

Indoor smoking regulations and the restaurant experience: A study on consumer evaluations

Kapalı alan sigara düzenlemeleri ve restoran deneyimi: Tüketici değerlendirmeleri üzerine bir araştırma

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Abstract

This study examines restaurant experience in the context of indoor smoking regulations, considering restaurant atmosphere, customer satisfaction, behavioural intentions, smoking status, and restaurant section. Drawing on the servicescape approach and the Stimulus-Organism-Response (S-O-R) framework, data from 544 participants were analysed using structural equation modelling and a 2×2 factorial analysis of variance. Restaurant atmosphere was strongly associated with customer satisfaction ($\beta = .849, p < .001$) and directly associated with behavioural intentions ($\beta = .356, p < .001$). Customer satisfaction was positively associated with behavioural intentions ($\beta = .551, p < .001$). Smoking status had no significant main effect on overall atmosphere ($p = .055$), whereas the main effect of restaurant environment ($p < .001$) and the smoking status × restaurant environment interaction ($p = .002$) were significant. Among smokers, atmosphere ratings were higher in smoke-free than in smoking-permitted sections, while the corresponding environment difference among non-smokers was not significant. The findings show that smoking status alone does not indicate how customers evaluate smoking-permitted and smoke-free restaurant environments.

Keywords: Restaurant Atmosphere, Smoke-Free Environment, Customer Satisfaction

JEL Codes: M31, L83, I18

Öz

Bu çalışma, kapalı alan sigara düzenlemeleri bağlamında restoran deneyimini; restoran atmosferi, müşteri memnuniyeti, davranışsal niyetler, katılımcıların sigara kullanım durumu ve değerlendirmenin yapıldığı restoran bölümü üzerinden incelemektedir. Araştırma, servicescape yaklaşımı ve Stimulus-Organism-Response (S-O-R) modeli temelinde kurgulanmış; 544 katılımcıdan elde edilen veriler yapısal eşitlik modellemesi ve 2×2 faktöriyel varyans analizi ile incelenmiştir. Restoran atmosferinin müşteri memnuniyetiyle güçlü ve pozitif yönde ilişkili olduğu ($\beta = .849, p < .001$) ve davranışsal niyetlerle de doğrudan ve anlamlı bir ilişki gösterdiği ($\beta = .356, p < .001$) belirlenmiştir. Müşteri memnuniyeti de davranışsal niyetlerle pozitif yönde ilişkilidir ($\beta = .551, p < .001$). Sigara kullanım durumunun genel atmosfer üzerindeki ana etkisi anlamlı değildir ($p = .055$). Buna karşılık restoran ortamının ana etkisi ($p < .001$) ile sigara kullanım durumu × restoran ortamı etkileşimi ($p = .002$) anlamlıdır. Sigara kullanan katılımcılar sigarasız bölümlerdeki atmosferi sigara içilebilir bölümlere göre daha olumlu değerlendirirken, sigara kullanmayan katılımcılarda restoran bölümleri arasındaki fark anlamlı değildir. Bulgular, sigara kullanım durumunun tek başına sigara içilebilir ve sigarasız restoran ortamlarının nasıl değerlendirileceğini açıklamadığını göstermektedir.

Anahtar Kelimeler: Restoran Atmosferi, Sigarasız Ortam, Müşteri Memnuniyeti

JEL Kodları: M31, L83, I18

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Introduction

Customer experience in food and beverage establishments depends not only on what is served but also on the setting in which consumption takes place. Restaurants are therefore experiential environments in which aesthetics, ambience, spatial arrangements and service encounters contribute to how customers evaluate their visit. Recent research continues to support this view. Wang et al. (2025), in a meta-analysis of servicescape research, show that different dimensions of the service environment contribute differently to consumer satisfaction. Bonfanti et al. (2026) likewise identify experiencescape and consumer-related characteristics among the main antecedents of restaurant customer experience. Within restaurant research, the DINESCAPE framework remains an established way of representing these environmental cues through facility aesthetics, ambience, lighting, table settings, layout and service staff (Ryu & Jang, 2008).

The servicescape perspective treats the service environment as a stimulus that can shape customer perceptions and responses (Bitner, 1992). This view is consistent with the Stimulus-Organism-Response (S-O-R) model, in which environmental stimuli affect internal evaluations that subsequently influence behavioural responses (Mehrabian & Russell, 1974). In this study, restaurant atmosphere represents the stimulus, customer satisfaction the internal evaluation process, and behavioural intentions the response. Recent restaurant studies continue to report relationships between atmospheric or servicescape cues, satisfaction and behavioural outcomes (Chao et al., 2021; Rathnasiri et al., 2025), extending earlier evidence from hospitality and leisure-service settings (Wakefield & Blodgett, 1996; Ryu & Han, 2011).

Not all features of the restaurant experience, however, are created deliberately by the business. Regulatory and social conditions can also affect which environmental cues customers encounter and how they experience them. Smoke-free policies are relevant in this respect because they regulate where smoking may occur and influence exposure to tobacco smoke across hospitality spaces. Research on smoking and social norms also shows that environments can communicate which behaviours are considered acceptable in particular settings (Hoek et al., 2022). The spatial consequences of smoking restrictions are not uniform. Smoking may shift to designated, outdoor or partially enclosed areas, and second-hand smoke can move between adjoining spaces depending on enclosure and proximity (Tong et al., 2024). In this study, smoking regulation therefore refers to the broader institutional setting, whereas the environmental variable actually measured is the smoking-permitted or smoke-free restaurant section evaluated by the participant.

In Türkiye, the legal framework for tobacco control was established in 1996 and strengthened through amendments to Law No. 4207 in 2008 (Bilir, 2017). Provisions covering restaurants, eateries, cafés and similar hospitality establishments came into force on 19 July 2009 (Başbakanlık, 2009). Implementation has continued to pose practical questions for hospitality businesses. Recent qualitative research with venue owners and staff in Istanbul and Ankara identifies physical requirements, customer reactions and enforcement among the difficulties encountered in applying smoke-free rules (Baltacı et al., 2024). These findings should not be taken to imply a uniform pattern across Türkiye, but they do show that legal requirements are implemented through venue-level practices that may vary in their physical and operational form.

International research on smoke-free policies has concentrated mainly on public health, second-hand smoke exposure, workplace conditions and economic consequences. Smoke-free rules have been shown to reduce tobacco-smoke exposure in hospitality settings (Goodman et al., 2007) and, in general, have not produced the substantial losses to hospitality businesses predicted by opponents of regulation (Fichtenberg & Glantz, 2002; Scollo et al., 2003; Alamar & Glantz, 2004). Customer experience within smoking-permitted and smoke-free restaurant sections has received much less direct attention. Restaurant-servicescape research, by contrast, provides detailed accounts of how environmental cues shape satisfaction and behavioural outcomes, yet smoking status and the smoking conditions of the section in which the experience takes place are seldom considered together. Bringing these two areas of research together makes it possible to examine how customers with different smoking statuses evaluate restaurant environments that operate within the same regulatory setting.

The study approaches this question at two analytical levels. The first examines the structural relationships among restaurant atmosphere, customer satisfaction and behavioural intentions. The second examines whether atmosphere evaluations differ by participant smoking status, restaurant environment (smoking-permitted versus smoke-free section), and the interaction between these two factors. Smoking regulation itself is not treated as an experimentally manipulated variable. It provides the institutional background within which the restaurant sections are experienced, while the empirical comparisons concern smoking status and the actual section evaluated by each participant. This

distinction makes it possible to consider smoke-free policy within restaurant-experience research without attributing cross-sectional differences directly to the regulation itself. Two research questions guide the study. RQ1: How are restaurant atmosphere, customer satisfaction and behavioural intentions related? RQ2: How do smoking status, restaurant environment and their interaction differentiate evaluations of restaurant atmosphere?

Literature review

Restaurant-atmosphere research draws on the atmospherics and servicescape traditions, both of which treat the physical environment as part of the consumption experience rather than as a passive backdrop (Kotler, 1973; Bitner, 1992). DINESCAPE applies this perspective specifically to restaurants through six dimensions: facility aesthetics, ambience, lighting, table settings, layout and service staff (Ryu & Jang, 2008). Together, these dimensions capture both physical and human elements of the dining environment. Research conducted in Türkiye has also linked restaurant atmosphere with emotional responses, satisfaction, behavioural intentions, social-media sharing, and spending-related outcomes (Ünal et al., 2014; Akkuş, 2019; Özer, 2026). Recent evidence likewise suggests that these elements should not be treated as interchangeable. Wang et al. (2025) show that servicescape dimensions differ in their associations with satisfaction across service sectors and cultural settings, while Bonfanti et al. (2026) identify experiencescape as a major antecedent domain of restaurant customer experience. Examining restaurant atmosphere both as an overall construct and through its individual dimensions is therefore useful for identifying where environmental evaluations converge and where they differ.

The S-O-R model provides the basis for the first analytical part of the study. It proposes that environmental stimuli influence internal evaluations, which subsequently shape behavioural responses (Mehrabian & Russell, 1974). In a restaurant setting, atmosphere can be treated as the environmental stimulus, satisfaction as the customer's internal evaluation, and behavioural intentions as the response. Previous hospitality research has consistently linked restaurant atmosphere and servicescape cues with satisfaction, word-of-mouth, revisit intentions and related behavioural outcomes (Wakefield & Blodgett, 1996; Ryu & Han, 2011). More recent international studies continue to report comparable relationships in restaurant settings (Chao et al., 2021; Rathnasiri et al., 2025). Based on this literature, H1 proposes that restaurant atmosphere is positively associated with customer satisfaction, H2 that restaurant atmosphere is positively associated with behavioural intentions, and H3 that customer satisfaction is positively associated with behavioural intentions.

The second analytical part considers smoking status and the restaurant section in which the experience is evaluated. Smoking status may shape how customers respond to tobacco-smoke cues and restrictions, but it does not necessarily indicate a preference for environments in which smoking is present. Kraft and Benet (2010), for example, treat tobacco smoke as an element of the service environment and find that smokers are not simply more favourable toward smoke-present settings. Longitudinal research also shows that smokers' attitudes toward smoke-free public and hospitality spaces can change over time (Park et al., 2019). Smoking status can therefore be treated as a relevant individual characteristic without assuming in advance which environment smokers will evaluate more positively. H4 accordingly examines whether overall restaurant-atmosphere evaluations differ between smokers and non-smokers.

The restaurant section provides the environmental counterpart to smoking status. Smoking-permitted and smoke-free sections may differ in tobacco-smoke exposure, odour and other sensory conditions, while smoking-permitted hospitality spaces can also vary considerably in their physical configuration (Tong et al., 2024). H5 therefore examines whether overall atmosphere evaluations differ between smoking-permitted and smoke-free sections. Any such difference is treated as a section-level difference rather than as evidence that one particular physical characteristic, or the regulation itself, produced the observed evaluations.

The interaction between smoking status and restaurant environment requires a more cautious theoretical argument. Contemporary person-environment (P-E) fit research defines fit broadly in terms of compatibility between personal characteristics and physical, social or cultural aspects of the environment, rather than limiting it to simple similarity between the person and the setting (Kandler et al., 2024). At the same time, the characteristics of a person and an environment cannot simply be combined and treated as a direct measure of perceived fit; different ways of conceptualising and measuring fit capture distinct phenomena (Edwards et al., 2006). Recent hospitality research nevertheless shows that P-E fit can provide a useful perspective for examining how customer evaluations vary across combinations of individual and service conditions (Yang et al., 2024). In this study, P-E fit is used only in this limited sense: it provides a rationale for asking whether the same restaurant environment may be evaluated differently depending on smoking status. Perceived fit itself

is not measured. H6 therefore proposes that smoking status and restaurant environment interact in differentiating overall atmosphere evaluations.

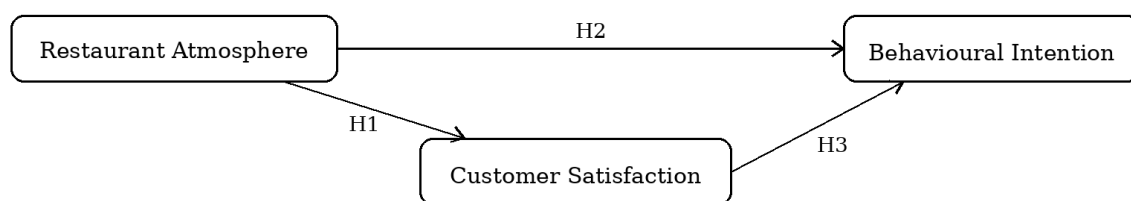
The literature thus supports two related lines of analysis. One concerns the established relationships among restaurant atmosphere, satisfaction and behavioural intentions. The other concerns whether atmosphere evaluations vary according to smoking status, the restaurant section being evaluated, and the interaction between them. Keeping these two levels separate also preserves the distinction between the legal context of smoking regulation, the participant's smoking status, and the smoking-permitted or smoke-free section in which the evaluation is made.

Method

Research model design and hypotheses

The research design consists of two complementary analytical components. The first examines the relationships among restaurant atmosphere, customer satisfaction and behavioural intentions within the S-O-R framework. Restaurant atmosphere represents the stimulus, customer satisfaction the internal evaluation process, and behavioural intentions the response. These relationships are tested using structural equation modelling (SEM). The second component examines differences in restaurant-atmosphere evaluations according to smoking status and restaurant environment using a 2×2 factorial ANOVA. Smoking status refers to the participant's smoking category, whereas restaurant environment refers to the smoking-permitted or smoke-free section in which the questionnaire was completed. Their main effects and interaction are examined separately. Smoking regulations are not treated as an experimental factor in either analysis; they constitute the broader legal and institutional setting in which the restaurant experience takes place.

Model 1: Structural Relationships



Model 2: Factorial Effect

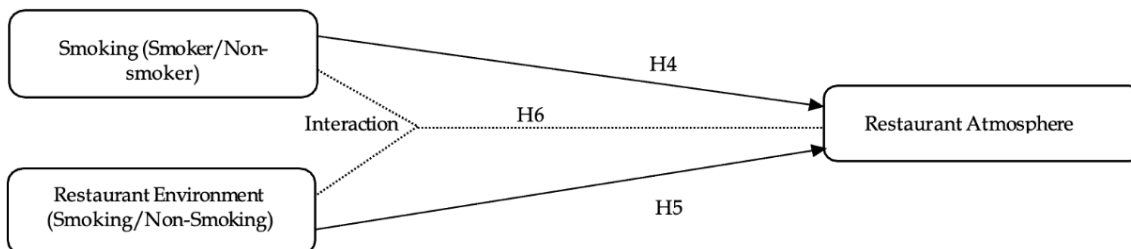


Figure 1: Research Model

Source: Created by the authors.

The two analytical components therefore address different but related questions. The structural model examines how restaurant atmosphere, satisfaction and behavioural intentions are associated, while the factorial model examines whether atmosphere evaluations vary according to an individual characteristic, an environmental condition, and their combination. Based on the theoretical framework developed above, the following hypotheses are proposed:

H1: Perceived restaurant atmosphere is positively associated with customer satisfaction.

H2: Perceived restaurant atmosphere is positively associated with behavioural intentions.

H3: Customer satisfaction is positively associated with behavioural intentions.

H4: Perceived restaurant atmosphere differs between smokers and non-smokers.

H5: Perceived restaurant atmosphere differs between smoking-permitted and smoke-free restaurant sections.

H6: The difference in perceived restaurant atmosphere between smoking-permitted and smoke-free restaurant sections varies by smoking status.

Population and sample

The study was conducted in eight restaurants located in Istanbul, Türkiye. Data collection was conducted between 15 March and 30 June 2025. Convenience sampling was used, and data were collected through face-to-face questionnaires, yielding 544 usable responses. All participating restaurants had both a section in which smoking was permitted in practice and a smoke-free section. These sections were clearly differentiated in the day-to-day operation of the establishments, although smoking areas were not necessarily identified through formal signage. Customers were instead directed to the relevant seating areas according to the restaurant's established arrangement. Participants completed the questionnaire while seated in the section they were evaluating. At the time of administration, the questionnaire was coded to record both the participant's smoking status and whether the respondent was seated in the smoking-permitted or smoke-free section. Restaurant environment therefore refers to an actual setting experienced at the time of data collection rather than to a hypothetical preference or retrospective assessment. The physical characteristics of smoking-permitted sections were not uniform across establishments. Depending on the venue, these areas included roofed or semi-open sections and, in some cases, enclosed front sections separated from the smoke-free interior. The smoking-permitted/smoke-free classification should therefore not be interpreted as a simple outdoor/indoor distinction. Before analysis, the data were screened for missing information, inconsistent responses and data-entry errors, and questionnaires that did not meet these criteria were excluded. Ethical approval for the study had been obtained in 2020, but fieldwork was postponed because the COVID-19 pandemic and the subsequent gradual reopening of hospitality establishments did not provide suitable conditions for the planned restaurant-based data collection. The study was subsequently conducted in 2025 within the approved research framework.

Data collection tool

The questionnaire consisted of three sections. The first measured participants' perceptions of restaurant atmosphere using the DINESCAPE scale developed by Ryu and Jang (2008). The scale comprises 21 items across six dimensions: facility aesthetics, ambience, lighting, table settings, layout and service staff. The second section measured customer satisfaction and behavioural intentions using items adapted from Ryu et al. (2008), Ryu et al. (2010) and Heung and Gu (2012). All measurement items were rated on a five-point Likert scale ranging from 1 = "Strongly Disagree" to 5 = "Strongly Agree." The third section included questions on smoking status, restaurant environment and demographic characteristics. Questionnaires were administered face to face. Participation was voluntary, and informed consent was obtained before questionnaire administration.

Data analysis process

The data were analysed using SPSS and AMOS. Descriptive analyses were first used to summarise participants' demographic characteristics and responses to the smoking-related questions. The measurement model was evaluated using confirmatory factor analysis (CFA), composite reliability (CR), average variance extracted (AVE), and the Fornell-Larcker criterion for discriminant validity. In addition to the separate scale CFAs, a combined measurement model incorporating restaurant atmosphere, customer satisfaction and behavioural intentions was estimated. Potential common-method bias was assessed using Harman's single-factor test and by comparing the combined measurement model with a single-factor CFA.

Restaurant atmosphere was modelled as a latent construct through its six dimensions in the structural equation model. For the factorial analyses, the computed overall atmosphere score and the corresponding dimension scores were treated as observed variables. H1-H3 were tested using structural equation modelling (SEM). For the tests of H4-H6, smoking status was recoded into two categories. Because both "Yes" and "Occasionally" indicated current smoking behaviour, respondents selecting either category were classified as smokers ($n = 292$), while those selecting "Never" were classified as non-smokers ($n = 252$). The resulting factorial design comprised four cells: smoking-permitted/smoker ($n = 191$), smoking-permitted/non-smoker ($n = 111$), smoke-free/smoker ($n = 101$), and smoke-free/non-smoker ($n = 141$). A 2×2 factorial ANOVA was used to test the main effects of smoking status and restaurant environment and their interaction. Partial eta squared (η^2) was reported as the effect-size measure. When an interaction was significant, group means and simple effects were examined to determine the direction and pattern of the difference.

Findings

Participants' demographic characteristics are summarised in Table 1, providing an overview of the sample in terms of gender, marital status, age, education and monthly income.

Table 1: Findings Regarding Participants' Demographic Characteristics

	Frequency	Percentage (%)		Frequency	Percentage (%)
Gender			Age		
Female	269	49.4	18-25	165	30.3
Male	275	50.6	26-35	128	23.5
Marital Status			36-45	137	25.1
Single	312	57.3	46+	114	21.1
Married	232	42.7	Monthly Income		
Education Level			No income	118	21.6
≤ High School	76	14.0	1-22105	161	29.6
Associate Degree	105	19.3	22106-50000	96	17.6
Undergraduate	298	54.8	50001-100000	90	16.5
Postgraduate	65	11.9	100001 TL +	79	14.5
Total	544	100	Total	544	100

Source: Created by the authors.

The zero-income category was retained separately because it indicates the absence of personal monthly income, whereas the next category represents respondents with a positive income. The upper boundary of 22,105 TL corresponds approximately to the monthly net minimum wage in Türkiye at the time of data collection in 2025.

The gender distribution was nearly even, with women accounting for 49.4% of the sample and men for 50.6%. Most participants were single (57.3%). The largest age group was 18–25 years (30.3%), followed by those aged 36–45 (25.1%), 26–35 (23.5%), and 46 years or older (21.1%). In terms of education, undergraduate degree holders constituted the largest group (54.8%). Regarding income, 21.6% of participants reported no personal monthly income, while 29.6% reported an income between 1 and 22,105 TL.

Table 2: Participants' Attitudes towards Smoking and Smoking Bans

	Frequency	Percentage (%)		Frequency	Percentage (%)
Smoking Status			Effect of Smoking-Ban Violations on Restaurant Preference		
Yes	200	36.8	Very effective	310	57.0
Occasionally	92	16.9	Slightly effective	163	30.0
Never	252	46.3	Not at all effective	71	13.0
Support for Smoking Ban			Perceived Effect of Smoking Restrictions on Dining Enjoyment		
I support	365	67.1	Making it more enjoyable	158	29.1
I don't support it	121	22.2	Making it less enjoyable	201	36.9
I don't know	58	10.7	Doesn't make much difference	185	34.0
Total	544	100	Total	544	100

Source: Created by the authors.

Table 2 summarises participants' smoking status and attitudes towards smoking restrictions. Of the 544 participants, 36.8% reported smoking regularly, 16.9% occasionally, and 46.3% never smoking. Most participants (67.1%) supported the smoking ban. Smoking-ban violations were also considered relevant to restaurant choice, with 57.0% describing their effect as very strong and a further 30.0% as slight. Regarding the perceived effect on dining enjoyment, 29.1% indicated that the restrictions made the experience more enjoyable, 36.9% reported the opposite, and 34.0% perceived little difference.

Table 3 presents participants' retrospective reports of eating-out frequency before and after the smoking restrictions, together with several smoking-related experiential evaluations. The proportion reporting eating out once a week or more was 40.8% for the period before the restrictions and 45.8% for the period after them. Some of the lower-frequency categories declined over the same retrospective comparison. Because these responses were collected at a single point in time and rely on participants' recall, they are treated as descriptive reports rather than as evidence that the regulation caused changes in eating-out frequency. A majority of participants (65.6%) reported being bothered by second-hand smoke while dining. Concern about passive smoking also varied across the sample: 33.1% reported being very concerned, 38.2% sometimes concerned, and 28.7% not particularly concerned. Perceptions of enforcement were predominantly negative. In total, 72.1% of participants indicated that the smoking prohibition was not adequately enforced. This result reflects participants' perceptions of enforcement and should not be interpreted as an objective measure of compliance.

Table 3. Participants' Behavioural and Experiential Findings Regarding the Smoking Ban

	Frequency	Percentage (%)		Frequency	Percentage (%)
Frequency of Eating Out Before the Restrictions			Frequency of Eating Out After Restrictions		
Once a week or more	222	40.8	Once a week or more	249	45.8
Every few weeks	145	26.7	Every few weeks	165	30.3
Once a month	104	19.1	Once a month	69	12.7
Every 2-3 months	27	5.0	Every 2-3 months	36	6.6
Once a year or less	46	8.5	Once a year or less	25	4.6
Bothered by Second-hand Smoke While Dining			Concerns about Passive Smoking		
Yes	357	65.6	Very	180	33.1
No	187	34.4	Sometimes	208	38.2
Request for Smoke-Free Zones			Not really	156	28.7
Yes	246	45.2	Choosing a Smoke-Free Restaurant		
No	298	54.8	Yes	246	45.2
Perception of the Enforcement of Prohibition			No	298	54.8
Yes	152	27.9			
No	392	72.1			
Total	544	100	Total	544	100

Source: Created by the authors.

Following the descriptive assessment of participants' demographic characteristics and smoking-related responses, the measurement properties of the study constructs were examined through confirmatory factor analysis.

Table 4 presents the factor loadings, composite reliability (CR), and average variance extracted (AVE) values for the measurement scales. Across the reported dimensions, factor loadings are generally substantial, CR values exceed 0.70, and AVE values exceed 0.50, supporting convergent validity and internal consistency (Fornell & Larcker, 1981; Hair et al., 2017). Discriminant validity is examined separately in Table 7 using inter-construct correlations and the Fornell-Larcker criterion.

Table 4: Results of Factor Analysis for the Scales

Restaurant Atmosphere Scale		Avg.	Standard Deviation	Factor Loadings	CR	AVE
Facility Aesthetics		3.58	0.872		0.869	0.570
	Paintings/pictures are visually attractive.	3.61	1.098	0.706		
	Wall decorations are visually appealing.	3.73	1.045	0.765		
	Plants/flowers make me feel happy.	3.15	1.180	0.800		
	Colors used create a warm atmosphere.	3.68	1.104	0.782		
	Furniture (e.g., dining table, chair) is of high quality.	3.56	1.154	0.720		
Ambience		3.36	1.045		0.924	0.753
	Pleasing music.	3.32	1.343	0.823		
	Background music relaxes me.	3.45	1.233	0.839		
	Temperature is comfortable.	3.59	1.174	0.845		
	Air aroma is enticing.	3.05	1.197	0.958		
Lighting		3.59	0.978		0.894	0.738
	Lighting creates a warm atmosphere.	3.64	1.115	0.830		
	Lighting makes me feel welcome.	3.62	1.035	0.890		
	Lighting creates a comfortable atmosphere.	3.52	1.085	0.857		
Table Settings		3.20	0.975		0.890	0.731
	The linens (e.g., table cloths, napkin) are attractive.	3.36	1.186	0.814		
	The table setting is visually attractive.	2.94	1.200	0.798		
	Tableware (e.g., glass, china, silverware) is of high quality.	3.18	1.161	0.946		
Layout		3.56	0.968		0.857	0.667
	The seating arrangement gives me enough space.	3.66	1.025	0.868		
	Layout makes it easy for me to move around.	3.58	1.175	0.818		
	The seating arrangement makes me feel crowded. (R)	3.46	1.091	0.762		
Service Staff		3.66	0.936		0.820	0.605
	An adequate number of employees makes me feel cared for.	3.52	1.088	0.707		
	Employees are neat and well dressed.	3.79	1.008	0.843		
	Attractive employees make me feel good.	3.66	0.983	0.777		
Satisfaction Scale		Avg.	Standard Deviation	Factor Loadings	CR	AVE
					0.881	0.653
	I was pleased with the meal at this restaurant.	3.68	1.094	0.670		
	Overall, I am satisfied with this restaurant.	3.74	1.016	0.822		
	The overall feeling I got from this restaurant put me in a good mood.	3.84	0.939	0.927		
	I really enjoyed myself at this restaurant.	3.82	0.987	0.794		
Behavioural Intention Scale		Avg.	Standard Deviation	Factor Loadings	CR	AVE
					0.898	0.691
	I would like to visit this restaurant again in the future.	3.87	1.072	0.859		
	I would recommend this restaurant to my friends or others.	3.82	1.040	0.939		
	I would like to visit this restaurant more often.	3.70	1.042	0.804		
	I would recommend this restaurant.	3.60	1.117	0.707		

Source: Created by the authors.

The satisfaction and behavioural-intention measures also demonstrate acceptable to high factor loadings and satisfactory reliability (CR = 0.881, AVE = 0.653 for satisfaction; CR = 0.898, AVE = 0.691 for behavioural intention). These results support the use of the measures in the subsequent structural analysis, while the combined measurement model provides an additional assessment of their joint measurement fit.

Table 5: Goodness-of-Fit Indices for the Separate Measurement Models

Goodness-of-Fit Indices	Acceptable Fit	Atmosphere Scale	Satisfaction Scale	Behavioural Intention Scale
χ^2/df	≤ 5.00	3.818	3.920	5.868
GFI	≥ 0.90	0.911	0.996	0.995
AGFI	≥ 0.85	0.877	0.964	0.947
CFI	≥ 0.90	0.945	0.998	0.997
RMSEA	≤ 0.08	0.072	0.073	0.085
RMR	≤ 0.08	0.051	0.010	0.010
NFI	≥ 0.90	0.927	0.997	0.996

Source: Created by the authors.

The separate CFA results presented in Table 5 indicate broadly adequate measurement fit, although the indices should be considered jointly rather than against a single cut-off (Kline, 2016). The restaurant-atmosphere model yielded $\chi^2/df = 3.818$, CFI = 0.945 and RMSEA = 0.072. The satisfaction model also showed satisfactory fit, with CFI = 0.998 and RMSEA = 0.073. For behavioural intention, GFI, AGFI, CFI and NFI were high, whereas $\chi^2/df = 5.868$ and RMSEA = 0.085 were slightly above the adopted benchmarks. The fit of this scale is therefore interpreted as mixed but generally adequate rather than uniformly strong. A combined measurement model was subsequently estimated to assess the constructs jointly.

The combined three-factor measurement model, in which restaurant atmosphere was represented by its six dimensions and satisfaction and behavioural intention by their respective four items, yielded $\chi^2 = 346.706$ ($df = 70$), $\chi^2/df = 4.953$, GFI = 0.919, AGFI = 0.878, CFI = 0.950, TLI = 0.935, RMR = 0.040 and RMSEA = 0.085 (90% CI [0.076, 0.094]). Several fit indices supported the adequacy of the combined model, although RMSEA remained slightly above the conventional 0.08 benchmark.

Table 6: Comparison of Fit Indices for the Three-Factor and Single-Factor Measurement Models

Fit Index	Three-Factor Measurement Model	Single-Factor Model
χ^2	346.706	813.065
df	70	73
χ^2/df	4.953	11.138
GFI	0.919	0.802
AGFI	0.878	0.715
CFI	0.950	0.866
TLI	0.935	0.833
RMR	0.040	0.057
RMSEA	0.085	0.137
AIC	416.706	877.065

Note: RMSEA 90% CI for the three-factor model = [0.076, 0.094]. Source: Created by the authors.

Common-method bias was assessed using two complementary diagnostics. Harman's single-factor test, conducted with the original measurement items, showed that the first factor accounted for 45.59% of the total variance, while six factors had eigenvalues greater than 1. A single-factor CFA was also estimated using the same 14 indicators and the same within-scale residual covariances as the three-factor measurement model. As shown in Table 6, the single-factor model fit the data substantially worse than the three-factor model. These results do not demonstrate the absence of common-method bias, but they provide no indication that a single common factor dominated the covariance structure.

Discriminant validity was assessed using the Fornell-Larcker criterion. As shown in Table 7, the square root of AVE for each construct exceeded its correlations with the other constructs. All constructs therefore met the Fornell-Larcker criterion for discriminant validity.

Table 7: Fornell-Larcker Discriminant Validity Matrix

	FA	AMB	LGT	TS	LAY	SS	SAT	BI
FA	0.755							
AMB	0.597	0.868						
LGT	0.646	0.540	0.859					
TS	0.538	0.498	0.534	0.855				
LAY	0.500	0.410	0.490	0.424	0.817			
SS	0.576	0.519	0.527	0.508	0.407	0.778		
SAT	0.656	0.522	0.673	0.542	0.527	0.707	0.808	
BI	0.694	0.551	0.607	0.499	0.462	0.633	0.772	0.831

Note: Diagonal values in bold are the square roots of AVE. FA = Facility Aesthetics; AMB = Ambience; LGT = Lighting; TS = Table Settings; LAY = Layout; SS = Service Staff; SAT = Satisfaction; BI = Behavioural Intention. All reported correlations are significant at $p < .001$.

Source: Created by the authors.

Having established the adequacy of the measurement model, the structural model was examined to test H1-H3. The standardized path coefficients are presented in Table 8.

Table 8: Structural Path Results for the Proposed Model

Hypothesis	Structural Relationship	Standardized β	p	Result
H1	Atmosphere $\rightarrow$ Satisfaction	.849	< .001	Supported
H2	Atmosphere $\rightarrow$ Behavioural Intention	.356	< .001	Supported
H3	Satisfaction $\rightarrow$ Behavioural Intention	.551	< .001	Supported

Note: Standardized path coefficients are reported. **Source:** Created by the authors.

Restaurant atmosphere was positively associated with customer satisfaction ($\beta = .849$, $p < .001$), supporting H1. It was also positively associated with behavioural intentions ($\beta = .356$, $p < .001$), supporting H2. Customer satisfaction was positively associated with behavioural intentions ($\beta = .551$, $p < .001$), supporting H3. Among the three structural paths, the strongest association was between restaurant atmosphere and customer satisfaction, followed by the relationship between satisfaction and behavioural intentions. The second analytical component tested H4-H6 by examining the main effects of smoking status and restaurant environment and their interaction on overall restaurant-atmosphere evaluations. The results are presented in Table 9.

Table 9: Results of the 2×2 Factorial ANOVA for Overall Restaurant Atmosphere

Hypothesis	Variable	F	p	Partial η^2	Result
H4	Smoking Status	3.692	.055	.007	Not Supported
H5	Restaurant Environment (Smoking-Permitted/Smoke-Free)	31.950	< .001	.056	Supported
H6	Smoking Status $\times$ Restaurant Environment	9.253	.002	.017	Supported

Source: Created by the authors.

The main effect of smoking status was not statistically significant ($F = 3.692$, $p = .055$, partial $\eta^2 = .007$), and H4 was therefore not supported. Restaurant environment showed a significant main effect on overall atmosphere ($F = 31.950$, $p < .001$, partial $\eta^2 = .056$), supporting H5. The smoking status $\times$ restaurant environment interaction was also significant ($F = 9.253$, $p = .002$, partial $\eta^2 = .017$), supporting H6. Simple-effects analyses were used to examine the pattern underlying this interaction. Among smokers, overall atmosphere ratings were higher in smoke-free sections ($M = 3.871$, $SD = 0.722$) than in smoking-permitted sections ($M = 3.320$, $SD = 0.774$), $p < .001$. Among non-smokers, the corresponding difference was smaller and not statistically significant ($M = 3.557$ vs. 3.391 , $p = .070$). Within smoke-free sections, smokers reported higher atmosphere ratings than non-smokers (3.871 vs. 3.557 , $p < .001$), whereas no smoking-status difference was observed within smoking-permitted sections (3.320 vs. 3.391 , $p = .407$). The simple effects therefore indicate that the significant interaction was primarily associated with differences among smokers across restaurant environments.

Table 10: Results of the 2×2 Factorial ANOVA by Atmosphere Dimension

Dimension	Factor	F	p	Partial η^2
Facility Aesthetics	Restaurant Environment	31.147	< .001**	.0545
	Smoking Status	0.916	.339	.0017
	Interaction	2.804	.095	.0052
Ambience	Restaurant Environment	34.019	< .001**	.0593
	Smoking Status	2.032	.155	.0037
	Interaction	11.086	.001**	.0201
Lighting	Restaurant Environment	23.360	< .001**	.0415
	Smoking Status	10.551	.001**	.0192
	Interaction	6.063	.014*	.0111
Table Settings	Restaurant Environment	29.551	< .001**	.0519
	Smoking Status	4.913	.027*	.0090
	Interaction	1.570	.211	.0029
Layout	Restaurant Environment	2.532	.112	.0047
	Smoking Status	0.141	.707	.0003
	Interaction	3.865	.0498*	.0071
Service Staff	Restaurant Environment	6.729	.010*	.0123
	Smoking Status	0.243	.622	.0004
	Interaction	9.672	.002**	.0176

Note: * $p < .05$ and ** $p < .01$. Partial η^2 values are reported as effect sizes.

Source: Created by the authors.

The dimension-level ANOVAs reported in Table 10 show significant main effects of restaurant environment for Facility Aesthetics, Ambience, Lighting, Table Settings and Service Staff, but not for Layout. Smoking status showed significant main effects only for Lighting ($F = 10.551$, $p = .001$, partial $\eta^2 = .0192$) and Table Settings ($F = 4.913$, $p = .027$, partial $\eta^2 = .0090$). Significant smoking status $\times$ restaurant environment interactions were found for Ambience ($F = 11.086$, $p = .001$, partial $\eta^2 = .0201$), Lighting ($F = 6.063$, $p = .014$, partial $\eta^2 = .0111$) and Service Staff ($F = 9.672$, $p = .002$, partial $\eta^2 = .0176$). The interaction effect for Layout was statistically significant, although the effect size was small ($F = 3.865$, $p = .0498$, partial $\eta^2 = .0071$). Among smokers, ratings were consistently higher in smoke-free than in smoking-permitted sections for Ambience (3.893 vs. 3.078, $p < .001$), Lighting (4.076 vs. 3.463, $p < .001$) and Service Staff (3.950 vs. 3.484, $p < .001$). The partial η^2 values were generally small, with the larger restaurant-environment effects observed for Facility Aesthetics, Ambience and Table Settings, at approximately 0.05–0.06. These dimension-level analyses are treated as supplementary evidence indicating which components contribute to the overall atmosphere pattern rather than as separate hypothesis tests.

Table 11: Results of the 2×2 Factorial ANOVA for Satisfaction and Behavioural Intention

Variable	Factor	F	p	Partial η^2
Satisfaction	Restaurant Environment	9.920	.002**	.0180
	Smoking Status	4.898	.027*	.0090
	Interaction	11.357	.001**	.0206
Behavioural Intention	Restaurant Environment	12.345	< .001**	.0224
	Smoking Status	4.329	.038*	.0080
	Interaction	3.533	.061	.0065

Note: * $p < .05$ and ** $p < .01$. Partial η^2 values are reported as effect sizes.

Source: Created by the authors.

Supplementary factorial analyses were also conducted for customer satisfaction and behavioural intention. The results are presented in Table 11. For customer satisfaction, the main effects of restaurant environment ($F = 9.920$, $p = .002$, partial $\eta^2 = .0180$) and smoking status ($F = 4.898$, $p = .027$, partial $\eta^2 = .0090$) were significant. Their interaction was also significant ($F = 11.357$, $p = .001$, partial $\eta^2 = .0206$). Among smokers, satisfaction was higher in smoke-free sections than in smoking-permitted sections ($M = 4.141$ vs. 3.649, $p < .001$). Among non-smokers, satisfaction did not differ between the two restaurant environments ($M = 3.720$ vs. 3.736, $p = .878$). For behavioural intention, significant main effects were found for restaurant environment ($F = 12.345$, $p < .001$, partial $\eta^2 = .0224$) and smoking status ($F = 4.329$,

$p = .038$, partial $\eta^2 = .0080$). The smoking status $\times$ restaurant environment interaction, however, was not statistically significant ($F = 3.533$, $p = .061$, partial $\eta^2 = .0065$).

Discussion and conclusion

This study examined restaurant experience at two related levels. The first concerned the relationships among restaurant atmosphere, customer satisfaction and behavioural intentions, while the second concerned differences in atmosphere evaluations according to smoking status and the smoking-permitted or smoke-free section in which participants were seated. Keeping these levels separate is important because smoking regulation itself was not manipulated or measured as a varying treatment. It formed the legal and institutional setting in which the restaurants operated, whereas the empirical comparisons involved participant smoking status and the restaurant section actually experienced. This distinction allows smoking-related restaurant conditions to be considered within servicescape research without attributing observed cross-sectional differences directly to the regulation.

The structural results confirm the importance of restaurant atmosphere within the customer experience. Atmosphere was strongly associated with satisfaction ($\beta = .849$) and was also significantly associated with behavioural intentions ($\beta = .356$), while satisfaction showed a positive relationship with behavioural intentions ($\beta = .551$). These results are consistent with the servicescape and S-O-R traditions (Bitner, 1992; Mehrabian & Russell, 1974) and with recent restaurant research linking atmospheric conditions with satisfaction and behavioural outcomes (Chao et al., 2021; Rathnasiri et al., 2025). They are also consistent with Wang et al. (2025), whose meta-analysis shows that servicescape dimensions contribute to satisfaction, and with Bonfanti et al. (2026), who identify experiencescape as a central antecedent of restaurant customer experience. The structural model therefore reinforces relationships that are already well established in restaurant and servicescape research. The less familiar part of the study concerns how atmosphere evaluations vary across smoking status and restaurant environment.

Smoking status did not significantly differentiate overall atmosphere at the conventional .05 level ($p = .055$), although smoking-status differences were found for selected atmosphere dimensions, satisfaction and behavioural intention. Restaurant environment, by contrast, showed a significant main effect on overall atmosphere. This difference should be understood at the level of the restaurant section rather than as an effect caused by smoking regulation. Smoking-permitted and smoke-free sections may differ not only in tobacco-smoke exposure but also in enclosure, ventilation, proximity to smoking activity and other physical characteristics. Evidence from partially enclosed hospitality settings shows that such features can materially alter smoke exposure (Tong et al., 2024). Because these physical configurations were not standardised across the restaurants in this study, the environment main effect shows that smoking-permitted and smoke-free sections were evaluated differently but does not identify a single feature responsible for that difference.

The interaction between smoking status and restaurant environment is more informative. Smokers rated overall atmosphere substantially higher in smoke-free sections than in smoking-permitted sections (3.871 vs. 3.320), whereas the corresponding difference among non-smokers was smaller and not statistically significant. The highest overall-atmosphere rating was therefore observed among smokers seated in smoke-free sections. This finding is inconsistent with a simple congruence assumption that smokers will necessarily evaluate smoking-permitted environments more favourably. Kraft and Benet (2010) do not report the same smoker/non-smoker asymmetry found here, but their results similarly caution against treating smoking status as a straightforward indicator of how customers will respond to tobacco smoke within a service environment. From a P-E fit perspective, the present interaction is best understood as evidence that personal and environmental conditions can jointly differentiate evaluations. It should not be interpreted as a direct measure or test of perceived fit. This position is consistent with work showing that P-E fit extends beyond simple person-environment similarity and that different approaches to conceptualising fit should not be treated as interchangeable (Edwards et al., 2006; Kandler et al., 2024). Yang et al. (2024) likewise illustrate how a P-E fit perspective can be used in hospitality research to examine context-dependent customer evaluations without making perceived fit itself the measured outcome.

The smoker pattern can be read in more than one way. A direct explanation arising from the study design is that smoking-permitted and smoke-free sections may have differed in physical comfort, enclosure, ventilation, layout or other unmeasured characteristics, while participants also selected the sections in which they were seated rather than being randomly assigned to them. These factors may therefore have contributed to the higher atmosphere ratings observed among smokers in smoke-free sections. A second, more interpretive possibility is that smoke-free dining has become increasingly normalised as a routine service condition, including among people who continue to smoke.

International evidence is compatible with this possibility. Park et al. (2019) report a substantial increase over time in Korean smokers' support for smoke-free restaurants and bars, while Thrasher et al. (2010) document changes in smoking-related norms and policy support following comprehensive smoke-free legislation in Mexico City. Satterlund et al. (2012) similarly describe how non-smoking became normative behaviour inside California bars over a longer period, and Hoek et al. (2022) argue more broadly that environments help establish social norms by signalling where smoking is regarded as acceptable. At the same time, positive evaluation of a smoke-free dining environment does not necessarily imply rejection of smoking-permitted spaces. Fu et al. (2018) found that smokers across six European countries expressed considerably stronger support for smoke-free rules in indoor settings than for restrictions on smoking on outdoor restaurant terraces. Smoke-free indoor dining and continued access to smoking-permitted spaces can therefore coexist in smokers' evaluations and preferences. This distinction is particularly relevant here because the outcome measured in the present study is an evaluation of the section in which the respondent was seated, not a direct measure of seating or restaurant preference. The present data cannot determine whether the observed pattern primarily reflects section characteristics, self-selection, changing smoking norms, or some combination of these factors.

The supplementary analyses provide further detail about where the interaction appears. Significant interactions were observed for Ambience, Lighting, Layout and Service Staff, although the interaction effect for Layout was small (partial $\eta^2 = .0071$). For Ambience, Lighting and Service Staff, smokers rated these dimensions more positively in smoke-free than in smoking-permitted sections. Satisfaction showed a similar pattern. Smokers reported higher satisfaction in smoke-free sections, whereas the environment difference among non-smokers was negligible. Behavioural intention differed according to restaurant environment and smoking status as main effects, but the interaction was not statistically significant. The smoking-status and environment combination therefore appears more clearly in immediate evaluations of atmosphere and satisfaction than in behavioural intention. Because the atmosphere dimensions are correlated components of the same broader experience, these results are treated as supplementary evidence of a common pattern rather than as independent tests of separate regulatory effects.

The theoretical contribution of the study lies in bringing smoking-related restaurant conditions into the analysis of customer experience without assuming that smoking status determines which environment a customer will value. The established servicescape and S-O-R relationships remain important, but the interaction results show that customer characteristics and restaurant conditions can combine in less predictable ways. In particular, smoking status should not be treated as equivalent to a preference for a smoking-permitted environment. P-E fit is useful here as a perspective for considering person-environment combinations, but the findings do not demonstrate fit in a technical measurement sense. The study also adds a customer-experience perspective to a literature on smoke-free hospitality that has concentrated mainly on health exposure, compliance and economic outcomes. In doing so, it shows that the distinction between smoking-permitted and smoke-free space is relevant not only to regulation and exposure but also to how customers evaluate the dining environment.

For restaurant managers, the results suggest that smoking status alone is a poor basis for inferring customers' preferred dining conditions. A customer who smokes should not automatically be assumed to value a smoking-permitted section more highly. Management attention is better directed toward the overall quality of the restaurant environment and toward dimensions that showed consistent variation across conditions, particularly ambience, lighting, service staff and customer satisfaction. High-quality smoke-free dining conditions may contribute to favourable experience evaluations among smokers as well as non-smokers. At the same time, atmosphere evaluation and seating preference remain different outcomes, so these findings should not be used to imply that every customer would choose the same type of section. Smoking status is better treated as one customer characteristic among several rather than as a complete segmentation rule for restaurant design or seating decisions.

Several limitations define the scope of these conclusions. The study relied on convenience sampling from eight restaurants in Istanbul, which limits the extent to which the findings can be generalised to other restaurants or regions in Türkiye. The data are self-reported and cross-sectional, and participants were not randomly assigned to smoking-permitted or smoke-free sections. Unmeasured factors associated with section choice may therefore have contributed to the observed group differences. The physical characteristics of the two types of section were also not standardised across establishments. Differences in enclosure, ventilation, proximity, layout and other section-level features cannot be fully separated from the restaurant-environment classification. In addition, the retrospective questions concerning eating-out frequency before and after the restrictions are subject to recall bias and were

therefore interpreted descriptively. Future studies could compare matched sections within restaurants, record enclosure, roof and wall configuration, ventilation and distance between smoking and smoke-free areas, and use observational, field-experimental or longitudinal designs. Research that directly measures seating preference and the reasons behind it would also help explain why some smokers evaluate smoke-free dining environments favourably while continuing to smoke.

Overall, the findings show that restaurant atmosphere remains closely related to satisfaction and behavioural intentions, but evaluations of smoking-permitted and smoke-free restaurant sections cannot be inferred from smoking status alone. The significant interaction was most evident among smokers, who evaluated smoke-free sections more positively on overall atmosphere and several of its dimensions. These results do not demonstrate an effect caused by smoking regulation or a general preference for smoke-free dining. They instead show that customer evaluations emerge from the combination of personal characteristics and the environment in which the dining experience takes place. This provides a more precise basis for connecting servicescape research with the operation of smoke-free hospitality settings.

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Author Contributions:

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Statement on Generative AI Use:

The authors declare that generative AI technologies were not used for data generation or analysis in the preparation of this study, except for language checking and text editing.

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