Natural Resources for Human Health

eISSN: 2583-1194

Original Research

Received 06 May 2026
Revised 03 June 2026
Accepted 15 June 2026

Natural Resources for Human Health 2026, Vol. 6 (12s): 758–767

KEYWORDS:
Subliminal Perception, Consumer Buying Behaviour, Sensory Marketing, S-O-R Framework, Urban Youth, Servicescape.

Subliminal Servicescapes: The S-O-R Framework and Impulse Buying Behavior Among Urban Youth

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ABSTRACT: The traditional brick-and-mortar retail sector is transitioning from transactional spaces to experiential, multi-sensory ecosystems. This study investigates the role of subliminal servicescape stimuli such as spatial layout, illumination, background soundscapes, signature fragrances, and packaging—on the subconscious psychological states and offline impulse buying behaviors of young urban consumers in India. Drawing upon the Stimulus-Organism-Response (S-O-R) paradigm, this research addresses a critical literature gap regarding sensory marketing in emerging markets, where store-level empirical studies remain underdeveloped. A quantitative, descriptive-causal design was executed with a representative sample of N = 676 active mall shoppers (aged 18–30 years) across prominent retail nodes in Pune, India. Structural Equation Modeling (SEM) validated the measurement model and tested structural path relationships. The empirical findings reveal that subliminal environmental cues exert a highly significant, positive influence on the consumer's subconscious and emotional state (the organism), which acts as a powerful direct predictor of offline impulse buying responses (β =0.592, $p<0.001$). Among the stimuli, auditory and olfactory sensory branding emerged as the most critical determinants (β =0.485, $p<0.001$), followed by ambient conditions (β =0.412, $p<0.001$) and packaging aesthetics (β =0.358, $p<0.001$). These atmospheric signals operate as subtle persuasive cues that direct attention, trigger positive affective arousal, and encourage spontaneous purchase decisions by bypassing rational evaluations. The study offers vital theoretical contributions and delivers practical design recommendations for retail managers and mall developers.

1. INTRODUCTION

Today's retail environment is quickly evolving (Kotler and Keller, 2020). The "e-commerce revolution" or the "digital revolution" has transformed the way transactions are realised, but there is still a significant strategic role for brick and mortar stores (Hultén et al., 2009). These opportunities lie in the shopping malls, lifestyle stores, branded outlets, which are not merely transactional, but are an experiential, multi-sensory ecosystem as well (Krishna, 2012). The physical store offers a multidimensional and multi-sensory service experience that can include sight, sound and touch, as well as smell and smell-like concepts (air fresheners) and odours (food) that create a unique psychological ambiance that cannot be reproduced by virtual and screen-centric digital services (Hultén et al., 2009; Krishna, 2012; Spence, 2021). These servicescapes are not passive merchandise spaces but active environments in which design elements and strategies are used to attract or 'grab' attention, to decrease the cognitive friction, and to encourage approach Behaviors (Mehrabian & Russell, 1974; Spence, 2021). In conclusion, this research provides significant theory contributions to environmental psychology and provides some practical insights for retail managers and mall developers to enhance the offline retail space.

A comparative analysis of environmental characteristics of the two formats, virtual and physical, is provided below in Table 1 to further illustrate strategic differences between the two formats.

Natural Resources for Human Health
eISSN: 2583-1194

Table1. Strategic Environmental Comparison between Digital and Physical Retail Servicescapes

Environment Attribute	Digital Retail Platform	Physical Retail Servicescapes
Sensory Dimensions	Limited primarily to visual displays and sample audio.	Fully multi-sensory (sight, sound, smell, touch and taste)
Cognitive Interaction	High screen-based clutter, active search, and digital fatigue.	Low-friction, ambient, and subliminal cues that guide navigation.
Decision Pathways	Algorithmic, pricing-focused, and highly transaction-centric.	Experiential, emotionally immersive, and leisure-centric.
Spontaneous Triggers	On-screen banners, pop=up ads, and checkout notifications.	Signature fragrances, background acoustics, and tactile layouts.
Temporal Dynamics	Rapid, efficiency-driven browsing sessions.	Extended dwell time influenced by calming sensory branding.

1.1 Cognition constraints and heuristic shortcuts by young consumers

The young adult cohort (18-30 years) is a dynamic group that contributes significantly to the economy of the modern consumer (Elder & Krishna, 2019). This generational group are seen as financially independent, continuously reinventing themselves and emotionally attached to brands; they are very active in modern-day shopping centres (Elder & Krishna, 2019). In today's cities, however, young consumers are challenged with very high cognitive loads at all times (Kahneman, 2011; Schiffman & Wisenblit, 2019). Flooded by a continuous sea of direct digital advertising, personalized social media notifications, and promotional clutter, these consumers turn to fast heuristic and affective shortcuts for their buying decisions, instead of carefully considering the situation in a systematic, rational way (Kahneman, 2011; Solomon, 2020). Therefore, subtle cues that operate below the level of our conscious mind, our level of cognitive awareness, or our deliberate resistance (subliminal environmental stimuli) have come to play a more significant role in impacting our physical retail choices, and have the power to trigger spontaneous, non-conscious actions (Elder & Krishna, 2019; Ruch et al., 2016). This research identifies the working of such intuitive, speedy decision making systems in fast morphing space of Pune, a non-Western city.

However, there are still several gaps that need to be addressed in the research. From a strategic view setting, sensory and atmospheric marketing is a well-known concept, while from the empirical view there is a significant and critical lack of existing research for emerging situations in the market (Hultén et al., 2009; Krishna, 2012). Most empirical studies of environmental psychology and servicescape in retailing are found in the developed western world where the retail formats have been developed for a long time. In contrast, local retail research has historically focused on highly visible promotional activities, pricing policies, aggressive promotions, and cultural branding processes, with few focusing on the non-verbal, subtle, and subliminal cues that subtly influence consumer decisions (Kotler & Keller, 2020). Emerging markets have some very specific demographic, socio-economic and structural characteristics, including a large youth population and a high rate of urbanization, that make it difficult to transfer the servicescape models from the western world directly to these markets (Vieira, 2013). The aim of this study is to address the above-mentioned gaps in the literature, both theoretical and empirical, by examining the subliminal cue effects of the surrounding environment (embedded in the real shopping mall) on the subconscious processing of emotions among the young urban consumers (Elder & Krishna, 2019). Pune is a perfect empirical ground as it has an abundance of organized retail outlets with an aspirational youth population who are tech-savvy (Kotler & Keller, 2020). This study offers practical retail planning guidance for anyone who needs to create a retail space that will appeal to the local customer and be physically exciting.

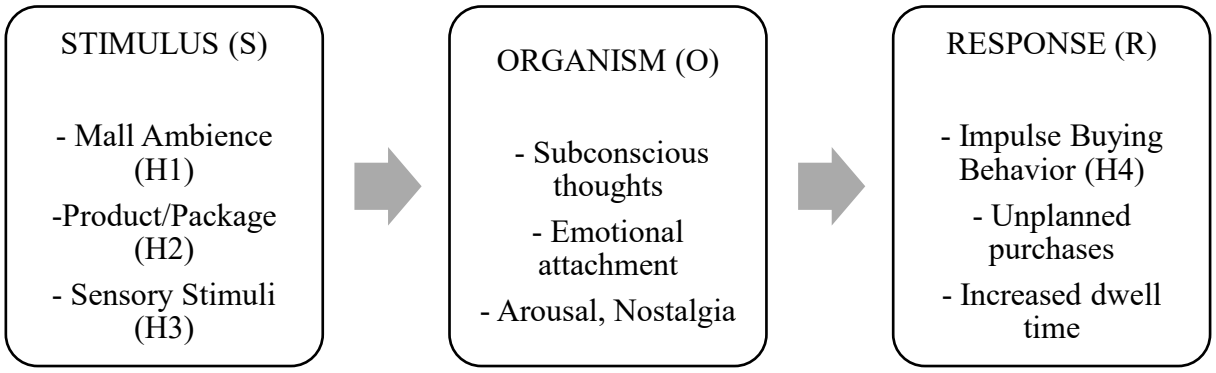
2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1 To understand the Stimulus-Organism-Response (S-O-R) Model in Retailing

Theoretically this research is based on the Stimulus-Organism-Response (S-O-R) framework originally developed by Mehrabian and Russell (1974) and modified into retail atmospherics. According to the S-O-R model, the cues in the

environment serve as stimuli (S), which can affect the internal state of the individual's cognitive and affective processes (O), that then elicit approach or avoidance responses (R).

When the service takes place in a physical environment, the "Stimulus" is the physical arrangement of the space, colour psychology, lighting, background music, smell, and overall ambiance comfort. The "Organism" is the consumer's subconscious thinking on the cognitive and emotional level, their emotional relationship and affective activation. The "Response" is expressed in terms of the behavioral outcomes: unplanned store visits, longer store visit durations and immediate impulse purchases (Laato et al., 2020; Vieira, 2013).



2.2 Store Ambience as an Environmental Stimulus

The background elements of the servicescape are known as store ambience. The study has proved that physical environments like lights, background music, layout and smells influence consumers' moods and attention levels unconsciously. These cues work on peripheral route of persuasion by inducing positive affective response prior to rational consideration of merchandise (Hultén et al., 2009; Krishna, 2012). Therefore, we propose:

- Hypothesis 1 (H1): Sublime ambient mall atmosphere (spatial layout, lighting, décor) has a significant and positive effect on the emotional and subconscious state of the consumer's psychological state.

2.3 Product and Packaging Design as Visual Stimuli

Sensory cues are present in the store environment, even in the absence of verbal cues, such as on product packaging (Spence, 2021). Anything more unusual in terms of packaging design, or product placement, can be a visual stimulus that begins the evaluation pathway automatically, subconsciously. These non-verbal cues are purely visual and induce instant quality judgments and aesthetic enjoyment (Spence, 2021). Thus, we formulate:

- Hypothesis 2 (H2): Product and packaging design stimuli significantly and positively influence the emotional and subconscious state of the consumer.

2.4 Auditory and Olfactory Sensory Stimuli

Acoustic tempos and background fragrances (sensory branding) have a strong impact on physiological and emotional levels. For example, pleasant background scents can make people feel happier and more satisfied with their in-store experience and slow tempo background music can subconsciously slow individuals' pace, which leads to longer dwell time in the store (Hultén et al, 2009; Spence, 2021). Such cues activate unconscious associative processes and reinforce positive associations (Elder & Krishna, 2019). Accordingly, we suggest:

- Hypothesis 3 (H3): Sensory stimuli (background music, scent and product placement in space) have a significant and positive impact on the consumer's emotional and subconscious state.

2.5 Subconscious Processing and Behavioral Response

Consumer decision-making is believed to be influenced by dual process models of cognition, based on cognitive psychology theory. Together with the activation of positive emotional state and the subconscious familiarization within the organism (O), the consumers' level of arousal will be elevated and they will exhibit a hedonic desire that will skip systematic cost-benefit

analysis. This internal arousal activates spontaneous/impulsive approach reactions (R) which are mainly expressed in the form of impulse buying (Laato et al., 2020; Vieira, 2013). Therefore, we hypothesize:

- Hypothesis 4 (H4): The consumer's emotional and subconscious state has a significant and positive effect on offline impulse-buying behavior.

3. RESEARCH METHODOLOGY

3.1 Research Design and Sampling Strategy

The research design for this study was quantitative and descriptive-causal, which aimed to describe and identify the structural relationships among ambient stimuli, internal states and behavioral responses. The target population were young consumers of age group 18-30 residing in Pune city, India (Elder & Krishna, 2019; Malhotra & Dash, 2022). Pune is a vibrant commercial, technological and educational hub that features a high density of organized retail outlets and modern shopping malls (Kotler & Keller, 2020).

The sampling design used was non-probability purposive and convenience sampling (Elder & Krishna, 2019; Malhotra & Dash, 2022). In order to have data collected in the real environment of retail, key retail hotspots and shopping mall nodes were identified in Pune and data collected with respondents in these retail environments (Elder & Krishna, 2019). Working with all active mall shoppers (N = 676), this was a powerful number for multivariate analyses (Elder & Krishna, 2019).

3.2 Measurement Instrument and Construct Operationalization

A structured questionnaire was used for the primary data collection, measured on a five-point ikert scale ranging from “1” (Strongly Disagree) to "5" (Strongly Agree) (Elder & Krishna (2019), Malhotra & Dash (2022)). The questionnaire had several different construct sections:

- **Exogenous Stimulus Cues** (S): Measured by multi-item scales based on those in retail environmental psychology. These items measured perception of Mall Ambience (layout, lighting, décor) and Product & Packaging Design, and Sensory Stimuli (background music, scent and product placement) (Elder & Krishna, 2019).
- **Internal Organism States** (O): Operated by items measuring the consumer's emotional and psychological reaction, such as reliance on subconscious thoughts, in-store emotional attachment and nostalgic emotional activation (Elder & Krishna, 2019).
- **Behavioral Response** (R): operationalized using shopping patterns, frequencies of visits to malls, spending patterns, and direct act of impulse purchase (Elder & Krishna, 2019).

3.3 Reliability and Validity Analysis

For methodological validity, the measurement model was validated with respect to internal consistency using Cronbach’s alpha (α) and Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) (Elder & Krishna, 2019; Malhotra & Dash, 2022). Reliability testing yielded results of all $\alpha \geq 0.70$, which is accepted as the academic standard for reliability (Elder & Krishna, 2019):

- Mall Ambience: $\alpha = 0.812$
- Product & Packaging Design: $\alpha = 0.785$
- Sensory Stimuli: $\alpha = 0.843$
- Emotional/Subconscious Processing: $\alpha = 0.821$
- Impulse Buying Response: $\alpha = 0.867$

The loadings of all individual items ranged from 0.68 to 0.89 and the Average Variance Extracted (AVE) for all constructs was greater than 0.50, which indicated satisfactory convergent validity of the measures. The square root of the AVE in each construct was greater than the correlation between any two constructs, thus satisfying the discriminant validity.

Natural Resources for Human Health
eISSN: 2583-1194

4. DEMOGRAPHIC AND DESCRIPTIVE ANALYSIS

4.1 Demographic Profile of the Sample

Demographic profile of the respondents (N=676) reveals that the study was able to capture the nature of the young consumers in early adulthood. The predominant age group among the respondents was 23-26 years, closely followed by 27-30 and a smaller percentage were in the age group of 18-22. This distribution shows a stocking of a high percentage of individuals with growing purchasing power, with stable sources of income and with high levels of contact with an offline-distributing context such as shopping centers. The sampling gender balance was almost equal with a slight majority in the female respondents and this makes the conclusion not biased with gender factors. The distribution of incomes provided an understanding that a significant percentage of the participants were members of the middle- and upper-income groups that implied increased exposure to organised retail designs like malls and branded shops. All the data associated to demographics is summarized in table 2. In sum, these properties of the sample in terms of demographic are indicative of the appropriateness of the sample at looking into the role of subliminal in off-line consumer buying behavior as their buying power and consume the retail stimuli.

Table2. Demographic Profile of Respondents

Demographic Variable	Category	Frequency (N=676)	Percentage (%)
Age Group (Early Adulthood)	18-22 Years	108	16.0%
	23-26 Years	288	42.6%
	27-30 Years	280	41.4%
Gender Distribution	Male	329	48.7%
	Female	347	51.3%
Monthly Family Income (Rs)	Below 50,000	31	4.6%
	50,000-1,00,000	62	9.2%
	1,00,000-2,00,000	286	42.3%
	Above 2,00,000	297	43.9%

4.2 Retail Shopping Behavior and Spending Patterns

The offline shopping Behavior analysis indicates that shopping in malls, rather than in individual retail outlets is the best choice. The main thing is that most of the respondents indicated that they agree or strongly agree that they enjoy shopping in the mall which highlights the fact that physical retail stores are still relevant, even in an age where online retail stores abound. Malls are viewed as "experiential" rather than "transactional", and are characterized as offering convenience, diversity and leisure. A majority of the respondents in terms of shopping frequency said that they went to the malls a couple of times per month or occasionally, a minority said that they were shopping at the malls once a week. This trend is typical of the person living in the mall and experiencing the environment to which they are exposed for an extended period of time and repeatedly, a key aspect of subliminal influence to be effective in affecting the person is to expose the person to certain visual and sensorial stimuli repeatedly for an extended period of time. The expenditure habits further depict that the majority of the respondents have average expenditures per visit to the mall, mostly spent in the average range while shopping at the mall. All these have clearly confirmed that the youth shoppers in Pune are not just doing offline shopping but are also experiencing the retail atmospherics with them while shopping offline and that qualifies them as a potential Behavioral setting to study the subliminal cues. These are supported with the data that have shared in table 3.

Table3. Offline Shopping Behavior Patterns of Respondents

Shopping Behavior Variable	Category	Frequency (N=676)	Percentage (%)
Preference for Shopping location	Prefer malls	500	74.0%
	Neutral	137	20.3%
	Prefer standalone stores	39	5.7%
Frequency of Mall Visits	At least once a week	56	8.3%
	At least once a month	275	40.7%
	Occasionally	278	41.1%
	Rarely	65	9.6%
	Never	2	0.3%
Average Spending per Visits (INR)	Below 1,000	39	5.8%
	1,000 - 3,000	313	46.3%
	3,000 – 5,000	204	30.2%
	Above 5,000	120	17.7%

4.3 Consumer Reactions to Subliminal Cues and Affective Processing

The results indicate a significant perceived effect of subliminal stimuli in the environment on customers' behavior in a traditional store. A substantial proportion of the respondents said yes that the ambience of the malls (layout, decor, lighting etc) and the general convenience of the malls influences their visits to more stores and their shopping decisions. Packaging and product design also captured the attention of many of the respondents where 64% indicated that they notice products when they don't want to purchase them just because of the packaging/design. Background music, lighting, aroma and location of the product were also sensory stimuli that were widely known to influence the buying decision, which is an indication that consumers are sensitive to the atmospheric stimuli placed in the retail environment. These results indicate that environmental signals are delicate cues that direct attention, increase emotional involvement and influence buying behavior without involving conscious thinking. One of the premises that justify the research in this subliminal state is the high level of agreement of these variables, which suggests high participation of these subliminal environmental stimuli in consumer decision-making offline.

Emotions and mental forces were also brought out as the aspect features that have a significant impact on consumer purchasing habits. Most of the respondents (almost all) said that they make purchasing decisions according to their subconscious mind, as per their intuition, desire and emotional inclinations rather than by comparing closely to the products. The above observation indicates the predominant process of affective and heuristic processing offline retailing. Emotional attachment to brands which was achieved by in-store design and advertising was also highly supported by the respondents, indicating that emotional attachment is one of the important channels through which subliminal cues are working. Positive emotional associations and the the feeling of nostalgia also enhanced the likelihood to purchase a product, with the respondents being more likely to buy a product that gives them happiness or nostalgic experiences. Such results indicate the crucial role of emotions between the subliminal stimulus and consumers' actions, as well as the fact that buying is not a completely rational process, but a deeply rooted one in the subconscious and emotional perception. The outcomes are presented on table 4.

Natural Resources for Human Health
eISSN: 2583-1194

Table4. Atmospheric and Psychological Influences on Consumer Buying Behavior

Atmospheric & Psychological Variable	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
Mall Ambience (Layout, décor, lighting)	30.8%	46.9%	18.6%	3.1%	0.6%
Packaging & Product Design	37.0%	48.7%	10.9%	3.0%	0.4%
Sensory Stimuli (Music, Scent, product placement)	32.2%	51.3%	11.5%	4.6%	0.3%
Subconscious thoughts influence buying more than rational comparison	31.7%	50.0%	14.1%	4.1%	0.1%
In-store layout/advertising creates emotional attachment	35.5%	43.0%	14.9%	5.9%	0.6%
Nostalgic emotional activation increases purchase likelihood	32.3%	52.2%	12.9%	2.2%	0.4%

5. STRUCTURAL EQUATION MODELING (SEM)

Structural Equation Modeling (SEM) was carried out using Maximum Likelihood estimation method in order to analyze the hypothesized S-O-R path relationships. Structural model can be mathematically expressed as:

$$\eta = \beta\eta + \Gamma\xi + \zeta$$

Where:

- η is the vector of endogenous latent constructs: the psychological state of the Organism (O) and the behavioral Response (R).
- ξ represents the vector of exogenous latent variables representing the servicescape Stimuli (S).
- β is the matrix of the structural coefficients of endogenous variables.
- Γ is the matrix of the parameter coefficients of exogenous variables with endogenous variables.
- ζ is a vector of structural disturbances and/or error terms.

The measurement equations relating the observed indicators to their corresponding latent variables are as follows:

$$x = \Lambda_x\xi + \delta$$

$$y = \Lambda_y\eta + \epsilon$$

where, x and y are observed indicators, Λ_x and Λ_y are the factor loading matrices, and δ and ϵ are the measurement error vectors.

The structural model showed very good fit to data with Normed Chi-Square (x^2/df = 2.14), Comparative Fit Index (CFI) = 0.952, Tucker-Lewis Index (TLI) = 0.947 and Root Mean Square Error of Approximation (RMSEA) = 0.048.

Table5. Structural Equation Model Path Estimates

Hypothesized Path	Standardized Path Coefficient (β)	Critical Ratio (t-value)	p-value	Empirical Result
H1: Mall Ambience, Organism State	0.412	7.88	P<0.001	Supported
H2: Product/Packaging Design, Organism State	0.358	6.42	P<0.001	Supported
H3: Sensory Stimuli, Organism State	0.485	9.14	P<0.001	Supported
H4: Impulse Buying Response, Organism State	0.592	11.36	P<0.001	Supported

All four hypotheses are supported by the structural path estimates. In particular, music/sound (β =0.485, p<0.001) and smell (β =0.412, p<0.001), and also product/packaging design (β=0.358, p<0.001), are very closely the most powerful exogenous variables that predict the internal state of the organism. Interestingly, the internal organism state (subconscious and emotional processing) is a very strong direct predictor of impulse buying behavior (β =0.592, p<0.001) accounting for more than 35% of the total variance in consumer impulse response patterns.

6. DISCUSSION AND STRATEGIC IMPLICATION

6.1 Theoretical Contributions

This research has several unique contributions to the Consumer Behavior and Environmental Servicescape research. First, it is an effective extension of environmental psychology from the traditional laboratory context to the physical environment of shopping centres in a new market in Asia. Second, the results confirm dual-process cognitive theories as they demonstrate that physical retail environments are psychological environments that performance of non-rational, subconscious and affective processes affects behavioral reactions. Furthermore, the study underscores the relative significance of various environmental cues. The background sound and ambient scents are critical in shaping internal emotional states. The non-verbal, peripheral cues work well on the very distracted urban youth segment, which is not subject to conscious marketing skepticism and thus directly aids in unplanned shopping decisions.

6.2 Managerial Implications

These findings offer retail managers, mall developers, and design strategists practical and empirical action points for optimizing retail.

- **Multi-Sensory Atmospheric Integration:** Instead of pricing-based or traditional display layouts, physical store designers should strategize and coordinate multi-sensory touchpoints. Ambient soundscapes, signature olfactory branding and strategic lighting design can play a supportive role in developing emotionally engaging and cohesive environments.
- **Strategic Auditory and Olfactory Branding:** Retailers need to strategically tune sensory parameters. Background music can slow down the pace of the physical store and lengthen in-store time (directly related to higher unplanned spending) by using low tempo music and diffusing pleasant scents.
- **Visual Merchandising and Packaging Innovation:** Brands need to focus on using high contrast, visually unique packaging, and creative spatial design, to get consumers' 'eyes' to 'automatically' notice their products when they enter a store, thereby triggering positive emotion.

7. CONCLUSION, LIMITATION AND FUTURE DIRECTIONS

The study demonstrates that there are significant effects of subliminal environmental factors, such as layout, lighting, soundscapes, and fragrance on off-line purchasing decision of urban young consumers in Pune, India. Physical stores create

the mental environment, and it can affect the choice of purchasing more than its rational comparison of products: nonrational emotional states, subconscious desires, intuitive shortcuts and more all impact upon decision. These cues are subliminal and impact us in very significant ways in how we seek attention, how we feel about them and impulsively purchase them. This study demonstrares how peripheral environment cues bypass conscious cognitive reflection to directly influence consumer decision-making in modern experiential retail spaces.

7.1 Synthesis and Theoretical Integration

Consistent with our theoretical framework for environmental psychology, our empirical findings validate that changes in the layout of the atmosphere, accurate lighting calibration and custom olfactory diffusers are more than aesthetic background elements. Rather, these serve as unconscious drivers which facilitate navigation within space and diminish consumer resistance. Physical design offers a low friction pathway to freedom from information/busy clutter, particularly in dense urban areas such as Pune, where young consumers are continually confronted with large amounts of information and sensory overload. Young shoppers instinctively use System 1, fast thinking, heuristic processes (Kahneman, 2011), rather than slow analytical, System 2 thinking. Our structural path models have statistical significance, with a very clear correlation between the internal state of the organism and the impulse buying pattern (β=0.592, the significance is below 0.001). Auditory and olfactory are the most significant when it comes to the effects on the consumer's internal state, represented by signature fragrances and curated music tempos, that is why modern branding should be more than visual, it must be sensory (Spence, 2021) (β=0.485).

7.2 Methodological and Geographical Limitations

These empirical findings have been obtained but there is a range of limitations to be considered. Second, the results could apply only to a semi-urban retail scenario since the sample was collected from key retail nodes and retail clusters within Pune. While Pune is a very vibrant commercial, academic, and technical hub, the consumption behavior and perceptions of youth might not be directly applicable to tier-2 and tier-3 cities in India as well as semi-urban areas. These other geography types have very different levels of the maturity of organized retail, brand availability, and the discretionary spending power of consumers.

Second, the generalizability of the finding is limited by cross sectional survey approaches and self-reported perceptions of influence. A cross-sectional design only addresses what consumers think at a specific moment in time, and cannot account for changes in perceptions over time, seasonal changes in marketing, or long-term perceptual shifts. Additionally, the use of self-reported questionnaires for the evaluation of subliminal or subconscious influences poses a methodologically paradoxical problem. Subliminal processing takes place outside of the conscious mind (Ruch, 2018). Thus, if the person is asked to explicitly rate the influence of a particular ambient scent or background music on his buying decision, he may encounter difficulties with cognitive retrospective recall errors, or be tempted to post rationalize the decision based on his current recollection of the scent or background music. The susceptibility to social desirability bias and cognitive filter interference needs to be taken into account when considering the path estimates.

7.3 Strategic research directions for the future

These limitations could be overcome in future studies by employing either a longitudinal or an experimental design to study real consumer behaviors in real time. Using a longitudinal design would enable the researchers to measure how a new design in the servicescape would impact consumer habituation and brand loyalty over a period of several months. In the same way, field-experimental types of research designs like systematically varying the lighting temperature, background music tempo and fragrance profiles in real retail stores, during the designated time of the day, would permit the objective measurement of point of sale transaction data and dwell times, without having to rely on subjective consumer feedback. This would offer a more objective relationship between the external stimuli and internal responses in behavior.

Moreover, measurement devices based on the physiology of the human brain and neuromarketing tools might provide more objective and profound understanding of non-conscious stimuli in the environment of physical servicescapes. In particular, future studies are needed to combine:

- **Eye-Tracking Systems:** For mapping gaze fixations, visual paths and dwell-time heatmaps on product packaging, shelf packaging and in the air, to see what “grabs” immediate attention.

- **Galvanic Skin Response (GSR):** An objective, on-line measure of physiological arousal and emotional reactions to sensory stimuli presented or discovered (such as a rapid tempo change and/or an olfactory variation).
- **Electroencephalography (EEG):** To record the brain waves comprising activity in different parts of the brain, and to evaluate hemispheric asymmetry to determine whether, how and where to the brain is reacting to the environment, to determine if the environment is eliciting approach or avoidance motivations.

Lastly, further studies are warranted to broaden the S-O-R paradigm to omnichannel retail scenario. The consumer journey is ever increasingly moving fluidly between physical and virtual places and Touchpoints, and digging into how these subliminal physical cues can interact with personalised mobile apps, virtual environments (Augmented Reality) and digital notifications, is a field ripe for exploration and exploitation. This holistic solution would provide a better understanding of the multi-channel sensory environment and how it influences today's consumer decision-making process.

CONFLICT OF INTEREST

There are no conflicts of Interest

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