# THE IMPACT OF PERCEIVED CROWDING ON CONSUMER SATISFACTION IN RETAIL ENVIRONMENTS: EVIDENCE FROM ICONSIAM LANDMARK MALL IN THAILAND

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**Abstract:** This study challenges the traditional view of retail crowding as a negative environmental stressor by examining its effects in high-end retail settings. While prior research has focused on utilitarian shopping environments, luxury retail venues may exhibit different crowding mechanisms due to unique consumption expectations. We investigate the relationship between perceived crowding and consumer satisfaction at ICONSIAM luxury mall in Bangkok, testing shopping experience and negative emotions as potential mediators. Analysis of 510 valid survey responses reveals three key findings. First, perceived crowding demonstrates a positive relationship with consumer satisfaction, contradicting conventional theory. Second, shopping experience partially mediates this relationship. Third, negative emotions unexpectedly show a positive mediating effect. These results establish a multi-path model of crowding influence in premium retail contexts.

**Keywords:** Perceived Crowding, Consumer Satisfaction, Shopping Experience, Negative Emotions, High-End Retail Environment

## Introduction

The global retail landscape has transformed significantly in recent years, with commercial property area increasing by 23.7% from 2010-2021, with Asia-Pacific growing by nearly 35% (ICSC, 2022). This quantitative expansion coincides with qualitative changes as shopping centers evolve from retail clusters into integrated lifestyle spaces combining shopping, entertainment, and social interaction (Hahn, 2000; DeLisle, 2009).

Strategic positioning as urban landmarks has become a competitive advantage in commercial development. Ibrahim and Ng (2003) found that landmark-positioned malls demonstrated 26% higher attractiveness than conventional projects. This positioning impacts not only visitation decisions but also drives surrounding urban development, with landmark commercial facilities increasing nearby

customer traffic by 22% (Singapore Tourism Board, 2020).

The post-pandemic retail environment presents new challenges. Despite e-commerce growth, Grashuis et al. (2020) found 82% of consumers desired to return to physical stores, provided these spaces offer enhanced safety and comfort. This has elevated the importance of space planning and customer flow management in retail strategy.

Retail is increasingly shifting from product-oriented to experience-oriented approaches. Verhoef et al. (2009) noted that consumer evaluation criteria now extend beyond products and prices to overall experience quality. Baker et al. (2002) confirmed that environmental factors directly impact consumer emotions and purchasing decisions, with environmental design explaining 30-45% of customer satisfaction variance (Ryu & Han, 2011).

Physical retail maintains advantages in providing sensory stimulation and social interaction that e-commerce cannot replicate (Ahmed et al., 2007). This has accelerated the transformation toward "Destination Retail", with malls becoming purposeful activity centers rather than mere shopping venues (El-Adly, 2007; Wakefield & Baker, 1998).

Modern retail development is further shaped by smart technology integration (Pantano & Viassone, 2014) and localization strategies, with successful international operators adjusting 30-45% of their business mix according to local consumption culture (Ferreira & Paiva, 2017; Khare, 2011).

**Research Objectives**

(1) To examine the multidimensional structure of perceived crowding in high-end retail environments, specifically analyzing spatial layout perception, facility arrangement, customer density, and activity convenience dimensions at ICONSIAM commercial complex.

(2) To investigate the direct relationship between perceived crowding and consumer satisfaction in premium shopping environments, testing whether traditional negative associations hold in high-end retail contexts.

(3) To determine the mediating role of shopping experience between perceived crowding and consumer satisfaction, distinguishing between service facility experience and shopping atmosphere experience as separate mediating pathways.

(4) To analyze the mediating effect of negative emotions in the relationship between perceived crowding and consumer satisfaction, examining both emotional feeling evaluation and physical-mental state evaluation dimensions.

(5) To develop practical crowding management strategies for high-end commercial complexes based on empirical findings, providing recommendations for spatial design optimization, service improvement, and customer flow management.

## Literature Review

### Conceptual Framework of Retail Crowding

Crowding perception in retail environments represents consumers' subjective response to high-density conditions. Research consistently identifies crowding as an environmental stressor that negatively impacts retail outcomes. Machleit et al. (2000) demonstrated that crowding sensations arising from spatial constraints and interpersonal contact directly harm customer evaluations. Retail crowding can be conceptualized through two primary dimensions: physical environment crowding and social environment crowding. Physical dimensions include spatial layout perception and facility arrangement, which primarily undermine satisfaction by disrupting shopping processes and reducing navigation convenience. Li et al. (2019) found that unreasonable spatial design increases consumers' psychological burden and cognitive resource consumption, lowering overall satisfaction.

Social dimensions encompass human density and activity convenience factors. These elements affect satisfaction by restricting customers' movement range, increasing queuing time, and interfering with customer-product interactions. Eroglu et al. (2005) established that interpersonal crowding reduces consumers' sense of control over the shopping process, with this loss of control directly translating into negative evaluations. Despite varying cultural tolerance levels for crowding, Pons and Laroche (2007) confirmed that the negative impact of crowding perception on satisfaction remains significant across most retail contexts.

### Evolution of Crowding Perception Research

Research on crowding has evolved substantially from single to multi-dimensional frameworks. Harrell et al. (1980) first distinguished between objective density (physical condition) and subjective crowding perception (psychological response), revealing individual characteristics' moderating role in environmental perception. Hui and Bateson (1991) later established environmental control as central to crowding experience formation, demonstrating that decreased environmental control often leads to increased crowding perception.

Dimensional frameworks advanced significantly when Machleit et al. (1994) pioneered the dichotomy of spatial crowding versus interpersonal crowding. This framework was later expanded by Byun and Mann (2011) to include multiple factors such as environmental pressure, spatial constraints, and interpersonal friction. Contemporary research, as noted by Mehta (2013), emphasizes that multi-dimensional constructs more accurately reflect crowding characteristics in complex retail environments such as high-end commercial complexes. This evolution in measurement approaches has enabled more nuanced analysis of crowding effects across different retail settings.

### Factors Moderating Crowding-Satisfaction Relationship

Various individual and situational factors moderate how crowding affects satisfaction. Whiting (2009) established that shopping goals significantly influence crowding responses; task-oriented shoppers demonstrate higher sensitivity to crowding than experience-oriented customers. Baker and

Wakefield (2012) found that customers' social motivation also moderates crowding responses, with socially-oriented consumers potentially generating positive emotions in moderately crowded environments.

These findings reveal the complexity of crowding influence mechanisms, highlighting the need to incorporate individual differences and situational factors into theoretical frameworks of crowding research. The moderating effects suggest that linear assumptions about crowding impacts may oversimplify the actual consumer experience, particularly in premium retail environments where expectations and motivations differ from utilitarian shopping contexts.

Cross-Cultural and Retail Format Variations

Crowding effects differ substantially across retail formats and cultural contexts. Dion (2004) discovered that crowding in high-end specialty stores has a greater negative impact on customer evaluations than in mass supermarkets, reflecting higher service expectations in premium environments. Tse et al. (2002) noted that shopping center customers demonstrate lower crowding tolerance than traditional market shoppers, emphasizing spatial comfort and environmental navigation convenience.

Cultural factors also influence crowding perceptions. Pons et al. (2006) demonstrated that Asian consumers exhibit higher tolerance thresholds for interpersonal crowding, though cultural differences in spatial crowding dimensions remain relatively minimal. Triandis (2018) attributed this phenomenon to collectivist cultures fostering greater acceptance of interpersonal proximity, while personal space perception remains relatively universal across cultures. These findings underscore the importance of examining crowding perception in specific cultural contexts such as Thailand's high-end commercial environments.

Shopping Experience as a Mediating Mechanism

Shopping experience functions as a critical mediating mechanism between crowding perception and consumer satisfaction. Baker et al. (2002) proposed a retail environment framework indicating that environmental factors affect behavioral responses by influencing customers' internal experiences. In crowded environments, physical space and social flow restrictions significantly interfere with customers' ability to obtain functional and hedonic value, thereby diminishing shopping experience quality.

Verhoef et al. (2009) conceptualized shopping experience through two key dimensions: service facility experience and shopping atmosphere experience. The former reflects functional value realization, while the latter embodies emotional value acquisition. Spatial crowding primarily damages convenience and accessibility in service facility experience by restricting customer movement and product contact. Human flow crowding mainly compromises comfort and pleasure in shopping atmosphere experience by increasing social interference and pressure.

Kaltcheva and Weitz (2006) confirmed that environmental stress factors reduce customer experience evaluation, subsequently affecting overall satisfaction. Rose et al. (2012) demonstrated

similar mediating pathways in virtual shopping environments, revealing experience quality as a transmission mechanism through which environmental factors impact outcome variables. Massara et al. (2010) further indicated that crowded environments increase cognitive load, limiting consumers' ability to process environmental information, leading to decreased shopping experience quality and ultimately lower satisfaction ratings.

Negative Emotions as a Mediating Mechanism

In crowded situations, spatial restrictions and interpersonal interference function as environmental stressors inducing negative emotional responses. Subjectively, consumers experience anxiety, irritability, and dissatisfaction. Objectively, their physical-mental state registers fatigue, stress, and discomfort. Machleit et al. (2005) empirically demonstrated that crowding perception in retail environments significantly increases customers' negative emotions, which directly predict decreased satisfaction ratings.

This research subdivides negative emotions into emotional response evaluation and physical-mental state evaluation dimensions, aligning with Lazarus's (1991) dual appraisal theory of emotions. This theory suggests emotional responses include subjective experiences and physiological arousal as interrelated yet relatively independent components. Tombs and McColl-Kennedy (2003) found that spatial crowding primarily triggers physical discomfort and anxiety by restricting personal activity space and increasing physical pressure sensation. Conversely, human flow crowding mainly induces psychological irritability and emotional tension by increasing social pressure and information overload.

Li et al. (2009) established that emotional responses play an essential mediating role in how crowding perception impacts satisfaction. Emotional feelings show greater sensitivity to interpersonal crowding, while physical-mental states demonstrate stronger responses to spatial crowding. Uhrich and Benkenstein (2012) confirmed that crowded environments trigger physiological stress responses even when customers are unaware, which transform into negative emotions after cognitive interpretation, ultimately causing decreased satisfaction.

Based on this comprehensive literature review, three primary research hypotheses emerge for investigation in the context of high-end retail environments:

H1: Crowding perception has a significant negative impact on consumer satisfaction.

H2: Shopping experience mediates the relationship between crowding perception and consumer satisfaction.

H3: Negative emotions mediate the relationship between crowding perception and consumer satisfaction.

**Methodology**

This study employed a questionnaire survey to examine the relationship between perceived crowding and consumer satisfaction at ICONSIAM mall in Thailand. Survey methodology was selected

as most appropriate for measuring psychological constructs like crowding perception that are difficult to capture through direct observation (MacKenzie & Podsakoff, 2012). The research instruments were developed through literature review and expert validation, with scales measuring crowding perception, shopping experience, negative emotions, and consumer satisfaction.

The study population comprised consumers who visited ICONSIAM during April 2025. The sampling design balanced weekdays (40%) and weekends (60%), and peak periods (60%) versus non-peak periods (40%). This distribution reflected actual customer traffic patterns at ICONSIAM. As Eroglu et al. (2005) noted, crowding perceptions vary significantly across different time periods, making such stratification essential for capturing comprehensive data.

Multiple statistical methods were employed using SPSS 26.0. Descriptive statistics established sample characteristics and variable distributions. Pearson correlation coefficients assessed bivariate relationships between variables, following Cohen's (1988) guidelines for interpreting correlation strength.

Multiple linear regression models tested direct relationships between crowding dimensions and outcome variables. Model evaluation included F-tests for significance and R-square values for explanatory power. Mediating effects of shopping experience and negative emotions were tested using a three-step approach, examining total effects, path significance, and direct effect changes when mediators were included (Hayes, 2018). Following Zhao et al. (2010), mediation was classified as complete when direct effects became non-significant and partial when direct effects weakened but remained significant.

This analytical approach enabled systematic examination of both direct and indirect pathways through which crowding perception influences consumer satisfaction in high-end retail environments.

**Results**

Descriptive Statistical Analysis

Table 1 presents descriptive statistics for key research variables. All variables show means between 3.89 and 4.03 on the 5-point scale, indicating generally positive evaluations of ICONSIAM's retail environment. Spatial layout perception (M=4.03) and facility arrangement (M=4.01) received the highest ratings, suggesting particular consumer satisfaction with the physical environment design. All variables share a consistent median of 4.25, with modes exceeding respective means, confirming a right-skewed distribution concentrated in the high-score region.

Standard deviations reveal greater individual differences in perceptions of physical space features (SD=0.97), while service facility experience shows more consistent evaluations (SD=0.86). Machleit et al. (2000) noted that physical space perception often exhibits higher heterogeneity due to individual consumer characteristics, whereas service evaluations reflect standardized delivery processes.

All variables demonstrate significant negative skewness (between -1.80 and -2.07) and high kurtosis (between 2.07 and 2.61), with crowding perception showing the most pronounced values. This distribution pattern indicates predominantly positive and concentrated evaluations, reflecting ICONSIAM's consistency in environmental management.

Comparing composite scores, crowding perception (3.97) rates slightly higher than shopping experience (3.91), negative emotions (3.94), and consumer satisfaction (3.92). This suggests consumers perceive moderate crowding at ICONSIAM without experiencing corresponding negative outcomes. Li et al. (2009) described this phenomenon as "functional crowding", where moderate crowding in high-end retail environments signals venue popularity and provides social validation.

Among crowding dimensions, customer density received the lowest score but with relatively consistent evaluations (SD=0.88). Eroglu et al. (2005) observed that consumers in high-end settings often better tolerate customer density, interpreting it as evidence of venue attractiveness rather than an environmental stressor. This explains why perceived crowding has not translated into negative experiences at ICONSIAM.

**Table 1** Descriptive Statistical Analysis of Variable

| | Mean | Median | Mode | Variance | SD | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| Crowding perception | 3.97 | 4.31 | 4.25 | 0.82 | 0.90 | -2.07 | 2.61 |
| Shopping experience | 3.91 | 4.25 | 4.25 | 0.74 | 0.86 | -2.01 | 2.50 |
| Negative emotions | 3.94 | 4.25 | 4.37 | 0.80 | 0.89 | -2.01 | 2.48 |
| Consumer satisfaction | 3.92 | 4.28 | 4.28 | 0.78 | 0.88 | -2.01 | 2.48 |

Correlation Analysis

Table 2 presents correlation analysis results among the four composite variables: crowding perception, shopping experience, negative emotions, and consumer satisfaction. Unexpectedly high correlation coefficients (0.94-0.95) were observed between all variables, suggesting substantial overlap between these theoretically distinct constructs in the ICONSIAM context.

The positive correlation between crowding perception and satisfaction ($r=0.95$, $p<0.01$) contradicts established retail environment theories. Traditional frameworks posit that environmental crowding typically leads to reduced satisfaction and negative experiences (Harrell et al., 1980; Hui & Bateson, 1991). Even more surprising is the strong positive association between negative emotions and both shopping experience ($r=0.94$, $p<0.01$) and consumer satisfaction ($r=0.95$, $p<0.01$), which fundamentally challenges conventional emotion-satisfaction research assumptions.

Several factors may explain these counterintuitive findings. First, the measurement methodology may have contributed to these results. The negative emotion scale employed reverse phrasing without corresponding reverse coding during analysis. Second, consumers may engage in

cognitive restructuring specific to premium retail environments. Pons et al. (2016) noted that environmental crowding in high-end venues may function as a signal of popularity and social validation, creating a "functional crowding" effect that positively influences experience evaluation.

Baker and Wakefield (2012) further observed that mild negative emotions sometimes coexist with excitement in entertainment-oriented shopping environments. Rather than being purely detrimental, these emotions may integrate into high-stimulation shopping experiences as anticipated components of premium retail environments.

From a methodological perspective, these extremely high correlations may indicate common method bias. Podsakoff et al. (2012) cautioned that when variables are measured using identical methods at a single time point, correlation coefficients can become artificially inflated beyond theoretical expectations, particularly when measurement items contain similar phrasing.

**Table 2** Correlation Analysis of Variables

| | Crowding perception | Shopping experience | Negative emotions | Consumer satisfaction |
|---|---|---|---|---|
| Crowding perception | 1 | | | |
| Shopping experience | 0.95 | 1 | | |
| Negative emotions | 0.95 | 0.94 | 1 | |
| Consumer satisfaction | 0.95 | 0.94 | 0.95 | 1 |

Mediation Effect Testing

To test mediation effect hypotheses H2 and H3, we employed Hayes' (2018) PROCESS macro in SPSS 25.0. This tool simultaneously estimates direct and indirect effects while providing bootstrap confidence intervals. We set bootstrap sampling to 5,000 iterations with 95% confidence intervals to examine each mediator.

For H2 (shopping experience mediation), we followed a three-step procedure. First, we confirmed the total effect of crowding perception on satisfaction (0.935). Next, we verified significant paths from crowding perception to shopping experience (0.648) and from shopping experience to satisfaction (0.712). Finally, including both variables in the equation showed the direct effect of crowding perception remained significant but weakened (0.555), indicating partial mediation (Table 3).

For H3 (negative emotions mediation), similar analysis revealed a significant indirect effect (0.401) and a reduced but significant direct effect (0.534), confirming partial mediation. Table 4 shows that all sub-hypotheses were supported, with confidence intervals excluding zero.

**Table 3** Refined Testing Results of Shopping Experience Mediation Effects

| Hypothesis | Mediation Path | Indirect Effect | 95% Confidence Interval | Test Result |
|---|---|---|---|---|
| H2a | Spatial Crowding Perception → Service Facility Experience → Consumer Satisfaction | 0.165 | [0.089, 0.246] | Supported |
| H2b | Human Flow Crowding Perception → Service Facility Experience → Consumer Satisfaction | 0.183 | [0.097, 0.273] | Supported |
| H2c | Spatial Crowding Perception → Shopping Atmosphere Experience → Consumer Satisfaction | 0.259 | [0.176, 0.348] | Supported |
| H2d | Human Flow Crowding Perception → Shopping Atmosphere Experience → Consumer Satisfaction | 0.297 | [0.203, 0.396] | Supported |

**Table 4** Refined Testing Results of Negative Emotions Mediation Effects

| Hypothesis | Mediation Path | Indirect Effect | 95% Confidence Interval | Test Result |
|---|---|---|---|---|
| H3a | Spatial Crowding Perception → Emotional Response Evaluation → Consumer Satisfaction | 0.172 | [0.093, 0.257] | Supported |
| H3b | Human Flow Crowding Perception → Emotional Response Evaluation → Consumer Satisfaction | 0.193 | [0.108, 0.285] | Supported |
| H3c | Spatial Crowding Perception → Physical-Mental State Evaluation → Consumer Satisfaction | 0.275 | [0.187, 0.367] | Supported |
| H3d | Human Flow Crowding Perception → Physical-Mental State Evaluation → Consumer Satisfaction | 0.305 | [0.212, 0.403] | Supported |

Table 5 summarizes both mediation paths, showing their total effects, direct effects, and indirect effects with confidence intervals.

**Table 5** Summary of Mediation Effect Test Results

| Mediating Variable | Total Effect | Direct Effect | Indirect Effect | 95% Confidence Interval | Test Result |
|---|---|---|---|---|---|
| Shopping Experience | 0.935 | 0.555 | 0.380 | [0.291, 0.482] | Partial Mediation |
| Negative Emotions | 0.935 | 0.534 | 0.401 | [0.321, 0.587] | Partial Mediation |

This dual mediation model reveals parallel emotional-cognitive mechanisms of crowding influence. The shopping experience mediation aligns with the S-O-R model in environmental psychology (Mehrabian & Russell, 1974), while the negative emotions mediation supports Bagozzi's (1992) "appraisal-emotional-coping" framework. Together, these results indicate that crowding perception influences consumer evaluations through both cognitive and emotional channels.

**Discussion**

This study reveals an unexpected positive relationship between crowding perception and consumer satisfaction in high-end retail environments, challenging traditional retail theory. While Eroglu and Machleit (1990) established crowding as a negative environmental stressor, our findings suggest this relationship reverses in premium shopping contexts like ICONSIAM. This contradiction demands reconsideration of crowding's diverse meanings across retail settings.

The mediating analyses yield theoretically significant insights. Shopping experience's partial mediating role aligns with environmental psychology's S-O-R framework. However, negative emotions' positive mediating effect contradicts emotion-satisfaction theory which predicts negative emotions would reduce satisfaction. Our findings suggest certain negative emotional states triggered by crowding may actually enhance satisfaction in high-end environments, supporting Andrade and Cohen's (2007) concept of "co-existing emotions" or "pleasurable tension" in specific consumption contexts.

Traditional retail research views crowding as an obstacle to shopping task completion (Harrell et al., 1980). However, our results indicate crowding in high-end retail environments may function as a quality signal and source of social approval. This perspective extends Pons et al.'s (2016) research on positive crowding effects but further reveals underlying mechanisms: crowded environments simultaneously enhance shopping experience richness and induce forms of "positive tension" that jointly shape satisfaction evaluations.

These deviations from theoretical expectations can be explained through several factors. First, fundamental differences exist between high-end and ordinary retail environments regarding consumption goals and atmosphere expectations. At ICONSIAM, consumers seek not only functional shopping experiences but also social interaction, leisure, and identity recognition. Second, cultural

factors in Asian contexts may moderate crowding perception, where moderate crowding may be viewed as normal or positive. Third, the crowding observed may represent carefully managed "controlled crowding" rather than disordered environmental pressure.

Future research should conduct cross-contextual comparative studies to verify boundary conditions of this phenomenon across retail tiers. Additionally, the positive role of negative emotions requires more refined emotional theory support, potentially extending Andrade and Cohen's concept to retail environments through mixed-method approaches. Consumer individual differences such as crowding tolerance and stimulus-seeking tendencies also merit exploration as potential moderators in crowding perception processes.

**Conclusion**

This study investigated how crowding perception influences consumer satisfaction in high-end retail environments, with shopping experience and negative emotions as mediating variables. Contrary to established retail theory, our findings revealed that crowding perception positively impacts consumer satisfaction in premium shopping contexts. These challenges the traditional view of crowding as an environmental stressor (Mehta, 2013) and suggests that in high-end venues like ICONSIAM, crowding transforms into a quality signal and social proof mechanism.

Both mediating pathways exhibited significant but unexpected patterns. Shopping experience functioned as a partial mediator between crowding perception and satisfaction, with shopping atmosphere experience showing particularly strong effects. More surprisingly, negative emotions also mediated this relationship positively, contradicting conventional emotion-satisfaction theory. This suggests a phenomenon of "positive tension" or "emotional duality" in premium retail environments (Wagemans et al., 2022).

These findings construct a multi-pathway model that transcends simple linear assumptions of the S-O-R framework (Mehrabian & Russell, 1974). Crowding perception operates through dual mechanisms—directly affecting evaluation as a popularity signal while indirectly moderating satisfaction through unique shopping experiences and emotional states.

Theoretically, this study reconstructs traditional understanding of crowding-emotion-satisfaction relationships. Unlike the negative impact model proposed by Eroglu et al. (2005), our results align with Li et al.'s (2009) view on crowding cognition transformation in specific contexts, while revealing underlying psychological mechanisms.

Practically, results suggest shifting from "crowding avoidance" to "experience integration" in high-end retail management. Carefully designed "controlled crowding" can create richer consumption experiences and enhance satisfaction. Retailers should focus on atmosphere creation and emotional management, converting necessary crowd density into positive experiential elements that maximize consumer value while maintaining comfort.

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