



International Journal of Retail & Distribution Management

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Article information:

To cite this document:

Ingrid Gottschalk, (2018) "Consumer evaluation of ambient scent: The impact of pre-information, environment, and persuasion knowledge", International Journal of Retail & Distribution Management, <https://doi.org/10.1108/IJRDM-04-2017-0085>

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Consumer evaluation of ambient scent

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The impact of pre-information, environment, and persuasion knowledge

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Received 21 April 2017
Revised 21 May 2017
28 March 2018
20 April 2018
Accepted 20 April 2018

Abstract

Purpose – The purpose of this paper is to broaden the list of boundary factors which impact consumer evaluation of ambient scenting. More specifically, this study aims at demonstrating that pre-informing about the scenting measure, the particular environment in which the scenting takes place and the disposition of persuasion knowledge are necessary variables to be considered for achieving positive evaluations.

Design/methodology/approach – A field experiment was carried out in a local grocery store (a “pay-now” environment) and in a medical therapy centre (a “pre-paid” environment, $n = 200$). The paper draws on the theoretical concept of spreading activation, the consumer decision process and the persuasion knowledge model. Data were analysed by using ANOVA and moderated regression analysis.

Findings – Consumers evaluated the scenting as more favourable when having been pre-informed about the marketing measure. Consumers were also more in favour of ambient scents in the usage-oriented, pre-paid service environment than in the purchase-oriented, pay-now store environment. Persuasion knowledge moderated the relationship between environment and evaluation of ambient scenting.

Research limitations/implications – As important research implication, the role of customers’ pre-information, environment and persuasion knowledge as boundary factors for scent marketing interventions is supported. These results can inform retailers how best to proceed in scent marketing. Future research could extend the present results with various informational measures and in different pre-paid and pay-now environments and experiment with different scents.

Practical implications – The results speak for pre-informing customers and using scents particularly in pre-paid environments, such as medical therapy centres. For customers with a higher level of persuasion knowledge, pre-information and a fitting environment are particularly advisable.

Originality/value – This paper adds important insight to scent marketing literature by addressing additional boundary factors which so far have been neglected. Methodologically, it differentiates itself by employing a field experiment, which offers higher external validity than laboratory experiments which are frequently used in scent research.

Keywords Ambient scent, Persuasion knowledge, Scent marketing, Environmental variable, Scent evaluation, Spreading activation

Paper type Research paper

Introduction

Facing heavy competition from online marketers, many offline retailers strive for new competitive advantages through creating favourable shopping environments (Bitner, 1992; Spangenberg *et al.*, 1996; Smith and Burns, 1996; Goldkuhl and Styvén, 2007; Ballantine *et al.*, 2010, 2015; Morrison *et al.*, 2011; Spence *et al.*, 2014). Scent marketing measures are one promising measure for improving the shopping atmosphere in classical stores. Research has demonstrated several positive effects of spreading scents in a shopping location. These include relaxation, mood improvement, evoking pleasant memories or higher in-store duration, thus increasing the chance of purchasing (Knasko, 1992; Mitchell *et al.*, 1995; Madzharov *et al.*, 2015). These effects often happen despite consumers being unaware of these odours (Holland *et al.*, 2005; Hilton, 2015; Labroo and Nielsen, 2010). However, when customers become aware of scenting, their subsequent reactions are not necessarily positive. In fact, research has demonstrated



adverse reactions such as presuming pure sales motives or even suspecting the disguise of bad quality through favourable odours (Lunardo, 2012). These negative effects are especially critical as scents embody the characteristics of public goods, meaning that consumers cannot escape the scenting. Instead of the desired positive effects, consumers might react irritated or angry, possibly not buying at all but leaving the particular environment. Consequentially, a retailer who wishes to improve the shopping environment through scenting faces a dilemma. The marketer has the possibility to leave customers uninformed, hoping for unconscious positive consequences, but facing possible negative effects when consumers become aware of the scenting. Alternatively, the retailer could actively pre-inform consumers regarding the scenting in the shopping environment. In this case, the retailer is ensuring honest communication with customers (Bradford and Desrochers, 2009), but possibly risking adverse reactions of individuals who do not approve of scenting measures.

This work examines the impact of consumer pre-information on evaluation of scents, thus shedding light into this unanswered question. In addition, this work proposes that the environment in which scenting takes place impacts consumer evaluation. More specifically, purchase-oriented, pay-now store environments, such as grocery or clothing stores, are compared to usage-oriented, pre-paid service environments, such as gyms or healthcare institutions. Consumer reactions in store environments which relate to the exchange of goods for money and embody a clear sales focus are expected to differ from those in special service environments, in which the service has already been paid for and the usage aspect is at the core. Furthermore, retailers and providers have to take into consideration that customers come to their place with different background knowledge on persuasion attempts, defined as persuasion knowledge, describing a consumer's beliefs about how marketers are trying to persuade him or her to buy and how best to react to achieve his or her own goals (Friestad and Wright, 1994). Therefore, the disposition of persuasion knowledge may alter the influence that the environment has on evaluations.

Prior research has primarily focused on specific outcomes of scent marketing measures, for example, the impact on the enhancement of brands (Morrin and Ratneshwar, 2003), on behavioural impacts like spending more money on-site (Hirsch, 1995), or the stimulation of social interactions (Zemke and Shoemaker, 2007). The discussion on specific boundary factors of scent marketing measures concentrated largely on the congruency between scent and scented products or scented stores (e.g. Bosmans, 2006; Parsons, 2009) or on demographic variables (e.g. Spangenberg *et al.*, 1996; Yildirim *et al.*, 2015). Prior research has not yet examined aspects of pre-information, the environment or persuasion knowledge as boundary factors. A recent systematic literature review on ambient scent topics underlines the existing deficits and also demonstrates that the scent marketing environment is mostly examined in laboratory experiments, while field studies are underrepresented (Rimkute *et al.*, 2016). This paper, therefore, aims at broadening the list of factors which may impact the relationship between scenting an environment as a marketing measure and consumer evaluation of this activity. This is an important consideration to be taken before spending money on adding ambient scents.

The purpose of this paper is to examine how so far neglected factors, namely consumer pre-information (given vs not given), the environment (pay-now vs pre-paid) and disposition of persuasion knowledge as moderator variable impact on customers' evaluation of ambient scenting. This research adds to literature in the field of sensory marketing, and scent marketing in particular. The theoretical background is based on the concept of spreading activation (Collins and Loftus, 1975; Anderson, 1983) and models of the consumer decision process (Blackwell, Miniard and Engel, 2006) and persuasion knowledge (Friestad and Wright, 1994). The paper is structured as follows. On the basis of a literature review

and relevant theoretical concepts, conception and hypotheses for the empirical analysis are developed. Drawing on the results of a field experiment, conclusions for marketing theory and practice as well as limitations and avenues for further research are given.

Literature review

Scent marketing is part of multi-sensual marketing, which can be defined as “marketing that engages the consumers’ senses and affects their perceptions, judgements and behaviour” (Krishna, 2010). Sensory marketing targets all five senses of human beings, including the sensations of vision, audition, taste, haptic and olfaction (Krishna, 2012; Krishna and Schwarz, 2014). It plays with sensorial stimuli, such as music, colour, layout or touch. In the form of scent marketing, it is directed to the olfactory sense. Ambient scents are defined as scents that are present in the environment, without originating from a particular object (Spangenberg *et al.*, 1996). They are assumed to be especially effective, as they include all products in a scented environment and not only those which had been especially enriched by fragrances (Davies *et al.*, 2003). Examples include characteristic odours in clothing stores or spreading exotic scents in travel agencies. The general effect of scents can be summarised as an enhancement of the scented targets (Gulas and Bloch, 1995).

Research on the effects of scent marketing measures demonstrates impacts on emotions, cognitions and behaviour. The affective component is easily activated as odours enter the limbic system of the brain without need for any mental effort (Spangenberg *et al.*, 1996). It was, for instance, experimentally shown that patients waiting for medical treatment could reduce anxiety or get a better mood in a scented room than the control group in a waiting room with no odour (Lehrner *et al.*, 2000, 2005; Fenko and Lookk, 2014). Odours are able to recall memories, feelings as well as memorised concepts or past events, even dating back to childhood and adolescence (Ehrlichman and Halpern, 1988; Chu and Downes, 2000). By giving access to stored information like product-class schemas, this cognitive stimulation may lead to a greater depth of information processing (Mitchell *et al.*, 1995). Even the imagination of scent has shown significant effects on consumers’ responses to advertised food products, including an increase in consumption (Krishna *et al.*, 2014). A further behavioural reaction can be shown in increased length of stay, as customers who feel comfortable in the scented environment may perceive an enhanced experience and forget about time (Spangenberg *et al.*, 1996; Morrison *et al.*, 2011). Visual and olfactory sensory cues may also impact on touching behaviour and make shoppers buy the articles they had touched before (Hultén, 2012). On the other hand, a negative reaction may occur if consumers suspect sales motives of retailers and may react with increased scepticism and a decrease in pleasure (Lunardo, 2012).

Scent literature suggests that several variables influence olfactory perception and possible resulting effects. Among them, the congruency aspect between fragrance and offerings plays a noticeable role (Bone and Jantrania, 1992; Morrin and Ratneshwar, 2003). The impact appears to be stronger with congruent than with incongruent scents (Ellen and Bone, 1998; Mattila and Wirtz, 2001; Spangenberg *et al.*, 2005; Bosmans 2006; Helmefalk, 2016), although literature also demonstrates opposite positive effects, for instance in respect to gender-incongruent scents (Doucé *et al.*, 2016), or shows that congruity can have a negative effect on consumer responses in case of spatial density (Poon and Grohmann, 2014). However, in line with the concept of associated scents, consumers will rather prefer a match of scent and scented elements or environments than have a state of incongruence (Parsons, 2009; Gvili *et al.*, 2017). Literature supported that given a proper fit, desirable effects like improving mood, reducing anxiety and enhancing attention and purchase intention can arise (Lehrner *et al.*, 2005; Lwin *et al.*, 2016).

The intensity of the odour can be considered as a further factor moderating the effect between scenting and consumer responses, especially if it is so high that even pleasant

scents turn to aversive at a high level of intensity (Spangenberg *et al.*, 1996). In sum, these prior findings show that various factors can impact the effect of ambient scenting and consumer reactions towards this measure. It is proposed that the list of boundary conditions has to be extended by pre-information and environment and the moderating role of persuasion knowledge.

Theoretical conception and hypotheses

Two independent variables are expected to impact consumer evaluation of scenting the environment. They consist of pre-informing one's customers on the sensory marketing measure and the respective environment that the scenting takes place in. Furthermore, individual disposition of persuasion knowledge is supposed to moderate the impact of environment. Consumer evaluation of the scenting serves as dependent variable, measuring the respondent's affective response towards the concept of scenting the particular place. In this context, scent is one atmospheric cue among others like background music and colour-schemes (e.g. Ballantine *et al.*, 2015; Spence *et al.*, 2014; Jang *et al.*, 2018). All factors need to interplay effectively to contribute to the pleasantness of a store. Scent may be one element that matters significantly for the improvement of the store atmosphere.

The assumed impact of pre-information draws on the cognitive procedure of retrieving memory-stored concepts, which has been extensively described by the concept of spreading activation (Collins and Loftus, 1975; Anderson, 1976, 1981, 1983). The spreading activation mechanism describes how exactly incoming information is being processed. To symbolise the mental work, spreading activation uses the model of an interconnected network of cognitive units which consists of nodes, representing concepts, and links, expressing the strength of the relationship to related concepts (Collins and Loftus, 1975; Anderson, 1983). If a new concept is announced, semantic processing follows the logic of spreading from the primed concept to its associations (Nelson *et al.*, 2013). Thus, "priming" or "preparation" can be described as "[...] an expanding set of links in the network out to some unspecified depth" (Collins and Loftus, 1975).

In respect to odours used in special settings, the individual who is being reminded of this concept through pre-information will conceivably rush through several steps of memory, including facts about different fragrances, feelings concerning preferred characteristics and experiences with scents under specific circumstances. Following this logic odour perception has been described as a processing model (Olofson *et al.*, 2012). Having the chance to activate their "Proustian memory" (Sugiyama *et al.*, 2015) is in contrast to those customers who are not pre-informed and miss the time of reflecting on scents. A feeling of scepticism may prevail if they become aware of the scenting on their own, which was shown to give rise to a more critical attitude towards scent marketing (Lunardo, 2012):

H1. Customers who are pre-informed about the addition of scent before starting their purchases or therapy will evaluate the respective scent marketing activity as more positive than not pre-informed customers.

Retail environments in which customer and supplier interact can be grouped into pay-now and pre-paid environments, drawing on the process of decision making and its sequence of decision steps. Pay-now environments, such as grocery stores, are characterised by a customer having to take actual purchase decisions. From his or her perspective, a price for the product or service is what has to be sacrificed (Zeithaml, 1988). Pre-paid environments, in contrast, are determined by consumption or usage and, therefore, represent a later stage of the decision-making process. For instance, in medical health centres or in sports and leisure environments like gyms or hotel facilities, the price has been paid in advance, with usually no need for further expenditures. The value of the offer is exclusively derived

through the usage situation (Vargo and Lusch, 2004; Vargo *et al.*, 2008). As a consequence, ambient scenting may be interpreted as improvement of the atmosphere, with no secondary ideas in marketer's intentions to sell. In pay-now environments, which require the exchange of value for money, however, the suspicion about sales motives may prevail and lead to a less positive evaluation of scenting measures. Therefore, it is hypothesised:

H2. Evaluation of ambient scents is more positive in a pre-paid environment than in a pay-now environment.

The general awareness of persuasion attempts for promotional ends was conceptualised by the persuasion knowledge model (PKM) (Friestad and Wright, 1994). This model challenges the idea of consumers as solely passive recipients and targets of marketers' persuasion attempts. Instead, consumers are seen as getting active themselves by developing persuasion knowledge over time. Against this background, they are able to analyse the steps taken ("persuasion attempt"), and may classify and evaluate the consequences that accrue to them personally ("persuasion coping behaviour"). The "agent" who is trying to persuade, as well as the "target" who is the envisaged addressee, are both disposing of knowledge in respect to main elements and the process of persuasion ("persuasion episode") (Friestad and Wright, 1994). In line with this model, consumers who have high persuasion knowledge are expected to see both sides of marketing tactics. On one hand, they are assumed to develop negative attitudes if sales motives are suspected (Campbell and Kirmani, 2000; Henrie and Taylor, 2009). On the other hand, customers are also expected to realise a possible advantage of marketing activity for the consumer side, such as creating pleasant shopping experiences (Spangenberg *et al.*, 1996; Morrison *et al.*, 2011; Isaac and Grayson, 2017). Against this background, it is supposed that the respondents' membership to one or the other environmental group (0 = pay-now, 1 = pre-paid) interacts with the individual persuasion knowledge score (low level vs high level) in so far, as in the pre-paid condition a high level of persuasion knowledge will lead to more positive evaluation of the scenting, while in the pay-now scenario a high level of persuasion knowledge will lead to less positive evaluation. This effect is assumed as the pay-now condition, the grocery store, represents the purchase situation which rises suspicions about sales tactics, while this is not the case for the pre-paid situation, the medical therapy centre, which emphasises usage aspects:

H3. Persuasion knowledge will moderate the relationship between environment and evaluation. Specifically, the link between environment and evaluation will be stronger for consumers with a high level of persuasion knowledge than for consumers with a low level of persuasion knowledge.

Empirical approaches

Preliminary survey

To gain more insights on consumer knowledge and beliefs on scents and scent marketing activities, a preliminary online consumer survey was conducted. The questionnaire was pretested ($n = 19$) and modified according to feedback. The final convenient sample consisted of 146 respondents (53.4 per cent female, $M_{\text{age}} = 44.34$, $SD = 16.35$).

In general, scents seemed to be fairly important to the respondents. Rated on a Likert scale from 1 = not at all to 5 = very important, the personal significance of scents and fragrances is on average $M = 3.88$ ($SD = 0.95$). The participants confirmed cognitive and emotional reactions to scents on a scale from 1 = not at all to 5 = very much. Among them, bringing back of memories ($M = 3.82$, $SD = 1.01$), including memorised stories and accompanying feelings, turned out to be most important. Behavioural reactions were for instance indicated by respondents' confirming a more positive reaction

when pleasant scents prevail ($M = 3.27$, $SD = 0.98$). Respondents were asked to indicate in which areas they could imagine marketers to disperse or add scents to products or environments. In respect to ambient scents, 22.9 per cent of the respondents expect scents in sports or leisure facilities, 21.6 per cent in retailing. Health environments are mentioned by 7.3 per cent. The perceived risks of adding scents concern primarily the possibility of a sensory overload (54.8 per cent) and health aspects (52.7 per cent). In sum, the results of the online pre-study confirm that odours are important to the participants, but that they see both, positive and negative sides, and even health risks as a possible negative characteristic. This indicates that despite noticeable expectations on consumer side the implementation of any scent marketing measure has to be thoroughly examined for possible adverse effects.

Research design and procedure of the field experiment. A quasi-experimental design was employed to test the hypotheses in a field experiment. A local, family-owned grocery store in a medium-sized German town was selected as a suitable pay-now environment, and a medical therapy centre, also located in a medium-sized German town, comprising physiotherapy, ergo therapy and speech therapy, was selected as a pre-paid environment. These decisions were taken for two reasons. First, these two environments represent typical pay-now vs pre-paid constellations. Second, it was essential to find two environments with nearly identical clientele, especially in respect to inherent demographic characteristics. The local grocery store (pay-now) is situated in a residential area with rather older inhabitants. The medical therapy centre (pre-paid) has customers who can generally be expected to cure illness in their later years.

The sample in each environment encompassed $n = 100$. At each location, a convenience sample of entrants was asked to participate in a survey. Upon agreeing, information on the scenting was randomly given to half of the respondents. In line with prior research, persuasion knowledge was measured following the persuasion knowledge scale developed by Bearden *et al.* (2001). The scale consists of six items which measure the respondent's perceived ability to fully understand marketers' strategies: I know when an offer is "too good to be true"; I can tell when an offer has strings on it; I have no trouble understanding the bargaining tactics used by salespersons; I know when a marketer is pressing me to buy; I can see through sales gimmicks used to get consumers to buy; I can separate fact from fantasy in advertising (Bearden *et al.* 2001, p. 125). Respondents were asked to indicate their persuasion knowledge (1 = not at all correct, 5 = fully correct). Finally, items were averaged to calculate the level of persuasion knowledge, and results were discussed in accordance with former literature (e.g. Ahluwalia and Burnkrant, 2004; Ham *et al.*, 2015; Martin and Strong, 2016).

The respondents were asked three successive questions in respect to scenting the particular environment, covering awareness, information and evaluation. First examined was whether the distribution of scent had been noticed at all. Participants were asked whether a fragrance was in use at the special site on the particular day (yes or no). The second question was intended for the manipulation check by requesting whether the participant had been informed about the scenting at the entrance (yes or no). Finally, each respondent had to express his or her personal opinion on the concept of spreading scent on-site: "What do you think about scenting this particular location?" (five-point Likert scale, 1 = not good at all, 5 = very good). The questionnaires were pretested ($n = 10$ each) and modified according to feedbacks. It took the respondents less than ten minutes to fill the questionnaire out.

The first part of the experiment took place in the grocery store. The natural odour of the fruit section was intensified by an organic citrus fragrance, distributed via the air conditioner. Prior research shows that this odour rates highly in respect to affect and

activation and that it was generally classified as pleasant and mood-lifting (Spangenberg *et al.*, 1996; Lehrner *et al.*, 2005). It also fulfils the criterion of congruence with the natural scent of the store which research recommends (Parsons, 2009; Lwin *et al.*, 2016; Gvili *et al.*, 2017).

At the entrance, all incoming customers were asked to participate in a scientific, non-commercial study after their shopping was finished. The customers willing to take part were randomly divided into being informed on the actual scenting or not. This happened via personal communication after thanking for their willingness to participate. After leaving the store, the customers who had agreed were requested to fill out the questionnaire on regular consumer behaviour, persuasion knowledge, attitude towards scenting the particular environment and demographics and were rewarded with a small gift. The second part of the experiment which took place in the medical therapy centre followed the same procedure. In the medical environment, citrus scent was expected to be positively associated with freshness and hygiene. Citrus fragrance also bears the potential to reduce anxiety and improve mood, as has been shown in different medical settings (Lehrner *et al.*, 2005; Fenko and Loock, 2014). Both congruency and likeability of the applied fragrance were pretested and confirmed, as is demanded in literature (Ward *et al.*, 2007; Parsons, 2009). The scenting was introduced to the reception and the waiting area, using hidden fragrance sticks.

Manipulation check and sample description. Out of $n = 100$ interviewed respondents in the grocery store setting, 12 participants failed the manipulation check. Although they had been informed about the actual scenting at the entrance they did not remember this at the exit. As shopping for daily needs is a rather diverse, time-consuming activity, forgetting about prior information is plausible. This notwithstanding, the 12 respondents had to be eliminated from the data set, resulting in a reduced subsample of 88 participants. In contrast, all patients in the medical environment answered the manipulation check correctly, possibly because they were less distracted. This led to a total sample size of $n = 188$.

Contrary to reality, 57.6 per cent of the respondents said that there was no scenting at the particular day. This result is consistent with research results in literature, though, describing that despite noticeable effects many or even all subjects in a scented condition did not notice the presence of an ambient scent (Spangenberg *et al.*, 1996; Morrin and Ratneshwar, 2000; Krishna *et al.*, 2010; Rimkute *et al.*, 2016). Compared to these results the present study shows a rather high awareness rate. Interestingly, the percentage of respondents who did not notice a scenting is significantly higher for the respondents in the grocery store (67.9 per cent) than for those in the medical therapy centre (49.0 per cent), $\chi^2_{\text{awareness}}(1,184) = 6.65, p < 0.05$. This result is plausibly due to the congruency aspect, as citrus scent is a natural companion for a grocery store that sells fruits, but not for a medical environment in which an unexpected scent may attract more attention.

Both subsamples (grocery store, $n = 88$ and medical therapy centre, $n = 100$) show consistent results in respect to demographic and dispositional characteristics. In total, 52.7 per cent of all respondents are female, the average age is $M = 47.7$ ($SD = 17.4$), ranging from 18 to 87 years. The participants of the experiments are mainly well educated (56.4 per cent reached university level). In accordance with the educational status, the total sample disposes of an above average persuasion knowledge of $M = 3.85$ ($SD = 0.77$). The analysis of internal consistency reliability of the persuasion knowledge scale showed a satisfying Cronbach's α of 0.81.

Gender, age, education and preference for information, as well as persuasion knowledge in general and knowledge about scenting as a marketing measure in particular are nearly evenly distributed. Due to the careful selection of both environments, there are no significant differences between both studies, as can be exemplarily demonstrated by χ^2 - or t -tests for

demographics like gender and education ($\chi_{\text{gender}}^2(1,188) = 0.61, p = 0.44$; $\chi_{\text{edu}}^2(1,188) = 3.016, p = 0.39$) or age and persuasion knowledge ($t_{\text{age}}(188) = -0.45, p = 0.65, t_{\text{pk}}(188) = 0.09, p = 0.93$). The same tendency is confirmed by Z-test. The differences between both groups in respect to age and persuasion knowledge are not significant with $p > 0.05$ each ($Z_{\text{age}} = 8.75, Z_{\text{pk}} = 4.56$). Both samples are nearly congruent in respect to (not) knowing about ambient scenting in general with more than one-third each having no knowledge on this marketing measure (34.8 per cent _{grocery store}, 37.0 per cent _{medical therapy centre}). These results support the reasoning that customers at the two locations share similar demographics and are, therefore, suitable experimental settings for this study.

Experimental results

The impact of pre-information and environment

H1 states that respondents who get informed about scent marketing measures before they start their purchases or begin their therapy can adapt to this measure by spreading activation on the scent concept, which also includes relevant positive aspects for the customer like the enjoyment of a pleasant scent. Thus, it is expected that pre-informed customers will react more positively than non-pre-informed respondents.

H2 assumes that the environment is a relevant factor for the evaluation of scents. While in pre-paid service arenas like medical therapy centres, but also in leisure environments, such as gyms or hotel facilities, the scenting may be solely interpreted as improvements of the atmosphere, the suspicion about sales motives may prevail in pay-now situations, e.g., a grocery store. Here, the hidden message of scent may be seen as the marketer's effort to influence or even manipulate his buyers' decisions.

A two-factorial ANOVA was applied to test both hypotheses. The focus is on two main and one interaction effect in respect to the respondents' evaluation of the particular environment. First, is there a systematic difference between the informed and the uninformed ones? Second, do customers of the grocery store or the medical therapy centre significantly differ in evaluating the ambient scenting? Third, is there an interaction effect between both factors?

The results of the two-factorial ANOVA with pre-information (PI: yes or no) and environment (grocery store vs medical therapy centre) as two independent variables show the expected differences. Pre-informed customers are significantly more in favour of scenting the environment (1 = not good at all, 5 = very good) than non-informed persons: $M_{\text{non-informed}} = 2.66, M_{\text{informed}} = 3.13, F_{(1,184)} = 4.484, p < 0.05$. As expected, also the environment makes a significant contribution to the evaluation of the scenting. The patients in the medical therapy centre do like the scenting significantly more than the consumers in the grocery store: $M_{\text{grocery store}} = 2.27, M_{\text{medical therapy centre}} = 3.43, F_{(1,184)} = 34.396, p < 0.001$. Results also show that there is no interaction between pre-information and environment, $F_{(1,184)} = 0.202, p = 0.65$. The respondents value being informed on the scenting, irrespective of their environment.

In sum, *H1* with its expectation that pre-informing one's customers will improve their evaluation of the ambient scent, independent of their actual environment, can be supported. Results also demonstrate that respondents in the pre-paid environment are significantly more in favour of the ambient scent than their counterparts in the pay-now environment. This result is in line with *H2*, expecting that scents are more positively evaluated if the environment comprises a usage-oriented, pre-paid constellation and are less positively evaluated if an exchange-oriented, pay-now situation is concerned.

The impact of persuasion knowledge. *H3* leans on the PKM and its implications for consumers' ability to view a marketing measure as a whole. Persuasion knowledgeable customers may either criticise the suspected manipulation attempt or they may derive

benefit from a pleasant shopping ambiance. An interaction effect between persuasion knowledge and environment is supposed in so far, as both in common may strengthen the perception of consumer-oriented intentions of the supplier. This is probably in diverse directions the case when customers are reflecting on the scent and its pay-now logic in a sales environment or free-of-charge consequence in a pre-paid service arena.

Moderated regression analysis by Hayes (2013) was used to test the predictor function of the environment as independent variable (0 = grocery store, 1 = medical therapy centre) and the moderating role of persuasion knowledge (mean-centred) on respondents' evaluation of scenting the particular environment as dependent variable. Results show that the relationship between environment and evaluation is indeed positively moderated by persuasion knowledge, indicated by a highly significant interaction effect (cf. Table I).

To gain more inside on the role of the moderator at various stages, the effect of three different levels of persuasion knowledge can be compared. These are low, mean and high levels determined as ± 1 standard deviation from mean of persuasion knowledge (Hayes, 2013; Field, 2013):

- (1) when persuasion knowledge (centred) is low (-0.77), there is a non-significant relationship between environment and evaluation of ambient scent ($b = 0.436$, 95 per cent CI $(-0.04, 0.91)$, $t = 1.81$, $p = 0.072$);
- (2) at the mean value of persuasion knowledge (0.00), there is a significant positive relationship between environment and evaluation of ambient scent ($b = 1.156$, 95 per cent CI $(0.77, 1.54)$, $t = 5.90$, $p < 0.001$); and
- (3) when persuasion knowledge is high (0.77), there is a significant positive relationship between environment and evaluation of ambient scent ($b = 1.877$, 95 per cent CI $(1.29, 2.46)$, $t = 6.30$, $p < 0.001$).

The model used also allows for visualisation (Hayes, 2013). Figure 1 demonstrates how the moderation effect of persuasion knowledge applies to high, medium and low levels of persuasion knowledge in a pay-now (grocery store) or pre-paid (medical therapy centre) environment. It underlines that in pre-paid situations, like in medical therapy, ambient scent is being evaluated more positively the higher the level of persuasion knowledge of the evaluator. For pay-now environments, like a grocery store, the contrary holds true. Ambient scent is being evaluated less positive the higher the level of persuasion knowledge. This means that respondents with higher levels of persuasion knowledge react more extreme on either side: more benevolent towards scent measures in a pre-paid environment, but less tolerant in pay-now environments.

H3 which assumes that the level of persuasion knowledge changes the relationship between the environment and the evaluation of scenting in the particular place can be supported (cf. Figure 1).

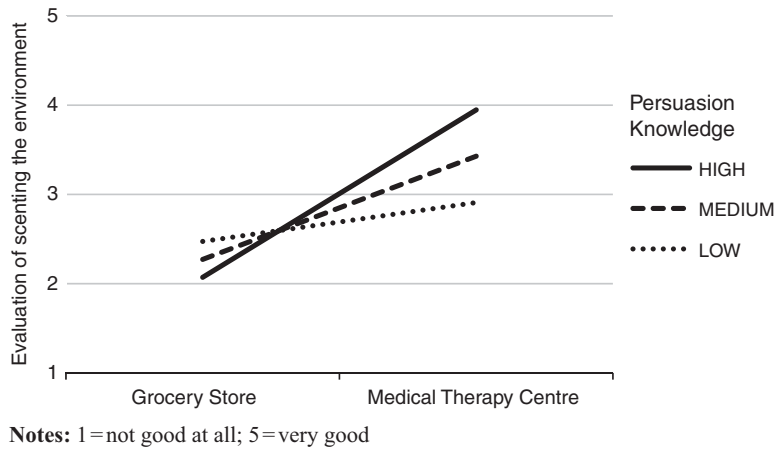
	<i>b</i>	LLCI, ULCI	SE B	<i>t</i>	<i>p</i>
Constant	2.89	2.699, 3.075	0.095	30.25	$p < 0.001$
Persuasion knowledge (centred)	0.24	0.001, 0.475	0.120	1.98	$p < 0.05$
Environment	1.16	0.770, 1.543	0.196	5.90	$p < 0.001$
Persuasion Knowledge \times Environment	0.94	0.460, 1.423	0.244	3.86	$p < 0.001$

Model summary: $R^2 = 0.224$, $F(3, 184) = 17.873$, $p < 0.001$

Notes: *b*, regression coefficient; LLCI, lower level of confidence interval; ULCI, upper level of confidence interval; SE B, standard error B

Table I.
Predictors of
consumer evaluation
of scenting a
particular
environment

Figure 1.
Interaction effect of environment and persuasion knowledge on respondents' evaluation of ambient scenting



Conclusions and limitations

Theoretical implications

This paper broadens the list of boundary factors which impact the relationship between scenting an environment as a marketing measure and consumer evaluation of this activity. Specifically, the results provide support for the so far neglected impact of consumer pre-information, environment and persuasion knowledge as boundary factors for scent marketing interventions. Thus, the presented study contributes to the theoretical underpinning of ambient scenting, which can be seen as a rather simple and cost-efficient marketing measure.

Pre-information. Current discussions focus on the question whether sensory marketing should be hidden or not (Hilton, 2015). This hidden approach seems to be attractive for considering scent marketing measures, as it implies that the pleasant environment is sufficient to stimulate positive reactions of the customers. However, the present research shows that pre-informing one's customers is a necessary prerequisite. Participants in the experiment at hand turned out to be more positive towards the scenting than non-informed participants, regardless of the environment. This result clearly speaks for open communication and against hidden actions.

Environment. The customers of the pay-now, exchange-dominated environment turned out to be by far more critical regarding ambient scenting than the patients in the pre-paid, usage-oriented environment. This result was backed by the analysis of open answers in the questionnaire, in which respondents expressed their associations with ambient scenting. The clear majority of the grocery store respondents had thoughts relating to issues like buying incentives and manipulation attempts (81.42 per cent). Only less than the third mentioned atmospheric advantages like the promoting of well-being (27.14 per cent; multiple responses possible). This is different for the medical therapy centre. No respondent in the medical therapy centre thought of sales reasons or even manipulative purposes, but exclusively of issues like atmospheric improvements, relaxing and well-being.

Persuasion knowledge. The expected moderating role of persuasion knowledge was supported. The results of the presented study underline that customers with a high level of persuasion knowledge react more intensely towards ambient scent in both environments, but in different directions. Customers high in persuasion knowledge rated the ambient scenting in the pre-paid environment of the medical health centre even higher than customers low in persuasion knowledge, and likewise less high in the pay-now environment

of the grocery store than their counterparts with low persuasion knowledge. Comparable result has been shown in recent research, demonstrating that persuasion knowledge access cannot only be associated with rising scepticism, but also an increase in credibility (Isaac and Grayson, 2017). This ambivalence of the persuasion knowledge concept had already been announced when it was introduced (Friestad and Wright, 1994). In respect to the present study, it indicates that ambient scenting requires sensitive preparation with thorough analysis of all relevant factors, including persuasion knowledge.

Managerial implications and limitations

Creation of a pleasant environment can lead to highlighting offers and attracting customers (Bitner, 1992; Helmefalk and Hultén, 2017). An easily applicable marketing measure like scenting an environment can lead to favourable results like feeling good, enjoying a pleasant atmosphere and possibly reacting positively in respect to the offerings (Doucé and Janssens, 2013). However, the present research shows that consumers' evaluations differ, depending on their pre-information on the ambient scent, the environment in which the scenting takes place with its either pay-now or pre-paid characteristics, and their disposition of persuasion knowledge.

Results indicate that using ambient scenting can particularly be recommended to managers in pre-paid environments. While pay-now customers remain rather sceptical, consumers under pre-paid conditions generally show more approval. Interestingly, this effect is reinforced by customers' general knowledge on marketers' persuasion attempts. This is the case as persuasion conscious consumers are able to assess both sides of the marketing measure, encompassing negative aspects like interfering with consumer preferences, but also including some value for the customer, such as a preferable store environment. The findings suggest scenting recommendations for the management of environments like medical care centres, but also a warning for primarily sales-oriented environments like retail stores. Patients can for instance benefit from hospital managers' masking the typical hospital scent (Van Rompay and Tanja-Dijkstra, 2010) or from being distracted during an unpleasant treatment (Jafarzadeh *et al.*, 2013). In contrast, consumers in retail environments who have high persuasion knowledge may suspect greater sales motives and unfair practices by marketers. If managers still wish to use ambient scenting in pay-now environments, the focus should be put on pre-informing one's customers, which turned out to be recommendable, regardless of the environment.

However, the question for the best strategy of transmitting the message remains. The procedure applied in the present field experiment, namely informing via personal communication, is not feasible in practice, at least not in large retail environments. Different possibilities are conceivable, such as installing signs at the customer entrance area, informing through audio-visual means or posts on the retailer's or medical centre's homepage. To get direct feedback from the customer, an installation of "likes" boards with smileys and green and red buttons, already known from airports to test cleanliness in toilets or politeness during security check, could be a further possibility. Likewise, customers could help choosing the adequate type of fragrance by expressing their preferences for diverse samples of scents.

Generally, the results speak for particularly positive impacts of ambient scents if consumers are pre-informed and pre-paid environments are concerned. As customers are confronted with manifold constellations which resemble a pre-paid environment, be it on airports, at stations and in public institutions, or in hotels, theatres or gyms, it is likely that the positive effect transfers to these contexts as well.

However, caution should be taken with generalisations of the present results. Here, only one representative of a pay-now environment (grocery store) and pre-paid environment (medical therapy centre) in one country (Germany) was analysed. Further research is

necessary trying to enlarge the appropriateness of scenting in different pre-paid and pay-now environments, and specifying the limits to scent marketing measures in such contexts, preferably in future national and international studies.

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