Malls designed for inclusion? Emotional experience of irritating aspects of the mallscape that distance consumers with disabilities

Iris Vilnai-Yavetz and Shaked Gilboa
Ruppin Research Group in Environmental and Social Sustainability, Faculty of Economics and Business Administration, Ruppin Academic Center, Emek Hefer, Israel, and
Vincent Mitchell
Business School, The University of Sydney, Sydney, Australia

Abstract
Purpose – This study aims to identify the irritating aspects in the mall environment that impact shoppers with disability and explore the opportunities to design inclusive mall environments.

Design/methodology/approach – A mixed-methods design was used in which data collected using a survey (n = 1,434 shoppers with and without disability) were analyzed by structural equation modeling (SEM) and repeated-measures two-way ANOVA. In addition, qualitative data were obtained from critical incident technique (CIT) stories (n = 521) from shoppers with and without disability.

Findings – Mall environmental irritants evoke feelings of irritation that mediate the impacts of “inconvenient ambient conditions,” “the annoying socialscape” and “overwhelming design and atmospherics” on decreased mall-visit frequency. Compared with shoppers without disability, shoppers with disability suffer more from these irritating aspects of the mall environment, as evidenced by significantly greater high-activation unpleasant emotions. The “poor access and accessibility” category of irritants mainly affects the mall experiences of shoppers with disability.

Practical implications – Based on the findings, this study offers spatial-, temporal-, social-, material- and virtual-oriented recommendations for the design of inclusive retail spaces. The authors suggest that people with disability have a unique “lived experience” perspective on retail environments and that solutions should be co-created based on ongoing consultations with shoppers and employees with disability.

Originality/value – To the best of the authors’ knowledge, this study offers the first systematic, comprehensive comparison of the impact of environmental irritants on shoppers with and without disability and extends the literature on irritating aspects of retail environments from individual stores to malls.

Keywords Shopping malls, Vulnerable consumers, Unpleasant feelings, Visit frequency, Mall-avoidance behavior, Environmental irritants, Exclusion, Atmospherics, Servicescape, Emotion, Disability, Retail

Paper type Research paper

Introduction

An estimated 1.3 billion people worldwide (16% of the global population) have at least one significant disability (WHO, 2023). The annual consumption of this segment of the population constitutes a significant share of the marketplace. For example, the spending power of people with disability and their households in the UK is rising and was estimated to be worth £274bn in 2020 (The Purple Pound, 2020). However, as illustrated by the opening quote, too often mall shoppers with disability face

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The authors hereby confirm that this manuscript has not been published elsewhere and has not been submitted simultaneously for publication elsewhere.

The authors also state that there is no potential conflict of interest for any of the institutions or for any of the authors for the past three years.

In addition, since some of the study participants were people with disabilities, the authors obtained institutional review board approval for this study (no. 173), which they can provide upon request.

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situations in which their needs and rights are ignored and their ability to enjoy aspects of the mall environment is limited. A recent review of 859 articles on consumer vulnerability identified major themes such as consumer vulnerability and well-being, ethics and vulnerable consumers and disability and gender (Basu et al., 2023). However, these themes do not include any aspects of the rich and diverse bodies of research on servicescapes (Biter, 1992) and retail atmospherics (Kotler, 1973). This omission comes despite Edwards et al.’s (2018) attempt to advance this research agenda by calling for investigations of the marketplace experiences of vulnerable consumers and the adaptations needed to design inclusive retail environments.

Research on servicescapes and retail atmospherics (e.g. Michon et al., 2005; Roggeveen et al., 2020; Stead et al., 2022; Vilnai-Yavetz et al., 2021) has focused mainly on the design of retail environments that produce positive consumer and marketing outcomes (D’Astous, 2000). The few studies of irritating aspects of retail environments (e.g. Aylott and Mitchell, 1998; D’Astous, 2000; Demoulin and Willems, 2019) have examined the general consumer population rather than vulnerable consumers (e.g. immigrants, the elderly and LGBTQ; Rosenbaum et al., 2017b), including consumers with disability. Consumers with disability might be particularly sensitive to environmental obstacles and disturbances. The few relevant studies of the retail environment include Baker et al. (2007), who investigated elements in the retail environment that communicate a message of inclusion or exclusion to shoppers with disability, and others focused on specific disabilities (e.g. hearing-impaired shoppers; Dehling, 2023; Beudaert et al., 2017). In this study, we build on this work and respond to Edwards et al.’s (2018) call for research by examining the emotional reactions of shoppers with various disabilities to a range of environmental irritants and the impact of these reactions on the actual avoidance of mall visits. We refer to these emotional reactions, which encompass feelings such as anxiety, anger, disappointment, fatigue, boredom and sadness, as "feelings of irritation," following Demoulin and Willems (2019).

Our work makes several contributions. First, our study is the first to offer a systematic, comprehensive analysis of the impact of a wide range of environmental irritants on shoppers with disability, extending the current very limited work (Beudaert et al., 2017; Dehling, 2023; Baker et al., 2007). Second, this study extends the small stream of research on irritating aspects of retail environments in individual stores (Aylott and Mitchell, 1998; D’Astous, 2000; Demoulin and Willems, 2019; Baker et al., 2007) to the context of mall environments. Third, we improve methodologically on prior work by using mall-visit frequency to measure actual avoidance behavior [analogous to Jung et al. (2021) in the context of approach behaviors], rather than measuring hypothetical behavioral intentions as a reaction to feelings of irritation and to retail environmental irritants. Finally, we deepen the analysis of environmental irritants and shoppers with disability (Beudaert et al., 2017; Dehling, 2023; Baker et al., 2007) by using large qualitative and quantitative samples and comparing shoppers with and without disability. This allowed us to determine how irritants affect shoppers with disability differently than shoppers without disability and include a wider range of factors to present more tangible recommendations for mall owners to consider when creating more inclusive retail spaces. This research aims to help the millions of people with disability realize the maximum potential value inherent in the consumption experience.

We begin by providing a brief literature review before developing the hypotheses. This study combines methods used in prior qualitative work [e.g. 115 critical incident technique (CIT) interviews (Baker et al., 2007)] and quantitative surveys (D’Astous, 2000; Demoulin and Willems, 2019) and is thus the first to use a mixed-methods design in this context. Specifically, a quantitative survey (n = 1,434) was followed by qualitative and quantitative content analyses of CIT stories (n = 521). The paper ends by discussing the theoretical and practical implications of our comprehensive examination of the impact of environmental irritants on the emotional experiences and mall-avoidance behavior of shoppers with disability.

**Literature review**

**Inclusion and exclusion of shoppers with disability in retail environments**

The inclusion of vulnerable consumers in the marketplace is an emerging field of research (e.g. Dodds and Palashkappa, 2022; Rosenbaum et al., 2017b). Basu et al. (2023) identified over 850 articles on this topic in the marketing and services literature. Nonetheless, relatively little is known about how specific groups of vulnerable consumers, such as consumers with disability, can realize the full value inherent in retail exchanges (Edwards et al., 2018). The literature on the exclusion of consumers with disability from retail environments is scarce. Early work suggested that consumers assess an environment as enabling and welcoming or disabling and unwelcoming before deciding whether to stay in a particular retail environment (Baker et al., 2007). Later work on servicescapes exclusion found that consumers with auditory disorders deploy three types of coping strategies when exposed to sensory overload in retail places: choosing between retail spaces to minimize harm, opting for electronic environments and delegating shopping to relatives (Beudaert et al., 2017). However, these strategies can distance consumers from society and cut them off from the many beneficial aspects of the retail experience, such as meeting with members of the local community and involvement in daily life (Gilboa and Vilnai-Yavetz, 2013; Tani, 2015). Research on the general consumer population has shown that preventing the possibility of shopping and spending leisure time in the mall is related to a decrease in well-being (Vilnai-Yavetz et al., 2022), implying that retail accessibility is important to consumers.

The UK Equality Act (Equality and Human Rights Commission, 2010) guarantees protection from discrimination on the basis of an actual or perceived disability or connection to someone with a disability. The terms of the act protect “access to goods, services and facilities.” To comply with the act, retailers and mall developers have modified mall environments to increase their accessibility to consumers with disability (Abaño, 2019; Chavez, 2023). However, the modifications required by law may be insufficient to accomplish the inclusivity that they are intended to ensure. Edwards et al. (2018) stressed the importance of studying the welfare and well-being of consumers with disability and encouraging the inclusion of these shoppers in retail and service environments. We therefore begin our review of how shoppers with disability experience their customer journey (Crosier and Handford,
Retail environment and shoppers’ reactions

In studying the impact of retail environments on shoppers with disability, we adopt Bitter’s (1992) servicescapes framework, which suggests that the physical environment in which services are delivered and products are offered and purchased can influence visitors’ behavior and can either enhance or hinder their experiences. Specifically, building on the stimulus–organism–response (SOR) paradigm (Mehrabian and Russell, 1974), Bitter suggested that consumers’ approach and avoidance behaviors are mediated by their internal responses to the perceptions of servicescape elements, such as the physical layout, store design and ambient conditions. At its core, the servicescapes framework (Bitter, 1992) represents a mediation process in which a psychological mechanism explains the impact of the retail environment on consumer reactions (Vieira, 2013).

Most prior works using the SOR paradigm have suggested that emotion is the primary inner psychological mechanism (O) mediating the impact of environmental stimuli (S) on shoppers’ responses (R) (e.g. Babin and Darden, 1995; Sherman et al., 1997). Building on a meta-analysis of SOR studies (Vieira, 2013), our work examines emotional reactions as the mediator between the retail environment and shoppers’ responses. However, this study differs prior studies of positive marketing outcomes and approach behaviors triggered by enabling environmental factors and mediated by pleasant emotions (Vieira, 2013) in several fundamental ways. First, we follow D’Astous (2000) and Demoulin and Willems (2019) and study environmental irritants that negatively affect shoppers’ experience of the retail environment. Second, similar to Demoulin and Willems (2019), who focused on the emotional response that environmental irritants evoke, i.e. the mediator, we study the unpleasant feelings of irritation. Third, we suggest that the consequence, shoppers’ avoidance behavioral response, manifests as a decrease in visit frequency. In the following section, we review the literature on irritating aspects of the retail environment and their impact on feelings of irritation and avoidance behaviors.

Irritating aspects of stores

Early work identified a set of environmental irritants in grocery stores (e.g. crowding, poor signage, and queuing) and termed them shopping stressors (Aylott and Mitchell, 1998). A comprehensive classification of environmental irritants was offered by D’Astous (2000), who identified 18 environmental irritants, such as overcrowding, loud music and dirt. Later, Demoulin and Willems (2019) confirmed the association between customers’ feelings of irritation evoked by these environmental irritants and reduced customer satisfaction. Baker et al. (2007) separated the hindering and enabling aspects of retail environment elements and extended Bitter’s (1992) servicescapes framework by suggesting that the assessment of an environment as enabling or disabling is important for customers’ decisions about whether they should visit or avoid visiting a store.

Building on Baker’s (1986) categorization of enabling servicescape elements for stores, D’Astous (2000) and Demoulin and Willems (2019) categorized environmental irritants into three categories: ambient factors, design factors and social elements. Ambient factors were defined by Baker (1986) as “background conditions that exist below the level of our immediate awareness.” This includes stimuli perceived by the senses, such as bad odors, dirt, noise and uncomfortable temperatures. Design factors were defined by Baker (1986) as “stimuli that exist at the forefront of our awareness”; in the context of irritants, these factors include confusing signage and inadequate store size. Finally, social elements include overcrowding, noisy children, annoying customers and misbehavior by salespeople. Rosenbaum and Massiah (2011) suggested that customer responses to social stimuli are often drivers of profound person–place attachments. The REPLACE framework (Rosenbaum et al., 2017a) builds on this by positing that social relations (benefits such as status or esteem) and social support (functional and emotional support that creates feelings of belonging and caring) are crucial resources provided by retail outlets; the exchange of these resources between shoppers and employees/other shoppers enhances shoppers’ well-being. However, as Demoulin and Willems (2019) suggested, these impactful servicescape elements may transform into substantial environmental irritants (e.g. negative interactions between customers; Furrer et al., 2023) if not properly managed.

Irritating aspects of mall environments

We suggest that the above categories of environmental irritants (D’Astous, 2000) are also relevant in the mall context. Although some aspects are relevant to malls but not stores (e.g. confusing wayfinding and poor parking arrangement) or vice versa (e.g. tiny dressing rooms and dirty and messy display windows), the entire categorization remains valid. To adapt Baker’s (1986) categorization to our topic, we highlight the hindering nature of the irritants and denote our ambient, design and social factors as inconvenient ambient conditions, overwhelming design and atmospherics, and the annoying socialscape, respectively.

We also suggest that compared with individual stores, malls have an even greater potential to create an irritating retail environment. A prominent feature of malls is the huge variety of factors that are interconnected in the physical complex, which offers a combination of stores and public spaces full of attention-catching atmospherics. Because the mall environment is richer in stimuli than an individual store or even a collection of individual stores, shoppers experience the mall as multisensory (Stead et al., 2022) and thus are expected to be at greater risk of environmental and sensory overload. Overload occurs when the sensory input from the environmental stimuli in a mall exceeds an individual’s processing capacity and becomes an environmental irritant (Beudaert et al., 2017; Malhotra, 1984). Environmental irritants can significantly affect the accessibility and inclusivity of malls, potentially creating barriers for individuals with disability. These environmental irritants can lead to feelings of discomfort, frustration and exclusion, ultimately influencing the decision to avoid visiting the mall. In the following section, we present our research hypotheses.
Hypothesis development

Differences in perceived environmental irritation between the categories of environmental irritants

Based on the definitions of the three categories of environmental irritants, we expect that the three categories of environmental irritants will differ in prominence. The ambient factors (“below the level of awareness”) can be argued to correspond to the hygiene factors in Herzberg’s (1964) dual-factor theory, meaning that they are taken-for-granted aspects of the retail environment: shoppers only become aware of ambient factors if something goes wrong with them and they become environmental irritants. The nature of the design factors (“at the forefront of our awareness”) suggests a stronger irritating impact of stimuli such as disorganized items, the large size of malls and confusing wayfinding. Finally, empirical findings on social factors suggest that this category has high irritating potential. For instance, an evaluation of the neural excitation (Rosenbaum et al., 2021). Studies comparing the irritating impacts of the three categories have found that social factors are the most irritating (i.e. D’Astous, 2000, alongside ambient factors; Demoulin and Willems, 2019, alongside design factors). Following this logic, we propose that the annoying socialscape of the mall will be perceived as the most environmentally irritating, followed by the overwhelming design and atmospherics and finally the inconvenient ambient conditions:

H1. The categories of environmental irritants in the mall differ in scores of perceived environmental irritation; specifically, the perceived environmental irritation score is highest for the annoying socialscape, intermediate for the overwhelming design and atmospherics and lowest for the inconvenient ambient conditions.

Differences in the level of perceived environmental irritation of the three categories of irritants between shoppers with and without disability

Edwards et al. (2018) illustrated the various challenges that consumers with disability face in retail environments. For instance, products may be located too high for consumers with mobility-related disabilities to reach, and product labels with small fonts may make it difficult for visually impaired consumers to select products and read product information. In addition, Baker et al. (2007) found that aspects of the store environment may be unwelcoming to consumers with disability; for example, strong fragrances in a perfume store may cause allergic reactions. Beudaert et al. (2017) also showed that shoppers with impaired hearing experience servicescape exclusion. An ordinary experience, such as eating in a crowded and noisy restaurant, may be overwhelming for shoppers with tinnitus. Building on these findings, we suggest that shoppers with disability may be more concerned about shopping irritants than shoppers without disability:

H2a–H2c. Shoppers with disability give higher perceived environmental irritation scores to all categories of environmental irritants – inconvenient ambient conditions (H2a), overwhelming design and atmospherics (H2b) and the annoying socialscape (H2c) – than shoppers without disability.

Mediating effect of feelings of irritation on the impact of environmental irritants on mall-visit avoidance

Next, we adopt the SOR paradigm (Mehrabian and Russell, 1974) and follow prior work suggesting that emotion is the inner psychological mechanism (O) mediating the impact of environmental elements (stimuli, S) on shoppers’ responses (R) (e.g. Babin and Darden, 1995; Sherman et al., 1997). Whereas most empirical work using Bitter’s (1992) servicescape framework examines an approach response as a result of evoked pleasant emotional reactions to retail environments (Vieira, 2013), we examine the avoidance response resulting from unpleasant emotional reactions to environmental irritants (Figure 1).

Following Vilnai-Yavetz and Gilboa (2010), who applied expectancy disconfirmation theory (EDT; Oliver, 1980) to the context of cleanliness and dirt in service environments, we use EDT to explain why the unpleasant emotions induced by mall environmental irritants result in avoidance behavior. Shoppers arrive at the mall expecting environmental elements that support functional planned purchases, an atmosphere of fascination and fantasy, relaxation and entertainment with family and friends and “seeing and being seen” by the local community (Gilboa and Vilnai-Yavetz, 2013). If mall environmental elements are properly managed (e.g. enough seating and pleasant music), they will evoke pleasant emotions and approach behaviors, such as increased sales (Turley and Chebat, 2002) and future visits to the mall (Dennis et al., 2010). However, if the mix of environmental elements is perceived as poorer than expected, these elements are interpreted as environmental irritants, and the result is negative disconfirmation and negative reactions. The basic link between negative disconfirmation of expectations (e.g. lack of seats and loud music) and shoppers’ feelings of irritation, which encompass unpleasant emotions ranging from annoyance and disappointment to anger and nervousness, has been demonstrated previously (Demoulin and Willems, 2019), allowing us to propose the following:

H3a–H3c. Perceived environmental irritants — inconvenient ambient conditions (H3a), overwhelming design and atmospherics (H3b) and the annoying socialscape (H3c) – increase feelings of irritation.

Extending Demoulin and Willems’ (2019) work, we test whether feelings of irritation mediate the impact of the three categories of environmental irritants on avoidance behavior. Following the rationales of the SOR (Mehrabian and Russell, 1974) and EDT (Oliver, 1980) frameworks, we suggest that perceptions of the three categories of environmental irritants of the mall (S) evoke feelings of irritation (O), which decrease mall-visit frequency (R) (Figure 1). We test this mediation at the mall level in our fourth set of hypotheses:

H4a–H4c. Feelings of irritation mediate the negative impact of the three categories of perceived environmental irritants – inconvenient ambient conditions (H4a), overwhelming design and atmospherics (H4b) and
Based on EDT (Oliver, 1980), we expect that all shoppers will show negative reactions to environmental irritants, which often create sensory overload. Sensory overload can result from a combination of irritants (e.g., loud music, bright lights and screaming kids) in the mall environment and contribute to feelings of irritation (Demoulin and Willems, 2019) and avoidance behaviors as shoppers seek to escape the overwhelming stimuli (Beudaert et al., 2017). The UK Equality Act (2010) states that retailers have a duty to adjust their businesses to ensure that shoppers with disability have access and can expect the same exciting experience in the mall as shoppers without disability. However, shoppers with disability may be more sensitive to sensory overload (Beudaert et al., 2017) and may have health conditions that make it difficult for them to use mall facilities in an optimal way (Edwards et al., 2018). Thus, despite having similar expectations as other mall shoppers, they have to deal with physical and nonphysical difficulties (e.g., Beudaert et al., 2017; Dodds and Palakshappa, 2022; Baker et al., 2007; Rosenbaum et al., 2017b) instead of enjoying the atmosphere of fun and fantasy in the mall (Elmashhara and Soares, 2019). We therefore expect that environmental irritants will evoke stronger feelings of irritation in shoppers with disability.

In addition, Baker et al. (2007) suggested that for at least some customers with disability, the assessment of the environment as enabling or disabling is an important factor in the decision to stay, go or return to a particular retail environment. Beudaert et al. (2017) showed that hearing-impaired shoppers who experience servicescape exclusion find various ways to avoid malls: they shop online, ask friends and family members to buy for them and seek out more inclusive and protected retail spaces. As a result, we suggest that shoppers with disability (compared with other shoppers) will reduce their visit frequency at the mall and propose the following:

H5a–H5b. Shoppers with disability report greater feelings of irritation (H5a) and decreased mall-visit frequencies (H5b) than shoppers without disability.

H6a–H6c. Disability moderates the impact of the three categories of environmental irritants on mall-visit frequency such that the negative effects of the inconvenient ambient conditions (H6a), overwhelming design and atmospherics (H6b) and annoying socialscape (H6c) are stronger for shoppers with disability than for shoppers without disability.

Overview

To answer the research questions, we used a mixed-methods design combining quantitative (Study 1) and qualitative (Study 2) methods. Study 1 was derived from the literature on irritating aspects of retail environments and on shoppers with
disability, whereas Study 2 served to deepen our understanding of the differences between categories of irritants and between types of disabilities found in Study 1. In Study 1, we tested our hypotheses by conducting a survey and analyzing the data using two-way repeated-measures ANOVA and structural equation modeling (SEM). To enrich our understanding of the findings, in Study 2, we analyzed qualitative data derived from CIT stories told by shoppers. Although we performed the two studies simultaneously as a convergent design study (Harrison et al., 2020), we present them as Study 1 and Study 2 to make them easier for readers to follow. This convergent design allowed us to triangulate the findings of the two studies, increasing credibility and validity (Harrison et al., 2020).

Study 1 – A quantitative analysis of the irritating aspects of the mall environment and their impact on feelings of irritation and mall-visit frequency

Study 1: Methodology

Data collection and participants

An online survey was used to recruit English-speaking UK residents registered with the Prolific platform (https://prolific.ac/). Online panel samples and conventionally collected data have similar validity and psychometric properties (Walter et al., 2019), and the Prolific platform produces high-quality data (Peer et al., 2017). Each participant was compensated with 1.35 GBP. The survey was distributed to a large sample of respondents to ensure that the final sample included adequate variation in mall-visit frequency and a sufficient number of respondents defining themselves as having disability. After excluding 68 respondents who declined to answer the question about disability and one respondent who failed the attention-check questions, the final sample included 1,434 respondents.

The sample characteristics were as follows: age range of 18–88 years, with an average age of 40.7 (SD = 14.09); 52% female; 40% married; 51% with a college or higher degree; and 63% with income below and 19% with income above the average UK monthly gross income. Disability was reported by 20.7% of the respondents (5.3% physical disability, 13.0% nonphysical disability and 2.4% physical and nonphysical disabilities). This proportion is consistent with data from the 2021 census in the UK, which indicated that the prevalence of disability in the UK is approximately 18% (Census UK, 2021).

Measures

The questionnaire included five measures comprising sets of items adapted from validated measures. All responses were quantified on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). See Appendix for the research questionnaire.

Feelings of irritation was measured with a ten-item scale comprising five items adapted from Demoulin and Willems (2019) (e.g. I will be nervous during my mall visit) and five items added to adapt this construct from the store to the mall environment (e.g. I will feel crushed after my mall visit, because malls are so busy). Perceived environmental irritation in malls was measured using 21 items. Sixteen of these items were taken from d’Astous (2000) and Demoulin and Willems (2019), who adopted Baker’s (1986) division of store elements into ambient, design and social, and adapted from the store context (e.g. “The store is too small”) to the mall context (e.g. “The stores in malls are usually too small”). The remaining five items were new items that were developed to fit the mall context (e.g. “Malls are too big”). The results of exploratory factor analysis (EFA; described below) were used to divide the 21 items into four subconstructs:

1. inconvenient ambient conditions (three items);
2. overwhelming design and atmospherics (seven items);
3. poor access and accessibility (three items); and
4. the annoying socialscape (eight items).

To measure avoidance behavior, we adopted a modification of the approach of Jung et al. (2021), who measured the increase in the actual frequency of mall visits instead of intentions to visit the mall. Specifically, we measured mall-visit frequency using an inverted five-point scale in which higher scores denoted decreased frequency of mall visits or greater mall avoidance. The scale ranged from 1 “once a week” to 5 “hardly ever.”

We also recorded six demographic items (gender, age, marital status, education, income and with or without disability), a marker question (perceived level of greenery in the neighborhood) and two attention-check questions. Finally, using the CIT approach, respondents were asked to describe in detail the worst experience they had had in a mall (an open-ended question).

To minimize the risk of social desirability bias (Richman et al., 1999), the respondents were neither informed about the focus of this research on disability nor asked about the implications of their disability (if any) for the research variables. The question about disability appeared last in the questionnaire and allowed the researchers to distinguish between the responses of respondents with and without disability. Similarly, the CIT open-ended question appeared at the end of the questionnaire, just before the demographic questions (see Appendix).

To create the construct feelings of irritation and the subconstructs of environmental irritants and adapt these constructs to the mall context (rather than the individual store context), two validated scales of environmental irritants were merged and new items were added to existing scales. We conducted an initial separate pilot study (n = 301) to verify the structure of the final set of scales. According to the EFA (varimax rotation method, eigenvalue ≥ 1.0), all items for feelings of irritation loaded on the same factor. By contrast, the environmental irritants items were loaded on four separate factors, which we labeled annoying socialscape, inconvenient ambient conditions, poor access and accessibility and overwhelming design and atmospherics. Three of these factors – annoying socialscape, inconvenient ambient conditions and overwhelming design and atmospherics – correspond to the division suggested by Baker (1986) for studying the store environment, which D’Astous (2000) and Demoulin and Willems (2019) adopted in the context of environmental irritants. Poor access and accessibility is a new factor that is especially relevant for large retail spaces such as malls and for shoppers with disability. Based on the EFA results, we performed confirmatory factor analysis (CFA, reported in the next section).

Assessment of common method bias, validity and reliability

To minimize the possibility of an automatic response pattern, which can raise the risk of common method bias (CMB, Malhotra et al., 2006), the survey included two attention-check items that were unrelated to the scale content. In addition, the survey incorporated a variety of response types, e.g. seven-point
scales, an open-ended question, 1–100 sliding scales and categorical response options. Finally, CMB was minimized by including a question that differed in theoretical focus as a marker variable. The respondents were asked to indicate the greenness of their environment (i.e. how much vegetation, trees and bushes, they are exposed to in daily life) on a scale of 0–100.

Harman’s single-factor test, in which EFA was performed while constraining all items to a single factor (Malhotra et al., 2006), gave a variance of 41%, indicating that the items did not load on a single common factor. In addition, the marker variable indicated that there were no significant differences between the original CFA and CMB-adjusted CFA ($\Delta \chi^2 = 1.76, p > 0.10$). Finally, a multicollinearity test was performed in which the independent and mediator variables were used to predict the dependent variable. The highest VIF was 2.7, below the threshold of 5.0 (Menard, 2002). These tests indicated that the risk of CMB in the data was minimal.

Table 1 presents the average variance extracted (AVE), composite reliability (CR) and intercorrelations between constructs. For all scales, the CR and AVE values exceeded the thresholds of 0.70 and 0.5, respectively, confirming reliability and convergent validity (Hair et al., 2010). Discriminant validity was indicated by the square roots of the AVEs, which exceeded the constructs’ intercorrelations (Fornell and Larcker, 1981).

Study 1: findings

Differences between categories of perceived environmental irritation

Table 2 presents the mean and standard deviation of the perceived environmental irritation associated with each category of environmental irritant. To analyze the data and test the research hypotheses, a repeated-measures model was used in which the category of environmental irritant was the repeated-measures (within-subjects) factor and the predicted moderator – self-defined disability – was the between-subjects factor (as it was the same for all categories of environmental irritants).

The results supported H1 by demonstrating that perceived environmental irritation was greatest for the annoying socialscape, intermediate for overwhelming design and atmospherics and lowest for the inconvenient ambient conditions. Specifically, the results of a two-way repeated-measures ANOVA for the full sample ($N = 1,434$) showed a significant main effect of the category of environmental irritant on the average perceived environmental irritation score [$F(2.841, 4067.659) = 298.955, p < 0.001, \eta^2 = 0.173$]. Bonferroni post hoc tests showed that the annoying socialscape was the most irritating (mean of 4.1 on a seven-point scale), followed by overwhelming design and atmospherics (3.4) and poor access and accessibility (3.3) (with no significant difference between the two); the inconvenient ambient conditions were least irritating (3.1).

H2a–H2c were also confirmed; compared with shoppers without disability, shoppers with disability gave higher perceived environmental irritation scores to all categories of environmental irritants [inconvenient ambient conditions (H2a), overwhelming design and atmospherics (H2b), the annoying socialscape (H2c) and poor access and accessibility]. Specifically, a small main effect of with/without disability (the between-subjects factor) on perceived environmental irritation was found [$F(1, 1432) = 29.9, p < 0.001, \eta^2 = 0.02$]. In addition to the higher perceived environmental irritation scores of all four categories of environmental irritants, shoppers with disability gave higher perceived environmental irritation scores to each of the 21 individual irritants (see Figure 2). No interaction effect between the category of environmental irritant and disability was found.

Mediation of the impact of perceived environmental irritants on feelings of irritation and mall-visit avoidance

To examine the mediation hypotheses, we performed SEM via maximum likelihood estimation (Anderson and Gerbing, 1988) with gender, age, education and income as control variables. Because the mall-avoidance construct was measured on a five-point scale instead of a seven-point scale, all variables were standardized for the analysis. Satisfactory fit measures were obtained: $\chi^2=10.4, p > 0.05$, $df = 5$, $\chi^2/df = 2.08$; CFI = 0.99, TLI = 0.99, RMSEA = 0.03. The direct and indirect effects are presented in Table 3. H3a–H3c were confirmed: inconvenient ambient conditions (H3a), overwhelming design and atmospherics (H3b) and the annoying socialscape (H3c) (but not access and accessibility) increased feelings of irritation.

Mediation tests were conducted by bootstrapping 5,000 samples with 95% confidence (Preacher and Hayes, 2008) on all mediation paths in the model. Supporting H4a–H4c, feelings of irritation fully mediated the impacts of inconvenient ambient conditions (H4a) and the annoying socialscape (H4c) and partially mediated the impact of overwhelming design and atmospherics (H4b) (but not access and accessibility) on mall-visit frequency (Table 3). Thus, higher perceived environmental irritation scores indirectly reduced mall-visit frequency by increasing feelings of irritation.

Table 1: Validity and reliability tests for each construct (n = 1,434)

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<th>Research variables</th>
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<td>1. Inconvenient ambient conditions</td>
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</tr>
<tr>
<td>2. Poor access and accessibility</td>
<td>0.77</td>
<td>0.81</td>
<td></td>
<td>0.64**</td>
<td>0.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Overwhelming design and atmospherics</td>
<td>0.67</td>
<td>0.85</td>
<td></td>
<td>0.77**</td>
<td>0.79**</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td>4. Annoying socialscape</td>
<td>0.71</td>
<td>0.89</td>
<td></td>
<td>0.70**</td>
<td>0.65**</td>
<td>0.75**</td>
<td>0.84</td>
</tr>
<tr>
<td>5. Feelings of irritation</td>
<td>0.72</td>
<td>0.92</td>
<td></td>
<td>0.67**</td>
<td>0.55**</td>
<td>0.81**</td>
<td>0.69**</td>
</tr>
<tr>
<td>6. Mall-visit frequency (a)</td>
<td>–</td>
<td>–</td>
<td></td>
<td>0.16**</td>
<td>0.17**</td>
<td>0.28**</td>
<td>0.20**</td>
</tr>
</tbody>
</table>

Notes: **p < 0.01. Square roots of AVEs (convergent validity) are on the diagonal. (a) Higher mall-visit frequency scores denote decreased frequency/greater avoidance

Source: Authors’ own work
Differences between shoppers with and without disability in the impact of environmental irritants on feelings of irritation, mall-visit avoidance and the link between them (moderation)

To compare shoppers with and without disability, we first performed t-tests on our mediator (feelings of irritation) and dependent variable (decreased mall-visit frequency). Supporting H5a, the t-test results showed that shoppers with disability (M = 3.46, SD = 1.40) had significantly higher feelings of irritation scores than shoppers without disability (M = 2.88, SD = 1.20), with a medium effect size (Cohen, 1988), t(417.8) = 6.59; p < 0.001; Cohen’s d = 0.468; 95% CI[0.409, 0.757]. H5b, which predicted that shoppers with disability have greater avoidance behavior (lower mall-visit frequency) than shoppers without disability, was not confirmed (p > 0.05).

Table 2 Repeated-measures results for the differences in perceived environmental irritation of categories of environmental irritants (within-subjects factor) (N = 1,434)

<table>
<thead>
<tr>
<th>Shoppers with or without disabilities (between-subjects factor)</th>
<th>Category of environmental irritants (within-subjects factor)</th>
<th>Perceived environmental irritation (1–7)</th>
<th>F value</th>
<th>Post hoc comparisons (sig)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (N = 1,434)</td>
<td>Annoying socialscape</td>
<td>4.1 (1.13)</td>
<td>298.955***</td>
<td>&lt;0.001 &lt;0.001 &lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Inconvenient ambient conditions</td>
<td>3.0 (1.27)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poor access and accessibility</td>
<td>3.3 (1.34)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Overwhelming design and atmospherics</td>
<td>3.4 (1.23)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shoppers with disabilities (n = 297)</td>
<td>Annoying socialscape</td>
<td>4.3 (1.15)</td>
<td>92.561***</td>
<td>&lt;0.001 &lt;0.001 &lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Inconvenient ambient conditions</td>
<td>3.2 (1.30)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poor access and accessibility</td>
<td>3.6 (1.46)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Overwhelming design and atmospherics</td>
<td>3.7 (1.31)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Shoppers without disabilities (n = 1,137)</td>
<td>Annoying socialscape</td>
<td>3.9 (1.11)</td>
<td>347.944***</td>
<td>&lt;0.001 &lt;0.001 &lt;0.001</td>
</tr>
<tr>
<td></td>
<td>Inconvenient ambient conditions</td>
<td>2.9 (1.26)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poor access and accessibility</td>
<td>3.2 (1.29)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Overwhelming design and atmospherics</td>
<td>3.2 (1.19)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes: *** p < 0.001; Adjustment for multiple comparisons: Bonferroni
Source: Authors’ own work

Figure 2 Comparison of perceived environmental irritation scores for each environmental irritant by disability (with/without) – Quantitative survey (n = 1,434; responses on a scale of 1–7)

Source: Authors’ own work

Differences between shoppers with and without disability in the impact of environmental irritants on feelings of irritation, mall-visit avoidance and the link between them (moderation)

To compare shoppers with and without disability, we first performed t-tests of our mediator (feelings of irritation) and dependent variable (decreased mall-visit frequency). Supporting H5a, the t-test results showed that shoppers with disability (M = 3.46, SD = 1.40) had significantly higher feelings of irritation scores than shoppers without disability (M = 2.88, SD = 1.20), with a medium effect size (Cohen, 1988), t(417.8) = 6.59; p < 0.001; Cohen’s d = 0.468; 95% CI[0.409, 0.757]. H5b, which predicted that shoppers with disability have greater avoidance behavior (lower mall-visit frequency) than shoppers without disability, was not confirmed (p > 0.05).
Moderation tests
To test the moderating effect of disability, a multigroup SEM analysis comparing shoppers with and without disability was performed. The fit measures were satisfactory: \( \chi^2 = 10.7, p < 0.05, df = 10, \chi^2/df = 1.07; \) CFI = 1.00, TLI = 1.00 and RMSEA = 0.007. Moderation was examined by imposing equality on a specific path in the model (partially constrained) and comparing it with the free model. Moderation is confirmed if the partially constrained model differs significantly from the free model (Kline, 2010). Moderation by disability was confirmed for the link between the perceived environmental irritation of inconvenient ambient conditions and mall-visit frequency, as the constrained model for this path differed significantly from the free model (\( \Delta \chi^2 = 7.8, p < 0.01 \)). A significant impact of ambient irritants on decreased mall visits was observed for shoppers with disability (\( \beta = 0.17, p < 0.05 \)) but not for shoppers without disability (\( \beta = -0.07, n.s. \)). Thus, \( H6a \) (ambient) was confirmed, but \( H6b \) (design) and \( H6c \) (social) were not.

Study 2 – A qualitative analysis of the worst experiences of mall shoppers with and without disability

Study 2 – Methodology
Data collection and participants
Of the 1,434 respondents to the survey in Study 1, 112 reported that they did not visit enclosed shopping malls of this type. The respondents who did report visiting enclosed shopping malls of this type were asked whether they had ever had a bad experience while visiting a mall; 122 answered that they had never had a bad experience and the remaining 1,200 respondents answered an open-ended question using the CIT approach (see Baker et al. (2007) for a detailed description of this technique): “Please describe the worst experience you had in a mall (using at least 25 words). In your description, please include as many details as possible, such as what exactly happened, where in the mall you were, who was involved, how you felt, what you thought, how you behaved or others behaved, why you think it was the worst and any additional details that are relevant to fully understand your experience.” Of the sample of 1,200 stories, 256 were told by shoppers with disability. To better understand the challenging experiences of this population in the mall environment, we included all 256 stories in the analysis and added 265 stories told by shoppers without disability for comparison. To add stories from shoppers without disability, we systematically sampled every second story from the remaining 944 CIT stories until reaching 265 worst experiences of shoppers without disability. Thus, a total of 521 CIT stories were analyzed.

Analyses
After the CIT stories were collected, content analysis was performed to delve deeper into the phenomenon and uncover its dimensions. We focused on affect words conveying feelings of irritation, the environmental elements evoking these feelings and aspects of disability mentioned by the respondents. The large number of stories allowed the integration of qualitative and quantitative analyses, which is an advantage of the CIT method. CIT stories provide rich qualitative descriptions and allow the relative incidences of certain behaviors and attitudes to be quantified (Baker et al., 2007).

The analysis comprised five stages. First, the word count of each story was determined. Burns et al. (2000) suggested that the simple word count is a gross measure of the level of involvement and willingness for self-disclosure. In the present study, we expected shoppers with disability to provide longer stories than other shoppers because the challenges they face during mall visits are likely to increase their involvement.

Second, we followed Moon and Iacobucci (2022) by generating a term-and-frequency matrix to impose a structure on the unstructured text of the CIT stories. Multiword expressions with a single meaning (e.g. loud music and poor accessibility) were organized in a table. The 521 stories were scanned and reviewed, and all relevant mentions of an environmental irritant were identified, marked and counted. This process was performed separately for stories from shoppers with disability and stories from shoppers without disability. For each environmental irritant, the frequencies were translated to the percentage of the total number of stories in the group (shoppers with or without disability). The matrix was used to compare the 21 environmental irritants included in the quantitative questionnaire and additional irritants revealed by the data.

Third, following Moon and Iacobucci (2022), sentiment analysis of the two groups of CIT stories was performed. Each story was analyzed to detect explicit emotional words (e.g. anger, embarrassment and depression). First, we looked for the ten emotional words that served as the quantitative questionnaire items for feelings of irritation (e.g. nervous, bored and crushed). Next, additional emotional words (e.g. panic and hate) were identified. Because the stories were predefined as “the worst stories,” the full process of scoring words by levels of pleasantness and activation and sorting word characteristics of natural language conveying emotional information (Whissell, 2009) was unnecessary. Instead, we focused on explicit unpleasant emotional words and verified them using a list of distinctly emotional words with extreme scores for (un)pleasantness in the dictionary of affect (Whissell, 1989). Finally, the number of mentions of each emotional word in the stories was calculated. Frequencies and percentages were calculated separately for stories of shoppers with and without disability.

Fourth, a more deliberate data analysis was performed by coding each of the affective words and environmental irritants as mentioned (1) or not mentioned (0) by the respondent. Then, four dichotomous constructs were created for the environmental irritants based on the categorization discussed previously: the annoying socialscape, inconvenient ambient conditions, poor access and accessibility and overwhelming design and atmospherics. Mentions of terms in each construct or their absence were coded as 1 or 0 as described above. Similarly, building on the circumplex model of affect structure (Feldman Barrett and Russell, 1998), we created two dichotomous constructs for the affective words: high-activation unpleasant (e.g. panic, anger and anxiety) and low-activation unpleasant (e.g. depressed and bored). To avoid bias by irrelevant or unusual terms, only words that were mentioned by at least three respondents were included in the creation of the constructs. Chi-square analyses were used to test the relationships between environmental irritants (mentioned/not mentioned in each category), reported affect (high-activation unpleasant/low-activation unpleasant) and disability (with/without).
Finally, as recommended by Baker et al. (2007), sample verbatim quotes were chosen from the CIT stories of shoppers with and without disability to add qualitative richness to the findings. These quotes are displayed in the text of the findings section and in the term-and-frequency matrix to illustrate the environmental terms, the emotional words and the way shoppers with disability experience irritating aspects of the mall environment.

**Study 2 – findings**

**Qualitative findings from critical incident technique stories of worst experiences**

**Environmental irritants.** Our analysis of CIT stories showed that when shoppers were asked about their worst visit to the mall in general, 90% (with and without disability) mentioned between one and seven environmental irritants as a major source of inconvenience during their mall visits (Table 4). Specifically, supporting the findings of Study 1 (H1), at least one irritant from the annoying socialscape category was found in most (74%) CIT stories. Irritants belonging to overwhelming design and atmospherics were mentioned by one-third (32%) of the respondents, whereas the other two categories—inconvenient ambient conditions and poor access and accessibility—were mentioned by much lower shares of the respondents (17% and 13%, respectively).

When the individual environmental irritants were compared, the nine most irritating were “crowding” (“...it was full of people so much so that I could barely move at all...” n = 225, 43.2% of the sample), “annoying customers” (“I had a gentleman walk so close behind me with his son and daughter. He took my shoe off my foot and then told me to get out of the f***g way as I was walking too slow,” 84, 16.1%), “too hot/cold” (“...a too hot environment with hardly any air conditioning in an over packed area...,” 65, 12.5%), “impossible to find what one needs” (“Despite having big stores in the mall, the stock was still limited and the most generic ranges,” 61, 11.7%), “inconvenient parking arrangements” (“Spent forever trying to find the car and queuing to get out,” 57, 10.9%), “turbulent kids” (“...full of screaming uncontrolled children...,” 55, 10.6%), “loud music” (“Music was deafening,” 54, 10.4%), “long queues” (“The lifts that remain operated had huge queues. Very inconvenient,” 46, 8.8%) and “wayfinding is difficult” (“I went looking for one specific item and continually got lost in the mall,” 33, 6.3%). More than half of these irritants received high perceived environmental irritation scores in Study 1.

**Environmental irritants and shoppers’ emotional reactions.** The analysis of CIT stories revealed that experiencing mall environmental irritants is an emotion-saturated process, as confirmed by the mediation testing in Study 1 (H3 and H4). The range of unpleasant emotions evoked by mall environmental irritants was much wider than expected based on the prior literature and the set of emotions tested in the quantitative research model. Whereas the construct of feelings of irritation comprised ten items (emotional words), analyzing the CIT stories yielded approximately 60 words of unpleasant affect. Using the circumplex model of affect (Feldman Barrett and Russell, 1998), the qualitative findings showed that the respondents experienced more high-activation unpleasant emotions (mentioned by 29%) than low-activation unpleasant emotions (21%). No relationship was found between any of the four categories of environmental irritants and low-activation unpleasant emotions (p > 0.05). However, a significant link was observed between the annoying socialscape and high-activation unpleasant emotions: 33% of the shoppers describing annoying socialscape irritants experienced these emotions, compared with only 20% who did not mention the annoying socialscape (chi-square = 8.296, p < 0.01, phi = 0.126). This again supports the findings of Study 1 on the salience of the annoying socialscape (H7).

Because crowding was by far the most frequently mentioned irritating aspect, we tested the relationships of crowding with both low- and high-activation unpleasant emotions. A significant

<table>
<thead>
<tr>
<th>Research variables</th>
<th>Feelings of irritation</th>
<th>Mall-visit frequency (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconvenient ambient conditions</td>
<td>0.16***</td>
<td>-0.02</td>
</tr>
<tr>
<td>Poor access and accessibility</td>
<td>-0.04</td>
<td>-0.03</td>
</tr>
<tr>
<td>Overwhelming design and atmospherics</td>
<td>0.45***</td>
<td>0.11**</td>
</tr>
<tr>
<td>Annoying socialscape</td>
<td>0.26***</td>
<td>0.01</td>
</tr>
<tr>
<td>Feelings of irritation</td>
<td>0.24***</td>
<td></td>
</tr>
</tbody>
</table>

**Mediation through feelings of irritation**

<table>
<thead>
<tr>
<th>Research variables</th>
<th>Feelings of irritation</th>
<th>Mall-visit frequency (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconvenient ambient conditions</td>
<td>0.04*** [0.022, 0.056]</td>
<td></td>
</tr>
<tr>
<td>Poor access and accessibility</td>
<td>-0.01 [-0.024, 0.002]</td>
<td></td>
</tr>
<tr>
<td>Overwhelming design and atmospherics</td>
<td>0.11*** [0.07, 0.14]</td>
<td></td>
</tr>
<tr>
<td>Annoying socialscape</td>
<td>0.06*** [0.042, 0.087]</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Chi square = 10.7, p > 0.05, df = 5, chi square/df = 2.1, CFI = 1.0, TLI = 0.99, RMSEA = 0.028; (a) Higher mall-visit frequency scores denote decreased frequency/greater avoidance; **p < 0.01, ***p < 0.001

**Source:** Authors’ own work.

Table 3 Results of mediation testing: direct and indirect effects (standardized estimates) of the study model (n = 1,434)
Table 4 Term-and-frequency matrix of CIT stories about worst mall experience: environmental irritants mentioned (qualitative study, $n = 521$)

<table>
<thead>
<tr>
<th>Environmental irritant mentioned</th>
<th>Frequency</th>
<th>%</th>
<th>Sample quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inconvenient ambient conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dirty</td>
<td>24</td>
<td>4.6</td>
<td>...The food court was filthy, and screaming kids and teens were everywhere. Shops were too busy to browse, never mind buying something. We left. Would never go again at that time of the year. (Female, 26, disability: no)</td>
</tr>
<tr>
<td>Bad smell</td>
<td>9</td>
<td>1.7</td>
<td>Someone was sleeping on the floor of a toilet cubicle, the toilets were dirty and smelly, and that was the only toilet that could accommodate a pushchair. (Female, 41, disability: no)</td>
</tr>
<tr>
<td>Temperature – too hot or too cold</td>
<td>65</td>
<td>12.5</td>
<td>...I feel exhausted walking about in there. Some of the shops ... have extremely dazzling bright lights, and the shop is sickly warm, making me feel faint and thirsty. (Female, 52, disability: yes)</td>
</tr>
<tr>
<td>Poor access and accessibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to the mall is poor</td>
<td>3</td>
<td>0.6</td>
<td>We visited the ... mall in December (huge mistake) couldn’t find parking for at least an hour. We eventually got parked up and walked 15 mins to the entrance, and it was soooo busy ... (Female, 26, disability: no)</td>
</tr>
<tr>
<td>Parking arrangements are inconvenient</td>
<td>57</td>
<td>10.9</td>
<td>During Christmas time when it is very busy with shoppers and there are queues for the tills and no parking spaces. (Female, 43, disability: no)</td>
</tr>
<tr>
<td>Accessibility for disabled people inside the mall is poor (elevators, signage, etc.)</td>
<td>12</td>
<td>2.3</td>
<td>I’m in a wheelchair. There were very few disabled parking bays, let alone any that were available. Also, the accessibility was quite bad, lifts being out of order, etc. It was so busy I just felt awful. (Female, 37, disability: yes)</td>
</tr>
<tr>
<td>No place to sit</td>
<td>16</td>
<td>3.1</td>
<td>As someone with a disability there is a real lack of seating in shopping malls which means I can’t spend any real time there ... (Female, 47, disability: yes)</td>
</tr>
<tr>
<td>Toilets (dirty, far, closed)</td>
<td>24</td>
<td>4.6</td>
<td>I really needed to go to the toilets. We (me and my sister) were trying to find our way to the map but kept being intercepted by people. When we eventually found where the toilets were and got there they were absolutely disgusting and looked like they had not been cleaned or maintained in weeks. It was horrible. (Female, 27, disability: yes)</td>
</tr>
<tr>
<td>Overwhelming design and atmospherics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overloud music</td>
<td>54</td>
<td>10.4</td>
<td>Going into store after store looking for some items I needed only to have to turn around and come back out again because the music was so loud I just couldn’t stand it. I ended up buying some of the things I wanted online so I wouldn’t have to go into the store and endure the hideous noise. (Male, 55, disability: no)</td>
</tr>
<tr>
<td>Colors and artificial lights too bright</td>
<td>19</td>
<td>3.6</td>
<td>I had a panic attack due to there being too many people and the lights around me being too bright. I was with my partner, so they were able to calm me down. I now typically only go when I know that it will be less busy. I will also take noise-cancelling headphones with me if it is too loud for me. (Female, 23, disability: yes)</td>
</tr>
<tr>
<td>Impossible to find what one needs</td>
<td>61</td>
<td>11.7</td>
<td>Whenever I have visited one in the past I have hated it. It’s impossible to find anything, too busy. I get lost, I give up and come out empty-handed, can’t find my car when I want to leave. Then again, I don’t enjoy any kind of shopping. ... (Male, 62, disability: no)</td>
</tr>
<tr>
<td>Too many stores</td>
<td>3</td>
<td>0.6</td>
<td>...I was so hot and thirsty throughout my trip with some colleagues. I remember heading back to the car afterward and just feeling exhausted and desperate for a cool drink. There wasn’t a distinctive thing that happened, ... it was more the experience of traipsing around lots of familiar big stores and not really wanting to shop just for the sake of shopping. ... (Female, 38, disability: no)</td>
</tr>
</tbody>
</table>

(continued)
Table 4

<table>
<thead>
<tr>
<th>Environmental irritant mentioned</th>
<th>Frequency</th>
<th>%</th>
<th>Sample quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>The mall is too big</td>
<td>23</td>
<td>4.4</td>
<td>I used to go occasionally to . . . which is too big and too generic for me. I rarely found anything I needed, possibly because it’s so big I got worn out and lost enthusiasm for being there. (Female, 60, disability: yes)</td>
</tr>
<tr>
<td>Wayfinding is difficult</td>
<td>33</td>
<td>6.3</td>
<td>I got really tired when I was at . . . shopping mall. . . and it took me absolutely ages to get back to my car. It feels like a bit of a maze there. (Female, 40, disability: no)</td>
</tr>
<tr>
<td>Tiring to find</td>
<td>33</td>
<td>6.3</td>
<td>I got really tired when I was at . . . shopping mall. . . and it took me absolutely ages to get back to my car. It feels like a bit of a maze there. (Female, 40, disability: no)</td>
</tr>
<tr>
<td>Crowding</td>
<td>225</td>
<td>43.2</td>
<td>I was walking around the shopping mall trying to find a specific store, but there was too many people getting in my way. I started to feel anxious because I hate large crowds. When I eventually found the store, I had to wait in a long queue and had people who were rudely pushing in front, which then started to make me feel angry. (Male, 28, disability: yes)</td>
</tr>
<tr>
<td>Turbulent kids</td>
<td>55</td>
<td>10.6</td>
<td>. . . Wayward children running around and zooming around on scooters. Near-collisions from children and others when struggling to get around on crutches or walking stick due to my restricted mobility. Hooded teenagers/ youths walking around fast and in a threatening manner. Elderly people sauntering slowly and taking up the center of the aisle, oblivious to my and others’ attempts to get past. . . . Sweat lashing off me (forehead, chest, back) due to the near-collisions and overall very unpleasant experience. . . .” (Female, 51, disability: yes)</td>
</tr>
<tr>
<td>Deceived by a salesperson</td>
<td>5</td>
<td>1.0</td>
<td>I went back to a store a couple of days after purchasing a product, and I was told that I cannot get a refund for it, only an exchange. That made me feel like I was being taken advantage of, because I believe it was a lie from the shopping assistant to try to deceive me. I ended up keeping the product. (Female, 25, disability: no)</td>
</tr>
<tr>
<td>Indifferent salespeople</td>
<td>26</td>
<td>5.0</td>
<td>I was having a coffee and a chat with some friends in the . . . shopping mall. . . and I asked a salesperson where the toilets were. She pointed indifferently in a direction. I still could not find it, so I had to ask someone else. (Female, 70, disability: yes)</td>
</tr>
<tr>
<td>Too much pressure on selling</td>
<td>24</td>
<td>4.6</td>
<td>They are just smelly overcrowded spaces full of shops and salespeople trying to sell you things that you clearly do not need. It all seems so unnecessary; they generally bring out the worst in people. (Male, 59, disability: yes)</td>
</tr>
<tr>
<td>Salespeople have negative attitudes toward shoppers</td>
<td>24</td>
<td>4.6</td>
<td>I purchased some shoes that I didn’t try on in store, and then when I tried them on at home they were faulty. I took them back and got a snarly attitude from the cashier. (Female, 27, disability: yes)</td>
</tr>
<tr>
<td>Salespeople do not listen to clients’ needs</td>
<td>11</td>
<td>2.1</td>
<td>I was mobile phone shopping, and I went into one of the big networks shop, and I told them my requirements for a new phone . . . and the salesperson laughed in my face and said that I was dreaming and wouldn’t be able to get that package. I left and went to a different network, and they met all my requirements. (Male, 41, disability: no)</td>
</tr>
<tr>
<td>Annoying customers</td>
<td>84</td>
<td>16.1</td>
<td>The parking was very crowded, and the mall was busy. Many other shoppers were rude and irritating. . . . (Male, 45, disability: no) I used to go to . . . a lot, and it was always hot and crowded, and the people are annoying. One time I was in there, and there was a big crowd of (continued)</td>
</tr>
</tbody>
</table>
link of crowding with high-activation unpleasant emotions but not low-activation unpleasant emotions was detected. Among shoppers who mentioned crowding, 41% experienced high-activation unpleasant emotions. In comparison, only 20% of those who did not mention crowding experienced these emotions (chi-square = 26.543, \( p < 0.001 \), \( \phi = 0.23 \)). The following stories demonstrate the high-activation unpleasant emotions aroused by crowding:

Pre-Christmas shopping can be stressful, the mall was too full and with covid having been around I was wearing a face mask so trying to stay away from too many people but it was impossible. Queues were long so it was taking longer than normal to get out. (Female, 31, without disability)

I find malls very overwhelming and often quite depressing as I don’t enjoy large crowds [...] Crowded places often make me concerned about theft but also generally avoiding people walking in groups or crowds, at different paces and directions [...] I also have anxiety. (Female, 20, with physical and nonphysical disabilities)

Environmental irritants and shoppers with disability. The initial word count analysis showed that shoppers with disability were more involved in the situation of unpleasant mall visits, as their CIT stories were longer (mean = 48.6 words, SD = 26.8, max: 168) than those of shoppers without disability (mean = 43.3 words, SD = 23.7, max: 145); \( t(506.8) = 2.37; \ p < 0.01 \); Cohen’s \( d = 0.21 \); 95% CI[0.902, 9.615]. A story of a 47-year-old male shopper with a nonphysical disability illustrates the persistent challenges faced by shoppers with disability during an ordinary mall visit: “I found it difficult to concentrate, especially with the lighting; it always seems too bright and garish.”

We then examined whether and how having a disability is related to environmental irritation. Following Baker et al. (2007), we assessed the frequency with which each of the environmental irritants was directly associated with having a disability. First, we determined how many shoppers with disability explicitly mentioned their disability while describing their worst experience at the mall. Although the respondents were not aware of our interest in their disability-related difficulties, 27 respondents (11% of shoppers with disability) mentioned their disability as part of the story. Similar to Baker et al.’s (2007) findings, most (228 of 256; 89%) of the descriptions of worst experiences were not related to disability. When shoppers explicitly mentioned their disability, it was primarily related to issues of poor access and accessibility: “I just felt really anxious, claustrophobic and I really didn’t enjoy it at all [...] I have a disability and it was so far to walk around the mall [...] it isn’t accessible at all”; “Due to poor mobility and unable to stand for long I can’t queue up at tills, this usually means I put things back as there is never a designated disabled till in busy periods”; “As someone with disability, there is a real lack of seating in malls, which means I can’t spend any real time there, and also many smaller malls don’t have things like customer toilets that are easy to get to.” In general, only shoppers with disability mentioned accessibility in their stories. The only shopper without disability who mentioned accessibility was a parent of a daughter who uses a wheelchair: “I was shopping with my two daughters who are 11, one who is wheelchair dependent. The most convenient lift was out of order and we were unaware where the nearest alternative was. It took us a while to find an employee to ask and then it was inside a specific store which we located and it was very small so had to wait quite a while before it was our turn, and then we had to back track to where we were. Sometimes visiting with disabled people can be frustrating.” The explicit discussion of disability in the context of mall visits is an important insight and contribution of this study and reveals that these shoppers are unique in emphasizing issues of access and accessibility.

In contrast to Baker et al. (2007), who used CIT to collect stories only from consumers with disability, we collected stories

<table>
<thead>
<tr>
<th>Environmental irritant mentioned</th>
<th>Frequency</th>
<th>%</th>
<th>Sample quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long queues</td>
<td>46</td>
<td>8.8</td>
<td>children who were causing trouble and shouting, and the security had to get involved. It was unpleasant to witness. (Female, 23, disability: no)</td>
</tr>
<tr>
<td>Security issues</td>
<td>13</td>
<td>2.5</td>
<td>During covid... there where arrows on the ground saying keep left. I did not notice them, and a security guard shouted at me as if I was stupid. There should have been signs up high, as you don’t tend to look at the ground when walking. (Male, 51, disability: yes)</td>
</tr>
<tr>
<td>Poor customer service</td>
<td>19</td>
<td>3.6</td>
<td>I was treated really bad trying to return a damaged item. The jumper I bought cost 100 pounds and had a hole in it; customer service refused an exchange or money back, as they said it had been worn and they therefore were not liable for the quality issue. They were also very rude. (Male, 39, disability: yes)</td>
</tr>
</tbody>
</table>

Source: Authors’ own work
from both shoppers with disability and shoppers without disability, allowing us to compare their stories. The findings revealed that the two groups were similarly aware of most types of environmental irritants. For instance, shoppers with disability mentioned dirt as an irritant: “There was rubbish everywhere and everywhere looked dirty and unclean” and “noisy, dirty, very few places for people to sit down and rest, insufficient and unclean toilet facilities.” Shoppers without disability also mentioned dirt: “I saw food being sold in the middle of the mall that wasn’t handled in a hygienic way and it really put me off buying anything there” and “poor, unclean toilet facilities were also a problem.”

First, we compared the most frequently mentioned irritants between the two groups. In Study 1, shoppers with disability reported higher scores than shoppers without disability for all environmental irritants, but the order of the ranked irritants was rather similar. Here in Study 2, the leading irritants were also similar in the two groups, although the percentages of mentions differed. The six leading environmental irritants mentioned by both shoppers with and without disability were crowding, annoying customers, loud music, turbulent kids, too hot/cold and parking. Although salespeople’s behaviors ranked very highly in Study 1, they were mentioned to a lesser extent by both groups in the CIT stories (Figure 2).

Second, we compared the average numbers of environmental irritants mentioned by shoppers with and without disability. We expected shoppers with disability to mention more irritants, but the t-test results revealed the opposite: shoppers with disability (M = 1.65, SD = 1.13) mentioned significantly fewer environmental irritants than shoppers without disability (M = 1.92, SD = 1.22), with a small effect size (Cohen, 1988) r(520) = −2.68; p < 0.01; Cohen’s d = −0.235; 95% CI[−0.479, −0.074]. Also, compared with shoppers without disability, fewer shoppers with disability mentioned irritants belonging to inconvenient ambient conditions (chi-square = 4.937, p < 0.05; phi = 0.10) and to overwhelming design and atmospherics (chi-square = 4.602, p < 0.05, phi = 0.09). Thus, on average, shoppers with disability were troubled by fewer environmental irritants than shoppers without disability.

However, our data indicated that shoppers with disability were not less troubled by these irritants. Similar to the findings of Study 1, which confirmed that shoppers with disability had greater unpleasant emotions (H5a), a significant correlation between the average number of environmental irritants mentioned and the number of emotional words expressed was found for shoppers with disability (Pearson r = 0.14, p < 0.05) but not for shoppers without disability (Pearson r = 0.03, p > 0.05). These results not only confirm the unique impact of environmental irritants on feelings of irritation among shoppers with disability but also offer an important insight. For shoppers with disability, the experience of mall irritants is holistic. Although we examined the effects of individual environmental irritants and compared their effects and those of categories of irritants, most of the CIT stories invoked a combination of environmental irritants of various categories. Moreover, the number of irritants significantly affects the emotional reactions of shoppers with disability but not those of shoppers without disability. The following quote illustrates how the various irritants interact to create the holistic atmosphere:

“...being in a large and hot mall with my children trying to find shoes for them. The shoe shop was really overcrowded with nowhere to sit and everyone trying to get the indifferent shop assistant’s attention to get the shoe size they required. It took ages to get the shoes we needed and to find anywhere to sit to try them. Everyone pushing past each other. My youngest needed the toilet, and it was a lift to the toilets. Lots of people were waiting for the lift and pushing past each other. The lift kept going to different floors, and my son was desperate to go to the toilet. Trying to get around the very slow people or fast people bumping into us. It was hard to find the toilet and the car again. The carpark has sharp turns where you can’t see very well and queues to get out. The customer service all round was poor. I felt claustrophobic and panicked and hate being bumped into. I felt frazzled and exhausted and overwhelmed by the lights and noise and bustle. (Female, 41, nonphysical disability).”

Shoppers with disability and emotional responses. The sentiment analysis of the CIT stories identified 58 unpleasant emotional words. Although a statistical comparison of the number of terms identified is not possible, shoppers with disability mentioned more negative emotional words (48) than shoppers without disability (44).

Given the large number of words that were mentioned, we defined an emotional word as frequent if it was mentioned by at least 10–11 shoppers (i.e. at least 4% of the group). We then compared the frequent emotional words between the two groups. Because built environments have emotion-eliciting qualities (Russell and Pratt, 1980), we adopted the circumplex model of affect structure (Feldman Barrett and Russell, 1998) and modified it to illustrate the differences between the two groups of shoppers in their responses to the mall environmental irritants. In Figure 3, the size of the circles representing each emotion reflects the percentage of respondents reporting this emotion, following Aylott and Mitchell’s (1998) technique for highlighting the relative incidences of shopping stressors. The majority of the frequent emotional words (mentioned by 4% or more) were unpleasant and high activation (six terms); only two were unpleasant and low activation. This confirms that mall environments that are not properly managed possess a strong irritating quality. More importantly, the emotional responses of shoppers with disability included seven frequent words, whereas those of shoppers without disability included only three frequent words. Thus, the responses of shoppers with disability were more intense than those of shoppers without disability and represented very high-activation emotions such as panic and anxiety. Shoppers without disability mentioned lower activation emotions, such as frustration and annoyance.

Applying Feldman Barrett and Russell’s (1998) circumplex model of affect to the full list of emotions, we found no relationship between experiencing low-activation unpleasant emotions (e.g. frustrating, embarrassed, depressed, helpless and uncomfortable) and disability (p > 0.05). However, significantly more shoppers with disability (33%) experienced high-activation unpleasant emotions (e.g. anxiety, panic, stress, anger, hate and nervousness) than shoppers without disabilities (25%; chi-square = 4.06, p < 0.05, phi = 0.09). This supports the findings of Study 1 (H5) and adds to them by revealing the intense nature of the emotional experiences of shoppers with disability.

These findings yield an additional insight: shoppers with disability suffer more than shoppers without disability from the holistic atmosphere created by environmental irritants. In line with the quantitative and qualitative findings on the link between the number of irritants and the intensity of unpleasant emotional experiences, both shoppers with
physical disability and shoppers with nonphysical disability mentioned a mix of environmental irritants saturated with emotions:

I only go to malls when I have to due to struggling with mental and physical health issues. First, malls are difficult for me to get around, as I have problems with my lower back. Also the lighting and echoey noise trigger my anxiety levels, which can cause full-blown panic attacks. (Female, 52, with physical and nonphysical disabilities).

I am physically disabled and have very impaired mobility and find malls far too busy, not enough disabled parking and often a very long trek to the toilets. I find going round a mall on my mobility scooter very stressful due to the fact they are so crowded and there are always kids running around not being properly supervised and getting in the way, and as I’m at high risk if were to get covid, I’m now very nervous in public busy places due to the risks of getting infected. (Female, 57, physical and nonphysical disabilities).

I was just really loud because of all the people and the music, and it was boiling in there, and I just felt very overwhelmed with that and the bright lights as well; it was like surgery lights; they were so bright. (Female, 23, nonphysical disability).

Finally, another set of stories supports the SOR paradigm confirmed in Study 1 (H4) and indicates that the holistic experience of mall environmental irritants elicits unpleasant emotions, which in turn increase mall avoidance. For instance:

Having to use a wheelchair, but it was so busy it took me ages to move anywhere as everyone was in the way and no one noticed me or moved. I felt very annoyed and frustrated, and it stopped me visiting for a while. (Female, 48, physical disability).

I have had a severe panic attack in a busy mall. I was in the food court and it felt too hot and crowded and I felt immediately overwhelmed with nowhere to hide from the crowds. I raced to the bathrooms to get some space alone and found them very crowded, with a huge queue for the women’s toilets. I had to leave because I was so distressed. (Female, 24, nonphysical disability).

Taken together, the results of the qualitative data analysis provide us with four insights. First, the findings suggest that both shoppers with disability and shoppers without disability face challenges from all categories of mall environmental irritants. However, our second insight is that shoppers with disability are much more bothered by poor access and accessibility. Poor access and accessibility is a prominent functional quality that has a greater impact on shoppers who need environmental adjustments to use the mall than on shoppers without disability. Third, the qualitative findings indicate
that for shoppers with disability, the negative experience associated with environmental irritants is holistic and originates from multiple irritants. Finally, as a result, shoppers with disability experience more high-activation unpleasant emotions more intensely, leading to mall-avoidance behavior.

Discussion

To support the design of retail spaces for inclusion, this study aimed to identify irritating aspects of the mall environment and to shed light on their impact on shoppers with disability. Environmental irritants evoked feelings of irritation that fully mediated the negative impacts of inconvenient ambient conditions and the annoying socialscape and partially mediated the negative impact of overwhelming design and atmospherics on decreased mall-visit frequency. The annoying socialscape category as a whole and the crowding irritant specifically were prominent environmental irritants that were significantly associated with high-activation unpleasant emotions.

Environmental irritants had a greater impact on shoppers with disability than on shoppers without disability, but the decrease in mall-visit frequency in response to these feelings of irritation was similar between the two groups of shoppers. Nonetheless, compared with shoppers without disability, shoppers with disability were more disturbed by the environmental irritants, were more emotionally involved in the situation of visiting the mall and had stronger, more varied, and more intense feelings of irritation in response to environmental irritants (i.e. greater high-activation unpleasant emotional responses [Feldman Barrett and Russell, 1998] such as panic and anxiety). Unpleasant emotions are associated with health issues (e.g. Steptoe and Kivimäki, 2013; Suls, 2018). The WHO indicates that people with disability are at greater risk of suffering from a variety of health problems, such as obesity, diabetes and depression (WHO, 2023). Thus, a situation that induces high-activation unpleasant emotions puts shoppers with disability at greater risk than the rest of the population.

With respect to mall avoidance, in accordance with Beudaert et al.’s (2017) findings that shoppers with auditory deficiencies use coping strategies to avoid environmental irritants in retail spaces (e.g. choosing between physical retail spaces to minimize harm and opting for electronic environments), we found that shoppers with other types of disability also used these strategies. For instance, “I was forced to buy a product that I didn’t want […] which made me feel upset and very depressed. After that encounter, I do all my shopping online […]” (male, 22); “I went to buy clothing, and the salesperson was totally indifferent […] After this, I left and went to high street to get what I wanted […]” (male, 36). However, even though shoppers with disability suffered more, their reduction in mall-visit frequency was similar to that of shoppers without disability. This finding suggests that residents with disabilities who continue visiting malls are resilient, probably out of necessity. When shoppers protect themselves from the risk of environmental irritation, they also distance themselves from the opportunities inherent in the marketplace and human society. Research has shown that these opportunities can help to fulfill needs for affiliation and support and are associated with shoppers’ well-being (Rosenbaum et al., 2020). Avoidance accentuates the sense of social isolation and evokes negative feelings such as loneliness, fear and depression, conditions that are harmful to health (Steptoe and Kivimäki, 2013). In addition, evidence from COVID-19 lockdowns suggests that the loss of shopping and leisure time at the mall may compromise the general well-being of shoppers (Vilnai-Yavetz et al., 2022). Because shoppers with disability are at greater risk of suffering from a variety of health problems (WHO, 2023), they may face greater harm from mall avoidance, underscoring the urgent need to find inclusive design solutions.

Theoretical implications

Our findings have several theoretical implications. First, this study extends the scarce literature on irritating aspects of the store environment (Aylott and Mitchell, 1998; D’Aoust, 2000; Demoulin and Willems, 2019) to malls. A large body of literature has examined the impacts of mall atmospherics (e.g. Krey et al., 2022; Michon et al., 2005; Turley and Chebat, 2002; Vilnai-Yavetz et al., 2021) and store atmospherics (e.g. Bhatt et al., 2020; Roggeveen et al., 2020) on approach behaviors, but no study has extended prior work on store environmental irritants (D’Aoust, 2000; Demoulin and Willems, 2019) to the mall context. The current study bridges this gap by identifying environmental irritants in malls, revealing their relative impacts on mall avoidance behavior and focusing on shoppers with disability. Specifically, we identified entertainment venues (e.g. coffee shops and food courts) as environmental irritants (e.g. “filthy food court,” “food outlets that smelt awful,” “the food court was […] crowded with big queues,” “at the food court there were no seats” and “no signs to explain where the food area was”). Because recreation with family and friends is an essential aspect of the mall experience (Chebat et al., 2014; Gilboa and Vilnai-Yavetz, 2013), entertainment venues can easily become environmental irritants. We also identified access and accessibility as especially relevant in mall environments. If not properly managed, functional elements that are specific to malls, such as elevators, escalators, parking lots and toilets, can become mall environmental irritants. Shoppers with disability who choose to disclose their health conditions and actively and explicitly discuss their disability mentioned this category of environmental irritants as the most crucial. Future studies of the mall environment should include facilities that are especially important for shoppers with disability, such as elevators and escalators inside the mall and parking lots near the mall.

Second, as mentioned above, our findings highlight the crucial role of functionality in mall atmospherics in general and on environmental irritants in particular. Three theoretical consequences emerge from this. First, environmental irritants are mainly viewed via the functional lens; that is, they are environmental elements that are perceived as hindering functionality (e.g. facility accessibility and ambient conditions). For instance, “I needed only to have to turn around and come back out again because the music was so loud I just couldn’t stand it” (see Table 4 for more examples). By contrast, the elements of the servicescape (Bitner, 1992) and atmospherics (Kotler, 1973) that create positive outcomes can be analyzed in terms of their functional, aesthetic and symbolic qualities (Rafaeli and Vilnai-Yavetz, 2004). Second, our findings support the use of Baker’s (1986) categorization of store elements to categorize environmental irritants, as used previously by D’Aoust (2000)
and Demoulin and Willems (2019). Whereas the categorization of servicescapes (B Inner, 1992) includes the relatively abstract category of symbolic elements (i.e. “signs, symbols & artifacts”), which have been shown to produce positive outcomes in malls (e.g. Vilnai-Yavetz et al., 2021), Baker’s categorization comprises relatively concrete elements with a significant functional quality (e.g. air quality and cleanliness) that can become environmental irritants if not properly managed. Third, our findings highlight the salience of functionality, linking the terminology of environmental irritants (D’Aoust, 2000; Demoulin and Willems, 2019) with Gibson’s (1977) theory of affordances. Gibson (1977) suggested that the properties of an environment create opportunities for action and behavior. In the mall context, for example, marked stairs allow shoppers with impaired vision to notice the stairs and safely use them. However, if mall affor dances (Gibson, 1977) are not properly managed in general (and specifically with consideration for people with disability), our results suggest that they will become environmental irritants that diminish the perceived functionality of the space, limiting shoppers’ ability to engage in desired activities and leading to avoidance behavior.

Third, self-determination theory (Ryan and Deci, 2001) suggests that consumer well-being can be framed as a result of either hedonic or eudaemonic value. In the transformative service research literature (Anderson et al., 2013; Barnes et al., 2020), eudaemonic aspects focus more on fundamental needs, such as safety or minimizing barriers, whereas hedonic aspects concern relatively superficial factors that make an experience more enjoyable. Our findings illustrate how failing to properly adapt the mallscape can damage the eudaemonic dimension. Therefore, mall atmospheres with poor functional qualities (i.e. environmental irritants) undermine eudaemonic needs. For shoppers with disability, especially those with severe disability, the violation of their basic eudaemonic needs by poor access and accessibility elements justifies the greater intensity of their emotional reactions.

Finally, the confirmation of the hypotheses on the stronger impacts of the annoying socialscape on feelings of irritation and reduced mallvisit frequency and the finding that the crowding environmental irritant is associated with high-activation unpleasant emotions add to the wide stream of the literature reporting negative effects of crowding on shoppers’ responses. Perceived crowding increases shoppers’ stress and decreases their excitement (Rosenbaum et al., 2021); reduces length of stay (Michon et al., 2005); purchase intentions (Kim and Runyan, 2011) and purchases (Dion, 2004); and increases avoidance behavior (Kim and Runyan, 2011). Our study confirms that crowding is a salient and overwhelming environmental irritant for mall shoppers with disability, probably due to sensory overload. This suggests that when environmental stimulation exceeds shoppers’ coping capacities, they experience stress and use avoidance behaviors to regain equilibrium (Desor, 1972).

**Practical implications**

Enclosed shopping malls are integral to contemporary consumer culture; they offer a diverse range of products, services and experiences (Gilboa and Vilnai-Yavetz, 2013; Rosenbaum et al., 2017a) and draw masses of shoppers on a daily basis (Warnaby and Medway, 2018). Their centrality has made them public centers of urban life (Wu and Lo, 2018). However, for the 1.3 billion people with disability worldwide (16% of the world’s population) (WHO, 2023), malls are not always pleasant places. Malls integrate multiple store environments and provide a mix of stimuli that can confuse shoppers and overwhelm the senses (Beudaert et al., 2017; Malhotra, 1984). For instance, mall shoppers experiencing a combination of perfume fragrances, food aromas and even sewage smells from a clogged toilet are under olfactory attack. Moreover, a mall is a much larger complex than a store (Goss, 1993) and includes corridors and areas that connect stores, public spaces, logistic services, accessibility facilities and entertainment venues. Thus, compared with store visits, mall visits involve exposure to a greater variety of stimuli that act on all the senses (Stead et al., 2022) and produce much greater sensory overload (Beudaert et al., 2017; Malhotra, 1984). Our findings show that these stimuli are particularly challenging for people with disability.

However, this population represents a large potential market for malls. Malls can transform their environments to be more inclusive by considering environmental irritants and the specific needs and challenges faced by shoppers with disability. By addressing these irritants through accessible store layouts, clear signage, proper lighting, reduced noise levels and other accommodations, retail environments can become more welcoming and inclusive for individuals with disability, allowing them to fully participate in and benefit from the value inherent in retail exchanges (Beudaert et al., 2017; Edwards et al., 2018; Baker et al., 2007). Under the UK Equality Act (2010), retailers are obligated to make reasonable adjustments to ensure that people with disability can access businesses (e.g. marking the stairs or allowing service animals in the mall). However, our findings suggest that more is needed to minimize the negative psychological and physical effects of environmental irritants on shoppers. All categories of environmental irritants appear to evoke higher feelings of irritation in shoppers with disability than in other shoppers. We recommend that efforts to create more inclusive malls harness this unique “lived experience” perspective of people with disability by taking the following steps. First, Sharma et al. (2017) showed that co-creating value with customers with disability provides hedonic (pleasure and happiness) and eudaemonic (sense of achievement and purpose) well-being for these customers. Thus, malls could co-create solutions with shoppers with disability who are involved and willing to collaborate (a sometimes challenging goal due to the reluctance of service providers to cooperate; Mogaji and Nguyen, 2023). Second, malls could recruit and integrate more people with disability as employees in malls and consult them regularly. Third, malls could offer training sessions to both employees and store owners about the challenges faced by shoppers with disability in the mall. Fourth, malls should designate contact people (preferably with “lived experience” of disability) who can provide assistance both digitally and physically during the mall’s operating hours, akin to first aid officers. Fifth, malls should support the use of technologies to assist visitors with various types of disabilities (e.g. location services for people with cognitive disability; García-Catalá et al., 2022). After implementing these steps, specific actions, such as providing apps that allow shoppers with disability...
to search for and purchase items both physically and digitally or offering hours intended only for shoppers with disability, e.g. quiet hours, can be considered. Table 5 depicts the full set of recommendations, which are divided into five dimensions: spatial, temporal, social, material and virtual-oriented. For each dimension, examples of each of the four categories of mall environmental irritants are provided, and actions for assisting shoppers with various types of disabilities are recommended. These recommendations can help mall managers prioritize environmental irritants in their quest to minimize shoppers’ irritation in general and the more intense irritation experienced by shoppers with disability.

**Limitations and future research**

Multiple avenues for further research emerge from this work. First, our qualitative CIT analysis was based only on stories from shoppers with and without disability about their worst experience

<table>
<thead>
<tr>
<th>Dimension of suggested solution</th>
<th>Environmental irritant category</th>
<th>Sample environmental irritant(s)</th>
<th>Recommendation for action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social</td>
<td>Poor access and accessibility</td>
<td>Poor accessibility for people with disability inside the mall (e.g. elevators and signage)</td>
<td>Establish a joint and ongoing steering team comprising mall management and representatives of shoppers and employees with disability that will respond to ongoing and ad hoc challenges experienced by shoppers with disability</td>
</tr>
<tr>
<td></td>
<td>Overwhelming design and atmospherics</td>
<td>Sensory overload (e.g. overload music, too bright lights and too many stores)</td>
<td>This requires co-creating solutions together with shoppers with disability who are involved and willing to collaborate, integrating people with disability as employees at malls and consulting them constantly</td>
</tr>
<tr>
<td></td>
<td>Inconvenient ambient conditions</td>
<td>Sensory overload (e.g. dirt and bad smell)</td>
<td>The solutions created here will be manifested in the other (spatial, temporal, material and virtual) dimensions in this table</td>
</tr>
<tr>
<td></td>
<td>Annoying socialscape</td>
<td>Sensory overload (e.g. crowding, screaming kids and annoying customers)</td>
<td></td>
</tr>
<tr>
<td>Spatial</td>
<td>Overwhelming design and atmospherics</td>
<td>Sensory overload</td>
<td>Quiet and secluded areas colored with calming hues that are surrounded by biophilic atmospherics, such as plants and aquariums, and offer opportunities for rest, meditation, drinking water, etc.</td>
</tr>
<tr>
<td></td>
<td>Inconvenient ambient conditions</td>
<td></td>
<td>Design open-air atriums with greenery</td>
</tr>
<tr>
<td></td>
<td>Annoying socialscape</td>
<td></td>
<td>Offer concessions for people with disability, such as exemptions from long checkout lines and priority use of elevators for people with physical disability</td>
</tr>
<tr>
<td></td>
<td>Poor access and accessibility</td>
<td>Poor accessibility for people with disability inside the mall</td>
<td>Place braille signs at elevators and store entrances and install an audio system that indicates the floor numbers in elevators and escalators</td>
</tr>
<tr>
<td>Temporal</td>
<td>Overwhelming design and atmospherics</td>
<td>Sensory overload</td>
<td>Offer quiet hours with reduced noise that are intended only for shoppers with disability before and after regular opening hours. The number of people at the mall will be limited to avoid social crowding, slow-beat pleasant music will be played, the lighting will be dimmed, etc.</td>
</tr>
<tr>
<td></td>
<td>Inconvenient ambient conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annoying socialscape</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Overwhelming design and atmospherics</td>
<td>Sensory overload</td>
<td>At the entrance to the mall, offer earplugs or loan headphones, magnifying glasses and handheld mirrors to those who are interested</td>
</tr>
<tr>
<td></td>
<td>Annoying socialscape</td>
<td>Poor accessibility for people with disability inside the mall</td>
<td>At the entrance to the mall, loan mobility scooters and wheelchairs</td>
</tr>
<tr>
<td></td>
<td>Poor access and accessibility</td>
<td></td>
<td>Encourage the use of mall navigation apps (e.g. Mallway app UK, 2023). Help shoppers with disability to install and start using the application. These apps can help customers with disability find the shortest routes to their in-mail destinations and provide auditory and visual signals to assist navigation Phygital experience – providing apps that allow shoppers with disability to search and purchase both physically and digitally to reduce in-store crowding and minimize stay at the stores, hence reducing mall sensory overload. Such apps can use auditory and visual signs to signal the placement of products and possible obstacles (such as counters) in the store</td>
</tr>
<tr>
<td>Virtual</td>
<td>Overwhelming design and atmospherics</td>
<td>Wayfinding is difficult</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inconvenient ambient conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annoying socialscape</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ own work
at the mall. This could have biased our findings by emphasizing negative experiences. By contrast, Baker et al. (2007) asked only shoppers with disability about both their worst and best experiences at stores. Future research can ask both shoppers with and without disability about their best and worst experiences at the mall. Second, the respondents reported whether they possessed a (physical/nonphysical/both) disability. Our findings suggest that shoppers with different types of disability may differ in their sensitivity to specific environmental irritants. Future research can also distinguish between various types of disability (e.g. mobility difficulties, auditory deficiency, visual impairment and mental disability) and levels of severity to deepen the understanding of the associations between disabilities and environmental irritants and improve environmental inclusiveness at the mall. Third, the quantitative and qualitative data analyzed in this study were collected in a single survey. Although we showed that the risk of CMB in our quantitative data was minimal and believe that adding the CIT stories of the same respondents enriched the findings and increased our ability to make a valid interpretation, future research can obtain data from various sources and perspectives. For example, online surveys can be combined with mall intercepts and observations, data collected at different points in time (e.g. before, during and after the visit), and data obtained from consumers, salespeople and mall managers about leading environmental irritants at the mall. Fourth, the current research was conducted in one country (UK). Studies have shown that the behaviors of mall shoppers differ between countries (Gilboa et al., 2020). Future research could examine between-country differences in the context of mall irritants. Fifth, the emergence of the COVID-19 pandemic has spurred the creation of open shopping centers characterized by large open-air spaces surrounded by vegetation. Such shopping centers may help resolve some of the irritants mentioned in this study (e.g. crowding, bright colors and dazzling lights) but add other environmental irritants (e.g. sunlight exposure, weather conditions and air pollution). Future research could examine the differences in challenges and potential solutions that enclosed malls and open shopping centers present to shoppers with disability and specifically measure the degree of sensory overload and expectations of shoppers with disability. Finally, multiple technological tools are available to assist people with disability (e.g. technologies to help people with cognitive disability navigate indoors under stressful circumstances; Garcia-Catalá et al., 2022). Future research could examine the extent to which implementing these tools in large retail spaces such as enclosed malls reduces the irritating experience of the environment, improves satisfaction and decreases mall avoidance by shoppers with disability.

Conclusions
The quantitative and qualitative findings clearly demonstrate that perceived environmental irritants evoke feelings of irritation that mediate the negative impact of perceived environmental irritants on decreased mall-visit frequency. For all shoppers, the experienced feelings of irritation were mostly high-activation unpleasant emotions; however, shoppers with disability suffered more from the irritating aspects of the mall environment and experienced significantly more high-activation unpleasant emotions. The “poor access and accessibility” category of irritants mainly affects the mall experiences of shoppers with disability. Our findings indicate that people with disability have a unique “lived experience” perspective that must be considered to effectively improve mall inclusion. Accordingly, we offer spatial-, temporal-, social-, material- and virtual-oriented recommendations for designing inclusive retail spaces for shoppers with disability and suggest that any solutions be co-created by mall management and shoppers and employees with disability through ongoing consultation.

References
Emotional experience of irritating aspects

Iris Vilnai-Yavetz, Shaked Gilboa and Vincent Mitchell


Malloy app UK (2023), available at: https://apps.apple.com/uk/app/mallway-mall-navigation/id1513924477?l=he


Appendix. The study questionnaire

The following statements are about your perception of shopping malls. Please answer only about enclosed shopping malls composed of retail stores, restaurants, coffee shops, and services with on-site parking (e.g., Westfield London).

Part A: Feelings of irritation (adapted from Demoulin and Willems, 2019)

Imagine you are visiting the nearest mall to your home. Please indicate from 1 (Disagree Strongly) to 7 (Agree strongly) how much you agree with each statement regarding your feelings during this visit.

1. I will be nervous during my mall visit.
2. I will feel claustrophobic in the mall.
3. I will find my experience in the mall annoying.
4. When I think about my future experience in the mall, I expect to feel disappointed.
5. I will feel angry after my experience in the mall.
6. I will feel like a bomb, ready to explode, after visiting the mall.
7. After visiting the mall, I will feel depressed.
8. I will feel bored during my visit because the shops in the mall are generic.
9. I will feel crushed after my mall visit because malls are so busy.
10. I will feel tired after my experience in the mall.

Part B: Perceived environmental irritation (adapted from d’Astous, 2000; Demoulin and Willems, 2019)

Please indicate from 1 (Disagree Strongly) to 7 (Agree strongly) how much you agree with each statement regarding shopping malls and specific stores in shopping malls.

Inconvenient ambient conditions
1. There is a bad smell in malls.
2. Malls are dirty.
3. Malls are usually too hot or too cold.

Overwhelming design & atmospherics
4. The music inside malls or stores in malls is too loud.
5. The colors and artificial lights in malls are too bright.
6. It is impossible to find what one needs in malls.
7. The arrangement of items in malls’ stores changes too frequently.
8. There are too many stores in malls.
9. Malls are too big.
10. Wayfinding within malls is difficult.

Poor access & accessibility
11. The accessibility getting into malls is poor.
12. Parking arrangements in malls are inconvenient.
13. Accessibility for disabled people inside malls is poor.

Annoying socialscape
14. Malls are crowded.
15. Malls surround you with turbulent kids.
16. In malls, there is always a risk of being deceived by a salesperson.
17. Salespeople in malls are indifferent.
18. In malls, salespeople put too much pressure on selling to shoppers.
19. Salespeople in malls usually have negative attitudes toward shoppers.
20. Salespeople in malls do not listen to clients’ needs.
21. Malls are full of annoying customers.

(continued)
Part C: Mall visit avoidance

How frequently do you visit a shopping mall?

Please answer only about enclosed shopping malls composed of retail stores, restaurants, coffee shops, and services with on-site parking (e.g., Westfield London).

a. Once a week or more.
b. On average about 1 to 3 times month.
c. On average about 3 to 10 times a year,
d. Not much, about once or twice a year.
e. Hardly ever. I do not visit malls of this type at all.

Part D: The worst experience in a shopping mall

Please describe the worst experience you had in a mall (at least 25 words as an answer). In your description, please include as many details as possible, such as what exactly happened, where in the mall you were, who was involved, how you felt, what you thought, how you behaved or others behaved, why you think it was the worst and any additional details that are relevant to fully understand your experience:

___________________________________________

Part E: Demographics

Please fill in your personal details:

1. Gender [ ] male [ ] female [ ] non binary / third gender [ ] prefer not to say [ ]
2. Your age (years) ______________
3. Your marital status: Married [ ] Not married [ ]
4. Your education:
   1 = Middle school or lower
   2 = Technical school/high school
   3 = University, college undergraduate degree in progress (a student)
   4 = Completed undergraduate university or college degree
   5 = Completed graduate university or college degree or higher
5. The average UK monthly income is around £2,500 after tax. Is your monthly income:
   1) Much lower
   2) Lower
   3) About the same
   4) Higher
   5) Much higher
6. How would you describe yourself:
   1) I’m a person with physical disability.
   2) I’m a person with non-physical disability.
   3) I’m a person with physical and non-physical disability.
   4) I am not a person with disability.
   5) Prefer not to answer.

Source: Authors’ own work

About the authors

Iris Vilnai-Yavetz is an Associate Professor in marketing at the Ruppin Academic Center, Israel. Her research has examined physical and virtual atmospherics in the contexts of consumer behavior, organizational psychology, service and marketing and business and social sustainability. Her current research interests include mall experiences, promoting sustainability in organizations and social groups, and consumers with disabilities in retail and service environments. Professor Vilnai-Yavetz has published in outlets such as Journal of Service Research, Journal of Interactive Marketing, Journal of Retailing and Consumer Services, Computers in Human Behavior, Journal of Services Marketing, Environment and Behavior, European Journal of Marketing and Organization Science. Iris Vilnai-Yavetz is the corresponding author and can be contacted at: yavetzir@ruppin.ac.il
Shaked Gilboa is an Associate Professor at the Ruppin Academic Center, Israel. Her research has examined customer experiences in various contexts, such as shopping malls, hospitality services, crowdfunding and cities. Professor Gilboa has published in outlets such as International Journal of Hospitality Management, Journal of Retailing and Consumer Services, Journal of Services Marketing, International Business Review, International Journal of Entrepreneurial Behavior & Research, Internet Research and European Journal of Marketing.

Vincent Mitchell is a Professor of Marketing at The University of Sydney Business School. His h-index of 65 is the result of 30 years of research on consumer problems such as confusion, risk, complaining behavior, confinement and privacy and more than 200 academic and practitioner papers published in journals such as Harvard Business Review, Journal of Consumer Psychology, Journal of Business Research, Journal of Economic Psychology, Journal of Retailing and Consumer Services, Psychology and Marketing and Journal of Public Policy and Marketing.

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