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SCENTS RESEARCH AND ITS APPLICATIONS IN TOURISM

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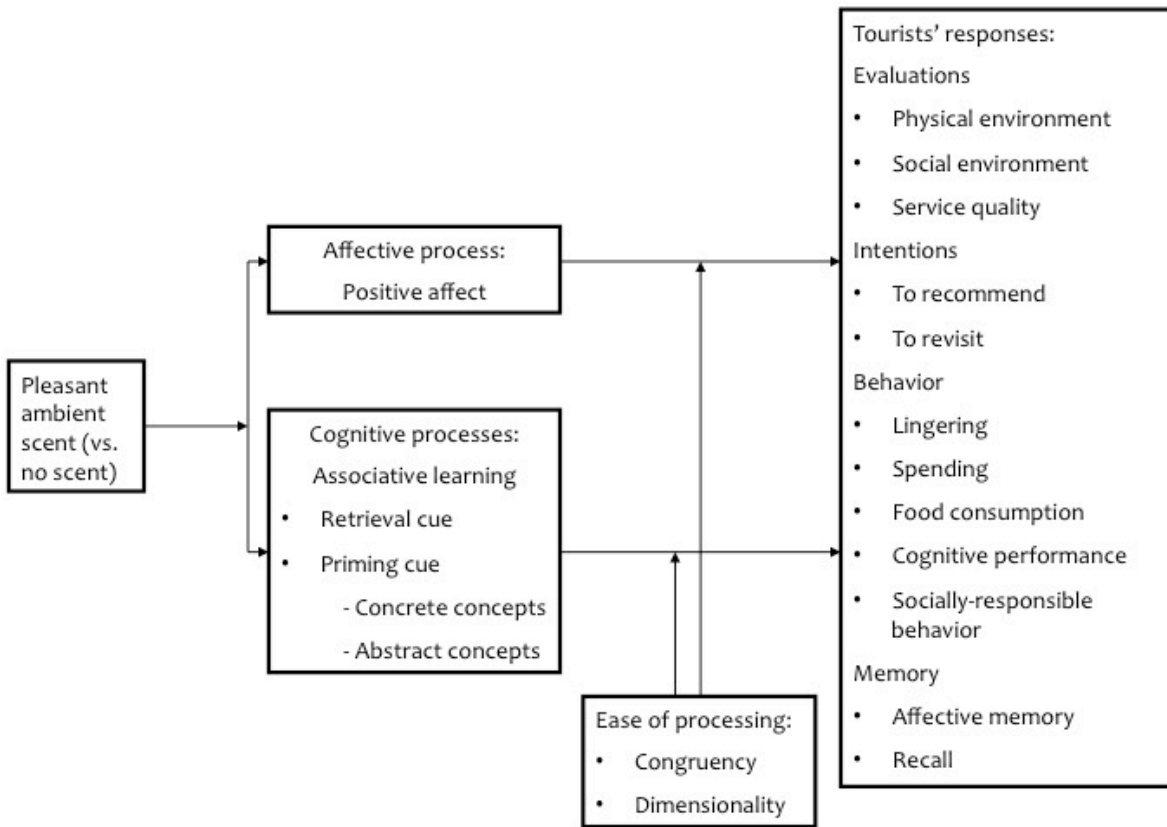
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SCENT RESEARCH AND ITS APPLICATIONS IN TOURISM

Tourism research has recognized the senses as one of the foundational aspects of designing unique tourist experiences and places (Agapito, 2020; Dann & Jacobsen, 2003). Sensory marketing, or engaging the senses to indirectly influence consumer behavior (Krishna, 2011) can particularly affect tourists. Tourists are more susceptible to sensory influences as they experience unfamiliar environments that bring new sensations or draw attention to existing ones in a different way (Agapito, 2020; Kock & Ringberg, 2019). Scent marketing, a subarea of sensory marketing that uses pleasant scents, is a thriving, \$200 billion industry, especially popular in the service sector, including tourism (Roschk & Hosseinpour, 2020). Despite tourism practitioners' increasing interest in scents, limited theoretical knowledge exists as to how scents work in tourism context (Agapito, 2020; Dann & Jacobsen, 2002). Such systematic exploration is particularly needed as tourism presents a unique setting. Tourism is service-heavy, with high degree of intangibility, and scent can act to “tangibilize” the tourist experience and act as a memory retrieval cue (Mekhail, 2011). Tourism settings are also sensory-heavy and scent can be an unobtrusive, yet powerful, sensory cue that requires little effort when processing (Krishna, 2011).

Extensive research in marketing has established strong effects of ambient scents on consumer behavior (for reviews Morrin, 2011; Roschk & Hosseinpour, 2020). The present paper synthesizes relevant knowledge from this research, describes its implications for tourism (see Appendix, Table 1), and offers a theoretical framework for studying scent effects in tourism (see Figure 1 below). Consumer research has demonstrated that ambient scents can significantly influence affect, evaluations, intentions, memories, and behavior through two main paths, namely affective and cognitive (Roschk & Hosseinpour, 2020). The first, affective path is based on the hedonic aspect of pleasant scents as sensory cues that evoke pleasure. The second, cognitive path is based on the associative aspect of scents as sensory cues that carry information. Recent meta-analysis suggests these two paths might work in parallel, with stronger effects occurring through the cognitive path (Roschk & Hosseinpour, 2020).

Figure 1: Theoretical Framework for Studying Ambient Scent Effects in Tourism



Scent effects through affective processes. The first, affective path is based on the stimulus-organism-response paradigm where a pleasant ambient scent (vs. no scent) would evoke a positive affective state in the consumer, which in turn would lead to approach behavior (Morrin, 2011). In tourism context, a pleasantly scented hotel lobby might contribute to tourists' positive state, and as a result to increased positive evaluations of the hotel (Strannegård & Strannegård, 2012). For example, pleasant ambient scent (vs. no scent) on a train has been shown to increase evaluations of the service quality (Girard et al., 2019).

Studies in consumer context have shown that the presence of a pleasant ambient scent leads to a variety of approach behaviors, such as positive evaluations of the store and merchandise, increased time spent in the store and intentions to purchase, revisit, and recommend the store (Morrin, 2011; Roschk & Hosseinpour, 2020). Pleasant scents lead consumers to experience positive affect, which then they attribute to factors in their environment, and evaluate it more positively (Morrin, 2011).

The positive effects of scent through the affective path have been shown when comparing the presence with the absence of a pleasant ambient scent. These findings can be particularly informative in tourism contexts where there is an opportunity to employ an ambient scent and a question of whether or not to do it. For example, tourism research can investigate whether a pleasant ambient scent (vs. no scent) in a hotel room would lead tourists to experience more positive affect, and as a result share more positive first impressions of the hotel in online reviews.

Scent effects through cognitive processes. The second, cognitive path is based on the associative learning paradigm where scents can become associated with specific information, emotion, or more general concepts (Herz, 2011; Holland, Hendriks, & Aarts, 2005). Once the association has taken place, scents can later serve as a retrieval cue and a priming factor.

Studies show that the presence of a pleasant ambient scent improves consumers' memory for brand information, because of increased attention (Morrin & Ratneshwar, 2003). Furthermore, studies show that scents can evoke memories related to emotional experiences much better and for longer time than other sensory cues (Herz, 2011; Morrin, 2011). Specifically, when a scent is experienced at the same time as a certain emotion, the scent can later serve as a retrieval cue and prime that emotion and the memory associated with it (Herz, 2011). Tourism research has shown that the aromas in a tourist destination are important for how tourists experience the destination (Agapito, 2020; Dann & Jacobsen, 2003). The findings from consumer research suggest scents carry importance long after the experience. Research can investigate whether scents might evoke stronger, more detailed, more emotional, and longer-lasting memories than other sensory cues (e.g. pictures).

Scents can also become associated with more general concepts upon repeated and prolonged pairing with these concepts. For example, citrus scents are commonly used in cleaning products and therefore associated with cleanliness. Some scents carry semantic meaning, which becomes activated upon scent encounter, and leads to increased mental accessibility of the associated concepts (Holland et al., 2015). Scents can make accessible concrete sensory concepts (e.g., cleanliness) or their referent abstract concepts (e.g., moral purity; Kock & Ringberg, 2019). In tourism context, a citrus ambient scent might lead consumers to perceive a hotel as cleaner (concrete concept) but also as more trustworthy (abstract concept; Kock & Ringberg, 2019) as cleanliness and morality are metaphorically associated. Studies have shown that a citrus ambient scent leads people to exhibit enhanced cleaning behavior such as keeping their desk cleaner after eating (Holland et al., 2005). Tourism research can investigate whether citrus scent in high-foot-traffic areas would lead tourists to refrain from littering.

The semantic associations that some scents carry serve to categorize them and distinguish the effects of different pleasant scents. Knowledge on how different categories of pleasant scents work is useful when comparing effects of various pleasant scents on tourist behavior (rather than comparing presence vs. absence of a pleasant scent).

For example, some scents are associated with temperature and are categorized as warm or cool (e.g., cinnamon scent is warm; peppermint scent is cool; Madzharov et al., 2015). Studies show that warm (vs. cool) ambient scents lead to perceptions of decreased space and increased social presence (Madzharov et al., 2015). As a result consumers display a power-compensatory behavior of increased spending and luxury purchases in the store (Madzharov et al., 2015). Furthermore, temperature-based scents can produce the so-called cross-modal effects where stimulation in one sense biases perception in another sense (Lefebvre & Biswas, 2019). Studies show that warm (vs. cool) ambient scents bias perceptions of ambient temperature, and as a result people are more likely to choose lower-calorie food options and decrease their calorie consumption (Lefebvre & Biswas, 2019).

Temperature-based scents are widely used in hospitality, travel, and entertainment (see Appendix, Table 2). Tourism research can investigate whether warm and cool scents can be strategically employed to alter temperature and social density perceptions where these perceptions are especially important (e.g., in waiting rooms or security lines at airports). Tourism research can also study whether warm scent could nudge tourists to choose healthier food

options. Studies can also investigate in which cases warm scents might lead to purchasing of more expensive and luxury products and services.

The gourmand scent category, in which scents are associated with foods or drinks, has also been shown to produce cross-modal effects. Studies show that prolonged exposure to indulgent-food scents discourages the choice of unhealthy foods (Biswas & Szocs, 2019). This effect is due to cross-modal sensory compensation where the indulgent scent serves to satisfy the reward system without the actual gustatory input (Biswas & Szocs, 2019). Tourism research can investigate whether indulgent scents can be used to encourage healthier food choices and consumption in areas where tourists spend more time and might be prone to unhealthy eating (e.g., airport lounges).

Coffee-like scent has been shown to produce effects associated with drinking coffee (Madzharov et al., 2018). In the presence of a coffee-like ambient scent participants report having more energy and being more alert, and as a result perform better on a test (Madzharov et al., 2018). Tourism research can examine whether coffee-like ambient scent in business centers and conference rooms might increase cognitive performance for business travellers. Tourism research can also examine whether pumping a coffee-like scent in the airplane cabin at the end of a long overnight flight might decrease travellers' tiredness.

Research has also established that some of the positive effects of pleasant scents can be enhanced by ease of processing of the scent. For example, semantically congruent scents have been shown to improve the effect of pleasant scents on evaluations (e.g., Christmas scent with Christmas music; Roschk & Hosseinpour, 2020). Tourism research can investigate whether a pleasant ambient scent would improve environment and service quality perceptions if it were congruent with other sensory cues such as music or interior colors. In addition, scent dimensionality or whether the scent has a simple (e.g., vanilla) versus complex structure (e.g., vanilla, citrus and coconut) moderates the effect of pleasant scents on spending (Herrmann et al., 2013). Tourism settings are generally sensory-heavy and researchers can test under which conditions simple (vs. complex) ambient scent might produce more positive effects on tourist behavior.

The current paper summarized consumer research that informs how pleasant ambient scents might affect different aspects of tourists' behavior and be strategically used to achieve specific goals in tourism context. Given scent marketing's popularity in the tourism industry, tourism research on scent will prove a fruitful area with multiple practical implications.

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APPENDIX

Table 1: Scent Effects on Evaluations, Intentions, Memory, and Behavior, and their Application in Tourism

Process and effects	Scent research findings	Applications for tourism research and industry
Affective process: pleasant scent on evaluations	<p>Pleasant ambient scent (vs. no scent) leads to more positive evaluations of the service quality and environment that persist long-term (Girard et al., 2019).</p> <p>Pleasant ambient scents lead to more positive evaluations of the store environment and merchandise, especially when scents are semantically congruent with the products being evaluated or with other ambient factors such as music (Morrin, 2011; Roschk & Hosseinpour, 2020).</p>	<p>Test whether pumping a pleasant ambient scent at a service desk (e.g., hotel/airline check-in or concierge, car rental desk) would lead to more positive service quality evaluations and in-the-moment online reviews on social media (e.g. Twitter). Test whether pumping a pleasant scent in hotel rooms prior to guests check-in would lead to more positive first impressions of the stay and likelihood of positive reviews posted on travel websites (e.g., Tripadvisor).</p> <p>Test whether pumping a pleasant ambient scent at welcoming desks (in hotels or entertainment venues) or security check-in at airports would lead guests to evaluate the personnel as more friendly.</p> <p>Examine whether a pleasant ambient scent in a hotel lobby would lead to positive evaluations of the hotel environment when congruent with other ambient factors: for example, a relaxing scent with slow music and pastel interior colors, or an arousing scent with bright interior colors and fast music.</p>
Affective process: pleasant scent on intentions	<p>Pleasant ambient scents increase consumers' intentions to purchase, revisit, and recommend the store and its products (Roschk & Hosseinpour, 2020).</p>	<p>Test whether a pleasant ambient scent in gift shops (in hotels, airports) would lead tourists to purchase more items and recommend the gift shop to fellow travellers. Test whether a pleasant ambient scent in entertainment venues such as concert or theater halls, would increase the likelihood of consumers to recommend and spread word-of-</p>

Affective process: pleasant scent on time spent	Pleasant ambient scents increase time spent in the store (Morrin, 2011)	mouth about the venue and their experience. Examine whether having pleasant ambient scents in museums or exhibit halls would increase the time tourists spent upon visiting. Test whether having a pleasant scent in hotel gyms would lead tourists to spend more time there.
Cognitive process: pleasant scent on memory	Pleasant scents improve memory for brand and product information (Morrin & Ratneshwar, 2003). Scents serve as retrieval cues for memories and related emotional experiences much better and for longer time than other sensory cues (Herz, 2011).	Examine whether having pleasant scents during museum visits would help tourists better remember and retrieve the information they learned during their visit. Test whether a pleasant scent in a hotel room bathroom would lead travellers to remember more details about hotel toiletries brands. Examine whether hotel signature scents bought for home would enhance memory for the hotel brand and the tourist experience. Test whether scents associated with the travel experience would evoke stronger, more detailed, more emotional, and longer-lasting memories than other memory cues such as souvenirs or pictures. Examine whether tourists that take home signature hotel scents would post more emotionally laden and detailed reviews online.
Cognitive process: citrus-based scent on evaluations and socially-responsible behavior	Citrus ambient scent activates semantic associations with cleanliness and moral purity, as well as primes cleaning behavior (Holland et al., 2005).	Examine if citrus-based scents would enhance perception of cleanliness when applied in hotel, airport, and aircraft areas with high foot traffic. Test whether pumping a citrus-based scent in a casino would lead guests to evaluate it as more trustworthy. Examine if citrus ambient scent would promote more conscious tourist behavior and decreased littering in public areas such as bathrooms or

		hallways. Examine whether pumping a citrus-based scent in hotel rooms would lead to more environmentally conscious behavior (e.g., recycling, reuse of towels).
Cognitive process: temperature-based scents on evaluations and spending	Temperature-based warm (compared to cool) ambient scent leads to perceptions of decreased space and increased social presence (Madzharov et al., 2015). Temperature-based warm (compared to cool) ambient scents increase spending and luxury purchases in the store (Madzharov et al., 2015).	Test whether a warm ambient scent would create “warmer”, comfortable, and cozy atmosphere in hotel lobbies and airport lounges. Test whether a cool ambient scent would decrease perceptions of social density in places with security-check lines at airports, elevators, or smaller physical spaces in hotels and airports. Investigate whether warm scents can lead to purchasing of more hotel service upgrades, more expensive treatments in spa salons, or more luxury items bought in hotel gift shops.
Cognitive process: temperature-based scents on food choice and consumption	Warm (vs. cool) ambient scent increases choice for lower-calorie food options, decreases calorie consumption, and increases non-alcoholic beverage consumption (Lefebvre and Biswas, 2019).	Investigate whether a warm ambient scent pumped prior to food service on the airplane would encourage choice of healthier food options and increase non-alcoholic beverage consumption.
Cognitive process: gourmand, food-based scents on choice and consumption	Prolonged exposure to an indulgent, food-based ambient scent (e.g., cookie smell) leads to decreased choice of unhealthy foods (Biswas & Szocs, 2019).	Investigate whether indulgent ambient scents can be applied in health and wellness tourism to strategically nudge tourists to eat healthier. Test whether pumping an indulgent scent in contexts where tourists are more prone to indulgent eating would improve food choice: for example, waiting areas at airports, during sports games, concerts, or shows.
Cognitive process: gourmand, coffee-like	Coffee-like ambient scent (vs. no scent) increases perceptions of alertness and energy, and improves cognitive performance	Test whether coffee-like ambient scent applied in the airplane cabin and airport corridors would increase energy and alertness as passengers

scent on cognitive performance	(Madzharov et al., 2018).	<p>come out of long-haul flights. Test whether coffee-like ambient scent can increase cognitive performance when applied in hotel business centers and conference rooms. Test whether applying coffee ambient scent in hotel gyms would improve the exercise experience for guests.</p>
Cognitive process: simple scent on spending	Simple versus complex pleasant ambient scents lead to increased spending in the store (Herrmann et al., 2013).	<p>Test whether simple scents in travel offices would facilitate choice for vacation options and increase tourists spending. Examine whether simple scents would lead to more satisfactory experience and increased spending in contexts where tourists are tired or overly stimulated such as when shopping at airports between flights, or when shopping for gifts in crowded tourist markets.</p>

Table 2: Examples of Scent Marketing Applications in Tourism

Company	Example
Four Points Hotels	Warm signature ambient scent, cinnamon apple pie (Mekhail, 2011)
Hotel Costes in Paris	“Brown” ambient scent in lobby: waxed wood and rum, mahogany, bitter orange peel, paprika, and oak moss (Mekhail, 2011)
Hyatt Place Hotels	The “Seamless” signature scent has warm vanilla and musk base (Roschk & Hosseinpour, 2020)
Omni Hotels & Resorts	Lemongrass ambient scent in the lobby (Mekhail, 2011)
The Hard Rock Café Hotel	Ambient scent of sugar cookies and waffle cones (Biswas & Szocs, 2019)
Disney Theme Parks	Ambient scent of cotton candy, popcorn, and caramel apples (Biswas & Szocs, 2019)
St. Louis Rams' Edward Jones Dome	Ambient scent of cotton candy (Biswas & Szocs, 2019)
Marlins Park Baseball Stadium in Miami	Ambient scent of caramel popcorn in the general concourse areas (Biswas & Szocs, 2019)
Cowboys Stadium in Dallas	Burger-and-fries ambient scent emitted during the games (Biswas & Szocs, 2019)
United Airlines	Signature fragrance has orange peel and fir trees; it is infused in jet bridges and member lounges (Biswas & Szocs, 2019)