Revista Turismo & Desenvolvimento | n.º 47 | 2024 | [254 - 270]

DOI 10.34624/rtd.v47i0.38709

e-ISSN 2182-1453

Affective and behavioural reactions in a cheese-tasting experience: **Segmentations** according to gender, generation and familiarity

Reações emocionais e comportamentais numa experiência de degustação de queijo: **Segmentações** em função do género, geração e da familiaridade

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Abstract | This paper aims to address the evaluation of the application of sensory elements in the development of gastronomic tourism experiences. Gastronomic tourism experiences are, by nature, multisensory and immersive. However, in order to motivate and increase the effectiveness and emotionality of these experiences, managers and entrepreneurs must include more sensory stimuli in the environment to stimulate the senses and thus improve the affective and behavioral response of the tourists. This study analyses the different affective and behavioural responses of diverse marketing segments when exposed to visual, olfactory and auditory stimuli in a cheese-tasting experience. To this end, an experimental multi-methodological of a simulated tourism experience was conducted. Galvanic skin response was analysed for implicit emotional information and emotional and intentional was measured through a questionnaire. The results show the relevance of the application of music in gastronomic experiences; and generational and gender trends in the choice and intentions according to sensory stimuli and product-experience responses. This is a topic of great

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relevance in tourism development, as it has specific implications for the enjoyment and design of such experiences.

Keywords | tourism marketing, food experience, emotion, gender, generation

Resumo | Este artigo tem como objetivo abordar a avaliação da aplicação de elementos sensoriais no desenvolvimento de experiências de turismo gastronómico. As experiências de turismo gastronómico são, por natureza, multissensoriais e imersivas. No entanto, para motivar e aumentar a eficácia e a emotividade destas experiências, os gestores e empresários devem incluir mais estímulos sensoriais no ambiente para estimular os sentidos, e assim melhorar a resposta afetiva e comportamental dos turistas. Este estudo analisa as diferentes respostas afetivas e comportamentais de diversos segmentos de marketing quando expostos a estímulos visuais, olfativos e auditivos numa experiência de degustação de queijo. Para o efeito, foi realizado um estudo experimental multimetodológico de uma experiência turística simulada. A resposta galvânica da pele foi utilizada para obter informações emocionais implícitas e a resposta emocional e intencional foi medida através de um questionário. Os resultados mostram a relevância da aplicação da música em experiências gastronómicas; e tendências geracionais e de género na escolha e intenções de acordo com estímulos sensoriais e respostas produto-experiência. Trata-se de um tema de grande relevância no desenvolvimento do turismo, pois tem implicações específicas na fruição e no desenho de tais experiências.

Palavras-chave | marketing turístico, experiência gastronómica, emoção, género, geração

1. Introduction

The development of experiences in tourism economies is essential for being adapted to the new trends in tourism consumption (Kandampully et al., 2022). Experiences are understood as authentic and immersive services, trying to add value in all the stages of the enjoyment journey of tourists (Williams et al., 2019). Different stakeholders, including destination marketing organizations, managers, and businesses should face these new tendencies improving the tourism offer (Bastiaansen et al., 2018). Some of the advices and implications

that they should follow for the creation of experiences are in line with the inclusion of affective elements in the services' encounters (Bastiaansen et al., 2018; Muskat et al., 2023). Emotions, feelings and affective elements are the main pillar of experiences, and sensory stimuli application is one of the most effective elements for arousing them (Agapito, 2020; Muskat et al., 2023).

Gastronomic tourism is the most relevant tourism typology that has been developed and studied in terms of the application of sensory elements (Agapito, 2020). Furthermore, academic research of these sensory stimuli application has generated relevant implications in the design and development of gastronomic tourism experiences (Moreno-Lobato et al., 2023; Spence & Youssef, 2019). Emotional researchers highlight the importance and increasing interest of developing future studies in terms of gastronomy and culinary experiences as a relevant research line in tourism and sensory marketing scopes (Agapito, 2020; Volo, 2021).

With the aim of improving the knowledge of the application of these sensory marketing tools, this research has the main objective to evaluate the affective and intentional reactions toward a gastronomic tourism experience enhanced with sensory stimuli and to consider the differences in the market segments. This study is framed within the psychological foundations of environmental psychology and the economic development of experiential and sensory marketing. Therefore, the research question is: how does the inclusion of visual, olfactory, and auditory elements affect the affective and behavioural assessment of gastronomic tourism experiences?

This study tries to approach an analysis of the affection and intentional behaviours of potential tourists when they are exposed to three complementary sensory stimuli, as visual, olfactory, and auditory, during a cheese-based tasting experience. These senses are related to the creation of environment and can add value to the taste application in a gastronomic experience. It takes into account the differences among the gender, generation, and familiarity segments of the sample. Through a multimethodological approach, an in-lab experiment was conducted, and implicit and explicit data was collected using an electrodermal data acquisition tool and paper-and-pencil questionnaires.

2. Theoretical framework

Different authors evaluate the decision-making process through the Stimulus-Organism-Response Model by Mehrabian & Russell (1974) in the environmental psychology field,

because it has the capacity of explaining the tourists' behaviour process (Le et al., 2018; Moreno-Lobato et al., 2023; Şahin & Kılıçlar, 2022). This model reflects this process in three steps: stimulus, related to the elements designed and included for triggering responses; organism, based on the reactions that a tourist has when facing a stimulus; and responses, which refers to the elections and intentions arising from this assessment (Mehrabian & Russell, 1974). A positive approach is followed, based on environmental psychology basis, so only positive reactions and behaviours are analysed because of the hedonic nature of tourism services (Le et al., 2018; Tuerlan et al., 2021).

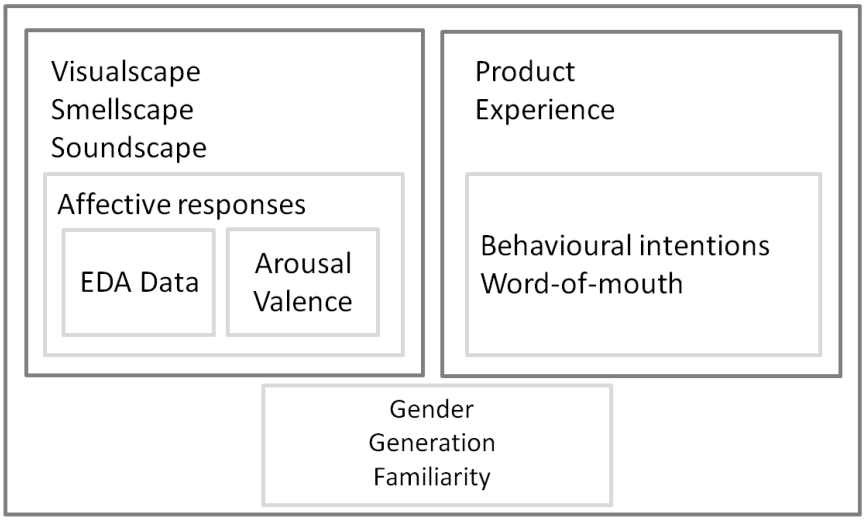

Figure 1. General research framework

Source: Own elaboration.

With these theoretical foundations, the study encompasses the analysis of emotions, feelings, and intentions in the field of gastronomic experiences, considering the differences in market responses according to different segmentations. Figure 1 shows the general model of the research.

2.1. Gastronomic experiences

Food-related activities are involved in our daily journey because eating is essential in the nutrition function, but gastronomic activities are not only referred to eating (Horng & Hsu, 2020; Okumus et al., 2018; Williams et al., 2019). Gastronomic, culinary or food activities can produce memorable, affective and immersive experiences (Hernández-Mogollón et al.,

2020; Şahin & Kılıçlar, 2022; Spence & Youssef, 2019). Therefore, tourism managers design them because consumers are increasingly interested in the development of experiences based on food (Di-Clemente et al., 2019).

Gastronomic tourism, also known as food tourism or culinary tourism, is conceptualized as all the services related with food and beverages that bring the culture of a destination closer to the tourists (Okumus et al., 2018). In terms of experienciality, gastronomic experiences involve a series of characteristics that make them especially interesting: the cultural attachment of the agro alimentary products, the multisensorial nature of culinary services, or the direct relationship with memories (Hernández-Mogollón et al., 2020; Şahin & Kılıçlar, 2022; Sthapit et al., 2020; Williams et al., 2019). In gastronomic experiences, all the senses are involved, especially the sense of taste, but the inclusion of controlled complementary sensory stimuli lead to specific affective reactions (Li et al., 2022; Okumus et al., 2018) and may allow driving consumers' future behaviours.

2.2. Sensory marketing

Different elements can affect the interpretation, evaluation, and behavioural intentions of a tourism experience. Based on the necessity of creating experiences in tourism, different elements can enhance and arouse emotions, but it is proved that physical elements are the most impactful marketing tool for creating aesthetic escapes and eliciting emotions (Bastiaansen et al., 2019; Horng & Hsu, 2020).

Escapes or environments have been defined as the elements designed to provoke emotions and can lead to specific behaviours and intentions (Kandampully et al., 2022; Moreno-Lobato et al., 2023). Sensory marketing develops the design and incorporation of sensory elements (sight, taste, touch, hearing and smell) in the creation of this escapes and environments around a service (Agapito, 2020). Although, traditionally, the focus has been on the visual elements, new trends highlight the relevance of applying different sensory elements to the tourism experiences, thus, different sensory-escapes are developed (smellscape, visualscape or soundscape) (Agapito, 2020; Urry, 2002). Multi-sensory stimuli make experiences' design more effective than a single-sensory environment (Le et al., 2018). The senses have been studied as the most direct triggers of organic emotional responses.

2.3. Emotions

Theoretically, affective responses can be divided in three types: subjective experience, based on the interpretation of the emotion; expressive behaviour, based on how one acts after an

emotion; and physiology, based on the bodily changes after a stimuli (Bastiaansen et al., 2019). This study tries to approach and understand these three types of affective responses.

First of all, emotions are defined as the physical and biological response to a specific situation depending on, i.e., the personal relevance of the situation or the surrounding environment (Bastiaansen et al., 2018; Volo, 2021). The evaluation of the autonomic nervous system allows understanding the physiological changes triggered by sensory stimuli. In this study, electrodermal activity was measured to obtain emotional arousal information (Caruelle et al., 2019). Moreover, the classical view of feelings is related and expressed in terms of arousal and valence, being the strength and the positivity, respectively. Arousal and valence are indicators capable of assessing the feeling reaction (Moreno-Lobato et al., 2021; Tuerlan et al., 2021; Volo, 2021). Both are examined in this study, trying to approach the affective process of tourists from an integrative way: implicit reactions through electrodermal activity and explicit reaction through questionnaires.

In terms of gastronomy experiences, tourism literature has underlined that gastro-emotions are unique (Şahin & Kılıçlar, 2022). Moreover, authors such as Bastiaansen et al. (2019) highlight the relevance of studying how emotions are related to the enjoyment and development of the experience, and Tuerlan et al. (2021) encourages to study the different affective eliciting processes, in different tourism contexts. Affective outcomes, moreover, have the capacity to generate outcomes in terms of behaviours or memories.

2.4. Behavioral intentions and Word-of-mouth

In terms of expressive behaviour, a series of studies confirm that emotional application can lead to cognitive results during an experience. The relationship between the affective responses and how it affects behaviours and intentions directly is an increasingly relevant issue (Bastiaansen et al., 2019; Şahin & Kılıçlar, 2022; Volo, 2021). Intentions in tourism literature have been conceptualized through a double-approach analysis, using behavioural intentions, but also word-of-mouth (WOM) and recommendation variables that include all facets in terms of tourism marketing results (Sahin & Kiliçlar, 2022).

Different authors faced the relevance of intentions, attitudes and WOM in gastronomic experiences through the dual analysis of the gastronomic experience itself and the involved agro alimentary product (Leri & Theodoridis, 2020; Moreno-Lobato et al., 2023). It can be explained by the relevance of the product in the experiential development of a gastronomic

tourism experience and the impact that these experiences have in the agro alimentary sector, being these tourism offers a promotional opportunity (Badu-Baiden et al., 2022; Hernández-Mogollón et al., 2020). Experientiality and tourism development, especially in the agri-food sector, therefore, produce positive results for complementary sectors.

2.5. Market segments differences

Studies confirm that there may be affective and behavioural differences according to various parameters of the sample such as age, gender, or familiarity.

Physiologically, Caruelle et al. (2019) discuss that age and gender can affect the electrodermal results because of biological differences. Cognitively, authors such as Williams et al. (2019) have developed a classification of gastro-tourists, also known as foodies, based on diverse themes that affect gastronomy tourism experiences through a qualitative method. In this way, specific segments have been analysed because of the increasing relevance of these markets. Balderas-Cejudo et al. (2019) analysed senior tourists as the priority market for gastronomic tourism, while some other researchers deal with the relevance of Gen Z behaviour in food experiences (Ding et al., 2022).

There is also research done on gender differences in the consumption of some specific tourism typologies (Quynh et al., 2021) and these issues need to be developed in various tourism typologies.

Finally, familiarity and knowledge about the agro-food product involved affect the assessment of an experience. This trend is explained, above all, by the concept “food neophobia”, related to the unpleasantness of new and non-known products (Badu-Baiden et al., 2022; Rita et al., 2023). Some authors highlight that higher familiarity levels could improve the behavioural results (Badu-Baiden & Kim, 2022), but some others do not confirm it (Rita et al., 2023), consequently there is no consensus in this issue. Familiarity is associated with cultural beliefs, so it is important to analyse it in specific cultural markets, i.e., food Asian studies that have increased in the last years (Okumus et al., 2018). On account of such, this study proposes to analyse the Spanish culture.

3. Methods

A multi-methodological study was conducted. This research comprises two different methods of analysis of tourists' reactions, developing a triangulation of the affective (implicit and explicit) results and intentional responses. This type of research protocols help to better understand the complex tourism decision-making process (Bastiaansen et al., 2019; Rita et al., 2023). A convenience snowball sampling technique was used to recruit the sample. First, demographic and consumption information, such as gender, age, cheese consumption preferences and frequency of consumption, have been gathered through a survey before the sample selection during the recruitment step.

Then, a controlled in-lab experiment was developed in April 2022 using biometric measuring tools for acquitting emotional information. A constant cheese-tasting experience was simulated, prompting participants with different complementary sensorial stimuli, with the aim of assessing the reactions to a multi-sensory gastronomic tasting. In addition to taste, three other senses have been involved: visual, olfactory, and auditory. In a three-step (one for each sense) experimental protocol, participants should taste a cheese-spoon while they were watching images referring to tasting experience development environments, smelling controlled odours congruent and incongruent with the product, and listening to two musical tracks. During the experiment, arousal information was measured through the RING by Bitbrain, a two-electrode sweat measurement device that records electrodermal reactions through the sweating data expressed in microsiemens (Caruelle et al., 2019). The information gathered by measuring the sweating levels is related to emotional arousal (Caruelle et al., 2019). For unifying this electrodermal information, galvanic skin response (GSR) Ratio, which is based on the range of emotional arousal according to the peaks and troughs of each participant's activity, was used (Caruelle et al., 2019).

After the experimental phase, participants were asked to answer another survey assessing the explicit feeling reactions, with a scale adapted from Bradley and Lang (1994), and behavioural intentions to the product and the experience, with items adapted from Walters et al. (2012), both in a 7-point Likert Scale.

The sample consisted of 55 participants who were Spanish and interested in gastronomic tourism and who liked cheese. The gender distribution was equitable, having 25 men and 30 women. In terms of age, the minimum was 22 years old, and the maximum was 67 years old. Participants were divided into generation segments. From the entire sample, a total of nine

people belong to the generation Baby Boomer (born from 1946 to 1964), 15 to Generation X (1965-1981) and 31 to Generation Y (1982-1999). In terms of cheese consumption frequency, six participants eat it two to three times a month, 15 eat cheese once or twice a week, 27 eat it more than two times a week and seven eat cheese every day.

4. Results

The results section is divided into descriptive results and segmentation results for implicit and explicit data collected. For descriptive results, mean data, standard deviation, maximums, and minimums are displayed. Differences among segments according to age, gender and consumption habits are explored using statistical analysis performed with SPSS 22. Some of the statistical analyses used were correlations and mean differences through ANOVA.

4.1. Descriptive results

From a descriptive perspective, Figure 2 shows that galvanic results, as implicit emotional measurement, displayed that music produces higher sweating responses (mean GSR= 0.38), followed by visual (mean GSR=0.23) and olfactory (mean GSR=0.12). Arousal data, as explicit measure showed that music arouses more feelings (mean=3.47) than olfactory (mean=3.25) and visual (mean=3.10). Valence information, related to the positivity of the feeling, revealed that music evokes more positive feelings (mean=4.02) than images (mean=3.82) or smells (mean=3.55).

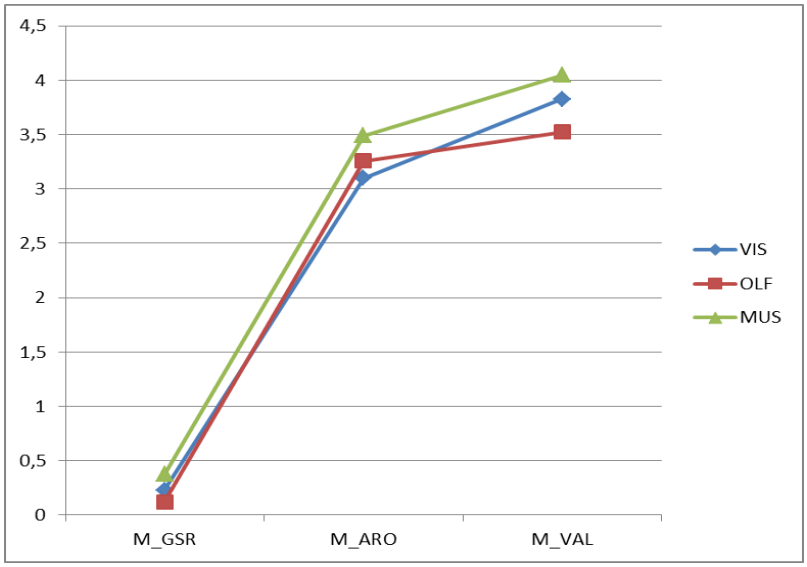

Figure 2. Mean data of each sensory stimulus

Source: Own elaboration. M_GSR: Mean GSR Ratio, M_ARO: Mean Arousal, M_VAL: Mean Valence, VIS: Visual, OLF: Olfactory, MUS: Musical

In terms of intentional and recommendation responses, explicit ratings show higher scores toward the gastronomic experience and product involved in both, behavioural intentions, and recommendation results. It is relevant to highlight that in terms of recommendation, the descriptive results show that the minimum score related to experience recommendation intentions is five points, which in a 7-point Likert scale is high (Table 1).

Table 1: Descriptive results of variables assessed.

Variables		N	Minimum	Maximum	Mean	SD*
VISUAL	GSR	55	0.06	6.10	0.23	0.80
	AROUSAL	55	2.10	4.40	3.10	0.59
	VALENCE	55	1.00	5.00	3.83	0.69
OLFACTORY	GSR	55	0.00	0.30	0.12	0.05
	AROUSAL	55	1.80	4.70	3.25	0.57
	VALENCE	55	1.38	5.00	3.52	0.73
MUSICAL	GSR	55	0.04	12.20	0.37	1.62
	AROUSAL	55	2.40	4.90	3.49	0.50
	VALENCE	55	1.00	5.00	4.04	0.72
EXP	BI EXP	55	2.40	7.00	5.81	0.97
	WOM EXP	55	5.00	7.00	6.37	0.77
PRO	BI PROD	55	2.60	7.00	5.71	1.08
	WOM PROD	55	3.00	7.00	6.31	0.92

Source: Own elaboration. BI: Behavioural intentions, WOM: Word-of-Mouth, EXP: Experience, PR: Products
*SD: Standard deviation

4.2. Segmentation results

From a descriptive point of view (Table 2), segments show differences in terms of mean emotional and intentional responses:

(i) Gender: Females score higher on all the affective and intentional variables, except for valence values, where males rate positive feeling higher.

(ii) Generations: Baby boomer, related to older participants, best assess all variables, with the exception of valence, that is higher rate by generation Y, the youngest group.

(iii) Familiarity: This segmentation helps to understand the affective-cognitive differences that a consumer can develop. While higher scores are related to 1-2 times a week consumers in terms of implicit results; cognitive and explicit responses are higher for regular consumers of the tasted product.

Table 2. Descriptive results by segmentation

Segments		N	GSR	AROUSAL	VALENCE	BI	WOM
GENDER	MEN	25	VIS: 0.11 OLF: 0.12 MUS: 0.15	VIS: 3.09 OLF: 3.12 MUS: 3.51	VIS: 3.90 OLF: 3.59 MUS: 3.99	EXP: 5.59 PR: 5.59	EXP: 6.09 PR: 6.06
	WOMEN	30	VIS: 0.33 OLF: 0.13 MUS: 0.56	VIS: 3.10 OLF: 3.37 MUS: 3.48	VIS: 3.77 OLF: 3.47 MUS: 4.09	EXP: 6.00 PR: 5.82	EXP: 6.60 PR: 6.52
AGE	BABY BOOMER	9	VIS: 0.78 OLF: 0.10 MUS: 1.47	VIS: 3.25 OLF: 3.27 MUS: 3.46	VIS: 3.92 OLF: 3.42 MUS: 4.06	EXP: 6.07 PR: 6.11	EXP: 6.74 PR: 6.78
	GEN. X	15	VIS: 0.13 OLF: 0.16 MUS: 0.20	VIS: 3.18 OLF: 3.15 MUS: 3.29	VIS: 3.90 OLF: 3.39 MUS: 3.87	EXP: 5.72 PR: 5.31	EXP: 6.13 PR: 5.96
	GEN. Y	31	VIS: 0.12 OLF: 0.11 MUS: 0.14	VIS: 3.02 OLF: 3.30 MUS: 3.60	VIS: 3.76 OLF: 3.62 MUS: 4.12	EXP: 5.78 PR: 5.80	EXP: 6.38 PR: 6.35
FAMILIARITY	2/3 MONTH	6	VIS: 0.10 OLF: 0.93 MUS: 0.14	VIS: 3.07 OLF: 3.18 MUS: 3.45	VIS: 3.46 OLF: 3.56 MUS: 3.46	EXP: 6.30 PR: 5.93	EXP: 6.50 PR: 6.39
	1/2 WEEK	15	VIS: 0.52 OLF: 0.12 MUS: 0.97	VIS: 3.05 OLF: 3.41 MUS: 3.46	VIS: 3.88 OLF: 3.70 MUS: 4.24	EXP: 5.92 PR: 5.56	EXP: 6.58 PR: 6.36
	+ 2 WEEK	27	VIS: 0.13 OLF: 0.12 MUS: 0.15	VIS: 3.11 OLF: 3.20 MUS: 3.58	VIS: 3.75 OLF: 3.42 MUS: 3.98	EXP: 5.65 PR: 5.55	EXP: 6.12 PR: 6.18
	EVERY DAY	7	VIS: 0.09 OLF: 0.14 MUS: 0.17	VIS: 3.20 OLF: 3.18 MUS: 3.23	VIS: 4.30 OLF: 3.50 MUS: 4.36	EXP: 5.80 PR: 6.51	EXP: 6.76 PR: 6.67

Source: Own elaboration.

Correlation analyses were developed in order to show the relationship between the different variables. Correlations allow understanding the relationship and the strenght of these relations. This type of statistical tests should be developed using scale data. For assessing the relationships between scale, ordinal and nominal data, non-parametric tests are used, in this case, the Spearman correlation test was applied to measure relationships between participants' segmentations and affective and intentional results.

In terms of demographic differences, gender could influence the perception of this multisensory gastronomic experience. Results show that differences in terms of gender are related to recommendation intentions. A Spearman correlation is developed to check the differences. Women are significantly more willing to recommend the experience and the product than men (WOM Experience=0.299; WOM Product=0.335), which was confirmed by an ANOVA analysis using gender as the factor (sig. WOM Experience=0.014; sig. WOM Product=0.068). There are no significant differences between genders in terms of affective reactions in visual, olfactory, and musical stimuli.

Concerning generation segmentations, implicit emotional results show differences. Through an ANOVA analysis using generation data as factor, olfactory results indicate that there are significant differences between generations in terms of galvanic data (Sig.=0.008). Also, musical applications lead to differences between generations in terms of electrodermal activity (Sig.=0.12). The same occurs with visual stimuli (Sig.=0.10).

In reference to the consumption tendencies, the cheese consumption frequency does not show differences in behavioural and recommendation behaviours or affective reactions. It means that familiarity with the product tasted has no significant effects on the assessment of a tourism tasting experience.

5. Conclusions

This paper sheds new lights on the implicit and explicit reactions of the gastronomic consumers during a tasting experience and tries to approach how the inclusion of sensorial elements affects reactions in different consumer segments. Multi-sensory environments designed during a gastronomic experience arouse implicit and explicit affective reactions and encourage behavioural and recommendation intentions.

As other studies confirm before, in this study, all the sensory stimuli applied (visual, olfactory and auditory) have results in the implicit emotional responses through the sweating

information, showing positive arousal results (Caruelle et al., 2019; Moreno-Lobato et al., 2023). Also, positive scores show the capacity of triggering explicit feelings through all sensory environments (musical, olfactive and visual) as arousal and valence mean scores show. But the nature of the senses provokes different reactions to each one. Even if some studies have highlighted the relevance of visualescapes in terms of pleasure for being the first and most familiar stimulus (Horng & Hsu, 2020), this familiarity can also affect the reaction responses in terms of emotionality because tourists are already very used to them. Furthermore, by nature, musical stimulus could be the most arousing sensory element, followed by the olfactory one (Agapito, 2020), and this study confirms it. Regarding marketing behavioural responses, intentions and WOM are positive for both, the experience itself and the involved food product, but the higher scores, in both variables, are related to the experience. It could be explained by the nature of gastro-tourists that lately started to look for experiences rather than product-oriented consumption (Di-Clemente et al., 2019).

In terms of gender and generations, a few differences in affective and intentional reactions are shown. When it comes to gender, women show significant differences in terms of recommendation of the experience and the product. According to previous studies, this may be explained by the gender roles associated with women, who are generally more open to sharing (Sun et al., 2019). Concerning the generation segments, implicit emotional differences in GSR could be explained by the biological characteristics of each age, since older participants are more emotional than younger ones in this case. There is no consensus of these trends yet, because different fields of application lead to different results (Boucsein et al., 2012). Instead, consumption tendencies and familiarity do not significantly affect the experience or product assessment, as some researchers have also confirmed (Rita et al., 2023).

It is important to highlight that, from a descriptive approach, explicit valence responses are the ones that show more different trends compared to the other variable trends in terms of segmentation differences. It could be associated with the cognitive and rationale nature of the valence variable. Arousal and electrodermal activity are highly interrelated, and intentions have an important relationship with the arousal information, but valence is not sufficiently proven as antecedent or consequence of emotional arousal. Different previous researches have shown discrepancies between arousal and valence results (Moreno-Lobato et al., 2023; Muskat et al., 2023).

A part of the implications of this study are related to the design of emotional gastronomic experiences, encouraging stakeholders and managers to include sensorial stimuli in their

gastronomic offer development, and considering the relevance of the results of each market and each sense.

Some of the limitations of the study come from ensuring the validity of the experimental development of the tasting because participants actually carry out a simulated tourist experience. Different reactions could appear when the development of the study is in a real environment. Besides, this research is carried out with Spanish participants and cultural characteristics could affect the final results (Rita et al., 2023). It would be advisable to increase the number of participants for greater generalisability of the results.

As future lines, cross-cultural studies could be interesting. Also, it could be relevant to take into account some other variables to be included in the theoretical model, such as: i) personal characteristics of the participants that can affect the affective and intentional assesment, i.e., goals, motivations or attitudes; ii) and result variables for understanding how sensory elements affect memory or quality of life.

Acknowledgements

This research is funded by the “Plan propio de iniciación a la investigación, desarrollo tecnológico e innovación 2022” of the Universidad de Extremadura (Acción II).

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