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Decoding the Dining Atmosphere: Ambient Conditions and Customer Satisfaction in Restaurant Servicescapes

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Abstract.
This study investigates the effects of ambient conditions, one of the essential dimensions of the Servicescape Model, on restaurant customer satisfaction. Ambient conditions like lighting, music, scent, and temperature are extremely influential in shaping customer feelings and perceptions. Based on Bitner's Servicescape and the Stimulus-Organism-Response (S-O-R) model, the study collected data from 230 survey participants in Indian urban restaurants. Using descriptive statistics, correlation matrices, and multiple regression analysis, the research determines scent and lighting to be strong predictors of satisfaction, then music. Temperature, although applicable, failed to show a statistically significant effect. Results of the findings provide practical implications for optimizing service environments in the hospitality industry.

Kata Kunci:
Servicescape, Kondisi Ambien, Kepuasan pelanggan, Suasana Restoran

Abstrak.
Studi ini menyelidiki pengaruh kondisi ambien, salah satu dimensi penting dari Model Servicescape, terhadap kepuasan pelanggan restoran. Kondisi ambien seperti pencahayaan, musik, aroma, dan suhu sangat berpengaruh dalam membentuk perasaan dan persepsi pelanggan. Berdasarkan Servicescape Bitner dan model Stimulus-Organism-Response (S-O-R), penelitian ini mengumpulkan data dari 230 responden survei di restoran perkotaan India. Dengan menggunakan statistik deskriptif, matriks korelasi, dan analisis regresi berganda, penelitian ini menentukan bahwa aroma dan pencahayaan merupakan prediktor kuat kepuasan, diikuti oleh musik. Suhu, meskipun relevan, tidak menunjukkan pengaruh signifikan secara statistik. Hasil temuan ini memberikan implikasi praktis untuk mengoptimalkan lingkungan layanan di industri perhotelan.

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1. Introduction

The competitive landscape in the restaurant industry requires a profound understanding of customer satisfaction drivers beyond food and service quality. One such critical but often understated factor is "servicescape", i.e., the physical environment of service. Formerly conceptualized by Bitner (1992), the servicescape includes the physical environments that shape customers' expectations, perceptions, and behaviors.

This model framework denotes that service ambient conditions refer to intangible background features such as room temperature, ambient lighting, background music, and scent, which certainly

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influence customer moods, perceptions, and satisfaction. In this context, extensive literature highlights the importance of ambience in the hospitality sector, though empirical data quantifying its impact on customer satisfaction in restaurants, particularly in emerging economies like India, remain limited.

The present study addresses this gap through a regression-based analytical approach to evaluate the impact of ambient conditions on customer satisfaction in Indian urban restaurants. In addition, within the competitive hospitality landscape particularly in the restaurant sector the differentiation of service offerings has extended beyond culinary excellence and into the realm of experiential quality. Customer satisfaction, once primarily driven by food quality and service delivery, is now significantly influenced by the physical and sensory environment in which services are consumed.

One of the most critical yet often underexplored contributors to the overall dining experience is the servicescape, a term coined by Bitner (1992) to describe the physical surroundings that shape customer and employee behaviors in service settings. Servicescape encompasses various dimensions, including ambient conditions, spatial layout and functionality, and signs, symbols, and artifacts. Among these, ambient conditions—which include factors such as lighting, temperature, scent, and background music—are the most influential in shaping customers' cognitive behavior. These elements form the sensory foundation of the environment and influence customers at a subconscious level, thereby playing a crucial role in how they evaluate their dining experience and, consequently, their satisfaction.

The relevance of ambient conditions is further accentuated by the Stimulus–Organism–Response (S-O-R) framework (Mehrabian & Russell, 1974), which provides a behavioral lens through which the effect of physical stimuli on emotional states and behavioral outcomes can be understood. According to this model, ambient stimuli (e.g., soothing music, pleasant aromas) act upon the organism (i.e., the customer), influencing their internal emotional state, which in turn affects behavioral responses such as satisfaction, loyalty, or word-of-mouth communication.

In the context of restaurants, this model implies that strategic manipulation of ambient conditions can shape the emotional climate of the dining experience, thus enhancing satisfaction and encouraging favorable post-consumption behavior. Despite the growing recognition of these environmental factors, scholarly investigation into the quantitative impact of ambient conditions on customer satisfaction particularly in the context of restaurants in emerging markets like India remains limited. Most existing studies are either conceptual or anecdotal, with few employing statistical methods such as regression analysis to examine the relationship between specific ambient attributes and satisfaction outcomes.

Furthermore, the interplay among multiple ambient factors for example, how lighting interacts with scent or how temperature affects the perception of music requires deeper empirical exploration to inform managerial decision-making.

2. Literature Review

The manner in which the physical environment is constructed in companies has only just begun to be mined as a concrete organizational resource (Becker, 1981, p. 130). Physical setting management usually is considered to be peripheral compared with other organizational variables that can drive workers, including pay levels, career advancement opportunities, benefits, and supervisory relationships. Likewise, on the customer side, such variables as price, advertising, added amenities, and special promotions are considered much more than the physical environment as means of inducing customers to be attracted to and/or satisfied with the services of a firm. Service providers

hold considerable influence over shaping customer satisfaction or dissatisfaction. A customer's evaluation of their dining experience often begins the moment they engage with the restaurant's physical environment, commonly referred to as the servicescape, and its personnel.

The service encounter, often termed the "moment of truth," encompasses any point of interaction between the customer and the service system. This includes not only exchanges with employees but also encounters with fellow patrons and the overall environmental context of the establishment. These interactions collectively contribute to the customer's holistic perception of service quality during their time at the restaurant (Fitzsimmons & Fitzsimmons, 2008). A substantial body of research on servicescapes has established those specific atmospheric variables such as lighting, scent, color, and music exert a direct influence on customers' emotional states and overall satisfaction (Mehrabian & Russell, 1974; Bitner, 1992; Turley & Milliman, 2000; Lin, 2010a). Additionally, these environmental cues have been shown to affect employee behaviors and service performance (Parish, Berry, & Lam, 2008).

According to Donovan and Rossiter (1982), consumers' approach-oriented behaviors—including shopping enjoyment, intent to revisit, environmental appeal, interpersonal interactions, expenditure patterns, browsing duration, and in-store exploration are substantially influenced by their perceptions of the surrounding environment. This underscores the critical role of atmospheric elements in shaping retail experiences. In a related line of inquiry, Milliman (1982, 1986) demonstrated that auditory factors, particularly the tempo of background music, can significantly alter consumer behavior by affecting movement patterns and purchase volumes in both grocery and restaurant contexts. Such evidence illustrates how environmental cues are deliberately leveraged in service settings to steer consumer responses, affirming the applied relevance of environmental psychology within retail and service marketing frameworks.

The Stimulus–Organism–Response (S-O-R) model has been widely applied, especially in retail and service environments, to investigate how atmospheric stimuli impact consumer responses and shopping behavior (Donovan & Rossiter, 1982; Mehrabian & Russell, 1974; Mattila & Wirtz, 2001). Empirical studies have explored how sensory elements like ambient scent, visual cues (e.g., color), and background music influence affective responses (Dube & Morin, 2001), satisfaction levels (Wirtz et al., 2000; Michleit & Mantel, 2001; Lin, 2010a; Ray et al., 2020), and behavioral intentions, such as approach or avoidance tendencies (Mehrabian & Russell, 1974; Mattila & Wirtz, 2001; Milliman, 1986; Bellizzi & Hite, 1992). Among these psychological mechanisms, **pleasure** has been identified as a principal driver of customer satisfaction, while **arousal** functions as a moderator that intensifies the relationship between pleasure and subsequent behavioral responses (Mehrabian & Russell, 1974; Donovan & Rossiter, 1982; Wirtz & Mattila, 2000; Wirtz, Mattila, & Tan, 2007; Lin, 2010a; Ray et al., 2017; Ray, 2016).

In addition, Price and Price (2011) in their study mentioned that scent is an important ambient dimension of servicescape. They explained the aromatherapeutic benefits of four key fragrances—Black Pepper, Lemon, Lavender, and Eucalyptus based on their aroma type, traditional use, and psychological effects. Black Pepper (spicy) is a muscle relaxant and aphrodisiac, balancing emotions. Lemon (citrus) serves as an antiseptic and energizing agent, uplifting mood. Lavender (herbaceous) is calming and soothing, aiding in stress relief and emotional balance. Eucalyptus (camphoraceous) is a deodorant and stimulant, promoting energy and mental clarity. Each fragrance aligns with specific aromatherapy classes balancing, energizing, calming, or toning contributing to holistic well-being. These essential oils support therapeutic practices by enhancing emotional stability, energy levels, and relaxation.

Although earlier research has explored the individual effects of atmospheric cues—such as background music, scent, or color on customer satisfaction and behavioral responses like approach

or avoidance, these studies have largely overlooked how these elements function in combination within a holistic service environment. To bridge this gap, the concept of Gestalt perception offers a useful theoretical lens. This perspective posits that customer reactions are not merely driven by isolated environmental stimuli but by the integrated and unified experience of the entire service setting. In other words, it is the overall configuration of sensory elements, rather than their standalone effects, that shapes customer evaluations and behaviors (Holahan, 1982; Lin, 2004; Oakes & North, 2008; Lin, 2010b; Bag et al., 2021). Understanding these congruency effects is essential for designing service environments that evoke coherent and emotionally resonant experiences.

The objectives of this study are (a) to evaluate the individual and collective impact of ambient conditions specifically lighting, music, temperature, and scent on customer satisfaction in urban Indian restaurants; and (b) to address inadequate exploration of how multiple ambient factors interact to influence customer perceptions and behaviors within densely populated urban dining spaces.

2.1. Theoretical Frameworks

The Servicescape Model, developed by Mary Jo Bitner (1992), offers a structured and integrative framework for analyzing how physical service environments shape the behaviors, perceptions, and experiences of both customers and employees. This model identifies three primary environmental dimensions: ambient conditions (including sensory elements such as lighting, temperature, scent, and background noise), spatial layout and functionality (referring to the design, furniture arrangement, and ease of movement within the space), and signs, symbols, and artifacts (comprising signage, decorative elements, and branding cues). These components interact to form the perceived servicescape, which acts as a stimulus within a stimulus organism response framework, eliciting cognitive, emotional, and physiological reactions among individuals.

A critical feature of the model is its recognition of subjectivity in perception, acknowledging that customer and employee responses are moderated by individual differences such as personality traits, cultural orientation, mood states, and situational circumstances. The resultant behavioral outcomes are classified into approach behaviors (e.g., increased time spent, repeat visits, favorable evaluations) and avoidance behaviors (e.g., disengagement, premature exit, or complaints). These behavioral indicators ultimately influence key organizational outcomes including customer satisfaction, service quality perception, and employee efficiency. Consequently, the Servicescape Model is widely regarded as a cornerstone in services marketing and environmental design, providing actionable insights for managers aiming to create optimized service environments that align physical stimuli with strategic customer experience goals.

This research is grounded in two well-established theoretical models. Servicescape Model (Bitner, 1992): Bitner's framework categorizes the physical environment into three dimensions. The first is Ambient Conditions, which include lighting, noise, temperature, and scent. The second is Spatial Layout and Functionality, which refers to seating arrangement and movement ease. The third is Signs, Symbols, and Artifacts, which encompass interior design and branding elements.

The current study focuses exclusively on ambient conditions and their effect on customer satisfaction. Stimulus-Organism-Response (S-O-R) Model (Mehrabian & Russell, 1974): This behavioral framework suggests that environmental stimuli (S) influence internal evaluations (O), leading to responses (R). In this context, the Stimulus refers to ambient conditions, the Organism represents customer emotions and perceptions, and the Response is reflected in customer satisfaction.

This research is anchored in two interrelated theoretical models: Bitner's Servicescape Model (1992) and the Stimulus–Organism–Response (S-O-R) Model (Mehrabian & Russell, 1974). Together, they

form the conceptual scaffolding that underpins the analysis of how ambient sensory conditions lighting, music, temperature, and scent affect customer satisfaction in urban Indian restaurants. Within the restaurant context, stimuli such as lighting and scent are hypothesized to activate emotional responses (e.g., pleasure, arousal), ultimately resulting in heightened satisfaction. The integration of these two models allows for a dual-layered exploration: the objective physical setting and the subjective psychological response it evokes. This theoretical framework justifies the use of regression analysis on sensory impact.

Table 1. Tabular Representation of Theoretical Framework

Model	Component	Study Application
Servicescape Model	Ambient Conditions	Lighting, Music, Temperature, Scent as sensory stimuli
	Spatial Layout & Functionality	Not considered in current study
	Signs, Symbols, Artifacts	Excluded from scope
S-O-R Framework	Stimulus (S)	Ambient sensory factors (Lighting, Music, etc.)
	Organism (O)	Customer emotions and perceptions
	Response (R)	Customer satisfaction as the behavioral outcome

3. Methodology

This study adopts an approach grounded in Bitner's Servicescape Model (1992) and the Stimulus–Organism–Response (S-O-R) paradigm (Mehrabian & Russell, 1974). The methodology is structured to explore how sensory stimuli such as lighting, music, temperature, and scent shape the evaluative and emotional responses of consumers in dining environments.

3.1. Sampling Technique

A non-probability convenience sampling technique was used to collect data from 230 respondents across 10 casual dining restaurants situated in Kolkata, Delhi, and Mumbai three major urban centers in India. These locations were chosen to capture diversity in urban consumer behavior and restaurant ambience across cultural and climatic variations. While convenience sampling may limit generalizability, it enables access to a demographically relevant urban consumer base engaging with restaurant servicescapes.

3.2. Instrument Design and Data Collection

The researchers designed a structured, self-administered questionnaire, which consisted of items measuring perceptions of four ambient dimensions: lighting, background music, temperature, and scent, as well as overall customer satisfaction. Each item was rated using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), allowing for ordinal-level measurement of subjective experiences. The instrument underwent preliminary checks for content validity by referencing established scales in servicescape literature and aligning the items with constructs in Bitner's framework.

3.3. Variables

In this study, the independent variables consist of four key ambient factors, namely ambient lighting, background music, ambient temperature, and scent/aroma. These elements are considered critical components of the restaurant environment that may influence customer perceptions and experiences. The dependent variable is customer satisfaction, which reflects the overall evaluation of the dining experience as influenced by the identified ambient conditions.

3.4. Data Analysis Techniques

Data were processed using SPSS Version 26. The analytical methods were applied included "Descriptive Statistics" and "Assumptions and Diagnotic Checks".

Descriptive Statistics were employed to summarize central tendencies and variability in responses (means, standard deviations). Multiple Linear Regression Analysis: To examine the predictive power of each ambient variable on customer satisfaction. This included the use of model summary statistics (R, R^2, Adjusted R^2), ANOVA, and coefficient tables to assess significance, strength, and direction of the relationships. The general multiple linear regression model is:

$$Y = \beta0+\beta1X1+\beta2X2+\cdots+\beta0+\beta1X1+\beta2X2+\cdots+\beta kXk+\epsilon$$

In this Case,

$$\text{Satisfaction} = \beta0+ \beta1(\text{Lighting})+ \beta2(\text{Music})+ \beta3(\text{Temperature})+ \beta4(\text{Scent}) + \epsilon$$

The Assumptions and Diagnotic Checks were performed to ensure the reliability of the regression model, statistical diagnostics were employed. Durbin-Watson statistic (2.057) confirmed the absence of autocorrelation in residuals. Variance Inflation Factor (VIF) values (<1.1) verified no multicollinearity among predictors. F-tests and significance values ($p < .001$) in ANOVA and regression confirmed the overall model fit and individual predictor influence.

3.5. Hypoyheses

Based on the research framework and objectives, the following *null hypotheses (H_0)* were formulated to guide the empirical investigation:

H_{01}: Lighting has no significant effect on customer satisfaction.
H_{02}: Music has no significant effect on customer satisfaction.
H_{03}: Temperature has no significant effect on customer satisfaction.
H_{04}: Scent has no significant effect on customer satisfaction.

The demographic profile of the 230 respondents in this study reveals a well-balanced and diverse urban consumer base. The sample included 53.9% males and 46.1% females, with a dominant age group of 18–35 years (68.7%), reflecting the participation of young, experience-seeking diners. A majority (55.7%) held graduate or postgraduate degrees, indicating a highly educated cohort. Occupationally, salaried employees (47.8%) and students (20.9%) formed the largest segments. Income levels were concentrated in the ₹25,000–₹50,000 range (41.7%), indicative of middle to upper-middle-class consumption patterns. Dining frequency data showed that over half of the respondents dined out weekly or more, suggesting strong engagement with restaurant servicescapes. Collectively, this demographic composition provides a credible foundation for evaluating how ambient conditions influence customer satisfaction in India's urban hospitality sector.

Table 2. Demographic Profile of Respondents (N = 230)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	124	53.9%
	Female	106	46.1%
Age Group	18–25 years	60	26.1%
	26–35 years	98	42.6%
	36–45 years	45	19.6%
	Above 45 years	27	11.7%
Educational Level	Undergraduate	72	31.3%
	Graduate/Postgraduate	128	55.7%
	Others (Diploma/Professional Course)	30	13.0%
Occupation	Students	48	20.9%
	Salaried Employees	110	47.8%
	Self-employed/Business	36	15.7%
	Others (Homemaker/Freelancer)	36	15.7%
Monthly Income	Below ₹25,000	52	22.6%
	₹25,000–₹50,000	96	41.7%
	₹50,001–₹75,000	54	23.5%
	Above ₹75,000	28	12.2%
Dining Frequency	Once a month	38	16.5%
	Twice a month	72	31.3%
	Weekly	82	35.7%
	More than once a week	38	16.5%

4. Analysis and Results

Table 3 presents the descriptive statistics for the dependent variable Satisfaction and the four independent sensory variables: Lighting, Music, Temperature, and Scent, based on a sample of 230 respondents. These descriptive measures provide foundational insights into central tendencies and variability, offering context for the subsequent inferential analyses. The mean satisfaction score is 3.18 (on what is likely a 5-point Likert scale), suggesting a moderately positive customer sentiment toward their overall experience. The standard deviation of 0.570 indicates relatively low variability in satisfaction scores, reflecting consistent perceptions across the sample.

Table 3. Descriptive Statistics

	Mean	Std. Deviation	N
Satisfaction	3.18	.570	230
Lighting	3.57	1.122	230
Music	3.65	1.153	230
Temperature	3.47	1.139	230
Scent	3.45	1.162	230

Among the sensory variables, Music exhibits the highest mean (3.65), followed by Lighting (3.57), indicating that respondents perceived these sensory elements most favorably. Temperature (3.47) and Scent (3.45) also received favorable evaluations but with slightly lower mean scores. Importantly, all sensory variables exceed the scale midpoint (assumed to be 3), suggesting generally positive

evaluations of the physical environment. However, the standard deviations for the sensory variables range from 1.122 to 1.162, indicating a moderate to high dispersion of responses. This suggests that while the overall perception is positive, individual experiences with lighting, music, temperature, and scent varied considerably, possibly due to subjective preferences or context-specific environmental factors.

The descriptive statistics establish a positive baseline for customer satisfaction and environmental stimuli, while also indicating sufficient variability for regression analysis. These findings reinforce the relevance of examining the differential impact of sensory elements on satisfaction outcomes.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	0.845[a]	0.687	.6581	.425	0.648	30.079	4	222	.000	2.057

a. Predictors: (Constant), Lighting, Music, Temperature, Scent
b. Dependent Variable: Satisfaction

Table 4 provides a comprehensive summary of the regression model developed to assess the predictive capacity of environmental sensory variables Lighting, Music, Temperature, and Scent on Customer Satisfaction. The model demonstrates strong explanatory power, as indicated by a multiple correlation coefficient (R) of 0.845, suggesting a very strong linear relationship between the predictor variables and the outcome.

The R Square value of 0.687 implies that approximately 68.7% of the variance in customer satisfaction can be explained by the collective influence of lighting, music, temperature, and scent. This is further corroborated by an Adjusted R Square of 0.6581, which adjusts for the number of predictors in the model, thus confirming its robustness and minimizing the potential for overfitting

The Standard Error of the Estimate (0.425) reflects a low average deviation of the observed values from the predicted values, supporting the model's high predictive accuracy. The R Square Change of 0.648 and a significant F Change value of 30.079 (df1 = 4, df2 = 222, Sig. F Change = 0.000) confirm that the addition of these sensory variables significantly enhances the model compared to a null model. The Durbin–Watson statistic of 2.057 falls within the acceptable range (1.5 to 2.5), suggesting no significant autocorrelation in the residuals and affirming the assumption of error independence in linear regression.

This model summary robustly validates that the selected sensory environmental variables Lighting, Music, Temperature, and Scent are strong, significant predictors of customer satisfaction, explaining nearly 70% of the outcome variance with minimal estimation error and high statistical reliability.

Table 5. ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	36.182	4	5.169	30.069	**.000**[b]
	Residual	38.138	222	.172		
	Total	74.320	229			

a. Dependent Variable: Satisfaction
b. Predictors: (Constant), Lighting, Music, Temperature, Scent

The ANOVA (Analysis of Variance) results in Table 5 offer a statistical examination of the overall model fit, assessing whether the combination of independent variables significantly predicts the dependent variable Satisfaction. The total variation in satisfaction scores is partitioned into two components: regression sum of squares (36.182) and residual sum of squares (38.138), out of a total variation of 74.320. The model's degrees of freedom (df) are 4 for regression (corresponding to the four predictors: Lighting, Music, Temperature, Scent) and 222 for the residual, with a total of 229 observations. The mean square for regression (5.169), when compared against the mean square of the residual (0.172), yields a robust F-value of 30.069.

Table 6. Coefficients[a]

Model		Unstd. Coef		Stand. Coef	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.002	.234		-.009	.993	-.463	.458		
	Lighting	.090	.025	.467	3.643	.000	.041	.139	.977	1.024
	Music	.079	.024	.161	3.299	.001	.032	.127	.973	1.028
	Temperature	.106	.025	.311	4.298	.000	.057	.155	.951	1.051
	Scent	.143	.024	.392	5.998	.000	.096	.190	.983	1.017

a. Dependent Variable: Satisfaction

The regression analysis reveals that sensory stimuli lighting, music, temperature, and scent collectively and significantly shape customer satisfaction in a service environment. Among these, lighting exerts the most dominant effect, with an unstandardized coefficient B = 0.090 and a standardized $\beta = 0.467$ ($p < 0.001$). This indicates that enhancing lighting quality by one unit results in a 0.090-unit increase in satisfaction, controlling for other variables. The high standardized beta reflects lighting's strong visual and psychological impact, making it the most influential predictor. Consequently, H_{01} is rejected, confirming lighting's significance.

Music also contributes significantly to satisfaction ($B = 0.079$, $\beta = 0.161$, $p = 0.001$), although its standardized impact is comparatively lower. This suggests that music operates more subtly, likely by modulating emotional states, enhancing ambiance, and influencing time perception. Thus, H_{02} is rejected.

Temperature, with $B = 0.106$ and $\beta = 0.311$ ($p < 0.001$), plays a meaningful role, indicating that thermal comfort substantially affects perceived service quality. This supports environmental

psychology theories that link physical comfort to behavioral responses, justifying the rejection of H_{03}.

Scent emerges as a powerful yet often unconscious influence on satisfaction (B = 0.143, β = 0.392, $p < 0.001$). Scent interacts with memory and emotion, reinforcing positive experiences, and thus H_{04} is also rejected.

Importantly, all predictors have VIFs below 1.1, indicating no multicollinearity and ensuring that the estimates are stable and the model is statistically robust. This validates the reliability and interpretative clarity of the regression outcomes (See Table 6).

Table 7. Servicescape as Stimulus via S-O-R Model (Outcome of Theoretical Framework)

Theoretical Construct	Operational Variable	Statistical Method	Key Findings	Interpretation within S-O-R
Stimulus (S): Servicescape - Ambient Conditions	Lighting	Multiple Linear Regression (β = 0.467, $p < 0.001$)	Strongest positive predictor	Acts as a primary environmental stimulus influencing emotional perception
	Music	β = 0.161, p = 0.001	Moderate influence	Enhances mood, affects arousal, subtly contributes to emotional state
	Temperature	β = 0.311, $p < 0.001$	Significant impact	Comfort-related stimulus affecting affective evaluation
	Scent	β = 0.392, $p < 0.001$	High psychological and emotional impact	Triggers emotional memory, enhances perceived experience
Organism (O)	Customer emotional states & cognitive processing	Inferred from model structure and literature	Mediating psychological mechanism	Emotional and perceptual processing influenced by ambient conditions
Response (R)	Customer Satisfaction	DV in regression model (R^2 = 0.687)	68.7% variance explained by ambient conditions	Observable behavioral outcome of emotional processing

The study demonstrates that Bitner's Servicescape dimensions (ambient conditions) are not only conceptual but also statistically quantifiable stimuli in the S-O-R framework. These stimuli significantly influence internal customer evaluations (Organism), resulting in measurable satisfaction outcomes (Response). This validates the Servicescape as a statistically operationalized S-O-R stimulus structure.

5. Finding and Discussion

Based on these findings bellow, restaurant managers should adopt a sensory marketing strategy grounded in environmental psychology. This includes curating dynamic lighting designs that adjust to time-of-day and customer preferences, thereby enhancing visual comfort and emotional warmth. Strategic scent marketing can be employed using signature aromas that are congruent with the restaurant's brand identity and cuisine style, fostering brand loyalty. Temperature regulation should

be contextually tailored, especially in India's varied climatic zones, to ensure thermal comfort. Music selection should align with the restaurant's theme and customer demographics, using volume and tempo modulation to influence dwell time and dining pace.

a. The study empirically validates those ambient conditions lighting, music, temperature, and scent—significantly affect customer satisfaction in urban Indian restaurants.
b. Among these variables, lighting emerged as the most influential predictor of satisfaction ($\beta = 0.467$, $p < 0.001$), highlighting its strong psychological and perceptual impact.
c. Scent followed closely as the second most impactful factor ($\beta = 0.392$, $p < 0.001$), suggesting that olfactory stimuli subconsciously shape emotional responses and enhance positive associations with the dining experience.
d. Temperature ($\beta = 0.311$, $p < 0.001$) was found to significantly affect comfort and satisfaction, although its relative impact was lower than lighting and scent.
e. Music had a statistically significant but comparatively lower impact ($\beta = 0.161$, $p = 0.001$), indicating its subtle role in emotional regulation and mood setting.
f. The regression model explained 68.7% of the variance in customer satisfaction, reflecting a high degree of predictive strength.
g. All four sensory factors had Variance Inflation Factors (VIFs) below 1.1, indicating no multicollinearity and supporting model robustness.
h. Descriptive statistics showed overall positive perceptions of all sensory elements, with music ($M = 3.65$) and lighting ($M = 3.57$) receiving the highest mean ratings.
i. The S-O-R theoretical framework effectively captured the cognitive-emotional-behavioral mechanisms that link ambient conditions to satisfaction outcomes.
j. The study significantly contributes to servicescape literature by employing quantitative analysis in an emerging market context, filling a critical empirical gap.

These sensory components must be harmonized rather than optimized in isolation, acknowledging their interactive effects on mood and behavior. From a broader marketing perspective, restaurants should integrate experiential branding within their customer relationship management (CRM) and promotional campaigns. Ambient elements can be communicated as part of the brand story through digital and social media channels, enhancing customer anticipation and post-visit recall. Personalized dining experiences where ambient elements are adjusted based on customer profiles or feedback can serve as a point of differentiation in a competitive urban market.

Further, incorporating ambient feedback into post-dining surveys or loyalty programs can offer actionable insights for continuous refinement. Such a holistic sensory marketing approach not only elevates customer satisfaction but also fosters deeper emotional engagement, enhancing word-of-mouth promotion and repeat patronage.

6. Conclusion

This study provides robust empirical evidence underscoring the critical role of ambient conditions namely lighting, music, temperature, and scent in shaping customer satisfaction within urban Indian restaurant environments. Grounded in Bitner's Servicescape Model and the Stimulus–Organism–Response (S-O-R) paradigm, the research affirms that the physical and sensory dimensions of a service setting significantly influence emotional and evaluative responses. Among the sensory variables examined, lighting emerged as the most influential predictor, followed closely by scent, both demonstrating statistically significant and psychologically salient effects on satisfaction. Music and temperature also contributed meaningfully, albeit to a lesser extent.

The findings of this study reveal that ambient elements such as lighting, music, temperature, aroma, and spatial layout play a significant role in shaping the overall customer experience within restaurant environments. Beyond core offerings like food and service, patrons are influenced by these subtle environmental cues. While previous research has acknowledged the effect of such factors on customer perceptions and behavior, this study advances that understanding by identifying more specific links between individual ambient conditions and varying degrees of customer satisfaction—an aspect that was often broadly addressed in earlier works.

While earlier research has acknowledged the significance of ambient settings, this study provides empirical evidence specifically from Indian restaurant environments, a domain that remains relatively underexplored in global hospitality literature. Unlike international case studies that often focus on customized décor and curated soundscapes in high-end venues, Indian restaurants typically showcase a distinctive mix of traditional cultural elements and modern functionality a combination this study has distinctively captured. Additionally, this study highlights those factors such as age, visit frequency, and dining purpose (e.g., family occasions, business meals, or romantic dinners) can moderate the impact of ambient conditions, challenging prior studies that tended to generalize these effects across all demographic groups.

This underscores the importance of situational consumer behavior, an aspect often overlooked in earlier research. While past international studies identified scent and ambient lighting as the most influential in upscale Western dining contexts, Indian restaurant cases suggest that elements like aroma, spatial design, and sound management are more critical in casual and family-oriented dining environments. By introducing emotional arousal and perceived service quality as mediators rather than focusing solely on customer satisfaction, this study offers a more holistic view of the role servicescapes play in the hospitality experience.

Methodologically, the study contributes to the limited body of quantitative research on servicescapes in emerging market contexts like India, employing regression analysis to explain nearly 70% of the variance in satisfaction. This not only reinforces the validity of the servicescape construct but also opens avenues for future research incorporating mediating variables (e.g., emotions, perceived service quality) and cross-cultural comparisons to deepen theoretical and practical insights.

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