

NEUROMARKETING AND FASHION: A SYSTEMATIC REVIEW ON ITS SENSORY IMPLICATIONS

NEUROMARKETING Y MODA: UNA REVISIÓN SISTEMÁTICA SOBRE SUS IMPLICACIONES SENSORIALES

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ABSTRACT

Introduction: Fashion is a sector that at all times appeals to the emotions and feelings of the individual, due to its social implications. In this sense, neuromarketing becomes a very valuable tool to study the different reactions of the public when exposed to it. Different tools applied in neuromarketing reveal how consumers feel when they buy, touch or look at a fashion product with which they relate. **Methodology:** The present research aims to make a systematic review of publications in academic journals on fashion and neuromarketing, as an integrative tool that allows the compilation of studies on the same topic, in order to establish a state of the art. This review is carried out in the Scopus and WOS databases, in Spanish and English, between 2000 and 2023. The objective is to study the neuromarketing tools that are best suited to this sector and to analyze how they have evolved, been used and integrated over the years. **Results:** Twenty-three results were found that matched the search, and for each one of them the authors studied the country where the research was carried out, the year of publication, the journal where the research was published, the neuromarketing tool applied, the results obtained, and where the manuscript focuses: on the company, on the consumer, on both or on neither of them. **Discussion:** Twenty-three results were found, of which only 12 were valid. The main

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cause of exclusion was the repetition of results in the two databases consulted. In these studies, not only the response of the consumer is observed, but fundamentally the response of the company and its perception. **Conclusions:** It is concluded that neuromarketing and consumer neuroscience tools, although scarce in the fashion industry, provide relevant and useful information and multidisciplinary groups are proposed to increase the scientific production applied to the case study.

Keywords:

neuromarketing; fashion; emotions; feelings; systematic review.

RESUMEN

Introducción: La moda es un sector que en todo momento apela a las emociones y sensaciones del individuo, debido a sus implicaciones sociales. En este sentido, el neuromarketing se convierte en una herramienta muy valiosa para estudiar las diferentes reacciones de los públicos a la hora de exponerse a ella. Las diferentes herramientas que se aplican en neuromarketing ponen de manifiesto las emociones que el individuo siente cuando compra, toca o simplemente mira un producto de moda con el que se siente identificado. **Metodología:** La presente investigación pretende hacer una revisión sistemática de las publicaciones realizadas en revistas académicas sobre moda y neuromarketing, como herramienta integrativa que permite recopilar los estudios sobre un mismo tema, con la finalidad de establecer un estado de la cuestión. Dicha revisión se llevará a cabo en las bases de datos Scopus y WOS, en los idiomas español e inglés, y entre los años 2000 y 2023. Su objetivo es estudiar las herramientas de neuromarketing que mejor se adaptan a este sector y analizar cómo ha sido su evolución, utilización e integración a lo largo de los años. **Resultados:** Se han encontrado 23 resultados que coinciden con la búsqueda y de cada uno de ellos se ha estudiado el país donde se desarrolla la investigación, el año de publicación, la revista donde se inserta dicha investigación, la herramienta de neuromarketing aplicada, los resultados obtenidos, así cómo y dónde pone el foco el manuscrito: en la empresa, en el consumidor, en ambos o en ninguno de ellos. **Discusión:** Se encontraron 23 resultados de los cuáles tan sólo 12 fueron válidos. La principal causa de exclusión ha sido la repetición de los resultados en las dos bases de datos consultadas. En estos estudios se observa la respuesta no solo del consumidor sino fundamentalmente de la empresa y su percepción. **Conclusiones:** Se concluye que las herramientas de neuromarketing y neurociencias del consumidor, aunque escasas en el sector de la moda, aportan información relevante y útil y se proponen grupos multidisciplinares para aumentar la producción científica aplicada al caso de estudio.

Palabras clave:

neuromarketing; moda; emociones; sensaciones; revisión sistemática.

1. INTRODUCTION

The 21st century has brought numerous changes to the way in which brands have configured their communication and advertising, seeing its maximum expression in advertising agencies that have gone from content creators to storytellers with the digital transformation (Hernández, 2021). In this sense, companies have evolved in the same way as their consumers have (Pérez, 2017). Addressing a passive audience is part of the past, the consumer is now a prosumer who interacts with the company that offers a product and service (Bellón, 2012). Likewise, the 21st century consumer wants to

experience, feel and decide their purchase based on the experiences provided by the brand, even more so in fashion companies (Valderrama et al., 2020).

Far away is that perception of fashion as a merely functional sector (Paz, 2016). Since the Middle Ages, fashion has been acquiring a specific meaning that has served as a social communication tool for those who wore one fashion or another, becoming considered an art in which collaborations of fashion designers with fine artists and the artistic organization were established (Muzzarelli, 2013).

This evolution of the fashion sector, also associated with the change that all brands have experienced due to the evolution of communication and the sales process of fashion companies, has contributed to design processes and research that emotionally involve the consumer (Bovone, 2018; Fortes, 2020; Valderrama et al., 2020), since fashion is a sector deeply linked to consumer emotions (Llovet, 2016). From its beginnings, fashion is structured as an expressive system, which as defined by Barthes and Roche (2003) becomes a second-degree language that communicates beyond the merely apparent.

The fashion product is a visible element and, as such, sensory. It also has an emotional function, insofar as it allows to satisfy the desires of the person who uses it and allows him to express his own identity and values through it (Kim and Lee, 2013).

On the other hand, it has an important social impact, since its use allows individuals to present themselves in one way or another in front of others. In this sense, it is important to note that fashion plays a very important role both in the construction of personal identity (Matthews et al., 2021) and in the sense of belonging to a particular social group (Tseïlon, 1992), especially in young individuals (McNeill and Venter, 2019). Because of this social role, fashion enables the creation of a strong sense of community that sometimes impacts the consumption of particular brands in the sector (Burnasheva et al., 2019). Similarly, the promotion of certain products by influencers or brand ambassadors encourages increased purchasing by individuals who either identify with the way of life presented by these, or wish to get to the same level (Gordillo and Sanz, 2020).

Similarly, it is important to highlight the role of emotions and sensitivity in the shopping experience itself, whether it is the distribution of the physical space in which the products are presented to the consumer or the attention of the staff at the point of sale. When point-of-sale marketing appeals directly to the consumer's emotions, especially visually, it generates a positive consumer response (Kim and Lee, 2013). Moreover, the visual image and the feelings it generates are of particular importance to encourage emotional purchases, i.e., impulse purchases (Elguera, 2017).

For all these reasons, recent fashion marketing trends have focused on the use of techniques centered on appealing to the consumer's feelings and emotions. In this regard, two major trends in the sector should be highlighted: sensory marketing and experiential marketing. In the first case, its techniques make it possible to improve the shopping experience by appealing to the senses at the point of sale: if the store has a pleasant temperature, smells good, or has a visually appealing color palette, the consumer will buy more (de Garcillán, 2015; Marín and Gómez, 2022). On the other hand, experiential marketing seeks to create holistic experiences for the consumer (Schmitt, 1999), combining "sensory (emotions), affective (feelings) and cognitive-creative (thoughts) experiences, physical and lifestyle experiences (performances) and experiences of social identification with a reference group or culture (relationships)" (de Garcillán, 2015, 474). Both techniques are based on the idea that emotions play an important role in decision

making (Lindstrom, 2008) and that, consequently, appealing to them can increase sales and create greater engagement between consumers and brands.

Neuromarketing is a recent interdisciplinary field of study that began to have scientific impact in 2005 (Paz et al., 2023). This discipline results from the combination of marketing and neuroscience applied to consumer emotion in the buying process (Coca, 2010). In this sense, it could be said that the field of study of neuromarketing or consumer neuroscience is responsible for analyzing the consumer's buying process, and whether or not consumers respond to the sales stimuli provided.

Since consumer neuroscience or neuromarketing investigates different parameters and the resulting responses to the consumer's neural stimuli, it is appropriate to investigate how feelings and emotions do or do not modify purchasing decisions. Neuromarketing is the scientific discipline capable of providing reliable empirical data since it offers information on the neural processes that occur during the purchasing process. All this provides the company with accurate information to plan and rethink its strategy in order to achieve its objectives in a social context in which the user wants and seeks experiences which are also shared with his community.

According to Lindstrom (2008), more than 85 percent of purchasing decisions are made unconsciously. The time it takes to decide whether or not to purchase a good or service is less than 3 seconds, with the greatest weight of decision falling on emotion and not on reason.

The relationship between neuromarketing and fashion is based on the knowledge of brain behavior that provides the tools of consumer neuroscience to know their preferences. This information is essential for the retail sector. From the moment a scientific discipline is able to measure the cognitive and emotional responses that result from visual impacts, fashion, which is an industry based on image, takes advantage of this to get to know its public exhaustively and thus work with a clear and effective business sales strategy.

In this sense, and applied to fashion companies, it is worth highlighting how the perception and purchase decision of the fast fashion consumer changes when knowing the impact of fast fashion on the environment and the sustainability of ecosystems (Hamelin and Chaudhary, 2023). Marko and Kusa (2023) analyze this problem faced by fast fashion through neuromarketing tools in which they conclude a loyalty to the brand itself through eco-friendly collections.

However, this process of experience and neurophysiological responses applied to sales also points to pupil dilation and postural differentiation as an indicator of purchase decision as another tool to be analyzed as neuromarketing applied to retail (Ramsøy et al., 2017).

To get to know how purchase processes are influenced, neuromarketing tools are applied confirming how the generative method of designs proposed by Wang et al. (2020) would improve communication between fashion designers and their customers.

Likewise, other tools used in neuromarketing and consumer neuroscience such as the analysis of senses marketing applied to the fashion sector have demonstrated the relationship between the positive influence of senses such as smell and hearing in the purchase decision in contexts of physical fashion store retailers (Straehle and Keibel, 2018; Martín and Majós, 2021). However, in online store and metaverse contexts, in which

digital marketing tools predominate, the application of the senses interrelated with neuromarketing lost touch and sensory experience and the impact of the tools of this discipline could not be measured in an e-commerce context (Marín and Gómez, 2021). However, other authors such as Moya and García (2022) and Sharma and Bansal (2023) have shown in their research how the neurophysiological responses of consumers to different product visualizations in e-commerce and the possibilities of information and real experience of the virtual world offer a greater emotional value since the consumer experienced what the product would be like in use.

It should be noted that fashion, understood as a form of expression and emotion, is developed from sensory and emotional experiences to capture the customer's attention.

Fashion is a sector intimately linked to individual aspects such as personality or character and not only purchasing power and social class to which one belongs. Taking into account the purchase decision time referred to by Lindstrom (2008), it is interesting to reflect on the possibilities offered by neuromarketing to achieve successful strategies in a saturated and competitive market in which companies, including fashion companies, currently coexist. Emotional aspects (Portela López and Rodríguez Monroy, 2023) are also basic to understand purchase motives, often exploited by influencers (Velasco Molpeceres, 2021; Fernández De Bordóns and Niño González, 2021; Guerrero Navarro et al., 2022;) or point-of-sale (POS) promotion (Marín Dueñas and Gómez-Carmona, 2021). Political messages based on emotionality deserve special mention (Fernández Holgado et al., 2022).

The ability to measure and analyze specific responses to sensory stimuli offers an unimaginable field of possibilities that allows specific strategies to be launched. These, in turn, can be measured and analyzed to know the real impact on the purchase decision, anticipating the success or failure of the retail brand in the sale, either in physical store or e-commerce. Fashion assumes that advertising as it has developed until the beginning of the 21st century has given way to a commercial communication that is characterized by experiences, senses and multichannel, offering a value that the consumer takes into account for his purchase decision even with new and unknown products for him (Baldo et al., 2015; Valderrama et al., 2020; Juárez et al., 2023; Barrientos-Báez et al., 2017, 2019, 2022).

2. OBJECTIVES

The main objective of this paper is to systematize the main research on the relationship between neuromarketing and fashion, in order to describe the state of the art about its main sensory implications. Its ultimate purpose is to show which are the different neuromarketing tools and techniques that are best suited to the fashion industry, how and where they have been applied, and whether they can be consolidated in the future as research tools for this sector.

3. METHODOLOGY

A systematic review is a methodological tool where all the information generated by research on a given topic or question is compiled. They provide a complete and unbiased synthesis of several relevant studies in a single document using rigorous and transparent methods. It uses systematic and explicit methods, which are chosen in order to minimize bias, thus providing more reliable results from which conclusions can be drawn and decisions can be made.

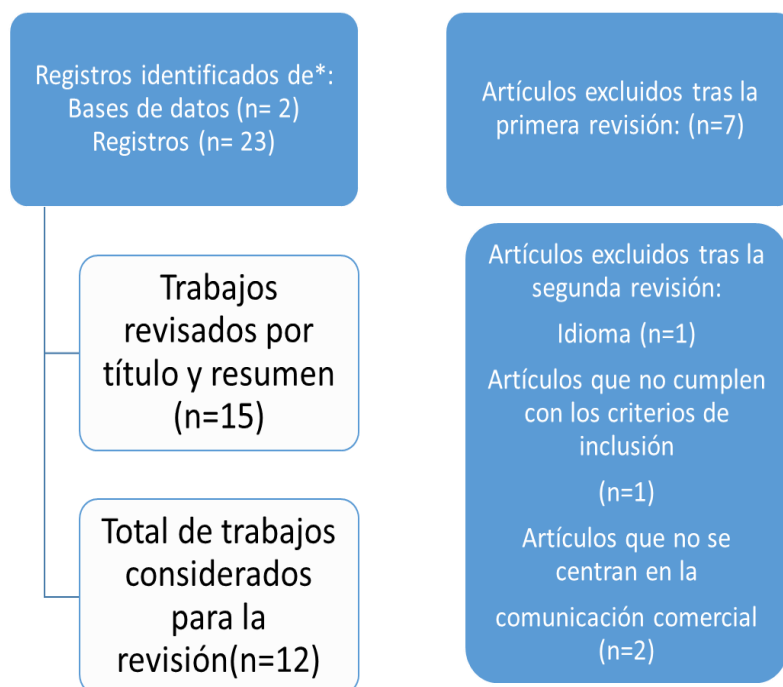
The systematic review has been used previously by various researchers (Aguilera Eguía, 2014; Fernández-Gómez et al., 2023; Hidalgo Marí et al., 2023) and has been shown to be

a valid tool for the detailed study of a subject. It has been carried out using keywords as the unit of analysis, on which a co-occurrence test was performed when the elements appear together in the same document, making it possible to identify the basic themes and to show the cognitive and conceptual aspects of a scientific field. After normalization of the network and application of statistical techniques, different groups are obtained whose nodes (keywords) are strongly linked to each other (clusters) and weakly linked to the rest.

In this case, a search was made in November 2023 for the concepts “Fashion” and “Neuromarketing” in the Scopus and WOS databases, chosen for their relevance and multidisciplinary. The results obtained in English and Spanish published between January 2010 and November 2023 were taken into account.

The review was carried out according to the PRISMA model (Page et al., 2020) as shown in Figure 1:

Figure 1. Graphical representation of the Applied Prism Model.



Source: Elaborated by the authors.

Table 1 shows the variables analyzed for the twelve records:

Table 1. *Table of data and variables analyzed.*

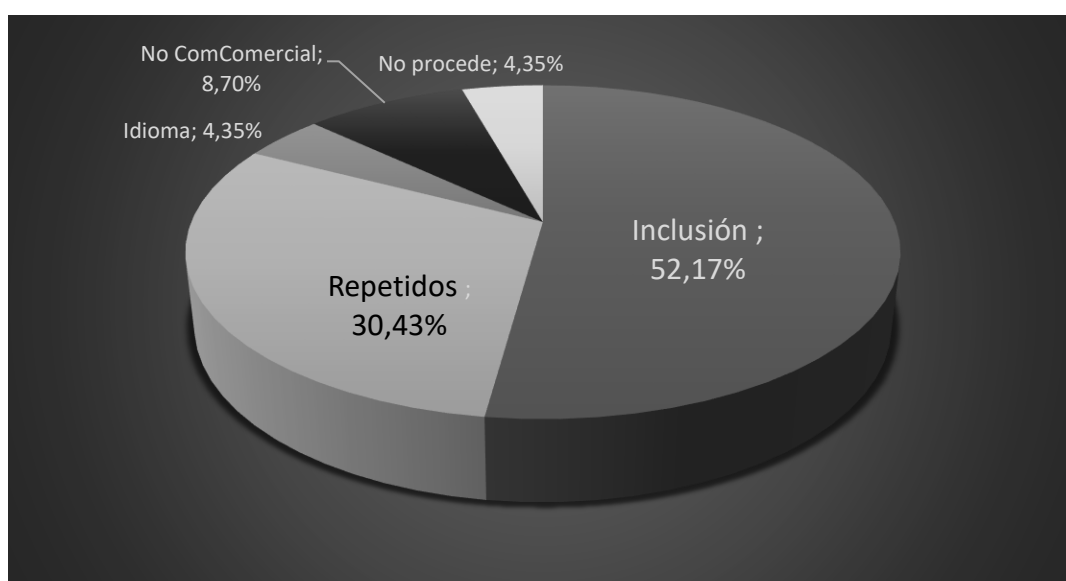
ID	TÍTULO	REFERENCIA COMPLETA (APA 7ª)	ABSTRACT	INCLUSIÓN	
				0. Inclusión	
				1. Repetidos	
				2. Idioma (inglés o español)	
				3. Sin abstract	
				4. No es un artículo empírico (cartas al editor, ponencia, etc)	
				5. Mencionan la comunicación de forma tangencial	
				6. No es comunicación comercial	
				7. No procede (no cumple con los criterios de inclusión)	
				8. Menciona la sostenibilidad de forma tangencial	
				9. Mencionan la moda de forma tangencial	
DIGITAL	METODOLOGÍA	HERRAMIENTA	HERRAMIENTA		
Sí	Cuantitativa	Estudio de caso	Estudio de caso		
No	Cualitativa	Análisis de contenido	Análisis de contenido		
No especifica	Mixta (cuando existen ambas)	Encuesta	Encuesta		
	Neuromarketing	Entrevista	Entrevista		
	No se especifica	Focus group	Focus group		
		Experimento	Experimento		
		Herramientas de neuromarketing	Herramientas de neuromarketing		
		Revisión sistemática	Revisión sistemática		
		Otras	Otras		
		No procede, únicamente utiliza una herramienta	No procede, únicamente utiliza una herramienta		
TIPO DE PUBLICACIÓN	PAÍS (área geográfica)	RESPONSABLE	AÑO	REVISTA	PRINCIPALES CONCLUSIONES
Libro		CC			
Capítulo de libro		CP			
Revista académica		BM			

Source: Elaborated by the authors.

4. RESULTS AND DISCUSSION

Once the search was performed, 23 results were found, of which only 12 were valid. The main cause of exclusion was the repetition of results in the two databases consulted. Figure 2 shows the papers included or excluded in percentages.

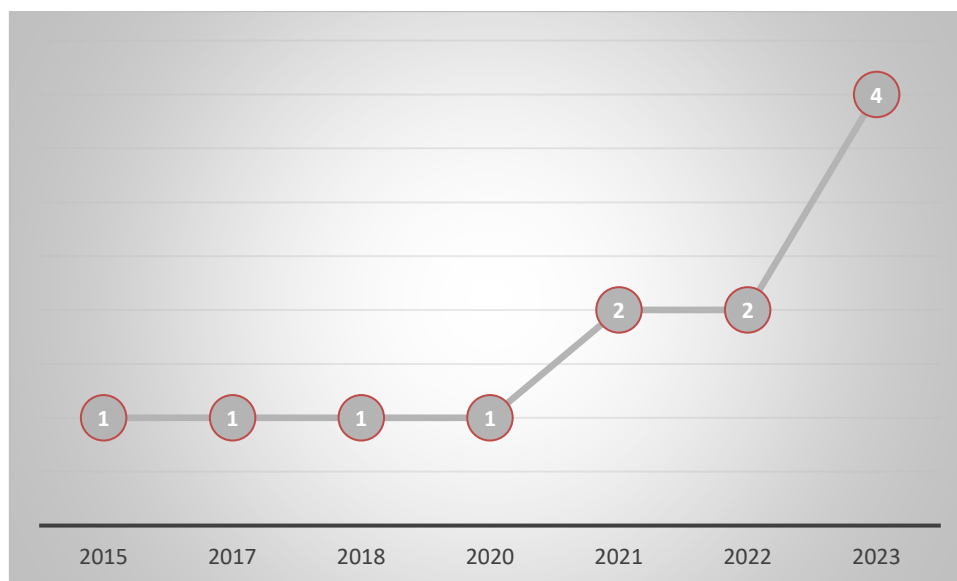
Figure 2. *Inclusion and exclusion criteria applied.*



Source: Elaborated by the authors.

Next, the years of publication of each of the selected items were studied. These results can be seen in Figure 3. This figure shows a timeline showing the upward trend of impact publications during the years 2021,2022,2023:

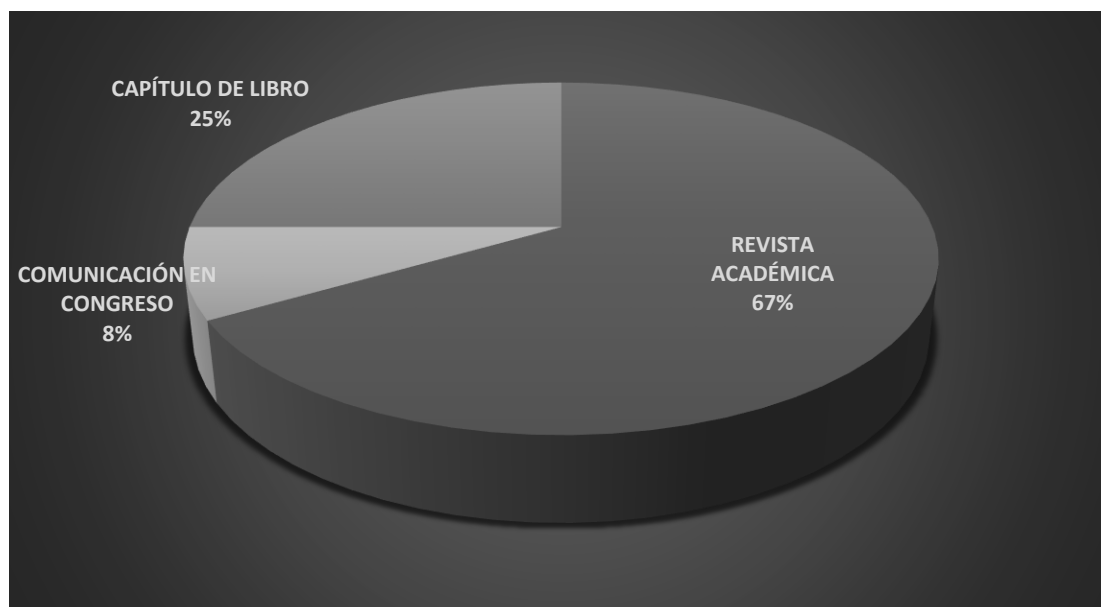
Figure 3. *Evolution of the number of publications per year.*



Source: Elaborated by the authors.

The works included in this research have been published in book chapters, academic journals or have been presented in scientific congresses as communications. The percentages of each of the categories can be seen in Figure 4 below:

Figure 4. *Type of publication in which the work is included.*



Source: Elaborated by the authors.

Of the eight articles published in indexed journals, three of them are published in the journal Vivat Academia and the remaining five in: Journal of Creating Value (of the SAGE group), Journal of Business Research, Communication Today, Journal of Neuroscience,

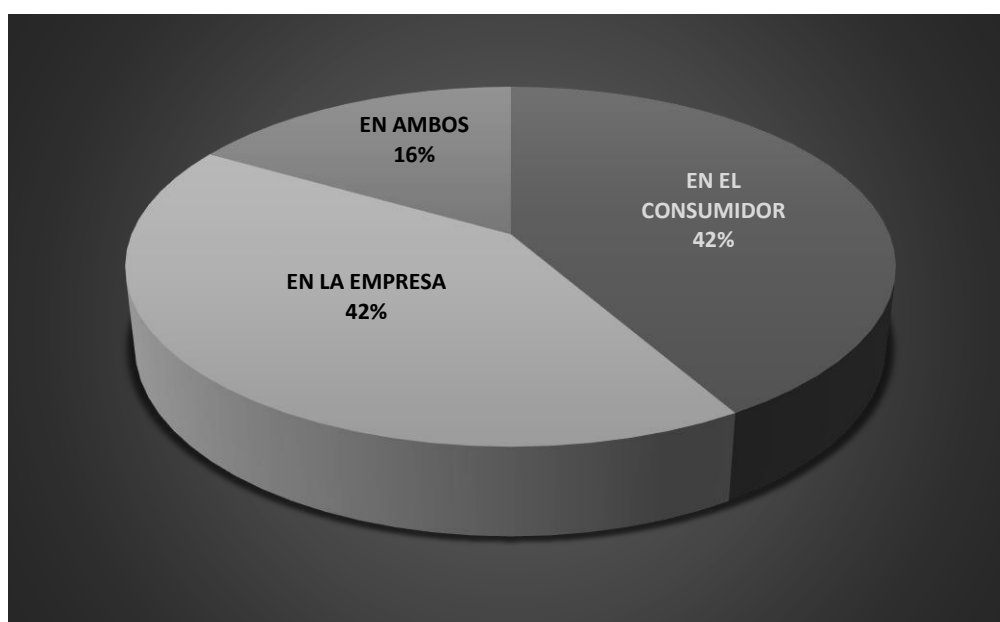
Psychology, and Economics and Design Science. Therefore, it can be seen that only one Spanish journal includes publications of this type. Accordingly, only the Spanish authors Marín and Gómez (2021 and 2022) consolidate the line of research with two publications in the same journal.

With respect to the methodology applied, the results obtained confirm that, of the twelve studies included in the research, only seven of them use neuromarketing methodology and tools, although always combined with others, whether quantitative or qualitative. With this data we are in a position to confirm that neuromarketing needs other traditional methodologies and tools to refute its results (Varón-Sandoval et al., 2023). Therefore, these studies use a mixed methodological approach, combining neuromarketing methods and tools, with surveys (three studies), interviews and experiments (two studies) and combined with other neuromarketing techniques (two studies).

The neuromarketing tools used in these seven cases were electroencephalogram, galvanic skin response and facial code.

Regarding the focus of the studies, the results confirm that there are as many studies focused on the consumer as on the company and its perception.

Figure 5. *Research focus.*



Source: Elaborated by the authors.

Regarding the use of digital media for research, it does not seem to be used as a common tool, since, of the twelve texts, only three state that they are used for their analysis.

The places where the research carried out is located show a great geographical dispersion, since only Spain is the only country that repeats itself on two occasions. In Europe, they are Spain, Portugal, Slovakia, Germany and Copenhagen; another survey was reported for the Australian market, another for the Chinese market and another for India.

The results obtained can be grouped into four major blocks: consumer behavior, concern for sustainability, the study of sensory marketing and the metaverse.

With respect to consumer behavior, it is found that neuromarketing emerges as a key tool for footwear brands, allowing them not only to increase their profits, but also to build customer loyalty and improve their brand image. These benefits are not limited exclusively to the footwear sector but extend to other products within the fashion industry. The application of these tools provides companies with the ability to create products with guaranteed success and improve shopping experiences, thus marking a significant change in the way they connect with their consumers (Baldo et al., 2015) In this line on the shopping experience and process, Juárez-Varón et al. (2023) confirm that touching products, smelling them, experimenting with colors and talking to employees are fundamental stimuli that are introduced at key moments at an emotional level and right there, when purchase decisions are accelerated and can affect the final behavior of the consumer. This data proves to be very valuable when designing shopping environments and orienting communication to the emotional aspects that occur in physical stores.

Marko and Kusá (2023), denounce the distrust of consumers towards information related to the ecological issue, including existing sustainable certifications, which directly affects the misleading perception of advertising and highlights the importance of transparency and authenticity in marketing strategies. And this distrust goes in line with an increased awareness and decreased purchase intention on non-sustainable products (Hamelin and Chaudhary, 2023), which are also perceived as lower quality, thus becoming a primary element for the sector.

With respect to what these studies conclude about sensory marketing, Marín Dueñas and Gómez Carmona (2021 and 2022), who study this aspect in Inditex, Zara and Stradivarius stores, corroborate that those techniques used actively show a positive impact on the shopping experience, building a more pleasant and memorable experience, although they do not directly influence the purchase decision. For Straehle and Keibel (2018), music used in marketing actions provokes positive emotional stimuli in the consumer, influencing in a powerful way the perception, identity and memory of a brand, so it becomes a powerful tool to create emotional relationships with its customers. However, according to Martín and Majós (2021), this same positive impact needs more research in Spain with respect to olfactory marketing. Another aspect to study is the display format of advertising stimuli (Moya and García-Madariaga, 2022) and its importance in designing emotionally positive experiences for the consumer.

As a current trend of study, Sharma and Bansal (2023) study the implications of the metaverse and analyze its approaches and challenges on ethics, security and privacy in product marketing. They propose that, as a new society takes shape, all its terms must be redefined to understand and connect with this emerging generation, foreshadowing a great cultural evolution.

5. CONCLUSIONS, RECOMMENDATIONS AND FUTURE RESEARCH

In the fashion industry, the in-store experience and digital tools that influence the purchase decision process coexist, so it is concluded that the study of neuromarketing tools or consumer neuroscience applied to the sales strategy is justified. Moreover, this study stands out for its attempt to address a topic of growing interest within the field of marketing and fashion, recognizing the importance of emotions and sensory reactions in the purchase decision making process. In this sense, this work presents a solid foundation for exploring the intersection between neuromarketing and the fashion industry. However, it is important to emphasize that the neuromarketing tools highlighted in this

paper as instruments for future developments should always be applied in an ethical manner, prioritizing transparency and sustainability, which are fundamental values for consumers.

In relation to some particularities of the study presented in these pages, this research describes thematic lines, tools and current patterns of research in the area, which is of great interest and opens avenues of analysis in the configuration of future lines of research in this field. It is, therefore, a study of an essentially descriptive nature on the production of knowledge in the area, characterized by the most relevant articles selected as a corpus of study. In this sense, it should be noted that future lines of research in this area, and the systematic and bibliometric reviews that will support them in the future, could be aimed at identifying the evolution of the area, its research networks, which gaps they cover or in which dissemination media they have more presence, venturing into a more critical analysis and a deeper interpretation of the results outlined here. Since the current discussion tends to focus more on the description of observed and current trends in the topic of study under consideration, future lines of research could delve into the theoretical and/or practical implications of these findings through a more analytical approach, allowing not only to identify the key contributions of the research reviewed, but also the limitations, gaps and opportunities for future research in the field of neuromarketing and fashion.

The systematic literature review presented in these pages focuses on articles from the Scopus and WOS databases, which in principle are suitable for consolidating and analyzing existing research related to the topics presented here. In this sense, although only high impact articles are considered in this research, the execution of this methodology and the depth of the analysis with other types of databases and materials could provide relevant information for the advancement, both theoretical and practical, of the discipline.

In this same line of analysis on the opportunities for the development of future research on this topic of study, one of the main challenges arising from this work is oriented towards the representativeness and scope of the systematic review of the literature carried out herein. The current selection of a relatively limited number of valid studies suggests a possible restriction in the spectrum of research considered; therefore, as future research proposals, the expansion of the search for research in other relevant databases and disciplinary fields that converge at the intersection between psychology, social sciences and fashion studies in general -for example- could significantly enrich the analysis, providing a more holistic and diverse view of the field of study presented here.

Sensory marketing in fashion refers not only to sight and touch, but also to other unconscious stimuli of the consumer, such as hearing through sounds and music, or smell, with different scents. All these stimuli, together with the experience offered by the metaverse and other possibilities of the digital sphere, such as audiovisual productions, augmented reality or online experience, present fashion brands with exciting opportunities and challenges in a new era of communication marked by the need to understand consumers' emotions, transparency and the rapid adaptation of brands to changes in the new communication ecosystem. In this sense, it is essential for fashion companies to investigate how all stimuli influence the buying process, both physically and digitally. Creating new shopping experiences in the virtual environment, taking advantage of the rise of the metaverse, will allow fashion brands to position themselves differently in a competitive and constantly changing market. Similarly, it would be interesting to encourage collaboration between consumers and designers of fashion products, as it

would allow them to better understand the interests of the former and create products and experiences that would generate greater brand loyalty that would be maintained over time.

However, this study reveals that there is little research linking neuromarketing and fashion. Nevertheless, the existing studies obtain very binding results. Moreover, these analyses are not very transversal and are very oriented to neuromarketing techniques or to experience and theory of communication and marketing. In this sense, it is proposed to establish mixed working groups with multidisciplinary teams, integrating experts in neuroscience, neuromarketing and consumer psychology, to promote and legitimize applied research in the fashion sector: the proposal of multidisciplinary and collaborative approaches based on the contributions of different perspectives could undoubtedly highlight the applied value of the study outlined here and promote significant advances in this area, as lines of future development. Thus, an opportunity for development consists of advancing in future work that will allow us to delve into more specific fields of application of the lines of research described above, or others that may arise in tangential areas of knowledge.

The lines of research that emerge from this study present several opportunities for scholars who analyze the fundamentals of communication in the field of fashion. Among others, some of these lines will probably focus on: 1) expanding the academic corpus of the topics described here; 2) analyzing the relevance of the findings reached on advertising and communicational decision makers; 3) examining the implications for practitioners and companies through tools involved in business and communicational decision-making processes; and 4) fostering the relationship between academic research and organizational and business practice in the fashion industry. In this way, this field could be further developed to neuroscience in general and not only to neuromarketing and its tools, which have clearly demonstrated how they are linked to the sensory experience of the consumer in the fashion industry, whether fast fashion, sustainable, high fashion or luxury.

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