

REVIEW OF SENSORY INFLUENCES IN WINE MARKETING AND CONSUMPTION

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Abstract

This research explores the complexities of wine studies, emphasizing the intricate relationship between grape varieties, terroir, and the chemistry of wine. The study underscores the importance of terroir, which captures the unique combination of soil, climate, and geographical factors that influence the taste and quality of grapes. Additionally, research investigates expertise in the beverage field, highlighting how experience and domain-specific knowledge shape perceptual and cognitive skills. Using databases such as Scopus and Web of Science, a thorough literature review was conducted, leading to the identification of influential articles in the domain of multisensory experience-based wine marketing. The research emphasizes the importance of a holistic sensory experience in guiding consumer behavior and preferences, suggesting that as the wine industry progresses, understanding and capitalizing on these sensory experiences will be crucial.

Key words: Consumer behavior; Multisensory experience; Terroir; Wine chemistry; Wine marketing.

JEL Classification: Q13; M31; L66.

I. INTRODUCTION

The study of wines is an intricate subject that encompasses various aspects of this cherished beverage. Central to this study is understanding the different grape varieties, each of which has a unique set of characteristics. When these grapes undergo the processes of winemaking technology, they become the various wines that grace our tables.

Terroir, a term often used in the wine world, is of paramount importance. It refers to the unique combination of soil, climate, and geographical factors that influence the taste and quality of grapes in a specific region. This explains why wines from different regions, even when produced from identical grape varieties, can exhibit varied flavors and aromas.

The science behind wine is vast, and the chemistry of wine plays a significant role. Components such as acidity, tannins, alcohol, and sugar are more than just ingredients; they define the essence of wine. For example, tannins, sourced from grape skins, seeds, and stems, provide wine with its structure and can dictate its potential to age gracefully. Meanwhile, acidity lends the wine its vibrancy and can determine its shelf life. A profound grasp of these elements is vital for anyone who wants to discern the subtleties of wine.

The study of expertise in the field of beverages has long been neglected by science. Research shows that experience and accumulation of domain-specific knowledge influence perceptual, conceptual, memory, imagination, knowledge representation, judgment, and language skills. Beverage experts possess a more structured knowledge base, use domain-relevant knowledge, provide precise descriptions of products, and have superior recognition skills of olfactory and aroma imagery. However, the results in terms of perceptual skills are mixed. Studies have highlighted that genetic differences, sensory responses, and other factors can lead to intra-group and inter-group variability, which can affect the results of cross-sectional studies. Experts tend to outperform novices in specific contexts, but enhanced skills do not always generalize to untrained stimuli (Honoré-Chedozeau et al., 2019). A better understanding of sensory competence, including its limitations, will benefit the food and beverage industry in production and marketing processes. The research questions (RQ) of the study are as follows:

1. Who are the most influential authors in the field of cross-modal perception applied to wine?
2. How do the unique characteristics of the terroir, including soil, climate, and geographical factors, influence the sensory perceptions and consumer preferences of wines from different regions?

II. METHODOLOGY

In the world of academic research, we often face the question of which database to use to find and evaluate the specialized literature. Two prominent players in this field are Scopus and Web of Science.

Scopus, an expansive database of abstracts and citations, offers a wide range of peer-reviewed literature, covering scientific, technical, medical, social sciences, as well as arts and humanities. The platform provides a

suite of advanced tools that allow researchers to track, analyze, and visualize research trends to keep up with emerging ideas and discussions in diverse fields.

CiteScore, Scopus's measurement tool for evaluating journals, considers the number of citations received by a journal's documents over a three-year period divided by the number of documents published during that time. It is essential to recognize that while CiteScore provides a valuable snapshot of a journal's citation impact, it should be used as just one of many indicators when assessing a journal's quality.

The Web of Science is another prominent database designed for researchers, scholars, and students to dive into knowledge, bridging gaps across various scientific, technical, and social and humanistic disciplines. At the heart of this innovative platform are various metrics, such as the Impact Factor (IF) and the Article Influence Score (AIS). These can guide us in identifying the most influential research and the most productive minds. The Impact Factor, while straightforward, is a powerful indicator that measures a journal's influence by the number of citations it garners. The Article Influence Score goes beyond mere citation counting; it considers the quality of the citing journals, providing a more comprehensive view of a journal's significance. In this way, AIS considers not only quantity but also quality.

We can say that both Scopus and Web of Science are indispensable resources for researchers and academics, each offering a unique set of tools and measurements.

Using Scopus and Web of Science, studies on multisensory experience-based marketing in general were searched, with a specific focus on those related to the multisensory experience in wine promotion. The search was carried out using a funnel method, inspired by the model described in (Webster & Watson, 2002) and the guidelines from the PRISMA checklist (Page et al., 2021). Therefore, articles on multisensory experience were filtered on the basis of specific criteria.

The search began on the Web of Science and was supplemented with results from ScienceDirect (primarily for "full text") and Scopus. The searches utilized keywords or combinations of keywords. Web of Science does not strictly search by keywords but rather by "topics". Topic searches effectively look in the following fields (Clarivate Analytics, 2020): title, abstract, author-declared keywords, and Web of Science identified keywords (Garfield & Sher, 1993) based on the articles cited by each article. This type of search favors fewer common subjects or combination of subjects. For example, for the studied period, that is, 2018-2023, the combination of "wine", "marketing", and "multisensory" returned 12 results, while "marketing", "sensory", and "wine" returned 327 results.

III.RESULTS

In the process of conducting a comprehensive literature review, a systematic approach was adopted to ensure the inclusion of the most relevant articles. Initially, a broad search was conducted, resulting in the identification of 339 articles based on specific keywords. This can be considered as the first step in the analysis. Moving forward, the second step involved a preliminary filtering process. Given the time frame of interest, which was from 2018 to 2023, the initial list was narrowed down to 140 articles.

The third step in the analysis was more rigorous. At this stage, articles that were not directly related or were only loosely connected to the research questions were excluded. This meticulous filtering process is essential to ensure that the final list of articles is both relevant and comprehensive.

Upon reviewing the articles that made it through the third step, an interesting observation was made. By looking into the bibliographies of these articles, an additional 10 articles were identified as pertinent to the research. This brought the total number of articles in the fourth step to 40. However, after a thorough analysis, only 33 of these articles were considered suitable for further study, as detailed in Table 1. The data was downloaded in April 2023.

To summarize, the process of reviewing the literature and selecting articles was systematic and iterative, ensuring a balance between breadth and depth in the final list of articles.

The analyzed articles identified in step 4 are presented in Table 1.

Table 1 The analyzed articles

No Crt	Author, title, journal	Published year	Type	Number of cites
1	Galati, Antonino; Schifani, Giorgio; Crescimanno, Maria; Migliore, Giuseppina. "Natural wine consumers and interest in label information: An analysis of willingness to pay in a new Italian wine market segment." <i>Journal of Cleaner Production</i> .	2019	Article	85
2	Mora, M.; Urdaneta, E.; Chaya, C. "Emotional response to wine: Sensory properties, age and gender as drivers of consumers' preferences." <i>Food Quality and Preference</i> .	2018	Article	53
3	Cherubino, Patrizia; Martinez-Levy, Ana C.; Caratu, Myriam; Cartocci, Giulia; Di Flumeri, Gianluca; Modica, Enrica; Rossi, Dario; Mancini, Marco; Trettel, Arianna. "Consumer Behaviour through the Eyes of Neurophysiological Measures: State-of-the-Art and Future Trends." <i>Computational Intelligence and Neuroscience</i> .	2019	Review	51
4	Spence, Charles. "Multisensory experiential wine marketing." <i>Food Quality and Preference</i> .	2019	Article	38
5	Cravero, Maria Carla. "Organic and biodynamic wines quality and characteristics: A review." <i>Food Chemistry</i> .	2019	Review	30
6	Santos, Vasco; Ramos, Paulo; Sousa, Bruno; Valeri, Marco. "Towards a framework for the global wine tourism system." <i>Journal of Organizational Change Management</i> .	2022	Article	28
7	Sugrue, Meaghan; Dando, Robin. "Cross-modal influence of colour from product and packaging alters perceived flavour of cider." <i>Journal of the Institute of Brewing</i> .	2018	Article	27
8	Rodrigues, Heber; Parr, Wendy V. "Contribution of cross-cultural studies to understanding wine appreciation: A review." <i>Food Research International</i> .	2019	Review	22
9	Kustos, Marcell; Gambetta, Joanna M.; Jeffery, David W.; Heymann, Hildegard; Goodman, Steven; Bastian, Susan E. P. "A matter of place: Sensory and chemical characterisation of fine Australian Chardonnay and Shiraz wines of provenance." <i>Food Research International</i> .	2020	Article	20
10	Leri, Ifigeneia; Theodoridis, Prokopis. "How do personality traits affect visitor's experience, emotional stimulation and behaviour? The case of wine tourism." <i>Tourism Review</i> .	2021	Article	20
11	Vecchio, Riccardo; Lisanti, Maria T.; Caracciolo, Francesco; Cembalo, Luigi; Gambuti, Angelita; Moio, Luigi; Siani, Tiziana; Marotta, Giuseppe; Nazzaro, Concetta; Piombino, Paola. "The role of production process and information on quality expectations and perceptions of sparkling wines." <i>Journal of the Science of Food and Agriculture</i> .	2019	Article	20
12	Haase, Janina; Wiedmann, Klaus-Peter. "The Sensory Perception Item Set (SPI): An Exploratory Effort to Develop a Holistic Scale for Sensory Marketing." <i>Psychology & Marketing</i> .	2018	Article	19
13	Tempere, Sophie; Peres, Stephanie; Espinoza, Alejandro Fuentes; Darriet, Philippe; Giraud-Heraud, Eric; Pons, Alexandre. "Consumer preferences for different red wine styles and repeated exposure effects." <i>Food Quality and Preference</i> .	2019	Article	19
14	Eustice, Crystal; McCole, Dan; Rutty, Michelle. "The impact of different product messages on wine tourists' willingness to pay: A non-hypothetical experiment." <i>Tourism Management</i> .	2019	Article	17
15	Jaeger, Sara R.; Lee, Pui-Yee; Xia, YiXun; Chheang, Sok L.; Roigard, Christina M.; Ares, Gaston. "Using the emotion circumplex to uncover sensory drivers of emotional associations to products: six case studies." <i>Food Quality and Preference</i> .	2019	Article	17
16	Silva, Ana P.; Voss, Hans-Peter; van Zyl, Hannelize; Hogg, Tim; de Graaf, Cees; Pintado, Manuela; Jager, Gerry. "Temporal dominance of sensations, emotions, and temporal liking measured in a bar for two similar wines using a multi-sip approach." <i>Journal of Sensory Studies</i> .	2018	Article	17
17	Espinoza, Alejandro Fuentes; Hubert, Anne; Raineau, Yann; Franc, Celine; Giraud-Heraud, Eric. "Resistant grape varieties and market acceptance: an evaluation based on experimental economics." <i>OENO ONE</i> .	2018	Article	15
18	Kustos, Marcell; Goodman, Steve; Jeffery, David W.; Bastian, Susan E. P. "Using consumer opinion to define New World fine wine: Insights for hospitality." <i>International Journal of Hospitality Management</i> .	2019	Article	15
19	Jose Perez-Elortondo, Francisco; Symoneaux, Ronan; Etaio, Inaki; Coulon-Leroy, Cecile; Maitre, Isabelle; Zannoni, Mario. "Current status and perspectives of the official sensory control methods in protected designation of origin food products and wines." <i>Food Control</i> .	2018	Article	14
20	Puskas, Vladimir S.; Miljic, Uros D.; Djuran, Jovana J.; Vucurovic, Vesna M. "The aptitude of commercial yeast strains for lowering the ethanol content of wine." <i>Food Science & Nutrition</i> .	2020	Article	14
21	Souza Gonzaga, L.; Capone, D. L.; Bastian, S. E. P.; Jeffery, D. W. "Defining wine typicity: sensory characterisation and consumer perspectives." <i>Australian Journal of Grape and Wine Research</i> .	2021	Article	14

22	Danner, Lukas; Johnson, Trent E.; Ristic, Renata; Meiselman, Herbert L.; Bastian, Susan E. P. "Consumption Context Effects on Fine Wine Consumer Segments' Liking and Emotions." Foods.	2020	Article	13
23	Juerkenbeck, Kristin; Spiller, Achim. "Importance of sensory quality signals in consumers' food choice." Food Quality and Preference.	2021	Article	13
24	Spence, Charles. "Wine psychology: basic & applied." Cognitive Research-Principles and Implications.	2020	Review	13
25	De Luca, Modesto, Raffaele Campo, and Rosalind Lee. "Mozart or pop music? Effects of background music on wine consumers." International Journal of Wine Business Research.	2019	Article	11
26	Spence, Charles. "What's the Story With Blue Steak? On the Unexpected Popularity of Blue Foods." Frontiers in Psychology.	2021	Review	7
27	Spence, Charles. "Musical Scents: On the Surprising Absence of Scented Musical/Auditory Events, Entertainments, and Experiences." i-Perception.	2021	Article	6
28	Wang, Q. J., M. Frank, B. Houge, C. Spence, and K. A. LaTour. "The influence of music on the perception of oaked wines - a tasting room case study in the US Finger Lakes Region." Journal of Wine Research.	2019	Article	5
29	Almiron, Paula, Francisco Barbosa Escobar, Abhishek Pathak, Charles Spence, and Carlos Velasco. "Searching for the sound of premium beer." Food Quality and Preference.	2021	Article	3
30	Campo, Raffaele, Pierfelice Rosato, and Enrico Battisti. "Multisensory analysis and wine marketing: systematic review and perspectives." British Food Journal.	2022	Review	2
31	Infantes, Alejandra E., Gabriela P. García-Zavala, and Manuela Quaresma. "Exploratory Study on the Multisensorial Experience at the Vivencial Museum of Wine and Pisco in Arequipa, Perú." Estudios y perspectivas en turismo.	2020	Research-article	1
32	Aramendia, Gorka Zamarreno, Elena Cruz Ruiz, and Claudia Hernando Nieto. "Digitalization of the wine tourism experience: a literature review and practical applications." Doxa Comunicacion.	2021	Review	0
33	Dal Palu, Doriana, Claudia De Giorgi, Beatrice Lerma, and Eleonora Buiatti. "Multisensory Design: Case Studies, Tools and Methods to Support Designers." Frontiers of Sound in Design: A Guide for the Development of Product Identity Through Sounds.	2018	Article; Book Chapter	0

From the list in Table 1 we have kept the authors who appear in the list with at least 2 articles as well as the authors of the most cited article and calculated the number of citations as shown in Table 2.

Table 2 Top authors

Author	Number of articles in table 1	Number of Citations from table 1	Total number of articles in WoS	WoS number of citations without self-cites (h-index)
Spence, Charles	6	72	795	13931 (89)
Espinoza, Alejandro Fuentes	2	34	3	38 (2)
Giraud-Heraud, Eric	2	34	27	346 (9)
Antonino Galati	1	85	74	819 (22)
Giorgio Schifani	1	85	29	532 (18)
Maria Crescimann	1	85	67	725 (17)
Giuseppina Migliore	1	85	35	530 (17)

IV.DISCUSSION

Even if the domain of the published articles is broader: how the human brain manages and processes information from various senses (smell, taste, sight, hearing, and touch), the most influential author appears to be Charles Spence from Oxford University. He has published more than 1,100 articles (not all directly related to wines) that have garnered more than 54,000 citations. Of these, 795 are indexed by WoS, accumulating 13,931 in this online database. Of these, 74 were published in FOOD QUALITY AND PREFERENCE (Elsevier) and 61 in EXPERIMENTAL BRAIN RESEARCH (Springer). The works about wine were often coauthored with Qian Janice Wang, a former Ph.D. student at Oxford.

Other researchers with an impact in the field are:

- Antonino Galati (University of Palermo, Department of Agriculture) has published more than 50 articles, focusing mainly on agricultural economics, consumer behavior, and sustainable development.
- Giorgio Schifani has published more than 40 articles, with research areas in agricultural economics, sustainable agriculture, and consumer behavior.
- Maria Crescimanno is the author of more than 30 publications that emphasize agricultural economics, marketing, and sustainability.

- Giuseppina Migliore has published more than 20 articles, primarily in the fields of consumer behavior, sustainable agriculture, and agribusiness.

To answer RQ1, Charles Spence seems to be the most influential author in terms of the number of contributions, followed by the team of Galati, Antonino; Schifani, Giorgio; Crescimanno, Maria; Migliore, Giuseppina in terms of the impact of a single article.

To answer RQ2, terroir, a term deeply rooted in the wine industry, encapsulates the distinct interplay of soil, climate, and geography of a region, shaping the taste and quality of its grapes. This complex relationship explains why wines from different regions have different sensory characteristics, even if they were made from identical grape varieties. Take, for example, Pinot Noir. While both hail from the same grape, the one from Burgundy, France, offers a different sensory experience than its counterpart from Oregon, USA, all due to the nuances of terroir. Such distinctions often guide consumer preferences, drawing them towards the unique flavors and aromas of wines from specific regions.

The identified articles explore not only the sensory aspects but also the emotional and psychological dimensions of wine consumption. For example, some studies investigate the emotional responses evoked by different wines, suggesting that our reactions to wine go beyond just taste and aroma, touching on deeper emotional and cultural connections. Charles Spence's contributions to the list are particularly noteworthy. His research emphasizes the experiential multisensory marketing of wine, highlighting how various sensory cues, from the sound of a cork popping to the design of a wine label, can influence our perception and enjoyment of wine.

Furthermore, the articles emphasize the importance of regional characteristics in shaping wine profiles. Articles such as the one focusing on Australian Chardonnay and Shiraz wines (no. 9) emphasize the unique taste profiles that arise from specific regional terroirs, reaffirming the importance of geographical nuances in the wine industry.

Additionally, there is a significant emphasis on the cultural and marketing aspects of wine consumption. Some articles explore how cultural contexts, traditions, and even music can influence our wine preferences. Others examine the world of wine marketing, investigating how strategies such as multisensory analysis can be used to improve wine promotion and sales.

In essence, these articles highlight the world of wine consumption, where terroir, sensory perceptions, emotional connections, cultural contexts, and marketing strategies all intertwine to shape the way consumers perceive, appreciate, and choose wines.

V.CONCLUSION

The multisensory experience in wine promotion is a growing field of research. The literature suggests that sensory experiences play a crucial role in influencing consumer behavior. As consumers become more informed and conscious, the importance of providing a holistic sensory experience becomes paramount.

Charles Spence's work stands out in this domain, providing valuable insights into how sensory experiences can be leveraged in wine marketing. Other researchers, such as Antonio Galati and his colleagues, have also made significant contributions, highlighting the importance of labels and informed consumption.

We can conclude that the multisensory experience is not just a marketing gimmick, but a fundamental aspect of wine promotion. As the wine industry evolves, understanding and leveraging these sensory experiences will be key to success.

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