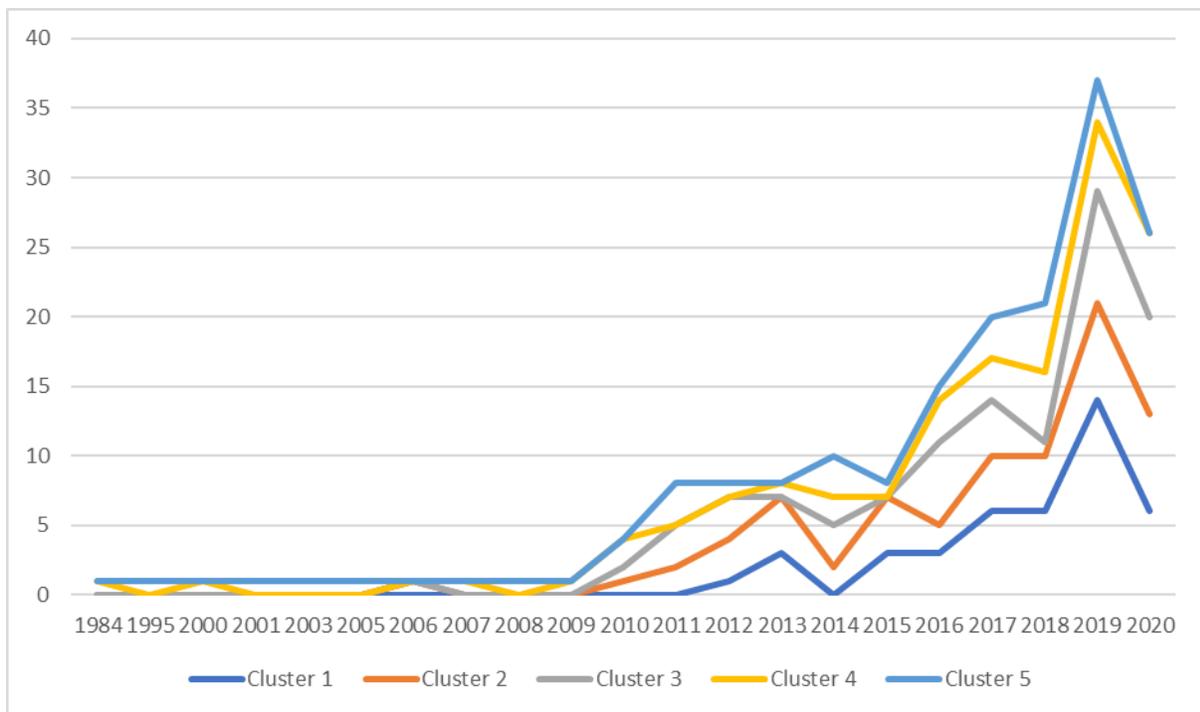


Figure 6
EVOLUTION OF THE FIVE SENSORY MARKETING CLUSTERS

However, as indicated in the figure also, research has picked up significantly after 2010. Table 6 outlines an overview of the clusters, mentioning significant themes and the most influential studies in each cluster.

| Table 6 OVERVIEW OF CLUSTER ANALYSIS | | | | | | | |
|---|---------------|-----------------------|--------------------|---------------------|-------|------|-------|
| Cluster no. | Central focus | Major Topics Explored | Total publications | Most cited articles | | | |
| | | | | Author | Title | Year | Total |
| | | | | | | | |

| | | | | | | | citations |
|----|--|--|----|-------------|--|------|------------------|
| 1. | Cross-Modal Associations | Ambient sound and effect on taste and food choices, sound symbolism, colour in various aspects and effect on taste and perception | 41 | Spence c. | Managing sensory expectations concerning products and brands: capitalizing on the potential of sound and shape symbolism | 2012 | 144 |
| | | | | Hagtvedt h. | Cross-modal communication: sound frequency influences consumer responses to color lightness | 2016 | 37 |
| | | | | Hagtvedt h. | Color saturation increases perceived product size | 2017 | 31 |
| 2 | Multi-sensory marketing and consumer behavior | Sensory marketing in tourism, multi-sensory destination marketing, tourist consumer experiences, sensory marketing in hotel choice, sensory marketing in restaurant experiences, | 38 | Peck j. | It just feels good: customers' affective response to touch and its influence on persuasion | 2006 | 177 |
| | | | | Hultén b. | Sensory marketing: the multi-sensory brand-experience concept | 2011 | 147 |
| | | | | Agapito d. | Exploring the conceptualization of the sensory dimension of tourist experiences | 2013 | 78 |
| 3 | Touch and Visual cues | Interaction of touch and visual sense, somatosensory and consumer behaviour, visual cues and Consumer behaviour, comparison of touch and visual sense on consumer behaviour, visual cues on product packaging, effect of touch on other senses, multi-sensory marketing and Consumer behaviour | 36 | Krishna a. | An integrative review of sensory marketing: engaging the senses to affect perception, judgment and behavior | 2012 | 355 |
| | | | | Spence c. | Multisensory design: reaching out to touch the consumer | 2011 | 151 |
| | | | | Elder r.s. | The "visual depiction effect" in advertising: facilitating embodied mental simulation through product orientation | 2012 | 145 |
| 4 | Olfactory sense and Consumer behavior | Ambient scent and CB, product scent and CB, scented advertisements, interaction of scent and colour on consumer behaviour, effect of multi-sensory cues on consumer behaviour, interaction of smell and taste on Consumer behaviour, nosenography | 30 | Spence c. | Store atmospherics: a multisensory perspective | 2014 | 153 |
| | | | | Fiore a.m. | Effects of a product display and environmental fragrance on approach responses and pleasurable experiences | 2000 | 116 |
| | | | | Krishna a. | Product scent and memory | 2010 | 75 |

| | | | | | | | |
|---|---------------------------------------|--|----|------------------|--|------|-----|
| 5 | Sensory marketing and Emotions | Sensory marketing, development of sensory panel for textiles, scale for all senses, sensory marketing and emotions, sensory marketing for children, technology in sensory science, product development using consumer behaviour in sensory marketing | 24 | Bruwer j. | Consumer behaviour and sensory preference differences: implications for wine product marketing | 2011 | 123 |
| | | | | Van trijp h.c.m. | Sensory analysis in marketing practice: comparison and integration | 1995 | 50 |
| | | | | Lee h.-s. | Sensory evaluation and marketing: measurement of a consumer concept | 2005 | 40 |

Each cluster is presented in detail below.

Cluster 1 - Cross-Modality And Consumer Behavior

This cluster presents consumer behavior in a new light - Cross-Modality of senses and their use to create the desired impact. Studies in this cluster have looked at cross-modality of senses from different perspectives- Cross-modal associations and correspondences, cross-modal interactions, and cross-modal influences between senses and their effect on consumer behavior. This cluster collected 41 papers with the oldest publication in 2012, stating that this cluster is relatively new.

Out of the 41 publications, 22 studies discuss the auditory sense, which is almost 52%, clearly stating that sound studies in various forms dominate this cluster. The studies indicate that research in the auditory sense has been primarily concerning ambient sound and its influence on consumer behavior. Several studies have proven that music in the background affects the taste of the products, especially studied in wine and related food items (Biswas, Lund, & Szocs, 2019; Reinoso-Carvalho et al., 2020; Spence, 2019).

Further, there are also studies where sound has been found to influence color preference (Hagtvedt & Brasel, 2016); specific sounds are associated with a specific texture, thus, further strengthening the cross-modal associations between senses (Etzi et al., 2016). Another school of study stresses the pitch of the sound being used, whether in the background or advertisements, as the frequency of the sound has a cross-modal effect on other senses, especially gustatory (Lowe, Ringler, & Haws, 2018; Motoki, Saito, Nouchi, Kawashima, & Sugiura, 2019).

The second set of papers is about the cross-modal influence of the visual sense over the other senses, whether it is color-- the visual sense, creating perceptions about the taste and smell of the product, and influencing the same (Gilbert, Fridlund, & Lucchina, 2016; Carvalho, Moors, Wagemans, & Spence, 2017; Reinoso-Carvalho, Dakduk, Wagemans, & Spence, 2019) or it creating perceptions about the size of the object (Hagtvedt & Brasel, 2017).

An important area studied is sound symbolism. These studies indicate that the sound that the name of the brand emulates needs to be congruent with the product itself to build in the right perception (Spence, 2012; Favalli, Skov, Spence, & Byrne, 2013). These studies, thus, highlight the practical implication of the cross-modal correspondences between sounds and shapes, i.e., the auditory and the visual sense, respectively. Undoubtedly, this explains the popularity of Spence's 2012 study, which has the maximum-144 citations, which talks about the same concept. This is followed by Hagtvedt and Brasel's studies of 2016 and 2017 with 37 and 31 citations, respectively. Here, the authors present a cross-modal association between high-frequency sounds

and light-colored objects and low-frequency sounds and dark-colored objects (Hagtvedt & Brasel, 2016). This is followed by another study by the same duo in the following year where it has been proven that visual stimuli in the form of colors create perceptions about the size of the product (Hagtvedt & Brasel, 2017).

Over the last eight years, ever since 2012, the cluster has evolved positively. The earlier studies talk about the cross-modal associations between just two senses, whether auditory and gustatory or visual and tactile or visual and taste. However, recent studies have transcended studying the correspondence between multiple senses, towards a bimodal form of correspondences and a third sense being influenced by the same.

Sensory marketing in online shopping and e-commerce setup seems to be garnering the interest of the scholars as recent studies are now concentrating on the same. The focus now is on studying the influence of the interaction of senses on consumer behavior to implement the research practically effectively.

The studies in this cluster revealed certain areas that still seem under-explored and under-researched, which could be research areas for future studies. Table 7 is a compilation of the Future Research Directions of all the clusters.

| Cluster No. | Cluster Name | Future Research Directions |
|--------------------|---|---|
| 1. | Cross Modality and Consumer Behavior | <p>Is the consumer behavior different when vision and sound interact in the online shopping world?</p> <p>Does the interaction of vision and sound change when explored in the online shopping space?</p> <p>What is the effect of senses when shopping is affected by morality?</p> <p>How far does the auditory stimuli affect consumer behavior?</p> <p>What is the interaction effect of olfactory stimuli with the other senses?</p> <p>What is the most dominant sense when consumers are subject to multi-sensory stimuli?</p> <p>What kind of sensory stimuli needs to be released to affect consumer behavior in the online context?</p> |
| 2. | Multi-sensory marketing and consumer behavior | <p>Does sensory marketing work for tourism-spiritual, wellness and medical?</p> <p>Can sensory marketing be applied in services marketing?</p> <p>Can a mixed methodology approach be applied while validating the results of sensory marketing?</p> |
| 3. | Touch and visual cues | <p>What technology can be applied for using sensory marketing in the online context?</p> <p>How can the missing senses be compensated for by using the other present senses?</p> <p>Can and how to use sensory marketing to promote sustainable shopping practices and healthy eating habits?</p> <p>How can the concept of affective ventriloquism be applied with respect to sensory marketing?</p> <p>What is the vestibular sense and how can it be used in the field of sensory marketing?</p> |

| | | |
|----|---------------------------------------|---|
| 4. | Olfactory sense and Consumer behavior | <p>How does the sense of smell interact with other senses influencing consumer behavior?</p> <p>How does the sense of smell interact with other senses influencing consumer behavior?</p> <p>What is the effect of sensory overload on consumer behavior?</p> <p>What is the effect of overload of stimuli of smell on consumer behavior?</p> <p>What is the concept of olfactory imagery and how is it possible to create the same?</p> <p>How far can scents and smells be used for wellness and spiritual healing?</p> <p>What is the concept of aromatherapy and its healing effects?</p> |
| 5. | Sensory marketing and Emotions | <p>How is consumer behavior different while dining-in and usual consumption of food?</p> <p>How can sensory marketing be useful for influencing consumer behavior in online food ordering?</p> <p>How sensory marketing can help the consumer create an imagery/illusion of tasting the food without physically touching or tasting the food?</p> <p>How do emotions factor in the experience of the consumer, especially in the case of food?</p> <p>Is consumer behavior different with different types of food like savories vs main course or desserts?</p> |

A summary of the future areas of study in cluster 1 is indicated below:

1. Several studies have established that the sense of sight is the most evolved in humans (Kumar, 2014; Ifeanyiichukwu & Peter, 2018; Hecht & Reiner, 2009). Similarly, the auditory sense is the most unconscious sense with most creatures and inevitable to study. It is time we move beyond these two senses and explore the lesser researched senses like the olfactory sense. Future research could be directed towards studying other senses like the olfactory and its connection, interaction, and cross-modal correspondences with the other senses.
2. Further, we could study the priming effect of different senses over each other and the prominence of one sense over the other.
3. Another possible area of research could be studying different senses from a digital perspective. A whopping 95% of the shopping is expected to be made online by 2041 (Nasdaq, 2020), making it all the more significant to shift the focus to the online shopper. This reiterates that the two senses-vision and sound available online need to be explored in a new perspective for substituting other missing senses, like smell and touch, which are key to consumer decision-making.
4. Another probable area of research could be studying the effect of senses on the moral purchase behavior of the consumer. A study claimed that the pitch of background music might cue in morality and bring about healthier choices in food and eating habits (Huang & Labroo, 2020).

Cluster 2: Multi-Sensory Marketing And Consumer Behavior

This cluster studies multi-sensory marketing from different perspectives. Instead of just focusing on products and retail environment, this cluster has many studies from the perspective of tourist as a consumer. Out of the 39 research papers, 19 papers are on the marketing of the tourism industry-whether it is about the hospitality aspect of tourism or dining while on vacation. Hotels, being an integral part of tourist consumption, experiences in hotels, are one of the areas

which have garnered the interest of the scholars. Hence, multi-sensory marketing in hotels has been stressed to enhance the overall visit of the consumer (Kim et al., 2020).

Destination marketing is a relatively different aspect of tourism marketing, yet a very integral part. Destinations are the first thing where a tourist's experience starts. This reinforces the fact that in order to improve the revisit intentions of the tourists, their multiple senses need to be triggered so that their overall experiences become memorable (Kim, Lee, & Kim, 2020; Park, Lee, & Chung, 2017; Kah, Shin, & Lee, 2020). A few studies also discuss the importance of using multi-sensory marketing to influence the consumers visiting restaurants, whether while on vacation or for casual dining (Satti, Babar, & Ahmad, 2019; Jang & Lee, 2019).

Peck & Wiggins (2006) is most popular with the researchers and is the most cited one in this cluster with 177 citations. In this paper, the author reiterates the importance of touch in influencing consumer behavior and claims that touch is more effective than other senses. The second most cited study in this cluster with 147 citations presents a conceptual model stating that sensorial strategies can create consumer equity (Hultén, 2011). The next most cited paper in this cluster has 78 citations which is a study on tourism. It claims that the use of multiple senses helps build perceptions by the tourists as consumers and creates holistic experiences for them (Agapito et al., 2013).

The cluster has evolved over time, with previous studies focusing on offline audiences, but the most recent papers are moving towards using technology and advanced software. An important study has been conducted, which involves using big data analyses to assess the role of sensory marketing in enhancing consumer experiences (M. Lee et al., 2019). The study of sensory marketing in the e-commerce landscape seems to be a lesser researched area as there was just one study in this area (Yoganathan et al., 2019).

Considering the research already done in this cluster and the scope of this area, a lot still needs to be explored. Future directions for research within this cluster may focus on the following:

1. Sensory marketing in tourism may be further explored in different areas within tourism itself. Spiritual tourism, wellness tourism, and medical tourism could be probable areas for future sensory marketing research.
2. Studies involving big data analysis, further validated by experiments, could add both robustness and objectivity to future research.
3. After stressing too much on sensory marketing and its influence on consumer behavior, a new concept has questions about "how much is too much" in this area-Sensory overload. As mentioned in Chung (2020), sensory overload is a new dimension that takes sensory marketing to the next level. The right amount and blend of sensory stimuli can be studied as overexposure to the same are supposed to affect consumer behavior negatively.

Cluster 3: Touch and Visual cues

This cluster has sorted 36 studies under a common umbrella where tactile and visual senses have been studied. Studies discussed the interaction of two senses and also their effectiveness in influencing consumer behavior.

Several studies discuss the unimaginable importance of the sense of touch. A study on the sense of touch presents that consumer tend to like the product simply because they have participated in its value creation (Troye, 2012). Similarly, touching the food while eating it, i.e., eating with the hands, improves the hedonic evaluations of the food items (Madzharov, 2019). Thus, these studies establish that it is touch that is primary to humans can be used to influence product presentations (B. M. Ferreira, 2019) and product evaluations (Streicher & Estes, 2016).

Touch can have a biased effect while making a purchase decision explained through the concept of 'affective ventriloquism', which states that the intakes about the hedonic qualities of a

product seem to influence the evaluation of the products by overriding the stimuli from other senses, thus touch seems to be having prominence over the other senses (Thorbjørnsen et al., 2007).

On the contrary, this cluster also has a study (Ringler et al., 2019), which claims to restrict the shoppers from touching the products on display, called haptic blocking, would not hurt the sales of the stores. This lends an interesting angle to the sense of touch, which has since long been discussed in the context of purchase intention getting increased because of the fulfillment of the need for touch.

A few recent studies explore the impact of technological advances in shopping on using the sense of touch. The advent of online shopping and the use of i-pads and touchpads are supposed to impact the purchase intention of the online shopper positively compared to shopping by using the mouse through other devices (Rathee & Rajain, 2019; Zhu & Meyer, 2017).

This cluster has also picked up a set of studies where the interplay of the tactile sense with the visual sense has been highlighted in various perspectives. This collection of papers has studies that claim creating packaging of products that are in congruence with the visual features of the products, the products become more saleable (Krishna et al., 2017), restressing that the disconfirmation of the two senses can lead to a reverse reaction on the part of the consumer (B. M. Ferreira, 2019).

Also, a new concept called the ‘vestibular sense’, often referred to as the sixth sense, has been studied. This concept studies postures while eating, which the authors claim may affect the pleasantness of the food being eaten negatively and reduce portion size (Biswas, Szocs, et al., 2019).

This cluster includes the most cited seminal paper by Krishna, which has 355 citations. This paper stresses the importance of different senses, taking one sense at a time, and using sensory marketing to trigger consumers' desired effects (Krishna, 2012a). The second most cited paper has 151 citations and is a study on ‘affective ventriloquism’ (Thorbjørnsen et al., 2007) which has been mentioned earlier. Next in line is having 145 citations, published in 2010, which says that food advertisements presented in a multi-sensory format are more impactful in creating perceptions about the taste of the product than advertisements focusing only on the taste (Elder & Krishna, 2010).

Though a few studies on technological advances and online shopping have been done, there is still scope for further research to explore:

1. In the online context, the tactile sense is not present. Further studies can explore how to compensate it using the other two present senses, auditory and visual, taking the concept of mental imagery.
2. Concepts like the vestibular sense, which have been mildly touched in the field of sensory marketing and seem to be an unexplored area, maybe researched more deeply.
3. Another area that seems to be under-researched is sensory marketing to encourage healthy eating habits among customers and promote sustainable shopping practices using tactile and visual senses.

Cluster 4: Olfactory sense and Consumer behavior

Cluster 4 has brought together 30 studies and is primarily focused on the olfactory sense of smell from different perspectives. From the use of fragrance in services marketing (Goldkuhl & Styvén, 2007), ethical considerations while using scent as a marketing tool (Bradford & Desrochers, 2009), moving from ambient scent to product scent (Krishna et al., 2010), use of the power of scent to create memories about brands and products (De Luca & Botelho, 2020), this

cluster has covered studies across industries and products, instead of just focusing on product marketing or the retail setup.

It has taken studies from different disciplines like neuroscience (Rimkute et al., 2016). A new concept called Nosenography is noteworthy in this cluster. This is the study of smell to decode practices and the presence of smell in consumption spaces (Canniford et al., 2018). This cluster has also collected studies where the influence of socio-cultural and gender factors has been highlighted. A study lays down that consumers can decode the messages and products associated with certain scents, though socio-cultural factors influence such decoding and interpretation (Cerulo, 2018).

In this cluster, the oldest paper dates back to 1984, which has, though 19 citations, but has studied a different aspect of sensory marketing-sensory overload. Sensory overload is the phenomenon where the external stimuli received by the consumers are too much to absorb and process and hence, leads to unrest, stress, confusion, and burnouts (Malhotra, 1984).

The most cited paper in this cluster, with 153 citations, noticeably, discusses not only the olfactory sense but multi-sensory scenario and their effect on consumer behavior (Spence, 2014). Fiore, Yah, & Yoh (2000), the second most cited paper in this cluster, with 116 citations, suggest that environmental fragrances affect consumer behavior. Hence, they need to be chosen carefully and should blend with the product on display to positively affect the purchase intentions of the consumers. Krishna et al. (2010), which is the third most cited paper in this cluster, again talks about the scent of the product and its influence on creating memories about the product amongst the consumers, thus improving the recall value.

Though many studies have been covered in this cluster, there is still scope for research that can be conducted in this area:

1. Considering the research, already been done in an olfactory sense, so far, the focus is more on the offline context. Future research could aim at, just like other clusters, compensating this missing sense in an online context with other present senses and see the effect of the same on consumer perception.
2. Digitalization and technological advances on creating a sense of smell online, which is not too synthetic and closer to real, need to be studied.
3. Another interesting area could also be the interaction of smell with the other senses. There is no but one study by Starostová et al., 2018, which talks about the effect of color on smell perceptions and its effect on consumer behavior. This could be taken further by studying the effect and influence of other senses like touch on smell vice versa or sound on smell etc.
4. Interesting studies could also be done on the overload of the scents in various scenarios and the effect on consumer behavior.
5. Another area that has been mildly touched in this cluster is the concept of olfactory imagery (Meng et al., 2020). The research in sensory marketing is limited to the visual and tactile sense with interest now moving towards the auditory and the gustatory sense, though little focus on the olfactory sense. Exploratory research on the creation of Olfactory Imagery can open up many new avenues.
6. Another area of research that has not been touched is the use of appropriate smells and scents for wellness and spirituality. Aromatherapy and its healing effects are well accepted all over the world and are a rapidly growing industry. However, this cluster doesn't explore this area at all.

Cluster 5: Sensory marketing and Emotions

It has 24 studies that are primarily centered around sensory science and its usage in food and food products. It is noteworthy that maximum studies have been picked from journals that publish studies on food and developments in the same field. Another important observation is that most papers discuss the marketing of products using sensory science. However, a few

studies present the development of products and product packaging, keeping the sensory aspects in mind so that selling and marketing become much easier and effective (Raz et al., 2008; Talavera, 2017). A few studies have also tried to develop a sensory panel (Philippe et al., 2003) and sensory scales for quantifying the effect on the senses.

Also, there is a set of studies that focuses on emotions and their relevance in sensory marketing. Mohammad (2011) discusses that abstract notions and concepts have strong color associations, and colors can help trigger the desired emotional responses if correctly used. A step further, emotional responses to food types were gauged by measuring them through different parameters like EEG, ECG, AEFA etc., and an objective approach to various emotional tendencies was followed (Walsh et al., 2017).

The highest cited paper in this cluster, which has 123 citations, is an exploratory study where an experiment has been conducted in the Australian wine region, and differences have been studied between men and women and also different generations in terms of their wine consumption patterns (Bruwer et al., 2011). The second highest cited paper, with 50 citations, talks about aligning the products with the requirements of the consumer, using sensory marketing (Van Trijp & Schiffersein, 1995). The next in line, with 40 citations and published in the year 2005, is again studying the behavioral patterns and rank the refresh-ness against different sensory stimuli, mainly visual (H. S. Lee & O'Mahony, 2005). Latest papers are more about integrating technology with sensory marketing and stress that latest innovations will help in further progress in this field (Crofton et al., 2019).

Going through the cluster reveals important spaces which could be filled in by fruitful research.

1. Though most research in this cluster is on food, it is imperative to mention that no research has been seen in dining and actual consumption of the products by the consumer, which opens for areas for future research.
2. Further, online food ordering is also an area that is lesser researched and can be further explored.
3. In the absence of the privilege to taste before ordering in the online scenario and also to have instant feedback from the customer through gestures and expressions, further research could be done on how sensory marketing can help the consumer create an imagery/ illusion of the taste of the food in the online setup without actually, touching or tasting the product.
4. Furthermore, research can be conducted on how far emotions factor in the ultimate experience for the consumer, especially in the case of food and later, on other product categories, though emotion as a mediator has been studied in one of the publications (Mohammad, 2011).
5. Even within the food, major research has been on wine and chocolates. Other products like savories or main course could also be researched.

DEVELOPMENT OF AN INTEGRATIVE FRAMEWORK

This section integrates and presents a comprehensive overview of the five clusters.

Cluster-wise dominance of senses

Figure 7 below is a graphic representation of how the senses have been studied across different clusters.

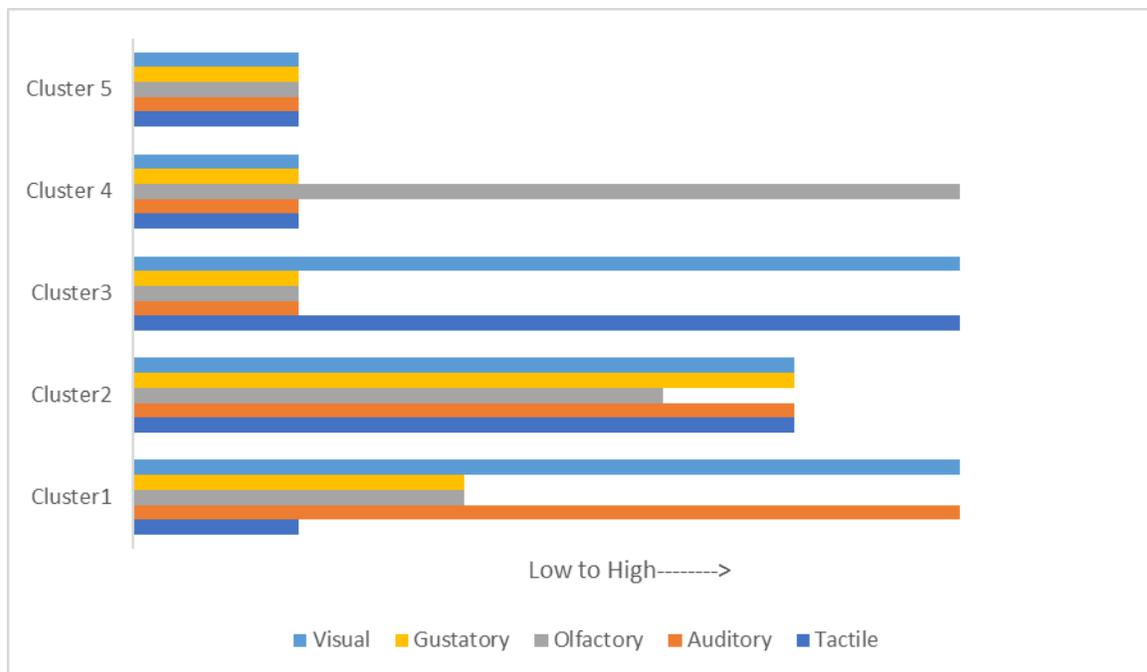


Figure 7
CLUSTER-WISE DOMINANCE OF SENSES

Cluster 1 focused majorly on auditory and tactile senses along with other senses. Cluster 2 captured all the senses. However, cluster 3 has given more attention to visual and tactile senses. Cluster 4 also focused majorly on olfactory sense. Cluster 5 is a general cluster talking about the association of emotions and sensory marketing.

Conceptual Framework of Sensory Marketing

Since times immemorial, humans have been using their senses-consciously and unconsciously to move around and find ways to survive (Krishna, 2012b). An initial study of the senses has been credited to Aristotle, who has been instrumental in documenting these senses, forming the foundation for future research. A brief description of each sense is presented below.

Touch: The sense of touch is the first sense that develops when an embryo is developing inside the womb and deteriorates the least with age (Ifeyanichukwu & Peter, 2018). Touching provides the much craved emotional connection among humans, as they are all physical creatures (Hutmacher, 2019). This explains why most purchase decisions are highly influenced by the sense of touch (Pantoja, Borges, Rossi, & Yamim, 2020; Ringler et al., 2019). Several studies have been conducted to reinforce the importance of the sense of touch amongst living beings.

Vision: Several studies have been undertaken where it has been well established that the sense of sight is the most evolved in humans (Hecht & Reiner, 2009; Ifeyanichukwu & Peter, 2018; Kumar, 2014). Seeing seems the easiest for us and is fundamental to every living creature: its animals, insects, and birds. When we say 'I See', it means I understand, which makes it imperative that seeing for humans is understanding. -

Smell: Sense of smell is the first most developed sense after the birth of a child, because of which newborn infants can recognize their breast-feeding mothers from their odor (Yeshurun & Sobel, 2010). However, as the other senses evolve, the sense of smell deteriorates in humans, and hence, adult humans, unlike animals, are not as sensitive to smell. Recent researches have focused on the sense of smell simply because of its astonishing effects on generating emotions (Bordegoni et al., 2019).

Taste: Even though humans are supposed to eat to satiate their biological need of energy to do the daily chores, food has developed as a multi-million industry, which stresses that we have now started eating, not out of a bodily requirement but also to please our senses. An interesting study by Elder and Krishna (2010) shows that an ad. targeting more than one sense (e.g., taste, touch, and smell) results in a better perception of taste than a marketing campaign that targets taste alone.

Sound: Hearing is basic to most creatures and is a very sensitive involuntary sensation (M. L. Lowe et al., 2019). Humans hear without consciously striving to do so, which has made this sensation a much-exploited one to add to the overall sensory experience of the consumers. Hence, the auditory sense becomes an important sense to rediscover and research further.

A conglomeration of all the senses and using them to send across the message to the consumers is Sensory Marketing (Krishna et al., 2016). (Krishna, 2012a) has defined sensory marketing as the marketing where the engagement of the senses of the consumers happens and which has an influence on the perception, judgment, and the behavior of the consumer.

This research presents the conceptual framework which explains the foundations of sensory marketing (Figure 8).

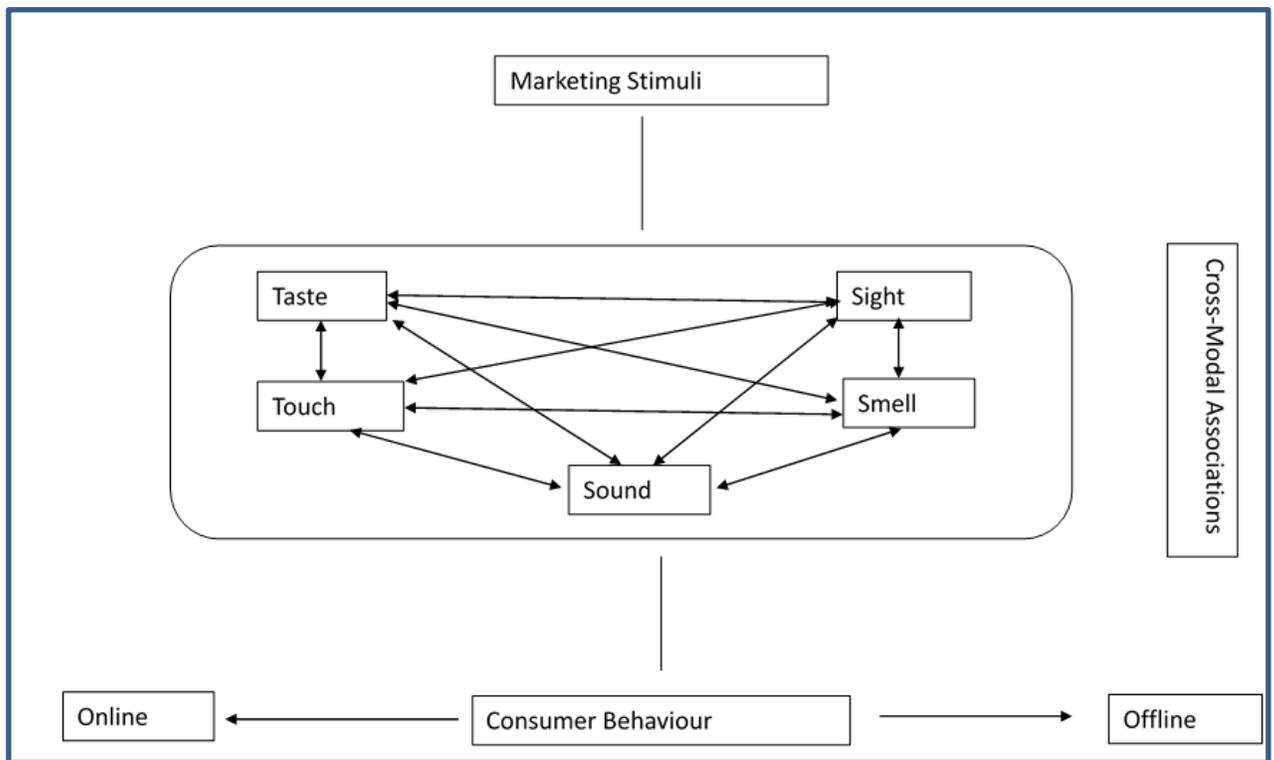


Figure 8

CONCEPTUAL FRAMEWORK

Sensory marketing involves providing marketing stimuli, such as product, packaging, advertisement, store atmospherics and so on, to trigger the senses and impact consumers. These senses have a relation with each other, and they react with one another in varied ways. For example, the taste is influenced and influences the sense of touch, sight, smell, and sound. It also has cross-modal associations with the other senses. The result of this interplay is the desired effect on consumer behavior. With the advent of technology and the transition of consumers towards online shopping, SM is now being applied and used in online and offline shopping mediums. Hence, consumer behavior is impacted to get the desired outcome. The following example explains the conceptual framework.

Imagine this situation. A shopper is walking in a store of home décor products. The entrance has beautiful plants, just as you would want your entrance to be. This triggers the first sense of vision, and perception starts building. It gives a warm feeling of an entrance to a cozy home. The consumer enters the store. He experiences a soothing ambient scent of artificially introduced flowers but is very natural, just like the real scent of a garden in full bloom. Instantly, the second sense is triggered. Soft instrumental music is being played in the background. The consumer wants to stay in the store for a little longer. He starts moving around seeing the various display of the products. The lighting is just appropriate. The products are displayed in an organized manner, and everything seems to be in place. Every single product welcomes the consumer to touch and feel it. The consumer touches the ceramic vase-it feels so smooth. Then he touches the artificial flowers, they feel so soft and delicate, just as the real petals are. The retail store atmospherics has triggered consumer senses and cross-modal sensory associations. This will finally affect consumer behavior in an offline context.

DISCUSSIONS AND CONCLUSIONS

Theoretical Implications

The study of senses is as old as humankind, and senses have always been used for marketing and positioning brands. The effectiveness of sensory marketing has aroused the interest of practical users like brand managers, marketers etc., but also of academicians. SM studies have been conducted covering different literatures, methods, industries, and products. However, researchers have always struggled to find a collection of studies under a single umbrella that can provide a comprehensive and holistic understanding of the research done in this field. Therefore, this study presents a bibliometric analysis of Sensory Marketing and provides future research directions.

This study provides a systematic overview of the sensory marketing research using bibliometric analysis. It highlights the influential articles, authors, and countries contributing to sensory marketing through citation analysis. Furthermore, it offers the changing trends in the themes through a thorough keyword analysis during this time.

The bibliometric coupling presents the thematic clustering of the studies. It divides SM literature into five clusters. The critical review of each cluster is discussed in detail. A comprehensive discussion on future research direction under each cluster is also presented. Also, future research directions in the research question form are inserted in Table 7.

Further, clusters are integrated, compared, and mapped to highlight the sense-wise contribution. Also, a conceptual framework is developed which integrates and extends the sensory marketing literature.

Practical Implications

With the overwhelming shift of consumers to the online mode, practitioners need to find newer ways to engage their senses and create memorable absorption of messages. This explains the ever-increasing popularity of newer technologies like AR, VR, ASMR etc., being introduced to the consumers. However, the foundations need to be referred to implement marketing plans and campaigns effectively.

Also, the insights from the cross-modality cluster will further help practitioners to understand how senses interact, impact, and correspondence. This can be applied while designing a product, store atmospherics, and marketing campaigns. Advertisers need to look for newer ways to inculcate sensory aspects while creating interesting images, videos, and messages. Consumers are not only looking for functional benefits of the products. They look for sensory experiences before deciding and during consumption of their purchases. Therefore, marketers should explore the instances where senses can be engaged, and sensory experiences can be created. Hence, this study offers a comprehensive review of sensory marketing and important for practitioners on how and how many senses can be engaged.

Limitations and Future Research Directions

This study has a few limitations. *First*, it collects data consisting of only the most influential studies, authors, and journals. However, many a time, the most influential articles are unrelated and are a misfit in the overall cluster to which it has been allocated. This means that a specific cluster might have completely unrelated articles to that cluster, which this method of analysis can not address. *Secondly*, Scopus is a highly dynamic database that gets continuously updated. Hence, by the time the analysis gets published, the results might change altogether. The same keywords would give different results if applied at a later stage. *Third*, it does not provide details of the research methods, theories, and constructs (Paul and Criado, 2020). If the same could be provided, it would provide a better perspective and study to another level. *Fourth*, the basis of this method is that it takes only the titles and keywords into consideration for inclusion or elimination of studies in the. The text is completely ignored. Keywords do not constitute a reliable mode of collecting articles. *Fifth*, the clusters broadly study sensory marketing instead of suggesting future areas and further studies in this area. This identification is completely dependent on the authors, which might lead to some subjectiveness. A deeper and more bias-free study could be using Big Data Analytics as the basis for future studies to add robustness and delve deeper into this field.

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