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Smelling the books: The effect of chocolate scent on purchase-related behavior in a bookstore

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ABSTRACT

The aims of this research were to (1) explore the different effects of an ambient scent of chocolate on general approach versus goal-directed behavior, and (2) investigate whether an ambient chocolate scent diffused in a retail environment has a positive effect on consumers' behavior toward thematically congruent products. A field study with 201 participants shows that a chocolate scent positively influences general approach behavior and negatively influences goal-directed behavior in a bookstore. Moreover, when gender is controlled for, the chocolate scent improves approach and buying behavior toward thematically congruent books and decreases approach and buying behavior toward incongruent books. Sales figures also provide some indicative support for the findings.

Scents can influence people's attitudes and behavior (e.g., Holland, Hendriks, & Aarts, 2005). The scent of chocolate, for instance, evokes pleasure and arousal for most consumers (Knasko, 1995) and changes the behavior of visitors in a (cyber)shop. They stay longer, and they examine products they have picked up for a longer time (Vinitzky & Mazursky, 2011). Not surprisingly, a growing number of marketing managers have shown interest in the use of scents in a variety of marketplace contexts, such as movie theaters (Elliott, 2007) and retail store environments (Smith, 2009). Although research on ambient scent effects is substantial, investigators have paid relatively little attention to the combined effects of the store, its products, and scent (Krishna, 2012). The current study attempts to fill this research gap in two ways: (1) by examining possible differences in the effects of a chocolate scent on general approach behavior versus goal-directed behavior, and (2) by further unraveling the presently mixed results of thematically (in)congruent scent effects.

1. Chocolate as a pleasant ambient scent

In a retail setting, previous research has shown that ambient scents influence consumers' affective and cognitive reactions as well as their approach behavior toward products and stores (e.g., Spangenberg, Crowly, & Henderson, 1996; Ward, Davies, & Kooijman, 2007). A well known theoretical basis for studying ambient scent effects is the Stimulus-Organism-Response paradigm (Gulas & Bloch, 1995; Mehrabian & Russell, 1974). This model states that affective and cognitive responses triggered by an ambient scent mediate the effects of the scent on approach behavior. In line with this model, research has found that the presence of a pleasant ambient scent triggers a positive affective reaction (e.g., Baron, 1997; Doucé & Janssens, 2013) and/or a cognitive reaction such as enhanced attention, memory, and evaluation (Lwin, Morrin, & Krishna, 2010; Morrin & Ratneshwar, 2003). These affective and cognitive responses in turn lead to approach behavior, such as staying longer in the store and examining more products for a longer period of time (Vinitzky & Mazursky, 2011). Thus, a pleasant ambient scent may shift consumers' shopping goals from searching for specific products they want to buy (i.e., goal-directed behavior) to exploring stores in general and in detail (i.e., general approach behavior).

In this research, we focus on the scent of chocolate. Consumption of chocolate is known to positively influence mood (Parker, Parker, & Brotchie, 2006), and even the mere scent of chocolate leads to a higher positive mood and higher arousal (Knasko, 1995). Besides these affective reactions, the scent of chocolate may also elicit cognitive reactions. Especially the aroma of chocolate, compared to smells of other food, changes activity in the human central nervous system (Martin, 1998). The scent of chocolate can also reduce consumers' attention, perhaps implying that during the

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shopping trip consumers evolve from shopping for a specific product to enjoying the whole shopping experience. Combining these findings with the prediction of the Stimulus-Organism-Response paradigm, we assume that the scent of chocolate will lead to approach behavior. More specifically, we expect that:

H1: The presence of an ambient chocolate scent will have (a) a positive influence on general approach behavior, and (b) a negative influence on goal-directed behavior compared with no ambient scent.

2. Thematic congruency effects

The ambient scent model of Gulas and Bloch (1995) stipulates that the relationship between ambient scent perceptions and consumer responses can be moderated by congruency between the scent and the store's offerings. Several studies have revealed that scent has a positive effect only when it is congruent with the targeted product (e.g., Bosmans, 2006; Mitchell, Kahn, & Knasko, 1995), even when the product itself has no inherent scent. For example, approach behaviors of shoppers for men's and women's clothing increased when a gender-congruent scent was present in the store (Spangenberg, Sprott, Grohmann, & Tracy, 2006). Thus, only when the scent matches the product an effect can be expected.

In this study, we take a look at thematic congruency effects. These effects can be explained by odor priming, which means that when consumers perceive a scent, an automatic knowledge activation process may (unconsciously) begin (Schifferstein & Blok, 2002). A scent can prime certain concepts to consumers, and once these constructs are activated, consumers are more sensitive to subsequent congruent elements, which often lead to corresponding behaviors (Dijksterhuis, Smith, van Baaren, & Wigboldus, 2005). For example, when consumers smell chocolate, concepts associated with chocolate, such as cooking, become more readily accessible to the consumer's mind and cause consumers to react differently when encountering a cookbook than if they had not smelled chocolate (Schifferstein & Blok, 2002). To our knowledge, only two previous studies have investigated the effect of thematic congruency between an ambient scent and the products offered in the store. These studies had mixed results. Fiore, Yah, and Yoh (2000) concluded that consumers are more likely to purchase sleepwear, and are willing to pay more for these products in the presence of a congruent fragrance than in the presence of an incongruent fragrance. In contrast, Schifferstein and Blok (2002) showed that ambient scents (e.g., grass) had no effect on the sales of incongruent magazines (e.g., women's magazines) and congruent magazines (e.g., nature and soccer magazines). However, even though the selected magazines were very gender-specific, the study did not take gender into account. Moreover, only the sales of the magazines were measured, and no other data on approach behavior were collected. An ambient scent may also increase approach behavior toward congruent products, potentially resulting in increased sales in the long run.

The current study focuses on the thematic (in)congruity effects of a chocolate scent on observed approach and buying behavior (including sales) in a bookstore. More specifically, this work extends previous research by (1) observing actual behavior rather than using self-reported data, (2) controlling for gender, and (3) selecting broad and popular product categories (i.e., book genres). Taking the above into account, we expect:

H2: The presence of an ambient chocolate scent will lead to more (less) approach and buying behavior toward thematically congruent (incongruent) books compared with no ambient scent.

3. Method

3.1. Scent selection

In line with the arguments listed above, we selected a chocolate scent to be diffused in the store. A first pretest was conducted to verify the affective and arousing quality of the chocolate scent used in this study. Twenty participants (10 men and 10 women) were asked to sniff the scent (which was put on a cotton-tipped stick in a dark glass bottle) and to evaluate its pleasantness and its level of arousal on a 7-point semantic differential scale (i.e., unpleasant/pleasant and unaroused/aroused). Respondents found the chocolate scent pleasant ($M = 5.80$, $SD = .89$), significantly different from the scale midpoint of 4, $t(19) = 9.00$, $p < .001$, and having an average arousing effect ($M = 3.70$, $SD = 1.13$), not significantly different from the scale midpoint of 4, $t(19) = -1.19$, $p = .25$.

A second pretest was carried out to determine the intensity of the scent. If consumers think that a source other than the store or product, such as an ambient scent, influences their responses, they may correct for this influence on their behavior (Bosmans, 2006). Therefore, the ambient scent should not be salient. Before the experiment, the chocolate scent was dispersed in the bookstore at different levels of intensity and for several durations. Forty-eight customers replied to two questions: *Did you notice something special in the store atmosphere?* and *Now that we have mentioned the presence of a scent, do you detect the scent?* (Doucé & Janssens, 2013). The first question served as a test of whether respondents spontaneously reported scent-related elements. To determine an appropriate intensity of scent manipulation in the actual study, the intensity of the scent was lowered until none of the customers spontaneously noticed the chocolate scent. When we told those customers a scent was present, they noticed the scent and could all identify it as chocolate.

3.2. Incongruent and congruent book genres

A third pretest with 36 students was carried out to verify which book genres the respondents saw as most (in)congruent with the chocolate scent. More specifically, we wanted to know to what extent people believe that chocolate corresponds to a certain book genre. The students rated the congruency between chocolate and 10 book genres (i.e., *Comics & Graphic Novels; Romance Novels & Romantic Literature; Art & Photography; People & Society; Food & Drink (Cooking); Gardening, Animals, & Nature; Economy, Management & Law; Crime, Thrillers, & Mystery; History; Travel & Tourism*) on a 5-point Likert-type scale ranging from 1 = *not at all* to 5 = *extremely*. A repeated measures ANOVA was carried out, Greenhouse–Geisser test statistic: $F(6.03, 211.02) = 49.08$, $p < .001$, and indicated that the two genres most congruent with chocolate scent were *Food & Drink (Cook) Books* ($M = 4.36$, $SD = .80$) and *Romance Novels & Romantic Literature* ($M = 3.78$, $SD = 1.15$). These two genres differed significantly from all others (highest p-value = .002). Evidence for choosing these two as the most chocolate-congruent book genres was also found in a multiple-response analysis, in which participants indicated the four genres they thought fit best with the scent of chocolate. The top two, *Food & Drink (Cook) Books* and *Romance Novels & Romantic Literature*, were chosen 94.40% of the time.

We carried out a similar analysis with respect to the least congruent book genre. Of the four book genres that were rated least congruent with chocolate (mean below 2), *History* ($M = 1.58$,

SD = .81) and *Crime, Thrillers, & Mystery Books* (*M* = 1.97, *SD* = 1.00) were chosen as the incongruent book genres. These genres were also selected because they were equally as popular as the two congruent book genres and also equally present in the store.

Although the present study took place in a general bookstore and employs a broad range of genres, an association between gender and preferences for specific books might exist. For example, a large survey on reading behavior in the Netherlands showed that women prefer romantic literature (i.e., a congruent book genre), whereas men prefer history books (i.e., an incongruent genre; Peters & Witte, 2012). Therefore, we included gender as a control variable in the analysis of the effect of scent on approach and buying behavior toward (in)congruent books.

3.3. Participants and procedure

A field experiment was conducted for 10 days in a chain bookstore (2152 square feet) located in the main street of a municipality in Belgium. The bookstore did not have a coffee corner, and no shops associated with scents (e.g., a coffeehouse) were nearby. The interior design consisted of tables and shelves. Besides books, this retailer sold newspapers, magazines, DVDs, and lottery tickets. The store had only a few employees. The study applied a between-subjects design with two conditions: a control condition (no scent) and an experimental condition (chocolate scent). Both conditions were balanced between mornings and afternoons. The scent was dispersed with two scent dispensers provided by Scents, an olfactory marketing firm in Belgium. The scent appliance works according to the principle of microscopically fine atomization. The dispensers convert the liquid scent into microscopically fine particles and spray these particles into the room. One dispenser was placed near the entrance of the store above the cookbooks and the other dispenser was placed approximately in the middle of store above the crime, thrillers, and mystery books. This placement ensured that the scent was present throughout the entire store. The sex and the age of personnel, as well as the positions of the books in the store, did not change between the scent conditions. Additionally, the conditions were identical in terms of customers' age groups (≤40, 41–69, ≥70), $\chi^2(2) = .39$, $p = .82$, shopper traffic (not crowded [< 4 customers], crowded [between 4 and 7 customers], very crowded [>7 customers]), $\chi^2(2) = .09$, $p = .96$, and weather circumstances (sunny, cloudy, rainy), $\chi^2(2) = 5.53$, $p = .06$. These criteria were observed because they may vary by day or by every observation. The retailer did not change the music in the store (i.e., lounge music), nor did he launch any special promotions during the experiment.

Approach and buying behavior data were collected through direct observation and through the use of a self-developed coding scheme following the guidelines of Robson (2002). The direct observation was carried out by a researcher trained by the authors. This researcher only observed the customers and did not address them. A pretest checked the reliability of the researcher's observations. The rater who also carried out the observations in the main study and another independent rater observed the behavior of 10 customers. For those 10 test cases, an interrater reliability analysis using the Kappa statistic indicated that the two raters agreed almost perfectly (all Kappa ≥.80, all $p \leq .01$; Landis & Koch, 1977). Because observations needed to be as unobtrusive as possible, only one researcher observed the customers in the main field study. This researcher did not know the hypotheses of our study.

The researcher observed general approach and goal-directed behavior. General approach behavior implies that consumers inspect the store environment more generally and that a specific behavioral target, such as examining one particular book, is absent. The observed general approach behaviors of customers were coded as (1) closely examining multiple books, (2) reading synopses of multiple books, (3) lingering in the store, (4) chatting with the personnel, or (5) asking the personnel questions after screening the store environment. Goal-directed behavior means that consumers have a shopping goal and do not deviate from this goal. The observed goal-directed behaviors were coded as (1) searching for a specific book, (2) going directly to the cash register, or (3) asking questions of the personnel directly after entering the store. The researcher also observed specific approach and buying behavior toward thematically (in)congruent books. In line with Hall's (1968) guidelines about the use of public space, the researcher always kept a distance of more than 10 feet and avoided any interaction with the observed individuals. She observed every fifth customer who entered the store from a distance of approximately 13–16 feet.

Overall, the resulting sample of observed participants consisted of 201 customers (63 men and 138 women). The observer's estimation was that the customers' ages were between 14 and 80. The researcher studied 120 participants (44 men and 76 women) in the control condition without an ambient scent, and 81 participants (19 men and 62 women) in the experimental condition using the chocolate scent. Of the 201 observed participants, 119 (38 men and 81 women) bought either a congruent book or an incongruent book. For the analyses of the thematically (in)congruent scent effect on buying behavior, this subsample was used. Finally, for each observation session, total and specific sales figures of the (in) congruent book genres were registered (in euro).

4. Results

Only a few customers made a negative remark, gave a compliment, lingered in the store without a specific interest or goal, or ordered a book (10 observations or less). For those dependent variables, no analyses were conducted.

Tests of independence performed on the overall sample showed a significant positive association between the presence of the chocolate scent and general approach behavior: (1) closely examining multiple books, $\chi^2(1) = 7.46$, $p = .01$, $\varphi = .19$; (2) reading synopses of multiple books, $\chi^2(1) = 5.68$, $p = .02$, $\varphi = .17$; (3) chatting with the personnel, $\chi^2(1) = 6.71$, $p = .01$, $\varphi = .18$; and (4) asking questions after screening the store environment, $\chi^2(1) = 11.76$, $p = .001$, $\varphi = .24$. Additionally, scent had a negative effect on goal-directed behavior: (1) searching one specific book, $\chi^2(1) = 7.93$, $p = .01$, $\varphi = -.20$; (2) going directly to the cash register, $\chi^2(1) = 4.22$, $p = .04$, $\varphi = -.15$; and (3) asking questions directly after entering the store, $\chi^2(1) = 7.49$, $p = .01$, $\varphi = -.19$. Odds ratios are shown in Table 1. For example, customers were 2.22 times more

Table 1
Times more likely to demonstrate approach behavior in the scent condition compared with the control condition (odds ratio).

	Odds ratio[a]
General approach behavior:	
Closely examining multiple books	2.22
Reading synopses of multiple books	2.13
Chatting with personnel	2.76
Asking question after screening store environment	2.89
Goal-directed behavior:	
Searching for one specific book	.30
Going directly to cash register	.40
Asking question directly after entering store	.26

[a] Odds ratio of 1 indicates that the odds that a customer demonstrates the reported behavior are the same in both conditions. Hence, an odds ratio greater than 1 indicates that the odds that the specific behavior occurs are higher in the scent condition compared with the control condition. An odds ratio less than 1 indicates that the odds that the specific behavior occurs are lower in the scent condition compared with the control condition.

likely to closely examine multiple books when the chocolate scent was present in the store compared with the control condition. Overall, the results confirm that the presence of an ambient chocolate scent has a positive influence on general approach behavior and a negative influence on goal-directed behavior, supporting H1a and H1b. The total sales figures also provide some indicative support for the scent effect: an increase of 5.07% in the scent condition compared with the control condition, i.e., $(\text{sales}_{\text{scent condition}} - \text{sales}_{\text{control condition}})/\text{sales}_{\text{control condition}}$.

For the analyses of the effect of the thematically (in)congruent scent on approach behavior, we used the overall sample. To examine buying behavior, we used the subsample of customers who bought either a congruent book or an incongruent book. Using chocolate scent and gender as predictors, we conducted logistic regression analyses with indicator coding for the independent variables to predict approach and buying behavior toward (in) congruent books. As mentioned, an association between gender and preferences for the chosen book genres might exist. Therefore, gender was included as a control variable. For all dependent variables, tests of the full model against a constant-only model were statistically significant (marginally significant for examining incongruent books). Table 2 shows the results. Scent was a significant predictor for all dependent variables. For example, customers were 3.48 times more likely to examine congruent books in the scent condition than in the control condition, and they were 1.92 (=1/.52) times more likely to examine incongruent books in the control condition compared with the scent condition. Moreover, when a chocolate scent was present, customers were 5.93 times more likely to buy congruent books than in the control condition.

Table 2
Summary of logistic regression analyses.

	B (*SE*)	Wald statistic	*p*	Exp(*B*) – odds ratio
A. Examining congruent books – tables				
(Nagelkerke's $R^2 = .12$. model $\chi^2(2) = 18.67$, $p < .001$)				
Scent	1.25 (.31)	16.30	< .001	3.48
Gender	.20 (.32)	.40	.53	1.22
A. Examining congruent books – shelves				
(Nagelkerke's $R^2 = .16$. Model $\chi^2(2) = 24.89$, $p < .001$)				
Scent	1.17(.31)	14.54	< .001	3.22
Gender	.88 (.33)	6.87	.01	2.41
A. Examining incongruent books – tables				
(Nagelkerke's $R^2 = .03$. Model $\chi^2(2) = 4.66$, $p < .10$)				
Scent	−.65 (.31)	4.38	.04	.52
Gender	.22 (.32)	.45	.50	1.24
A. Examining incongruent books – shelves				
(Nagelkerke's $R^2 = .03$. Model $\chi^2(2) = 4.79$, $p < .10$)				
Scent	−.64 (.30)	4.71	.03	.53
Gender	.04 (.31)	.02	.90	1.04
A. Buying behavior				
(Nagelkerke's $R^2 = .24$. Model $\chi^2(2) = 22.31$, $p < .001$)				
Scent	1.78 (.44)	16.74	<.001	5.93
Gender	1.00 (.50)	4.00	.05	2.71

Note: Scent and gender were coded as 0/1 (scent: absent = 0/present = 1; gender: male = 0/female = 1). Buying behavior refers to buying either congruent book(s) (coded as 1) or incongruent book(s) (coded as 0).

Hence, the findings confirm H2. Again, the sales of the (in) congruent book genres offered indicative support: compared with the control condition, in the scent condition sales for the congruent genres increased 40.07%, and sales for the incongruent genres increased only 22.19%.

5. Discussion and conclusion

This research assessed the effect of ambient chocolate scent on (1) general approach and goal-directed behavior in a bookstore and (2) specific approach and buying behavior toward thematically (in) congruent books. We found that the presence of a chocolate scent has a positive influence on general approach behavior and a negative impact on goal-directed behavior in the store. In contrast with Schifferstein and Blok (2002), we found that the chocolate scent positively affects the sales of the store. These results are in line with the Stimulus–Organism–Response paradigm (Mehrabian & Russell, 1974) and the expectation that a chocolate scent will distract customers from their specific shopping goals toward enjoying the whole shopping experience. Moreover, our research confirms the positive effect of the scent of chocolate on approach and buying behavior toward thematically congruent books. Thus, an ambient scent can start an automatic knowledge activation process (i.e., odor priming), leading to an intensified positive scent effect for congruent book genres. For incongruent books, the chocolate scent has a negative effect on approach and buying behavior. However, this negative effect does not lead to a decrease in the overall sales of incongruent books, which may be explained by the fact that consumers who approached these books might have bought a number of them. These thematically (in)congruent scent effects were found while controlling for gender. With respect to this control variable, we found that women were more likely than men to approach and to buy congruent books (i.e., cookbooks and romantic literature). Overall, in line with the ambient scent model of Gulas and Bloch (1995), our findings show that scent-product congruency is of importance, even if the scent does not originate from the product.

5.1. Limitations and further research

Wanting to observe the customers as unobtrusively as possible, we were not able to verify exactly which concepts are evoked by the scent. Admittedly, while the findings can be explained by odor priming, the underlying processes were not directly tested. More research is needed to fully investigate whether this thematically congruent scent effect is caused entirely by odor priming, and whether this effect happens on a conscious or subconscious level. For example, future research could provide insight into the neurological underpinnings of the processes that might be at hand here. Moreover, because we only observed the customers, we were not able to collect data about customers' actual goal when they walked into the store and were therefore not able to directly test whether the chocolate scent distracted the customers from their goals. Furthermore, our study was conducted with one pleasant scent associated with food. To extrapolate the findings to other pleasant scents, future research could for example test whether a pleasant non-food scent has similar effects on consumer behavior. In terms of producing extra outcome variables, future research could also try to measure visual attention (e.g., eye tracking) and more thoroughly evaluate sales (e.g., assess cash register details).

Regarding the risk of corrective behavior of customers when the scent is salient, we acknowledge that thresholds of scent perception differ between individuals. However, a pretest of the intensity of the scent gave us an indication of the appropriate scent level. We believe that the approach used in this study was the best available.

With respect to the control condition, future research can select another scent without any congruence with the products, although finding a scent that is neutral for all book genres is not an easy task. Additionally, shopping is a holistic experience in which consumers are simultaneously exposed to several atmospheric cues, and the effect of one specific atmospheric cue might interact with another. Therefore, it is important to study interaction effects of fragrances with other atmospheric cues (Orth, Heinrich, & Malkewitz, 2012). Although some studies have already explored the combined effect of scent and other atmospheric stimuli on shopping behavior, such as scent and music (Mattila & Wirtz, 2001; Morrison, Gan, Dubelaar, & Oppewal, 2011; Spangenberg, Grohmann, & Sprott, 2005), future research could also investigate the effect of a combination of several atmospheric cues that are (in)congruent with the store's offerings.

5.2. Implications

We contribute to the theory and the scarce and rather mixed results about thematically congruent scent effects by pointing out that the scent of chocolate as a pleasant ambient scent should be congruent with the store's offerings. Our findings also have practical implications. Retailers can make use of pleasant ambient scents to improve the store environment, leading consumers to explore the store and to engage in more approach behavior. However, for optimal results, retailers should also pay attention to whether the scent is thematically appropriate for the store's products (e.g., sea breeze for a surfing shop). Retailers offering more than one product type should be aware of the possible negative effects of a pleasant scent that is thematically incongruent with part of the store offerings.

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