

Influencing consumer reactions towards a tidy versus a messy store using pleasant ambient scents



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ABSTRACT

Although retailers know that consumers do not like cluttered stores, messy layouts are sometimes inevitable. This research examines whether diffusing pleasant scents can overcome consumers' negative response to a messy store. Specifically, this study investigates the effect of pleasant scents (un)related to neatness on consumer evaluations of a tidy versus a messy store. An experiment with 198 respondents revealed that a pleasant scent not associated with neatness functions as a positively valenced prime, causing consumers to evaluate the products in the tidy store more positively than the products in the messy store. Additionally, when diffused in a messy store, a pleasant ambient scent has a negative effect on consumers' product evaluation, because of a mismatch between the pleasant scent and the unpleasant messy layout. However, this negative effect can be canceled out by diffusing a pleasant scent that is associated with neatness.

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Messy retail layouts are sometimes inevitable, especially at times such as bargain periods. However, a messy display can lower consumers' design perceptions, and perceptions of poor design can in turn have a negative effect on several dimensions of perceived customer value, such as perceived time and effort costs, psychic costs, service quality, and merchandise quality (Baker, Parasuraman, & Grewal, 2002). We examine whether retailers can overcome these negative elements by diffusing pleasant scents. Scents in general can generate (memory related) affective reactions as they are in a first stage directly processed in the brain's limbic system, which is the center of emotions and memory (Bosmans, 2006; Ehrlichman & Halpern, 1988). Herz (2007) indicated that pleasant scents can decrease the intensity of environmental annoyances by inducing a pleasant mood. However, according to research on matching effects, favorable evaluations require the valence of a stimulus (e.g., the store) to be consistent with the valence of the contextual cue (e.g., the scent in the store) (Brakus, Schmitt, & Zhang, 2008). This constraint means that consumers will respond more positively to a store environment with a pleasant scent only when the environment itself is pleasant (in this case,

tidy). Another important aspect is that the processing of odors does not end in the limbic system, as a scent can also be associated with semantic and episodic knowledge (Degel, Piper, & Köster, 2001). For example, many consumers associate the scent of citrus with cleaning. When consumers perceive the scent, such a semantic association may be activated, even when they are not consciously aware of the scent (Holland, Hendriks, & Aarts, 2005). This study examines whether pleasant ambient scents have the same beneficial effects on store and product evaluations in a tidy versus a messy store, and makes a difference between pleasant scents associated with neatness or not.

1. Priming effects

The store's offerings are never seen or evaluated in isolation, but they are always embedded in an environment or context that often include ambient scents, music, lights, etc. This context can have affective as well as cognitive priming effects on consumer behavior (Yi, 1990). With respect to the affective priming effect, a context can trigger an overall affective reaction which can subsequently be transferred to the consumers' evaluations of elements embedded by that context (e.g. products in a store), and eventually to their approach behavior (i.e., by affect transfer). With regard to the cognitive priming effect, the context can also make certain concepts more readily accessible in the brain of consumers. Once these

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concepts are activated, these constructs guide consumers' evaluations of and behavior toward the store and products. An ambient scent in a store can be such a contextual element, and can influence consumers' store and product evaluations via affective as well as cognitive priming.

1.1. Affective priming effects

A relevant theory for studying affective priming effects is the Stimulus–Organism–Response (S–O–R) paradigm (Donovan & Rossiter, 1982; Mehrabian & Russell, 1974), which provides the most common theoretical basis for studying the effects of atmospheric cues on shopping behavior. In the retail context, the paradigm holds that a store atmosphere (including pleasant scents) (S) can influence consumers' emotional responses (O), which in turn lead to approach or avoidance responses (R). Approach responses are positive responses to a store environment, whereas avoidance responses are negative responses to the store environment. Prior research has demonstrated that the positive affect associated with a pleasant ambient scent transfers to the items being evaluated (Douc  & Janssens, 2013; Morrin & Ratneshwar, 2000). Moreover, as Friedman and F rster (2010) indicated, a scent and its associated pleasantness can function as an implicit affective cue, indicating that a pleasant ambient scent can also have a positive effect on consumer evaluations without evoking conscious feelings of pleasure.

1.2. Valence match and processing fluency

A pleasant context, however, does not always lead to more positive reactions. The reaction triggered by the context (e.g., the ambient scent) may depend on the valence (i.e., affective tone) of the stimuli under evaluation (e.g., the store and its products). An affective primer activates the corresponding affect, leading to easier activation of concepts with a similar affect (Fazio, 2001). This response implies that the match between the affective tone of the contextual cue (e.g., scent) and the affective tone of a stimulus (e.g., the store) could generate processing fluency (De Bock, Pandelaere, & Van Kenhove, 2013). Processing fluency refers to the experienced ease of processing an external stimulus (Schwarz, 2004). When people readily process the environment, they experience a positive affective state that can be misattributed to the environment rather than to the ease of processing (Winkielman, Schwarz, Fazendeiro, & Reber, 2003). Thus, a pleasant scent diffused in a pleasant store environment can lead to processing fluency and subsequent more positive store and product evaluations, whereas a pleasant scent present in an unpleasant store environment can lead to processing disfluency and subsequent less positive store and product evaluations.

Prior research has applied the construct of processing fluency to the context of scent cues. For example, in the study of Herrmann, Zidansek, Sprott, and Spangenberg (2013) processing fluency was manipulated by diffusing either simple (therefore easier to process) or complex ambient scents in a store and found that simple scents increased sales, while more complex scents had no effect on spending. Our study extends existing research by applying the processing fluency construct to the interaction effects of pleasant ambient scents with the store environment (store messiness).

1.3. Cognitive priming effects

Odor priming is a process whereby “an odor unconsciously starts an automatic knowledge activation process” (Schifferstein & Blok, 2002, p. 540). A scent can activate certain concepts to consumers, which causes consumers to be more sensitive to

subsequent elements that fit with the activated information (Dijksterhuis, Smith, Van baaren, & Wigboldus, 2005). For example, a citrus scent is strongly associated with cleaning behavior, because this scent is often added to cleaning products. Thus, if one (unconsciously) perceives a citrus odor, knowledge related to citrus (e.g., cleaning) will become more easily accessible, and will result in a different response to the subsequent encounter of a tidy or messy environment. Holland et al. (2005) found that unconscious exposure to a citrus scent of all-purpose cleaner increases the accessibility of the cleaning concept automatically (i.e., listing more activities concerning cleaning and reacting more rapidly to cleaning-related words in a lexical decision task) and affects actual cleaning-like behavior (i.e., leaving fewer crumbs on the table after eating a crumbly cookie).

Our study examines the effect of a pleasant scent (un)related to neatness on consumer evaluations of a tidy versus a messy store. Based on the valence match and processing fluency theory, we expect that the presence of a pleasant scent not associated with neatness (i.e., black cherry scent) has a positive effect on consumer responses when the scent is present in a tidy store and a negative effect in a messy store. For a pleasant scent associated with neatness (i.e., lemon-tangerine citrus scent), we also expect a positive effect in the tidy store. Moreover, we expect that this positive effect in the tidy store will be greater for a pleasant scent associated with neatness than for a pleasant scent not associated with neatness, because the lemon-tangerine scent makes neatness more accessible in the customers' mind, increasing the salience of the tidiness of the store. Therefore, customers are more likely to notice the tidiness of the store and take it into consideration when evaluating the store and its products. However, in the messy store, the effect of a scent associated with neatness has two possible outcomes. On the one hand, the scent may have a negative effect on consumer responses because the activation of neatness makes the customers more likely to notice the messiness. Moreover, a scent that activates neatness can evoke an expectation of a well-organized environment. In line with the expectation disconfirmation theory (Oliver, 1980), we can assume that when the environment doesn't meet that expectation, feelings and evaluations will be the same or worse than when no scent is present (Bitner, 1992). On the other hand, in a messy store the scent may have a positive effect on consumer reactions. Because the scent activates neatness in the customers' mind, it can also give the impression that the store has been cleaned recently, leading customers to think the store isn't so messy after all. This reasoning leads to the following hypotheses:

H1. In a tidy store, compared to the no-scent condition, (a) the presence of a pleasant scent not associated with neatness as well as (b) the presence of a pleasant scent associated with neatness will improve respondents' affective, evaluative, and approach reactions toward the store and its products. This improvement will be (c) greater for the pleasant scent that enhances the accessibility of the neatness concept than for the pleasant scent that isn't associated with neatness.

H2. In a messy store, compared to the no-scent condition, the presence of a pleasant scent not associated with neatness will lower respondents' affective, evaluative, and approach reactions toward the store and its products.

As mentioned above, diffusing the scent associated with neatness in the messy store has two possible contradictory outcomes. Therefore, in lieu of a hypothesis, we formulate the following research question:

RQ1. What is the effect of a pleasant scent associated with neatness on respondents' affective, evaluative and approach reactions toward the store and its products in a messy store (a) compared to

the use of a pleasant scent that is not associated with neatness and (b) compared to the no-scent condition?

While **H1**, **H2**, and **RQ1** compared the scent effects for each store condition, the following section focuses on the differences between a tidy and messy store for each scent. We expect that a tidy store always evokes more positive consumer reactions than a messy store, because consumers do not like cluttered environments (Baker et al., 2002). However, because of the affective and cognitive effects of the scent that is not associated with neatness, we believe that the effect of tidiness will be greater when such scent is present in the store.

H3. Respondents' affective, evaluative, and approach reactions toward the store and its products will be more positive in a tidy store compared to a messy store for all three scent conditions: (a) no scent, (b) a pleasant scent not associated with neatness, and (c) a pleasant scent associated with neatness.

H4. The improvement of the respondents' reactions in the tidy versus the messy store will be greater when a pleasant scent not associated with neatness is present compared to the no-scent condition.

Given the two contradictory outcomes of the scent associated with neatness in the messy store, we formulate the following research question:

RQ2. Is the improvement of the respondents' reactions in the tidy versus the messy store greater when a pleasant scent associated with neatness is present (a) compared to the improvement when a pleasant scent that is not associated with neatness is present and (b) compared to the improvement in the no-scent condition?

2. Pretests

2.1. Scent selection

To determine pleasant scents that may or may not be associated with neatness, we conducted a pretest. We selected several scents from the four scent categories (Edwards, 2014), which are floral notes, fresh notes, woody notes and oriental notes. Participants were 25 undergraduate students, who received two cinema tickets (value of €15) for their participation. They were asked to sniff the scents and to evaluate the scents' association with neatness as well as their pleasantness and arousing nature. The association with neatness was measured by a 7-point Likert-type item, ranging from 1 = *not at all* to 7 = *totally*. The pleasantness and arousing nature of the scents were each measured by a 7-point semantic differential (i.e., unpleasant/pleasant; non-arousing/arousing). The scents were presented in random order (on a cotton-tipped stick in a dark glass bottle) and respondents were instructed to sniff the scents as many times as they liked while completing the survey. Between successive aromas participants smelled coffee grounds to restore their scent palettes (Krishna, Lwin, & Morrin, 2010). This technique is frequently used in the fragrance industry to neutralize the odors in the nose, preventing contamination from one odor to the next.

Orange, lemon-tangerine, grapefruit, bergamot, and water lily were the scents most associated with neatness (all $M \geq 5.32$). A lemon scent is particularly connected with the feeling of cleanliness, probably because of lemon's acidity and its use in former times to clean things, such as to polish silver (Krishna, 2010; Lwin & Wijaya, 2010). Therefore, we selected the lemon-tangerine scent as the scent associated with neatness. Moreover, this scent had a high association with neatness ($M = 5.44$, $SD = 1.33$), which was significantly different from the scale middle point of 4 ($t(24) = 5.43$, $p < .001$, $r = .74$). Participants also rated the lemon-tangerine scent

as more pleasant ($M = 5.08$, $SD = 1.32$; $t(24) = 4.09$, $p < .001$, $r = .64$) and as more arousing ($M = 4.88$, $SD = 1.27$; $t(24) = 3.47$, $p = .002$, $r = .58$) than the scale middle point of 4.

The pleasant scent not associated with neatness was selected by searching for a scent that was as pleasant and as arousing as the lemon-tangerine scent, but differed on the association with neatness. These criteria led to the selection of the black cherry scent as the scent not associated with neatness ($M = 3.92$, $SD = 1.50$), not significantly different from the scale middle point of 4 ($t(24) = -.27$, $p = .79$). Respondents found the black cherry scent more pleasant ($M = 5.52$, $SD = 1.33$; $t(24) = 5.73$, $p < .001$, $r = .76$) and more arousing ($M = 4.64$, $SD = 1.15$; $t(24) = 2.78$, $p = .01$, $r = .49$) than the scale middle point of 4. Moreover, the lemon-tangerine scent and black cherry scent differed on association with neatness ($t(24) = 5.25$, $p < .001$, $r = .73$), but did not differ on pleasantness ($t(24) = -1.19$, $p = .25$) and arousing quality ($t(24) = .86$, $p = .40$).

A separate pretest ($N = 15$) was conducted to verify the fit of both scents with casual clothing. The association of lemon-tangerine scent ($M = 2.40$, $SD = 1.72$) and black cherry scent ($M = 2.47$, $SD = 1.55$) with casual clothing did not differ ($t(14) = -.10$, $p = .92$).

2.2. Scent intensity

In separate pretests, we determined the intensity of the scents. This is done because when a scent becomes too intense, people may become more aware that the scent, and not the store, is responsible for their responses. Consequently, they may correct their behavior (Bosmans, 2006). Therefore, the ambient scent should not be salient. For the black cherry scent as well as for the lemon-tangerine scent a separate pretest was carried out. Each scent was diffused in a room similar to those used in the main experiment, with an Aerostreamer1000 fragrance appliance marketed by Scents, an olfactory marketing firm in Belgium. The appliance works according to the principle of warm evaporation (electrical). The liquid scent is heated on a metal plate, making it evaporate. Next, a fan distributes the scent. The intensity of the fragrance appliance can be adjusted by the amount of liquid that falls on the metal plate and the speed of the fan. For each scent about 10 respondents were asked two questions: "Did you notice something special in the room?" and "Now that we have mentioned the presence of a scent, do you detect the scent?" (Douce, Poels, Janssens, & De Backer, 2013). The first question checked whether respondents spontaneously reported scent-related elements. Spontaneously mentioning the scent meant that the scent was too salient. The intensity of the scents was lowered until respondents answered negatively to the first question and positively to the second. In the main study, the intensity of the fragrance appliance was set on the lowest level for each scent. The black cherry scent was diffused for 2 min and the lemon-tangerine scent was diffused for 2 min and 45 s before the respondents entered the room. Once the scents were diffused, the rooms were not ventilated until the end of the test.

2.3. Store environment

The participants of the main study saw three pictures of an actual clothing store located in a Belgian city. With the consent of the owner, we manipulated the messiness of the store. Messiness is a multi-faceted concept. To ensure that the photos of the clothing store conveyed the right degree of messiness, we conducted a pretest. Sixty-two respondents (45 women and 17 men) were shown three photos of the same store in either a tidy condition or a messy condition. They were asked to evaluate the store environment on various characteristics of messiness: "dirty,"

“disorganized,” “complex,” “cluttered,” “turbulent,” “messy,” “disorderly,” and “untidy,” using a scale from 1 = *not at all* to 7 = *very much*. A summated scale (mean of items) was calculated ($\alpha = .92$). Results indicated that the messy store ($M = 4.53$, $SD = .88$) was indeed perceived as messier than the tidy store ($M = 2.80$, $SD = 1.15$; $t(60) = 6.61$, $p < .001$, $r = .34$), and both stores were significantly different from the scale middle point of 4 (messy store: $t(30) = 3.33$, $p = .002$, $r = .52$; tidy store: $t(30) = -5.78$, $p < .001$, $r = .73$).

3. Method

3.1. Participants and procedure

A 3 (no scent vs. pleasant scent not associated with neatness vs. pleasant scent associated with neatness) \times 2 (tidy store vs. messy store) between-subjects full factorial design was conducted. Subjects were 199 undergraduate students who participated in the study in exchange for course credit. The data of one participant were discarded because he left most of the questions unanswered. The participants (100 men and 98 women; $M_{age} = 19.13$ years) entered a room that was either scented or unscented. Next, they filled in the manipulation checks, saw three photos of a clothing store in either a tidy condition (see Fig. 1) or a messy condition (see Fig. 2) and completed a survey containing dependent variables and demographics.

3.2. Manipulation checks

The scent pretest showed that both scents are pleasant, and therefore, they can trigger a positive affective reaction (affective priming). Moreover, the lemon-tangerine scent is associated with neatness, which may activate the neatness concept in the mind of the consumers. These results are very clear with respect to the scents' affective and cognitive priming capabilities, we nevertheless opted to include manipulation checks. However, these results must

be viewed with caution, because including manipulation checks at the beginning or at the end always has drawbacks. Measuring affective and cognitive effects at the end can suffer from biasing effects of the tidy/messy store pictures, whereas measuring them at the beginning could suffer from a scent exposure period that is too short. Nevertheless, we included manipulation checks at the beginning in an effort to gain more insight into the underlying process. The affective priming effect of the scent was measured by assessing respondents' feelings using a 7-point semantic differential scale (mean of four items; e.g., good/bad; $\alpha = .88$; Yi, 1990). The cognitive priming effect was measured by an open-ended question in which respondents were asked to indicate the elements they find important when choosing a clothing store. Responses were recoded into a dichotomous variable (i.e., mentioning tidiness of the store or not).

3.3. Dependent variables

Dependent measures were affective response toward the store (i.e., pleasure and arousal), evaluation of the store environment, evaluation of the store, evaluation of the products, and self-reported approach behavior. For every measure, a summated scale (means of items) was calculated and used in further analyses. All items were measured using 7-point semantic differential scales. Respondents' affective reactions were captured with the “pleasure” dimension of Mehrabian and Russell's (1974) PAD scale (e.g., unhappy/happy; $\alpha = .90$). The “arousal” dimension was not used in our analysis as it can be positively as well as negatively valenced (Spangenberg, Crowley, & Henderson, 1996). The “dominance” dimension was also left out because of a lack of empirical support (Donovan, Rossiter, Marcolyn, & Nesdale, 1994). The evaluation of the store environment ($\alpha = .96$) was measured by Fisher's (1974) 13-item environmental quality scale (e.g., unattractive/attractive) plus the item added by Spangenberg et al. (1996; unpleasant/pleasant). The evaluation of the store ($\alpha = .95$) was assessed with six items (e.g., dislike/like;

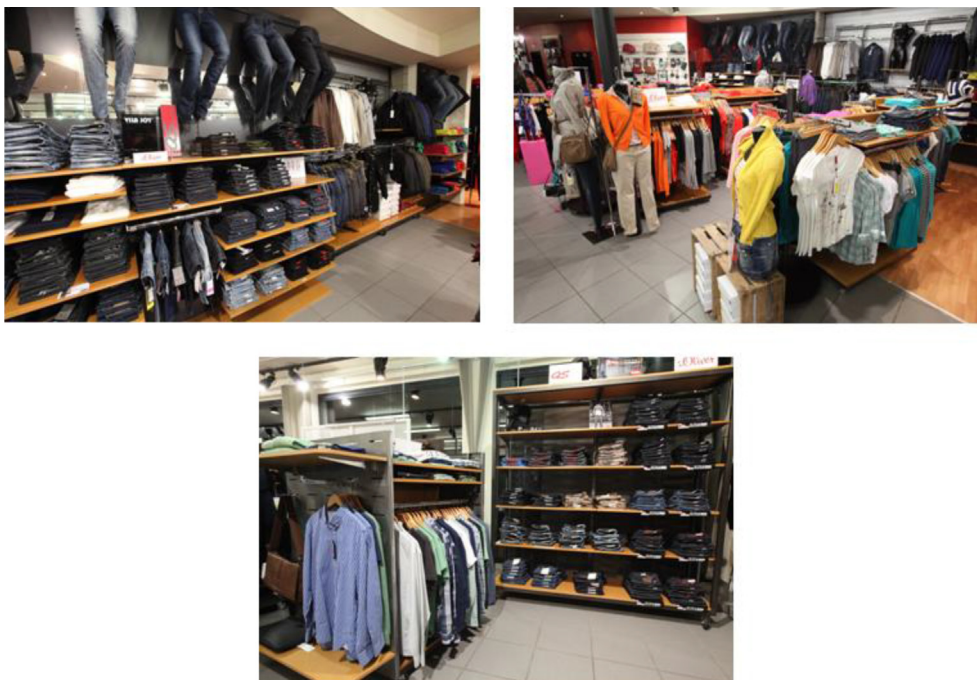


Fig. 1. Photos of the tidy store condition.

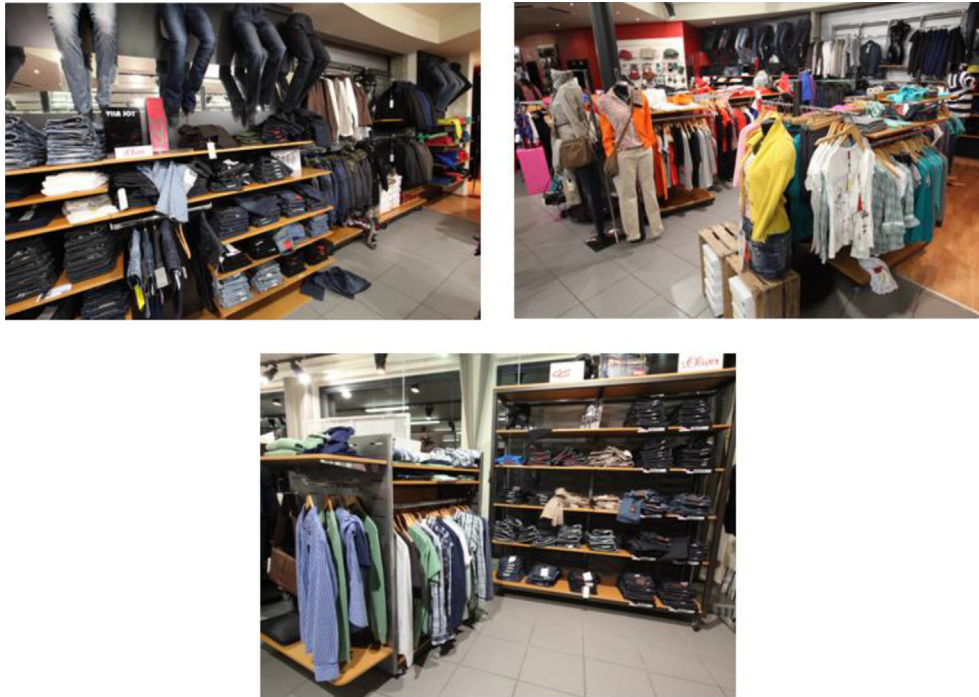


Fig. 2. Photos of the messy store condition.

Spangenberg et al., 1996; Spangenberg, Grohmann, & Sprott, 2005). The evaluation of the products ($\alpha = .88$) was measured by the mean of six items (e.g., bad/good; Bellizzi, Crowley, & Hasty, 1983; Spangenberg et al., 1996). Self-reported approach behavior ($\alpha = .92$) was measured by asking four questions, such as “Would you enjoy shopping in this store?” (Donovan & Rossiter, 1982; Spangenberg et al., 2005). Table 1 provides a summary of the scale items used in our study.

4. Results

4.1. Manipulation checks

To test whether scent had an affective priming effect, an ANOVA was conducted with scent condition as a fixed factor and respondents' feelings before they saw the store pictures as the dependent variable. We found no effect of scent on respondents' feelings ($F(2,195) = .12, p = .88$). Concerning scents' cognitive priming effect, a logistic regression analysis was carried out using scent condition as predictor and, as the dependent variable, mentioning tidiness of the store as an important element when choosing a clothing store. Results indicated at the 90% level of significance that when a lemon-tangerine scent was present, respondents were 2.49 times more likely to mention tidiness of the store as an important store element than when a black cherry scent was present ($\beta = -.91, \text{Wald} = 3.38, p = .07$). We found no significant differences in mentioning tidiness of the store between the black cherry scent and the no-scent conditions ($\beta = -.69, \text{Wald} = 1.93, p = .17$) or between the lemon-tangerine scent and the no-scent conditions ($\beta = -.22, \text{Wald} = .28, p = .60$). However, as mentioned, the exposure time to the scent between entering the experimental room and the manipulation check could have been too short to evoke explicit affective and cognitive priming effects. Nevertheless, the combination of the scent and the tidy/messy store pictures are assumed to trigger these reactions at a later stage.

4.2. Experimental findings

A two-way ANOVA with scent and store messiness as fixed factors was conducted for each of the dependent variables. For the tests related to the research questions, Bonferroni corrections for multiple group testing were made. We found a significant main effect of store messiness for each of the dependent variables. Compared to a messy store, a tidy store led to enhanced pleasure ($F(1,192) = 17.42, p < .001, \omega^2 = .08$), enhanced evaluation of the store environment ($F(1,192) = 11.52, p = .001, \omega^2 = .05$), enhanced evaluations of the store ($F(1,192) = 16.27, p < .001, \omega^2 = .07$), enhanced evaluations of the products ($F(1,192) = 13.05, p < .001, \omega^2 = .06$), and enhanced self-reported approach behavior ($F(1,192) = 16.65, p < .001, \omega^2 = .08$). On the other hand, an ambient scent did not have a significant main effect on the dependent variables (all $p > .26$). The interaction effect between scent and store messiness was significant only for product evaluation ($F(2,192) = 4.24, p = .02, \omega^2 = .03$). Overall, the effect sizes indicate a medium effect (Cohen, 1977).

However, we are mainly interested in the specific simple effects as formulated in H1 and H2. Therefore, we looked at the specific differences between the scent conditions in both the tidy store and the messy store. As indicated by Iacobucci (2001), it is appropriate to test simple effects in the presence of a nonsignificant interaction when a priori expectations exist and when the main effect is not significant. Summary statistics appear in Table 2. Although inspection of the respective means suggests that, compared with the no-scent condition, respondents' reactions to the tidy store were more positive when a pleasant scent (lemon-tangerine or black cherry) was present, none of these differences was significant. We also did not find a significant difference between lemon-tangerine scent and the black cherry scent (lowest $p = .12$). Thus, H1 is not supported. Consumers' affective, evaluative and approach reactions are not different in the three scent conditions. Similarly, when the respondents saw a messy store, the respective means suggest that their reactions were more negative when a pleasant scent (lemon-

Table 1
Scales of manipulation checks and dependent variables.

	7-Point scale
Affective priming (4 items; Yi, 1990)	Happy/unhappy Pleased/displeased Comfortable/uncomfortable Good/bad
Pleasure (6 items; Mehrabian & Russell, 1974)	Happy/unhappy Pleased/annoyed Satisfied/dissatisfied Contented/melancholic Hopeful/despairing Relaxed/bored
Evaluation of the store environment (14 items; Fisher, 1974; Spangenberg et al., 1996)	Attractive/unattractive Relaxed/tense Comfortable/uncomfortable Cheerful/depressing Colorful/drab Positive/negative Stimulating/boring Good/bad Lively/unlively Motivating/unmotivating Interesting/uninteresting Pleasant/unpleasant Open/closed Bright/dull
Evaluation of the store (6 items; Spangenberg et al., 1996; Spangenberg et al., 2005)	Good/bad Favorable/unfavorable Positive/Negative Like/dislike Modern/outdated Pleasant/unpleasant
Evaluation of the products (6 items; Bellizzi et al., 1983; Spangenberg et al., 1996)	Good/bad Pleasant/unpleasant Favorable/unfavorable High quality/low quality Attractive/unattractive Up-to-date/outdated
Approach/Avoidance behavior (4 items; Donovan & Rossiter, 1982; Spangenberg et al., 2005)	Would you like to visit this store? Would you enjoy shopping in this store? Would you like to stay in this store and explore the products? Would you like to buy something in this store?

tangerine or black cherry) was present compared with the no-scent condition. Moreover, the presence of a lemon-tangerine scent led to more positive reactions than the presence of a black cherry scent (RQ1b). However, none of the differences was significant (all $p > .15$), except for product evaluation. More precisely, the products in the messy store were evaluated more negatively when black cherry scent was present ($M = 3.58$, $SD = 1.11$) compared with the no-scent condition ($M = 4.36$, $SD = 1.07$; $p = .002$). No difference occurred in product evaluation in the messy store between the no-

scent condition ($M = 4.36$, $SD = 1.07$) and the lemon-tangerine scent condition ($M = 4.02$, $SD = .93$; $p = .18$). Hence, H2 is only supported for product evaluation.

With respect to H3, we evaluated the specific differences between the store messiness conditions for each of the different scent conditions. However, because of a nonsignificant interaction effect and a significant main effect of store messiness, the simple effects of the store messiness conditions for each of the different scent conditions cannot be interpreted unambiguously (except for product evaluation because of a significant interaction effect; Iacobucci, 2001). For product evaluation, we found that when a pleasant scent not associated with neatness (i.e., black cherry) was present, the respondents who saw the tidy store responded more positively than the respondents who saw the messy store ($p < .001$). We did not find this difference when a pleasant scent associated with neatness was present ($p = .16$) nor when no scent ($p = .67$) was present. Hence, for product evaluation only H3b is supported.

Additionally, we performed a more robust check by comparing the tidy versus the messy store difference in a scent condition (i.e., cherry or lemon-tangerine) with the no-scent condition (H4 and RQ2). This comparison enables us to evaluate the scent effect in a more exact way, because we control for any possible tidy versus messy store differences independent from the scents used. For the reasons mentioned above, we only interpret the results for product evaluation. We found that the positive effect of store tidiness (tidy store-messy store) is significantly higher in the black cherry scent (difference = 1.11) condition compared to the no-scent condition (difference = .11) for evaluation of the products ($t(192) = 2.83$, $p = .005$, $r = .20$). Hence, H4 was supported for product evaluation. Regarding RQ2, we did not find a significant difference between no scent (difference = .11) and lemon-tangerine scent (difference = .36; Bonferroni corrected $p = 1.00$) or between cherry scent (difference = 1.11) and lemon-tangerine scent (difference = .36; Bonferroni corrected $p = .12$) for product evaluation. For the other dependent variables, we found similar results for H3 and H4. However, as mentioned above, the nonsignificant interaction effect combined with the significant main effect of store messiness made it impossible to unambiguously interpret the store messiness effect for each of the different scent conditions.

5. Discussion

The aim of our research was to study the effect of a pleasant scent, whether related to the neatness concept or not, on consumer evaluations of a tidy versus a messy store. Although respondents' reactions did not significantly differ between the scent conditions when they saw a tidy store, in the messy store they evaluated the products more negatively when a pleasant scent not associated with neatness was present in the store environment than when no

Table 2
Effect of ambient scent and store messiness on affective reactions, evaluations, and approach behavior.

	Tidy store			Messy store		
	<i>M</i> (<i>SD</i>)			<i>M</i> (<i>SD</i>)		
	No scent ^a	Black cherry scent ^b	Lemon-tangerine scent ^c	No scent ^d	Black cherry scent ^e	Lemon-tangerine scent ^f
Pleasure	4.24 (1.08)	4.55 (1.05)	4.33 (.88)	3.87 (1.16)	3.63 (.95)	3.84 (.79)
Evaluation of the store environment	3.87 (1.14)	4.17 (1.21)	4.07 (1.15)	3.67 (1.12)	3.26 (1.15)	3.45 (1.26)
Evaluation of the store	3.90 (1.42)	4.40 (1.25)	4.21 (1.15)	3.63 (1.48)	3.24 (1.28)	3.35 (1.33)
Evaluation of the products	4.46 (.92)	4.68 ^e (1.06)	4.39 (1.04)	4.36 ^e (1.07)	3.58 ^{bd} (1.11)	4.02 (.93)
Approach/Avoidance behavior	3.84 (1.43)	4.17 (1.29)	4.23 (1.35)	3.44 (1.46)	3.02 (1.48)	3.39 (1.39)

Estimated marginal means, standard deviations (between brackets), and simple effect tests where appropriate.

Superscripts indicate the significant difference at $p < .05$ with the mean of the respective column (no corrections were made except for all comparisons with the lemon-tangerine scent in the messy store condition (Bonferroni correction)).

scent was present. Moreover, consumers only evaluate the products in a messy store more negatively than the products in a tidy store when a pleasant scent not associated with neatness is present. This pleasant scent not associated with neatness (i.e., black cherry) functions as a positively valenced prime, causing consumers to evaluate the products in the tidy store condition (pleasant, so valence matched with the contextual cue) more positively than the products in the messy store condition (unpleasant, not matched with the scent). These findings are in line with earlier research on the valence match between contextual cue and stimulus (Brakus et al., 2008; De Bock et al., 2013). When checking the tidy versus the messy store difference between a scent condition (i.e., black cherry or lemon-tangerine) and the no-scent condition, we also found a significant difference between cherry scent and no scent, and not between lemon-tangerine scent and no scent. This result means that the more positive evaluation of the products in a tidy store compared to the products in a messy store in the black cherry scent condition is explained by the presence of the pleasant scent not associated with neatness and not by the store's tidiness.

In conclusion, the negative effect of a pleasant ambient scent in a messy store on consumers' product evaluation disappears when the pleasant scent is associated with neatness. Apparently, the cognitive association of the lemon-tangerine scent with neatness gives the consumers in the messy store the impression that the store is not so messy.

5.1. Limitations and future research

This study was conducted with students who received course credit for their participation. Future research may use non-student samples. Nevertheless, we believe our results are robust. As Spangenberg et al. (1996) already stated using students as participants is only problematic when they do not have the knowledge, experience, or education background representative of the general population, and these differences affect their reactions towards the dependent variables. However, they argued that there is no scientific evidence indicating that students react differently to scents than non-students. Although we pretested whether the scents were associated with neatness, we did not verify exactly which concepts were evoked by the scents in the main study. We were unable to measure this effect because we did not want to draw attention to the scent. Furthermore, while the findings can be explained by the valence match of stimuli and cue leading to process fluency, we did not test this directly. Future research could gain insight into the neurological underpinnings of the observed effects and the elaboration process by using physiological measures like fMRI. With respect to the absence of a negative effect of the lemon-tangerine scent in a messy store, possibly the store was not messy enough to find a negative effect, and hence such an effect only takes place from a critical amount of messiness onwards. However, an exploratory inspection of a scatterplot of the respective data shows that the effects were linear over the whole range of perceived messiness, indicating that there was no such critical value for perceived messiness.

6. Conclusions

Our research extends existing research studying interaction effects of atmospheric cues (Morrison, Gan, Dubelaar, & Oppewal, 2011; Spangenberg et al., 2005) by examining whether negative store elements can be overcome by diffusing pleasant scents. Indeed, shopping is a holistic experience in which consumers are exposed to a number of atmospheric cues at the same time. Our research shows that a pleasant ambient scent has a negative effect on consumers' product evaluation when it was mismatched with

other environmental elements (i.e., a black cherry scent present in a messy store). So, the same contextual cue can have completely opposite affective, evaluative, and behavioral consequences, depending on the valence (i.e., affective tone) of the stimulus under evaluation. Additionally, we found that when a scent is associated with the negative element the retailer is trying to overcome, the match effect between scent and store is less pronounced. As a result, retailers who work with ambient scents should be aware that these ambient scents may have perverse effects when their store is messy. In our study, correctly choosing a pleasant scent (pleasant + associated with neatness) compensates for the negative effects of a store becoming messy.

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