# Effects of consumer sensory perception on brand performance

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**Abstract**

**Purpose** – Sensory perception is an important factor to understand and effectively appeal to consumers. As consumers process information consciously and subconsciously, both perception levels (explicit and implicit) are essential to investigate. This paper aims to analyze the effects of explicit and implicit sensory perception on brand experience and brand-related performance indicators and then investigate the correlations between the senses and experience dimensions.

**Design/methodology/approach** – The authors conducted a field experiment in a coffee house. For data collection, the authors used a questionnaire for explicit measures and a response latency measurement for implicit measures. For data analysis, structural equation modeling and a correlation analysis were conducted.

**Findings** – The results reveal positive relationships between explicit and implicit sensory perception, brand experience and brand performance in the context of gastronomy. Furthermore, implicit perception acts through explicit perception, and brand experience plays a major role as a mediator between sensory perception and consumer responses. Moreover, visual and haptic perception reveal the highest weights in the structural model and the strongest correlations with the experience dimensions.

**Originality/value** – This paper contributes to consumer research by providing empirical evidence for the importance of both the explicit and implicit sensory perception to effectively appeal to consumers. The results give valuable insights on the effectiveness of sensory marketing in generating memorable brand experiences and positive brand performance. Furthermore, the findings provide new knowledge on which senses (explicit and implicit) are related to different types of experiences.

**Keywords** Consumer behavior, Consumer perception, Brand performance, Sensory perception, Brand experience, Gastronomy

**Paper type** Research paper



## Introduction

Given the continuous homogenization of products and services, it is critical for companies to differentiate themselves from competitors. Especially in the service industry, marketing researchers and practitioners have a significant interest in effectively managing service encounters to maximize the consumers' satisfaction and loyalty (Morrison and Crane, 2007). Although brand management has traditionally focused on physical and functional aspects, consumers now wish for brands that can provide them with unique experiences (Brakus *et al.*, 2014; Mascarenhas *et al.*, 2006). In this context, sensory marketing is increasingly gaining importance as a means to better appeal to the consumer. The service industry and especially gastronomy have a high potential to apply a holistic communication concept that takes all five senses (sight, hearing, touch, smell and taste) into account (Hui and Bateson, 1991; Brakus *et al.*, 2009). Through a coherent sensory marketing approach, gastronomy has the opportunity to create an overall experience that leads to positive consumer perception and favorable consumer behaviors (Wiedmann *et al.*, 2013; Turley and Milliman, 2000; Zeithaml, 1988). However, to manage sensory marketing effectively, it is essential to consider that sensory stimuli may be processed consciously and subconsciously (Friese *et al.*, 2006).

According to well-established literature on cognitive psychology (Kahneman, 2003; Neys, 2006; Sloman, 2002; Stanovich and West, 2002), the consumer processes information by two different systems. The implicit system usually processes subconscious stimuli and works automatically and effortlessly, whereas the explicit system generally captures conscious stimuli and operates controlled and deliberately. Both cognitive systems form the consumer's decision-making process. Thus, the consideration of only one system is not enough to fully understand the consumer. Therefore, the creation of a comprehensive multisensory marketing concept requires the combination of both the implicit and explicit systems.

Although there is an increasing interest in assessing consumers' implicit and explicit sensory perception, there is still a lack of empirical research. Prior research has already acknowledged the importance of both perception levels (Kahneman, 2003; Sloman, 2002); however, it has treated the relationships between sensory marketing and brand experience by still focusing on a conceptual level (Hultén, 2011; Joy and Sherry, 2003; Walter *et al.*, 2010). Hence,

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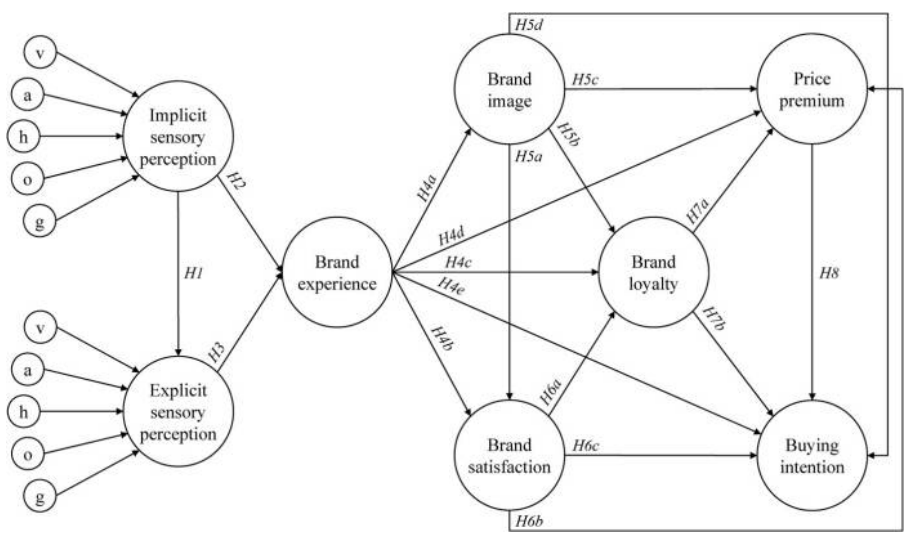
there is a knowledge gap with regard to the causal relationships between implicit and explicit sensory perception, brand experience and brand-related performance indicators (e.g. brand image, brand satisfaction, brand loyalty, price premium and buying intention). This paper presents a structural equation modeling analysis (for implicit and explicit sensory perception, brand experience and brand-related performance indicators) and a correlation analysis (for the five sensory perception dimensions and the four brand experience dimensions) for the given context of gastronomy. In this way, the authors provide three notable, novel contributions to the existing literature. First, the impact of implicit sensory perception on explicit sensory perception is empirically confirmed. Second, the effects of implicit and explicit sensory perception on brand experience are determined. Third, information on how the five senses (i.e. visual, acoustic, haptic, olfactory and gustatory perception) relate to the four brand experience dimensions (i.e. sensory, affective, behavioral and intellectual) are given. The results may provide a better understanding for brand managers (particularly in the context of gastronomy) about the effectiveness of sensory marketing communications in creating a memorable brand experience that further leads to positive brand perception and consumer behavior. Additionally, it emphasizes the importance of combining both implicit and explicit sensory stimuli to better appeal to consumers. The findings of the correlation analysis provide useful insights regarding which senses are related to different types of experiences, which marketing managers may use for the creation of such brand experiences.

Regarding the structure of the paper, first, the conceptual model and related hypotheses are presented based on existing research. Second, the methodology and results of the empirical study that includes the partial least squares (PLS) structural equation modeling and a correlation analysis are described. Finally, the paper provides a discussion of the results, managerial implications and conclusions leading to further research steps.

## Conceptual model and the development of hypotheses

The basic framework is displayed in Figure 1. In the following, the constructs and relationships of explicit and implicit sensory perception, brand experience and brand-related performance indicators are explained. The basic driver of the conceptual model is sensory perception. Sensory perception is defined as the consumer's evaluation of an object (e.g. product or brand) that determines the degree of appeal of the object to the human senses (i.e. visual, acoustic, haptic, olfactory and gustatory). Accordingly, a high evaluation represents a positive sensory perception, whereas a low evaluation indicates a negative sensory perception. Based on the common two-system theory of cognitive psychology (Kahneman, 2003; Neys, 2006; Sloman, 2002; Stanovich and West, 2002), the consumers' evaluation results from cognitive information processing that can be either subconscious (implicit) or conscious (explicit). In the first case, judgment is usually rendered fast, automatic and effortless, and in the latter case, it is slow, deliberate and effortful (Kahneman, 2003; Sloman, 2002). In addition, the explicit system has a very limited capacity, whereas the capabilities of the implicit system are nearly unrestricted. Thus, at a given moment, people can consciously direct their attention at selected information only (Smith and DeCoster, 2000). Nevertheless, the consumer is surrounded by all kinds of stimuli that he or she is not actually aware of but that the subconscious mind still gathers and stores. However, even if the information is not consciously present to the consumer, it can absolutely influence his or her decision-making processes (Friese *et al.*, 2006). The two different types of memory content should not be regarded separately. The psychology literature widely addresses the relationship between the two systems (Barrett *et al.*, 2004; Evans, 2003; Kahneman, 2011). For efficiency reasons, the explicit system often adopts the intuitive suggestions of the implicit system (Kahneman, 2011) to compensate for missing information or to justify the spontaneous suggestion. Consequently, the literature stresses a positive relationship that is directed from the implicit system to

**Figure 1** Conceptual model



the explicit system. Thus, with regard to valence, positive memory content on an implicit level can lead to similar positive perceptions on an explicit level. Conversely, negative implicit memory content may lead to negative explicit perceptions. Hence, we hypothesize the following:

*H1.* Implicit sensory perception has a positive effect on explicit sensory perception.

Sensory stimuli, whether perceived subconsciously or consciously, play a major role in establishing an outstanding brand experience (Hirschman, 1984; Hultén, 2011). According to Brakus *et al.* (2009, p. 53), a brand experience represents "subjective, internal consumer responses (sensations, feelings, and cognitions) and behavioral responses evoked by brand-related stimuli that are part of a brand's design and identity, packaging, communications, and environments".

Sensory marketing (i.e. marketing that aims to appeal to a consumers' senses to affect their perception, judgment and behavior; Krishna, 2012) offers diverse possibilities for creating experiences unique to the consumer. Furthermore, several studies provide evidence for the influence of sensory stimuli on the consumer, such as color and flavor (Compeau *et al.*, 1998), touch (Peck and Childers, 2006), background music (Milliman, 1986) and store scent (Spangenberg *et al.*, 2006). According to that, in the context of gastronomy, companies can design their stores and develop their products in a way that strongly appeals to customers' senses. For example, they can place especially comfortable furnishings, use a soothing color design and play arousing background music to evoke positive emotions and establish an exceptional atmosphere. In addition, they can emit appetizing scents and create new combinations of ingredients to intensify the customers' taste experience. Furthermore, these individual stimuli will merge into an overall experience (Hultén, 2011; Lindstrom, 2005). To create a strong holistic experience, companies have to thus apply a coherent concept of sensory marketing, meaning that the sensory stimuli reinforce each other and consequently transmit a consistent brand promise (Guzman and Iglesias, 2012). According to the theory of superadditive effects (Lwin *et al.*, 2010), the quality of the experience is positively related to the number of senses congruently addressed. Therefore, the more and the better the senses are appealed to (i.e. the higher the sensory perception), the better the perceived brand experience. Overall, the following is proposed:

*H2.* Implicit sensory perception has a positive effect on brand experience.

*H3.* Explicit sensory perception has a positive effect on brand experience.

In accordance with Pine and Gilmore (1999), brand experiences are highly subjective, vary in intensity and valence and encompass the customers at different levels. Therefore, the authors follow Brakus *et al.* (2009) and differentiate brand experience along four dimensions: sensory, affective, behavioral and intellectual. The affective dimension refers to customers' moods or feelings, such as pleasure and excitement, whereas the cognitive component comprises mental processes (e.g. stimulating consumers' creativity or engaging them in deep thinking). The behavioral dimension reflects individual actions or lifestyles. The sensory component appeals to the five human senses, which can further arouse emotional responses. According to existing research in the field of experiential marketing, the experiences offered by gastronomy may create an emotional connection between the customer and the brand (Arora, 2012; Morrison and Crane, 2007; Xie *et al.*, 2017). By providing high levels of emotional intensity, customers feel a higher level of satisfaction and are more likely to return to the service brand (Brakus *et al.*, 2009; Holbrook, 1999; Nysveen *et al.*, 2013; Triantafillidou and Siomkos, 2014). Therefore, it is assumed that the experiences stored in consumers' long-term memory may affect consumer perception (i.e. brand image and brand satisfaction) and consumer behavior (i.e. brand loyalty, willingness to pay a higher price and actual buying intention). Thus:

*H4.* Brand experience has a positive effect on (a) brand image, (b) brand satisfaction, (c) brand loyalty, (d) price premium and (e) buying intention.

Moreover, in the marketing literature, it has been shown that brand image and brand satisfaction are key performance indicators in brand management. By influencing consumers' expectations, perceived qualities and attitude toward the brand, brand image has been proven in existing marketing research to have a positive impact on brand satisfaction, brand loyalty, price premium and buying attention (Bloemer and De Ruyter, 1998; Keller, 1993; Patterson *et al.*, 1996). Furthermore, it is also assumed that higher satisfaction leads to higher loyalty, willingness to pay a price premium and likelihood of buying a brand's products or services (Rauyruen and Miller, 2007; Selnes, 1993; Tse and Wilton, 1988). Empirical studies have also revealed that consumers who show more trustworthiness and faithfulness toward a brand are more likely to pay a price premium and have a higher intention to buy products or services from the brand in the future (Chaudhuri and Holbrook, 2001). Consequently, the authors suggest the following:

*H5.* Brand image has a positive effect on (a) brand satisfaction, (b) brand loyalty, (c) price premium, and (d) buying intention.

*H6.* Brand satisfaction has a positive effect on (a) brand loyalty, (b) price premium, and (c) buying intention.

*H7.* Brand loyalty has a positive effect on (a) price premium and (b) buying intention.

*H8.* Price premium has a positive effect on buying intention.

## Methodology

### Measurement

The proposed model contains two formative and six reflective constructs (Figure 1). For measuring the formative constructs (i.e. implicit and explicit sensory perception), the sensory perception items (SPIs) developed by Haase and Wiedmann (2018) are applied (Table I).

**Table I** Items of the formative measurement models

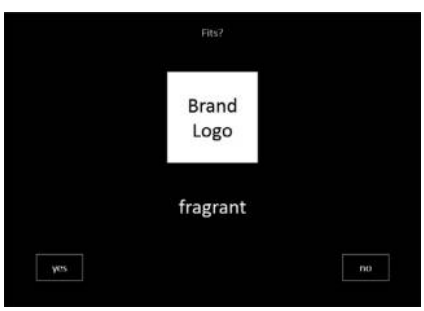
| Sensory perception | | | | |
|---|---|---|---|---|
| **Visual** | **Acoustic** | **Haptic** | **Olfactory** | **Gustatory** |
| **Attractive** | Euphonic | Comfortable | Fragrant | Appetizing |
| **Beautiful** | Good-sounding | Handy | Nice-smelling | Flavorful |
| **Pretty** | Melodic | Soothing | Perfumed | Palatable |
| **Aesthetic** | Sonorous | Well-shaped | Scented | Tasty |

**Note:** The items are used for the measurement of both explicit sensory perception (questionnaire) and implicit sensory perception (response latency measurement)

The 20 items were used for the measurement of both the implicit and explicit sensory perception to assess the two factors in a consistent manner and make them comparable. However, for a distinct measurement of the two perception levels, the authors applied two different methods that are specifically suitable for the respective case. For explicit (deliberate and controlled) sensory perception, the items were integrated in a questionnaire. The subjects were asked if they associated the coffee house with the following attributes (items), which they could reply to on a five-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). For implicit (spontaneous and automatic) sensory perception, the items were implemented in a response latency measurement that was soundly developed and validated by Haase and Wiedmann (2018). The methodology relies on well-established implicit association tests, such as the implicit association test by Greenwald *et al.* (1998) and the category-item association test by Fazio (1990). The response latency measurement was completed on a computer. The subjects were asked to intuitively decide whether the following attributes (items) fit the coffee house. Furthermore, it was emphasized that they should respond as quickly as possible without actually thinking about it. In case of agreement, they should press "E" for "yes", and in case of disagreement, they should press "I" for "no". The respective reminder labels were shown throughout the assignment task: "Fits?" at the top edge, "yes" at the bottom left corner and "no" at the bottom right corner of the screen. At the center, the brand logo of the coffee house was illustrated. Underneath, the SPIs appeared one after another and were presented in a white font color against a black background. Figure 2 shows the screen in an exemplary way.

In line with the approach of Greenwald *et al.* (1998), for every item, a final score was computed based on the response latency and the valence of sensory perception (i.e. "E" for agreement and "I" for disagreement). To ensure that answers were actually intuitive and not entered by mistake, only response latencies in the interval of 300 to 3,000 ms were considered. The valid response times were rescaled so that they took values in the interval of 0 to 1, which is from the weakest association possible at a response time of 3,000 to the strongest association possible at a response time of 300. Then, the signs of the rescaled response times were adapted according to the valence (positive for "E" and negative for "I"). Consequently, the final scores ranged from −1 to 1. Furthermore, the final scores for both the implicit and explicit sensory perception were *z*-transformed to reduce method variance (Bluemke and Friese, 2008) and to make the two factors comparable.

**Figure 2** Response latency measurement




The items of the reflective measurement models are shown below:

*Brand experience*

- The coffee house makes a strong impression on my senses.
- I find the coffee house interesting in a sensory way.
- The coffee house appeals to my senses.
- The coffee house induces feelings and sentiments.
- I have strong emotions for the coffee house.
- The coffee house is emotional.
- I engage in physical actions and behaviors when I stay at the coffee house.
- The coffee house results in bodily experiences.
- The coffee house is action oriented.
- I engage in a lot of thinking when I stay at the coffee house.
- The coffee house makes me think.
- The coffee house stimulates my curiosity.

*Brand image*

- I like the coffee house very much.
- The coffee house is really likable.

*Brand satisfaction*

- I am very satisfied with the coffee house.
- The coffee house absolutely meets my expectations.

*Brand loyalty*

- I would recommend the coffee house to my friends.
- I would regret if the coffee house was not existent.

*Price premium*

- I am willing to pay a higher price for the coffee house than for other coffee houses.
- The coffee house is worth a higher price compared to other coffee houses.

*Buying intention*

- I plan to visit the coffee house in the future.
- I intend to buy products of the coffee house in the future.

With regard to brand experience, the original scale of Brakus *et al.* (2009) consisting of four dimensions (i.e. affective, behavioral, intellectual and sensory) is adapted. Measuring consumer perception (i.e. brand image and brand satisfaction) and consumer behavior (i.e. brand loyalty, price premium and buying intention) relies on the item set developed by Wiedmann *et al.* (2011). All items are specified to the gastronomy context and are rated on a five-point Likert scale

(1 = *strongly disagree*, 5 = *strongly agree*). The variables were also *z*-transformed for further analyses.

### Data collection and sample

For the evaluation of the proposed model, a field experiment in a well-established coffee house serving gastronomic specialties (e.g. homemade chocolates) was conducted in January 2016. The recruitment of respondents was organized by marketing students in exchange for course credit. For the purpose of the study, a representative sample primarily consisting of students was the goal to obtain a balanced set of data with regard to levels of age, education and other demographic characteristics (Agrawal *et al.*, 2011; Dawar and Parker, 1994) . Therefore, the marketing students had to contact potential respondents by making use of their social network and invite them to participate in the field experiment. One special instruction for the students was the equal distribution of the sexes.

The main purpose was to investigate the sensory perception of the coffee house, which meant how well the individual senses of the customers were addressed. With regard to the setting, a gallery that provides a view down on the seating area and the counter display of the café was closed for the study to avoid any disruption during data collection. To examine the sensory perception of the coffee house, participants were first asked to observe the coffee house, which included taking in the whole atmosphere, listening to the ambient sound and feeling the furniture. In detail, sensory stimuli were present in the form of a cozy and tradition-rich interior design, including particular wood paneling, Dutch tiles, chandeliers and fireplaces (visual). Furthermore, soft and classic background music was played (acoustic). High-quality wood and soft-padded cushions were used for chairs and tables (haptic), and a discreet coffee smell filled the café (olfactory). Second, subjects were invited to pick a sweet-tasting chocolate truffle from a separate table and to taste it (gustatory). After absorbing the different sensory stimuli, the participants took a seat in a neutral and silent corner and were asked to complete the questionnaire. The first part included questions about the respondents' familiarity with the brand. Then, the implicit sensory perception was captured by the response latency measurement. After that, the participants proceeded with the questionnaire, which assessed the explicit sensory perception of the coffee house, the evaluation of the brand experience and brand-related performance indicators. Finally, the last section presented questions regarding demographics.

In total, 138 subjects participated in the study. Table II presents the corresponding characteristics of the sample. The participants' ages ranged from 18 to 67 years, with an average age of 25.7 years. With regard to gender, the distribution was almost equal (48.6 per cent women and 51.4 per cent men). Furthermore, most of the participants were students (80.4 per cent), had a senior high school diploma (61.6 per cent), and a monthly income below €1,000 (44.2 per cent).

### Data analysis

For the descriptive analysis of the demographic sample profile (i.e. means and frequencies), for some aspects of the evaluation of the measurement models (i.e. Cronbach's alpha, Pearson correlation coefficient and variance inflation factor, [VIF]), and for the correlation analysis, the analysis software SPSS 24.0 was used. To test the hypotheses, PLS structural equation modeling was applied, as the conceptual model comprises both formative and reflective indicators. Following a two-step approach, the analysis contains an evaluation of the measurement models (outer models) first and an evaluation of the structural model (inner model) second (Henseler *et al.*, 2009). For this purpose, the authors used the analysis software SmartPLS 2.0 (Ringle *et al.*, 2005), including the PLS algorithm (path weighting scheme) and a blindfolding and bootstrapping procedure (individual sign changes).

**Table II** Demographic profile of the sample

| Variable | Characteristics | *n* | (%) |
|---|---|---|---|
| **Age** | 18-24 years | 86 | 62.3 |
| | 25-30 years | 44 | 31.9 |
| | >30 years | 8 | 5.8 |
| **Gender** | Female | 67 | 48.6 |
| | Male | 71 | 51.4 |
| **Marital status** | Single | 130 | 94.2 |
| | Married | 8 | 5.8 |
| **Education** | Pupil | 1 | 0.7 |
| | Junior high school diploma | 5 | 3.6 |
| | Senior high school diploma | 85 | 61.6 |
| | University degree | 47 | 34.1 |
| **Occupation** | Scholar | 1 | 0.7 |
| | Trainee | 3 | 2.2 |
| | Student | 111 | 80.4 |
| | Full-time employee | 14 | 10.1 |
| | Part-time employee | 4 | 2.9 |
| | Housewife/househusband | 2 | 1.5 |
| | Unemployed | 3 | 2.2 |
| **Income** | Very low income (<€1,000) | 61 | 44.2 |
| | Low income (€1,000-2,000) | 24 | 17.4 |
| | Middle income (€2,000-3,000) | 18 | 13.0 |
| | High income (€3,000-4,000) | 12 | 8.7 |
| | Very high income (>€4,000) | 11 | 8.0 |
| | No answer | 12 | 8.7 |
| **Total sample size** | | 138 | 100.0 |

## Findings

### Structural equation modeling

*Evaluation of the measurement models.* Following the two-step approach of Henseler *et al.* (2009), first, the measurement models and then the structural model were assessed for quality. With regard to the two formative measurement models (i.e. implicit and explicit sensory perception), Table III presents the relevant criteria. Except for gustatory perception, all sensory perception dimensions show outer weights that are higher than 0.1 and are significant, as proposed by Hair *et al.* (2012). Moreover, the maximum VIF is 1.661, which falls far below the critical value of 10. Hence, the data are not biased because of multicollinearity (Diamantopoulos *et al.*, 2008).

With reference to the six reflective measurement models (i.e. brand experience, brand image, brand satisfaction, brand loyalty, price premium and buying intention), Table IV presents the results concerning reliability and validity. For all variables, the quality criteria are fulfilled. With a minimum of 0.744, all factor loadings are higher than 0.7, which affirms

**Table III** Evaluation of the formative measurement models

| | Weights | *t*-value | VIF |
|---|---|---|---|
| ***Implicit sensory perception*** | | | |
| **Visual** | 0.412 | 3.654 | 1.355 |
| **Acoustic** | 0.278 | 2.521 | 1.231 |
| **Haptic** | 0.488 | 3.988 | 1.597 |
| **Olfactory** | 0.181 | 1.653 | 1.410 |
| **Gustatory** | 0.013 | 0.167 | 1.635 |
| ***Explicit sensory perception*** | | | |
| **Visual** | 0.412 | 3.946 | 1.444 |
| **Acoustic** | 0.299 | 3.044 | 1.207 |
| **Haptic** | 0.349 | 3.222 | 1.661 |
| **Olfactory** | 0.246 | 2.395 | 1.237 |
| **Gustatory** | 0.153 | 1.571 | 1.407 |

**Table IV** Evaluation of the reflective measurement models

| | Loadings | AVE | $\alpha$ | $\rho c$ | FLC (AVE > $r^2$) |
|---|---|---|---|---|---|
| **Brand experience** | 0.744-0.851 | 0.659 | 0.829 | 0.885 | 0.659 > 0.389 |
| **Brand image** | 0.833-0.906 | 0.757 | 0.684 | 0.862 | 0.757 > 0.569 |
| **Brand satisfaction** | 0.895-0.917 | 0.821 | 0.783 | 0.902 | 0.821 > 0.569 |
| **Brand loyalty** | 0.849-0.889 | 0.756 | 0.678 | 0.861 | 0.756 > 0.609 |
| **Price premium** | 0.941-0.953 | 0.897 | 0.886 | 0.946 | 0.897 > 0.430 |
| **Buying intention** | 0.976-0.978 | 0.954 | 0.952 | 0.976 | 0.954 > 0.609 |

**Notes:** $\alpha$ = Cronbach's alpha; $\rho c$ = composite reliability; $r^2$ = highest latent variable correlation squared

indicator reliability (Hair *et al.*, 2011). The average variance extracted (AVE) has a minimum amount of 65.9 per cent throughout, thus surpassing the requirement of 50 per cent. Hence, convergent validity is confirmed. Additionally, in each case, the AVE is higher than the highest squared correlation with another latent variable, which satisfies the Fornell–Larcker criterion (FLC) for discriminant validity (Fornell and Larcker, 1981). Finally, Cronbach's alpha always takes a value above 0.6 with a minimum of 0.678, and composite reliability is above 0.7 with a minimum of 0.861. Therefore, internal consistency reliability is also fulfilled (Bagozzi and Yi, 2012; Churchill, 1979; Peterson, 1994).

Finally, the authors performed a Harman's one-factor test for the explicit measures to ensure that there is no common method bias. The analysis revealed that the questionnaire-based items explain only 30.94 per cent of the single factor's variance, which clearly falls below the limit of 50 per cent. Thus, the results negate that the data are biased because of the source of the measures (Podsakoff and Organ, 1986).

*Evaluation of the structural model.* To assess the quality of the structural model, two prediction-oriented and nonparametric measures are considered. Table V presents the results. The coefficient of determination ($R^2$) ranges from 0.358 to 0.660, which indicates a satisfactory goodness of fit (Chin, 1998). Furthermore, the cross-validated redundancy measure ($Q^2$) has a minimum of 0.214 and is positive throughout, thus confirming the model's predictive relevance (Geisser, 1974; Stone, 1974).

**Table V** Evaluation of the structural model

| | $R^2$ | $Q^2$ |
|---|---|---|
| **Explicit sensory perception** | 0.647 | – |
| **Brand experience** | 0.358 | 0.214 |
| **Brand image** | 0.389 | 0.290 |
| **Brand satisfaction** | 0.574 | 0.467 |
| **Brand loyalty** | 0.535 | 0.399 |
| **Price premium** | 0.493 | 0.435 |
| **Buying intention** | 0.660 | 0.630 |

In the following, the research hypotheses representing the structural relationships between the latent variables are examined. Table VI displays the path coefficients and *t* values that give the strength and significance of the relationships, respectively. In the case of the first hypothesis on the impact of implicit sensory perception on explicit sensory perception, the data analysis reveals a highly significant and very strong positive effect ($b = 0.804$, $p \leq 0.001$). Hence, hypothesis *H1* has full empirical support. The next two hypotheses address sensory perception as a driver for brand experience. The results detect that brand experience is directly driven only by the explicit system, but in a highly significant and very strong manner ($b = 0.539$, $p \leq 0.001$). The implicit system shows no direct effect ($b = 0.073$, $p > 0.1$). However, implicit sensorial memory content does not remain ineffective. In contrast, as a result of the two abovementioned highly significant and strong relationships, it affects brand experience via the explicit system; here, a perfect mediation effect is found (Baron and Kenny, 1986). *H2* is thus rejected in its proposed form, and hypothesis *H3* is confirmed.

The following five hypotheses test whether this effect is passed on to further brand-related performance indicators. The data analysis affirms a significant and positive effect of brand experience on brand image ($b = 0.623$, $p \leq 0.001$), brand loyalty ($b = 0.273$, $p \leq 0.001$), price premium ($b = 0.250$, $p \leq 0.01$) and buying intention ($b = 0.104$, $p \leq 0.1$). Brand satisfaction is not directly influenced ($b = 0.090$, $p > 0.1$). Hence, hypotheses *H4a*, *H4c*, *H4d* and *H4e* find full empirical support, and hypothesis *H4b* is negated. In addition, the findings reveal further effects between brand-related performance indicators. Brand image has a significant and positive effect on brand satisfaction ($b = 0.698$, $p \leq 0.001$) and brand loyalty ($b = 0.267$, $p \leq 0.01$). In contrast, there is no significant direct effect on the downstream measures of consumer behavior, that is, on price premium ($b = 0.146$, $p > 0.1$) and buying intention ($b = 0.128$, $p > 0.1$). Therefore, hypotheses *H5a* and *H5b* are verified, but hypotheses *H5c* and *H5d* are rejected. The same is true in the case of brand satisfaction, which also shows a significant and positive effect on brand loyalty ($b = 0.301$, $p \leq 0.001$) but no significant direct effect on price premium ($b = -0.034$, $p > 0.1$) or buying intention ($b = 0.043$, $p > 0.1$). Thus, hypothesis *H6a* finds empirical support, whereas hypotheses *H6b* and *H6c* are rejected. Brand loyalty does have a highly significant and positive impact on price premium ($b = 0.432$, $p \leq 0.001$) and buying intention ($b = 0.510$, $p \leq 0.001$), which supports hypotheses *H7a* and *H7b*. Finally, price premium positively affects buying intention ($b = 0.146$, $p \leq 0.05$), thus confirming hypothesis *H8*.

**Table VI** Evaluation of the structural relations

| | | | Original sample | Sample mean | SD | SE | *t* value |
|---|---|---|---|---|---|---|---|
| ***H1***: | Implicit SP | → Explicit SP | 0.804 | 0.809 | 0.040 | 0.040 | 19.886 |
| ***H2***: | Implicit SP | → BE | 0.073 | 0.118 | 0.082 | 0.082 | 0.890 |
| ***H3***: | Explicit SP | → BE | 0.539 | 0.550 | 0.114 | 0.114 | 4.727 |
| ***H4a***: | BE | → BI | 0.623 | 0.626 | 0.052 | 0.052 | 12.040 |
| ***H4b***: | BE | → BS | 0.090 | 0.099 | 0.063 | 0.063 | 1.419 |
| ***H4c***: | BE | → BL | 0.273 | 0.273 | 0.077 | 0.077 | 3.539 |
| ***H4d***: | BE | → PP | 0.250 | 0.247 | 0.078 | 0.078 | 3.207 |
| ***H4e***: | BE | → BU | 0.104 | 0.109 | 0.063 | 0.063 | 1.648 |
| ***H5a***: | BI | → BS | 0.698 | 0.699 | 0.066 | 0.066 | 10.664 |
| ***H5b***: | BI | → BL | 0.267 | 0.271 | 0.093 | 0.093 | 2.859 |
| ***H5c***: | BI | → PP | 0.146 | 0.162 | 0.102 | 0.102 | 1.437 |
| ***H5d***: | BI | → BU | 0.128 | 0.134 | 0.080 | 0.080 | 1.597 |
| ***H6a***: | BS | → BL | 0.301 | 0.298 | 0.087 | 0.087 | 3.458 |
| ***H6b***: | BS | → PP | −0.034 | −0.083 | 0.063 | 0.063 | 0.547 |
| ***H6c***: | BS | → BU | 0.043 | 0.066 | 0.048 | 0.048 | 0.892 |
| ***H7a***: | BL | → PP | 0.432 | 0.430 | 0.096 | 0.096 | 4.498 |
| ***H7b***: | BL | → BU | 0.510 | 0.510 | 0.088 | 0.088 | 5.780 |
| ***H8***: | PP | → BU | 0.146 | 0.147 | 0.072 | 0.072 | 2.026 |

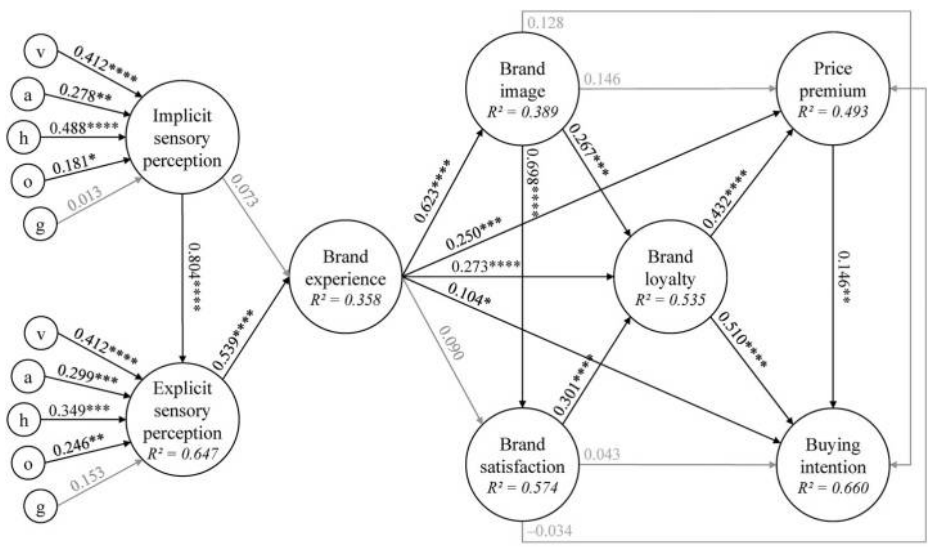
**Notes:** SD = standard deviation; SE = standard error; SP = sensory perception; BE = brand experience; BI = brand image; BS = brand satisfaction; BL = brand loyalty; PP = price premium; BU = buying intention

The findings provide full empirical support for 12 of the 18 hypotheses. The result is a complex impact model (Figure 3). In detail, the data analysis states a causal chain of various direct and indirect effects with sensory perception as the basic success driver for brand-related key performance indicators through the establishment of a positive brand experience. With regard to the relevance of the single senses, except for gustatory perception, all the sensory perception dimensions play a significant role. For implicit sensory perception, haptic perception is the most powerful driver ($b = 0.488$, $p \leq 0.001$), followed by visual ($b = 0.412$, $p \leq 0.001$), acoustic ($b = 0.278$, $p \leq 0.05$) and olfactory perception ($b = 0.181$, $p \leq 0.1$). Regarding explicit sensory perception, visual perception is the most important driver ($b = 0.412$, $p \leq 0.001$), followed by haptic ($b = 0.349$, $p \leq 0.01$), acoustic ($b = 0.299$, $p \leq 0.01$) and olfactory perception ($b = 0.246$, $p \leq 0.05$).

## Correlation analysis

To gain deeper insights into the relationship between sensory perception and brand experience, an additional correlation analysis has been conducted. In detail, the correlations between all five sensory perception dimensions (i.e. visual, acoustic,

**Figure 3** Empirical model




**Notes:** *Indicates significance at the $p \leq 0.1$ (**$p \leq 0.05$; ***$p \leq 0.01$; ****$p \leq 0.001$) level of confidence (two-tailed)

haptic, olfactory and gustatory) on both an explicit and implicit level and the four brand experience dimensions (i.e. sensory, affective, behavioral and intellectual) have been investigated (Table VII). The results show that all 40 correlations are significant at least at $p \leq 0.1$, where most are highly significant at $p \leq 0.001$. With regard to the sensory brand experience dimension, all correlations are highly significant at $p \leq 0.001$. The only exception is implicit acoustic perception, which is still significant but seems to play a minor role in the given case ($r = 0.204$, $p \leq 0.05$). In contrast, the visual sense appears to play the major role. Across all ten variables, it shows the highest correlation coefficients (explicit: $r = 0.475$; implicit: $r = 0.425$). Referring to the affective dimension, haptics turn out to be especially important. Haptic perception reveals the two strongest correlations across all ten variables (explicit: $r = 0.366$, $p \leq 0.001$; implicit: $r = 0.342$, $p \leq 0.001$). Furthermore, the behavioral dimension is especially related to explicit sensory stimulation. Here, the two strongest correlations are given with explicit visual perception ($r = 0.306$, $p \leq 0.001$) and explicit gustatory perception ($r = 0.294$, $p \leq 0.001$). Finally, the intellectual dimension is most strongly related with explicit haptic perception ($r = 0.437$, $p \leq 0.001$) and explicit visual perception ($r = 0.364$, $p \leq 0.001$), which are also highly relevant on the implicit level ($r = 0.334$, $p \leq 0.001$ and $r = 0.293$, $p \leq 0.001$, respectively).

## Discussion

This paper provides new insights on the effects of sensory marketing and the particular relevance of both modes of information processing (i.e. the implicit and explicit sensory perception) in the context of gastronomy by two analyses. First, a structural equation modeling analysis tested the relationships between implicit and explicit sensory perception, brand experience and brand-related performance indicators. Second, a correlation analysis investigated in more detail the relationship between the dimensions of sensory perception on both an explicit and implicit level and of brand experience.

The structural equation modeling largely confirms the introduced model. It has been shown that implicit and explicit sensory perception explained brand experience to a considerable degree and that sensory perception and brand experience are important drivers for brand-related performance indicators in the given context of gastronomy. In detail, implicit sensory perception shows a highly significant and strong effect on explicit sensory perception. The findings are in line with existing research highlighting the positive relationship between the two systems. As supposed, for sensory perception, the implicit system has high explanatory power in constituting the explicit system, which confirms the significant role when assessing consumer' opinions. Moreover, explicit sensory perception shows a positive and substantial effect on brand experience. In contrast, implicit sensory perception has an indirect and somewhat smaller effect through explicit sensory perception. Overall, the results indicate that sensory marketing is a strong predictor for brand experience. In particular, for both the implicit and explicit sensory perception, the visual and haptic perception are the most important drivers. Acoustic and olfactory perceptions also play a significant but less important role. With regard to gustatory perception, for both the implicit and explicit sensory perception, the findings show insignificant weights. Literature on sensory marketing states that taste often depends on the other four senses (Hultén, 2011; Krishna, 2012; Krishna *et al.*, 2016). Owing to given correlations, especially with visual and haptic perception that represent the strongest drivers of sensory perception, the distinct explanatory power of gustatory perception is problematic to separate (Diamantopoulos and Winklhofer, 2001). Thus, the weight of gustatory perception becomes insignificant and flows into the weights of the other four dimensions. Moreover, brand experience shows a positive impact on brand-related performance indicators. As consumer perception (including brand image and brand satisfaction) further influences consumer behavior (including brand loyalty, price premium and buying intention), partial mediating effects exist. More specifically, the indirect impact of brand experience through brand image, satisfaction and loyalty on price premium and buying intention is higher than the direct one. Therefore, when consumers have a positive experience with the brand, the overall assessment of the brand becomes more favorable, thus ultimately leading to more positive behavior toward the brand. The results confirm various research approaches with regard to brand equity (Chaudhuri and Holbrook, 2001). Owing to the mediator effect of brand loyalty, the direct paths of brand image and brand satisfaction show no significance with the terminative variables of consumer behavior (i.e. price premium and buying intention). The influence is only significant through the indirect path via brand loyalty.

The correlation analysis shows that all 40 relationships between the five senses (on an explicit and implicit level) and the four brand experience dimensions are significant, with most of them at $p \leq 0.001$. With regard to the strength, the coefficients predominantly indicate moderate correlations, as the separate dimensions of both sensory perception and brand experience are combined. Notwithstanding, the results indeed reveal which type of experience is most strongly related to which type of sensory stimulation. For each type of experience, different senses were more or less relevant. First, in accordance with basic literature on sensory marketing (Hultén, 2011; Lindstrom, 2005), all five senses are empirically confirmed to

**Table VII** Results of the correlation analysis

| | Brand experience | | | |
|---|---|---|---|---|
| | Sensory | Affective | Behavioral | Intellectual |
| ***Implicit sensory perception*** | | | | |
| **Visual** | 0.425**** | 0.239*** | 0.232*** | 0.293**** |
| **Acoustic** | 0.204** | 0.272**** | 0.163* | 0.288**** |
| **Haptic** | 0.424**** | 0.342**** | 0.287**** | 0.334**** |
| **Olfactory** | 0.388**** | 0.189** | 0.168** | 0.176** |
| **Gustatory** | 0.377**** | 0.180** | 0.205** | 0.254*** |
| ***Explicit sensory perception*** | | | | |
| **Visual** | 0.475**** | 0.326**** | 0.306**** | 0.364**** |
| **Acoustic** | 0.283**** | 0.287**** | 0.243*** | 0.348**** |
| **Haptic** | 0.424**** | 0.366**** | 0.269**** | 0.437**** |
| **Olfactory** | 0.343**** | 0.253*** | 0.202** | 0.192** |
| **Gustatory** | 0.406**** | 0.231*** | 0.294**** | 0.269**** |

**Note:** *Indicates significance at the $p \leq 0.1$; **$p \leq 0.05$ ***$p \leq 0.01$; ****$p \leq 0.001$) level of confidence (two-tailed)

be highly relevant in forming an overall sensory experience. Only implicit acoustics (although still significant) played a minor role, as the background music was clearly not appealing and outstanding enough to make a crucial difference in the given case. The visual sense (both on an implicit and explicit level) was found to play the major role. This finding goes in line with the sensory marketing literature that states that the visual sense is the dominant sense (Krishna, 2012; Schifferstein, 2006). For affective experiences, especially haptic stimuli (both on an implicit and explicit level) are highly important. Affective experiences arise from customers' moods or feelings (Brakus *et al.*, 2009). Thus, the comfort factor, coming from items such as convenient furniture made from high-quality wood and soft padded cushions, clearly contributes a large part to the fact that customers feel good and develop positive emotions. With regard to behavioral experiences, visual and gustatory perception (both on an explicit level) are particularly decisive. Consequently, for consumers to get active and to have bodily experiences, the conscious perception of the outstanding visual appearance of the coffee house and the good taste of the products are apparently the most decisive. Finally, for intellectual experiences, haptic and visual appeal play a major role on both an explicit and implicit level. Clearly, what makes the consumers think and stimulate their curiosity is an exceptional atmosphere based on outstanding visual and haptic stimuli. In the case of the coffee house, this was given especially by the extraordinary interior and furniture (e.g. Dutch tiles, chandeliers, fireplaces, high-quality wooden chairs and soft-padded cushions), which clearly differ from standard locations.

## Managerial implications

This paper provides marketing managers with valuable insights on the importance of sensory marketing to create unique brand experiences. Because both implicit and explicit sensory perception were found to be highly relevant, marketing managers need to ensure that they perform well on both perception levels. If this performance is neglected and the implicit and/or explicit sensory perception is negatively assessed, it will further negatively affect the brand experience and brand-related performance indicators. Accordingly, marketing managers need to set appealing sensory cues that fit the consumers' preferences and that are consistent across the five senses and across both perception levels. Doing so will constitute a positive sensory perception and hence brand success. To ensure that the planned multisensory marketing concept actually appeals to the target group on both perception levels, marketing managers are advised to conduct market research by engaging the introduced measurement approach. Doing so may essentially enhance the chances of success of the considered sensory stimuli.

With regard to the individual senses that may be addressed, the main focus of marketing practice is still on visual stimuli. However, this study provides empirical evidence for the relevance of an integrated approach by addressing several senses. In the given case of gastronomy, great potential especially lies in the visual and haptic senses. To create visual appeal, gastronomes may pay special attention to exceptional interior design. For example, when managers plan on establishing an atmosphere for people who appreciate a cozy ambience, the use of warm colors, fireplaces and dimmed light may be beneficial. For haptic appeal, for example, warm temperature, high-quality materials and comfortable furniture may be applied. Depending on the intensity to which the sensory cues are present, the sensory stimulation can be established on an explicit or implicit level. For example, the visual presentation of the food can be on an étagère which may positively surprise the customer (explicit) or nicely arranged on a plate which may be less striking (implicit). Furthermore, music can be played loudly in the foreground by a live band (explicit) or discreetly in the background (implicit). Moreover, haptic appeal can be achieved by providing special lounge areas where customers may take off their shoes and make themselves comfortable (explicit) or through convenient furniture with soft-padded cushions where customers can sit (implicit). With regard to olfaction, scented candles can be lighted in front of the customer (explicit) or a decent room-fragrance can be spread (implicit). Finally, the good taste of a certain product can be actively promoted by the service staff (explicit) or perceived incidentally while eating (implicit).

In this way, gastronomy can attract customers by creating extraordinary experiences. For the creation of specific types of experiences (sensory, affective, behavioral or intellectual), marketing managers may set different foci regarding sensory stimulation. For an overall sensory experience, all senses on both perception levels are highly relevant and shall thus flow into a holistic multisensory concept, with the visual sense being central. To evoke positive consumer emotions, especially haptic stimuli (of both the explicit and implicit form) are relevant. For bodily experiences, gastronomes need to ensure that customers consciously perceive that the products taste good and that the location is visually appealing. Finally, to create mental experiences that stimulate the customers' curiosity, visual and haptic stimuli (of both the explicit and implicit form) are particularly appropriate.

Furthermore, the creation of positive brand experiences leads to a positive relationship between the customer and the brand. Thus, marketing managers can establish customer satisfaction and a positive image of the brand, which eventually will cause consumers to be more loyal, to be more willing to pay a higher price and to buy their products and services.

## Limitations and future research

This study features some limitations that offer potential starting points for future research. The study tested the model in a first step on a limited and relatively homogeneous sample. For this purpose, a sample primarily consisting of students was chosen. Thus, further studies could verify the results for larger and more heterogeneous samples. Moreover, the data are related to the specific context of gastronomy. However, the findings might not unlikely be true for other various application areas of sensory marketing. Hence, future research may analyze the stated relationships for different industries such as fast-moving and slow-moving consumer goods, or even for B2B sectors where branding is increasingly shifting into focus. Furthermore, the data analysis has focused on causal relationships through structural equation modeling. To get an even better understanding of the effects of sensory marketing activities, examining the moderating effects of sociodemographic aspects (such as gender or age) via analyses of variance would be insightful. Finally, by an additional

correlation analysis, the study provides the first insights into the relationships between the dimensions of implicit and explicit sensory perception and the dimensions of brand experience. Future studies may focus on this specific issue and investigate in even more detail the relationships between the single dimensions to deepen the knowledge on the application of sensory stimuli to create particular brand experiences. To conclude, sensory perception, especially in both explicit and implicit forms, remains an under-researched construct in the marketing literature that offers several promising opportunities for further research.

## Conclusion

This paper provides empirical evidence for the power of multisensory stimulation in the context of gastronomy. This study gives new insights on the causal relationships of explicit and implicit sensory perception on brand experience and further brand-related key performance indicators. The results support 12 of the 18 research hypotheses outlined in the conceptual model, thus indicating a causal chain of positive direct and indirect effects between sensory perception and brand-related performance indicators. Implicit perception always acts through explicit perception. Furthermore, brand experience plays a major role as a mediator between consumers' sensory perceptions and their responses. In addition, this paper provides valuable knowledge on the correlations between the five senses and the four brand experience dimensions. The results may help gastronomes to create effective sensory stimuli and thus to succeed in a competitive market. Additionally, it may also benefit brand managers, as the empirically confirmed research model may be adapted to other contexts.

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