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EMOTIONAL PATHWAYS BETWEEN PERCEIVED CROWDING AND SHOPPING SATISFACTION: EVIDENCE FROM A CREATIVE POP-CULTURE EVENT

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Abstract

This study investigates how perceived crowding influences shopping satisfaction through emotional responses at Comic Frontier (Comifuro), a large-scale creative event in Indonesia. This study, which was established from Stimulus-Organism-Response (S-O-R) framework, differentiates between Human Crowding and Spatial Crowding while exploring how emotional responses Pleasure and Arousal mediate these effects. Data were obtained from 112 shoppers, and the proposed model of the study was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 3. Findings indicate that Human Crowding increases both Pleasure and Arousal, whereas Spatial Crowding Decreases Pleasure but does not significantly affect Arousal. Conversely, Spatial Crowding significantly reduces Pleasure but does not affect Arousal. Both human and spatial crowding have indirect positive effects on satisfaction through pleasure. However, arousal showed weaker and inconsistent mediating effects, suggesting that high stimulation does not necessarily increase satisfaction in crowded environments. The analysis revealed full mediation by emotions, emphasizing that emotions serve as the primary pathway linking environmental perception and satisfaction. This study highlights that event success relies on managing physical space to enhance comfort while leveraging the energy of social density. The results provide theoretical support for the S-O-R model in specialized event settings and offer organizers actionable insights for managing high-density environments.

Keywords: Perceived Crowding, Emotions, Satisfaction

1. INTRODUCTION

The global landscape of popular culture is now defined by large-scale fan gatherings, which function as dynamic spaces where enthusiasts connect over shared interests, interact directly with creators, and participate in specialized marketplaces. One of them is *doujinshi* marketplace, a concept that originated in Japan as a platform for self-published creative works (*doujinshi*) made by people who share a common interest or goal (Comic Market Committee, 2014). The most prominent global example is Comic Market (Comiket) in Tokyo, attracting hundreds of thousands of attendees biannually (Miho, 2016).

Inspired by Comiket, a similar *doujinshi* marketplace is being held in Indonesia. Comic Frontier (Comifuro), as stated on its website (Comic Frontier, 2017; Comic

Frontier XX, 2025), is a major exhibition-style event that aspires to be a platform for independent creative talents, known as Circles, to showcase, distribute, and sell their self-published works directly to a large, dedicated audience. Since 2022, Comic Frontier has evolved into a major biannual event held at the Indonesia Convention Exhibition (ICE) BSD City, a modern venue that also hosts international concerts and major trade exhibitions.

Event organizers typically aim to draw a high volume of attendees. The consequence of these are that attendees have to deal with crowding within a confined space (Kim et al., 2016). While excessive crowding is often linked to negative outcomes in retail (S. Eroglu & Harrell, 1986; Machleit et al., 2000), research reveals that crowding can sometimes be positive at events and festivals, creating an exciting atmosphere that enhances the experience (Kim et al., 2016; Mowen et al., 2003). Consequently, one major issue in managing events is grasping how crowd density relates to attendee satisfaction (Kim et al., 2016). A clearer conceptualization of crowding is therefore essential to understand why it sometimes contributes positively to satisfaction and other times negatively.

The research basis is the Stimulus-Organism-Response (S-O-R) model originally proposed by Mehrabian and Russell (1974). This framework proposes that the environmental stimulus (perceived crowding) is processed by the individual, first triggering an emotional response (the organism state) that subsequently drives the final behavioral outcome (response). The emotional responses investigated in this study are Pleasure and Arousal (Mehrabian & Russell, 1974). Pleasure reflects the hedonic valence of the affective state, reflecting how happy or joyful an individual feels, while Arousal indicates the person's level of stimulation or alertness (Das & Varshneya, 2017; Lin & Liang, 2011). Earlier research has shown that emotional responses act as intermediary factors linking perceived crowding to overall satisfaction (S. A. Eroglu et al., 2005; Machleit et al., 2000; Mehta, 2013).

Despite the increasing popularity of fan conventions, limited research explains how perceived crowding influences satisfaction in high-density creative events. Existing studies predominantly focus on retail stores, malls, and tourism context, where crowding is generally associated with negative outcomes such as reduced satisfaction (S. A. Eroglu et al., 2005; S. A. Eroglu & Machleit, 1990; S. Eroglu & Harrell, 1986; Kim et al., 2016). While these studies provide valuable insights into crowding effects in commercial settings, their findings may not fully apply to creative fan events where high visitor density and social interaction are expected in the experience. In such environments, crowding may function not only as a constraint but also as a source of excitement and social energy. Furthermore, although previous research suggests that emotional responses play an important role in linking environmental stimuli to satisfaction, empirical investigations on how emotional responses mediate the relationship between crowding perceptions and satisfaction in high-density creative fan events remain limited.

Therefore, the main aim of this study is to examine how perceived crowding influences satisfaction at Comic Frontier by investigating the mediating role of emotional responses. This study is structured to achieve four primary objectives. First, this study analyzes the effect of human crowding on attendees' emotional responses, specifically pleasure and arousal. Second, this study evaluates how spatial crowding influences these same emotional states. Third, the study assesses the direct effects of pleasure and arousal on overall satisfaction. Lastly, this study investigates the mediating role of pleasure and

arousal in the relationship between perceived crowding (both human and spatial) and satisfaction.

Understanding these relationships is particularly important for managing high-density creative events. From a managerial perspective, the findings of this study can assist event organizers in designing environments that enhance attendee experience while managing high visitor density. By identifying how different forms of crowding influence emotional responses, organizers of creative events such as Comic Frontier can better manage spatial layouts, visitor flow, and environmental conditions to create an atmosphere that maintains excitement without diminishing comfort. This understanding is particularly relevant for large exhibition venues, where effective crowd management strategies can improve accessibility, reduce stress, and ultimately enhance overall satisfaction.

From a theoretical perspective, this research contributes to the growing body of literature applying the Stimulus-Organism-Response Model to experiential consumption settings. Although previous studies have widely applied the model to retail stores and shopping malls, limited empirical research has examined how environmental density in fan-driven creative events influences emotional reactions and satisfaction outcomes. By investigating the mediating roles of pleasure and arousal in the relationship between perceived crowding and satisfaction, this study extends existing environmental psychology research into the context of fan conventions and creative marketplaces. Consequently, the findings provide a more nuanced understanding of how environmental stimuli operate within voluntary high-density event environments, where crowd presence may simultaneously function as both a constraint and a source of excitement.

2. LITERATURE REVIEW

2.1 Perceived Crowding

Perceived crowding is a concept rooted in environmental and consumer behavior research, referring not only to the actual density in a setting but also to how individuals psychologically evaluate that density (Vaske & Donnelly, 2002). Early theoretical work emphasizes that crowding is not determined solely by physical conditions, but by subjective appraisal. For instance, Stokols (1972) conceptualizes crowding as a psychological state arising when spatial or social conditions are perceived to restrict individual goals or activities. This perspective highlights that identical physical environments may produce different crowding perceptions depending on individual expectations, tolerance levels, and situational context.

Building on this view, perceived crowding is generally conceptualized along two dimensions: the density of people (human crowding) and the limitations of physical space (spatial crowding) (Machleit et al., 1994). Human crowding describes the sensation of being surrounded by an excessive number of individuals. In retail context, this perception originates from the high number of shoppers simultaneously engaged in activities like browsing and interacting on the selling floor. Conversely, spatial crowding is the feeling of being physically restricted due to high spatial density, a condition often influenced by the configuration and number of fixtures and merchandise within the environment. This distinction is theoretically important because the two dimensions operate through different psychological mechanisms. Human crowding primarily involves social evaluation and interaction, while spatial crowding is linked to physical restriction and reduced behavioral freedom.

In traditional retail environments, both forms of crowding are generally associated with negative outcomes. Spatial crowding tend to reduce comfort, mobility, and diminished shopping performance, as excessive fixtures or narrow aisles restrict navigation (S. A. Eroglu et al., 2005; S. A. Eroglu & Machleit, 1990; S. Eroglu & Harrell, 1986). Human crowding is also often viewed as undesirable, particularly when excessive social density impedes exploration, goal completion, or decision-making. Under highly stimulating settings, individuals may feel stressed, irritated, or perceived loss of control (Machleit et al., 2000).

However, empirical findings are not entirely consistent. Studies in fields such as tourism, festivals, and environmental psychology indicate that, in some situations, a crowded environment may elevate the experience by generating a lively and engaging atmosphere, commonly described as "positive crowding" (S. A. Eroglu et al., 2005; Mowen et al., 2003; Pons et al., 2006; Popp, 2012; Wakefield & Blodgett, 1994). In these contexts, the presence of many people may signal popularity, excitement, and shared participation, which can increase enjoyment rather than reduce it. This indicates that crowding is not inherently negative, but its effects depend on how it is interpreted within a given context. Recent studies continue to report mixed findings regarding the effects of crowding on consumer experience, particularly in experiential settings, suggesting that contextual factors play a significant role in shaping crowding perceptions (Milman et al., 2020; Pikkemaat et al., 2020; Ruiz et al., 2021).

Despite these insights, existing literature presents an important conceptual issue. While studies acknowledge that crowding can produce both positive and negative outcomes, they provide limited explanation of why these differences occur beyond general references in a certain context or setting. In particular, prior research tends to treat crowding as a uniform construct, without sufficiently distinguishing how human crowding and spatial crowding generate different emotional responses through distinct mechanisms. As a result, the underlying process through which crowding influences experience remains insufficiently explained.

This limitation is especially relevant in high-density experiential environments, where individuals voluntarily enter crowded spaces and may interpret social density differently from utilitarian settings. In such contexts, human crowding may function as a source of social stimulation and collective energy, whereas spatial crowding may still act as a constraint by restricting movement and comfort.

2.2 Emotions

Emotion is a core psychological process that shapes how individuals interpret and evaluate experiences. It can be viewed both as a subjective feeling consciously recognized by individuals (Westbrook, 1987) and as a psychological state triggered by cognitive appraisals of situations (Bagozzi et al., 1999). In consumer contexts, emotions are not merely reactions but actively shape how experiences are judged, remembered, and evaluated (Oliver, 1997; Westbrook & Oliver, 1991).

Environmental psychology provides an important foundation for explaining how event environments evoke emotional states. Mehrabian & Russell (1974) introduced the Stimulus Organism Response (S-O-R) framework, explaining that environmental factors (S) elicit emotional states (O) which then guide consumer behaviors (R) (R. J. Donovan et al., 1994; R. Donovan & Rossiter, 1982; Lin & Liang, 2011). They also proposed the Pleasure, Arousal, and Dominance (PAD) framework as a structured approach to analyze these emotional reactions. Pleasure reflects the extent of happy, comfortable, and

entertained feelings of the individuals; Arousal represents the level of excitement or stimulation; and Dominance describes on what degree does a person feel in control of their environment (Das & Varshneya, 2017; Lin & Liang, 2011).

Although the PAD framework includes dominance, prior research consistently shows that dominance plays a limited role in typical consumption settings, where individuals have relatively low control over the environment (R. Donovan & Rossiter, 1982; Koo & Lee, 2011; Li et al., 2009; Vieira & Torres, 2014). As a result, most empirical studies focus on pleasure and arousal as the primary emotional dimensions influencing consumer responses.

A substantial body of research supports the role of emotions as antecedents of satisfaction. Positive emotional states, particularly pleasure, have been shown to enhance overall evaluations of consumption experiences, leading to higher satisfaction (Elmashhara & Soares, 2020; Mano & Oliver, 1993; Oliver, 1997; Wirtz et al., 2000). Empirical evidence from tourism and event contexts further indicates that pleasure consistently emerges as a strong predictor of satisfaction (Bigné et al., 2005; Carneiro et al., 2019). However, the effect of arousal is less consistent. While some studies report a positive relationship between arousal and satisfaction (H. Song et al., 2019; H.-J. Song et al., 2015), others find no significant direct effect or only indirect effects through pleasure (Bigné et al., 2005; Carneiro et al., 2019; Moon et al., 2016).

These inconsistent findings highlight an important theoretical issue: emotional responses do not automatically translate into satisfaction. Instead, their influence depends on how they are cognitively processed and whether they contribute to overall value perception. In highly stimulating environments, such as events or festivals, arousal may become normalized or even excessive, reducing its evaluative relevance despite increasing momentary engagement. As a result, arousal may function more as an activating condition rather than a direct determinant of satisfaction.

In the context of perceived crowding, emotions are positioned as key mediating mechanisms within the S-O-R framework. Prior studies suggest that crowding influences satisfaction not only directly but also indirectly through emotional responses (S. Eroglu & Harrell, 1986; Kim et al., 2016; Machleit et al., 2000). However, existing findings are largely derived from retail and service environments, where crowding is typically perceived as a constraint that reduces comfort and control.

This creates a critical limitation in the literature. In high-density experiential settings, such as events or festivals, crowding may generate both negative and positive emotional responses simultaneously. Human crowding, for instance, may increase excitement and social energy, while spatial crowding may induce discomfort due to movement restriction (Das & Varshneya, 2017; Kim et al., 2016). As a result, the emotional mechanisms linking crowding to satisfaction may operate differently compared to traditional retail contexts.

Despite the recognized importance of emotions in the S-O-R framework, empirical research examining how pleasure and arousal mediate the relationship between perceived crowding and satisfaction in highly stimulating event environments remains limited. In particular, the inconsistent role of arousal and the context-dependent nature of emotional responses suggest that the crowding-emotion-satisfaction relationship requires further investigation in settings where high density is expected and even desired.

Despite extensive research on perceived crowding, emotions, and satisfaction, three key limitations remain. First, prior studies often treat crowding as a unified construct, overlooking the distinct mechanisms through which human and spatial

crowding influence experience. Second, although emotions are recognized as mediators, the specific roles of pleasure and arousal remain inconsistent and context-dependent. Third, most empirical evidence is derived from retail settings, limiting the applicability of findings to high-density experiential events where crowding may be perceived differently. These gaps indicate the need for a more nuanced examination of the crowding-emotion-satisfaction relationship within creative event environments.

2.3 Satisfaction

In consumer behavior studies, satisfaction is considered a central concept and is typically described as an evaluative assessment of the consumers after using a product or service (Oliver, 1980). Satisfaction often conceptualized as the outcome of comparing consumer's initial expectations and the performance or outcome that they perceived of the purchase or service encounter (Kotler & Keller, 2006). When performance meets or exceeds expectations, individuals tend to experience satisfaction, whereas failure to meet expectations may produce dissatisfaction (Kotler & Keller, 2006; Oliver, 1980). However, this perspective alone is insufficient to explain satisfaction in experiential contexts, where evaluations are not based solely on functional outcomes but also on affective experiences.

A substantial body of research highlights that satisfaction is not purely cognitive but is strongly shaped by emotional responses experienced during consumption (Oliver, 1997; Westbrook, 1987). Emotions serve as immediate internal reactions that consumers later integrate into an overall evaluation of their experience. Positive emotions such as pleasure and enjoyment tend to enhance satisfaction because they signal that the experience is rewarding, whereas negative emotions such as stress or discomfort reduce satisfaction by indicating that the experience is undesirable (Babin & Griffin, 1998; Machleit et al., 2000; Mano & Oliver, 1993). This suggests that emotional responses play a critical role in shaping satisfaction, particularly in contexts where experiential aspects are more salient than functional performance.

Within the Stimulus-Organism-Response (S-O-R) framework (Mehrabian & Russell, 1974), satisfaction is positioned as a response shaped by internal emotional states. In this context, perceived crowding acts as an environmental stimulus that influences satisfaction indirectly through emotional mechanisms. Prior studies show that crowding affects satisfaction not only directly but also through emotions, particularly pleasure and arousal (S. Eroglu & Harrell, 1986; Kim et al., 2016; Li et al., 2009; Machleit et al., 2000). However, these findings are largely derived from retail environments, where crowding is typically associated with discomfort and reduced control.

This indicates an important limitation in the existing literature. In high-density experiential settings, such as events or festivals, crowding may simultaneously generate both positive and negative emotional responses. For example, high social density may increase excitement and enjoyment, while spatial restriction may reduce comfort. This suggests that the relationship between crowding and satisfaction cannot be fully understood without examining the underlying emotional mechanisms that shape individuals' evaluations.

Numerous studies further highlight the critical influence of emotions on satisfaction. The feelings consumers experience during a product or service interaction heavily shape their overall evaluation. Positive emotions like happiness, excitement, or pleasure generally boost satisfaction, whereas negative emotions such as frustration or anxiety tend to diminish it (Babin & Griffin, 1998; Machleit & Eroglu, 2000; Mano &

Oliver, 1993). Evidence from multiple service and retail contexts shows that consumers' satisfaction is directly affected by emotional reactions triggered by environmental factors, crowd density, or the quality of interactions (Elmashhara & Soares, 2020; Kim et al., 2016; Lee et al., 2008; Li et al., 2009; Machleit et al., 2000; Pons & Laroche, 2007). This pattern reinforces the view that satisfaction in experiential environments is closely linked to affective responses rather than purely cognitive evaluations.

3. RESEARCH METHODS

A quantitative research design was employed in this study to explore how perceived crowding influences attendees' emotions and overall satisfaction at the Comic Frontier event. The study adopted a non-probability purposive sampling technique to ensure that all respondents possessed the relevant experiential background required to evaluate the constructs under investigation.

The respondents' criteria are valid Comic Frontier attendees who had made a purchase during the event. Data collection utilized a hybrid approach, where questionnaires were distributed on-site QR code and post-event social media distribution, mainly through Google Forms. The questionnaire incorporated a mandatory initial screening question confirming both attendance and purchase activity. For post-event responses, participants were required to provide proof of a valid event ticket.

A total of 123 responses were initially collected. These responses then undergo screening process based on the predefined criteria. Responses that did not meet one or more of the requirements (respondents who did not attend Comic Frontier or did not make any purchase during the event) were excluded. As a result, 11 responses were removed, yielding a final sample of 112 valid respondents, which were deemed suitable for further analysis.

In this study, all latent variables were measured using established scales from previous research, which then will be adapted to the context of the research. Human Crowding (HC) and Spatial Crowding (SC) drew on items from Kim et al. (2016) to capture distinctions between social density and physical constraints. Satisfaction was assessed with items based on Han et al. (2019) and Elmashhara & Soares (2020). While most variables used a 7-point Likert scale (1 = Strongly Disagree to 7 = Strongly Agree), the emotional constructs, Pleasure (PL) and Arousal (AR), were measured with a 7-point semantic differential scale (e.g., Pleased/Annoyed, Excited/Calm), following the dimensional method introduced by Mehrabian & Russell (1974).

The hypotheses for the study are based on the Stimulus-Organism-Response (S-O-R) framework. This model fundamentally posits that the event's environmental conditions, referred to as the Stimulus (e.g., crowding), influence attendee's internal emotional state (the Organism), which, in turn, directly determines their satisfaction (the Response).

Crowding is conceptualized as two distinct dimensions based on the framework established by Kim et al. (2016) and Machleit et al. (2000). Human Crowding refers to the perception of high social density and the sheer number of people. Human Crowding is typically perceived positively in social and event settings, often interpreted as a sign of popularity that enhances collective excitement. Spatial Crowding refers to the feeling of physical restriction or confinement. As this limits an individual's movement and comfort, it is widely linked to negative emotions across various settings. Therefore:

H1a: Human Crowding positively influences Pleasure.
H1b: Human Crowding positively influences Arousal.

H2a: Spatial Crowding negatively influences Pleasure.
H2b: Spatial Crowding negatively influences Arousal.

Following the S-O-R framework, the emotional states experienced by the attendee are the psychological mechanism that directly shapes their overall attitude toward the consumption experience (satisfaction). Pleasure, which captures the joy and happiness derived from the event environment, is expected to be a positive factor in the attendee's overall evaluation. Arousal, which reflects the attendee's level of excitement and stimulation, may also contribute positively to the experience. However, the direct strength of its link to satisfaction is highly dependent on the specific event context. Therefore:

H3: Pleasure positively influences Satisfaction.
H4: Arousal positively influences Satisfaction.

According to the S-O-R framework, environmental stimuli such as crowding influence satisfaction indirectly rather than having a direct effect on the final evaluative judgment. Instead, this influence is theorized to be channeled through the attendee's internal emotional state (Emotions). Research in retail contexts found that while emotions often mediates the relationship between human crowding and satisfaction, the effects of spatial crowding were often not completely mediated, meaning a direct link from spatial crowding to satisfaction still remained significant even when emotions were accounted for (Machleit et al., 2000).

Given this theoretical background, emotions (Pleasure and Arousal) are hypothesized to act as the psychological bridge between the perception of density and the ultimate satisfaction with the shopping experience. Therefore:

H5a: Pleasure mediates the relationship between Human Crowding and Satisfaction.
H5b: Pleasure mediates the relationship between Spatial Crowding and Satisfaction.
H6a: Arousal mediates the relationship between Human Crowding and Satisfaction.
H6b: Arousal mediates the relationship between Spatial Crowding and Satisfaction.

The proposed theoretical model for the research was examined through Partial Least Squares Structural Equation Modeling (PLS-SEM), employing SmartPLS version 3 for the analysis. This technique was selected because its causal-predictive capabilities is highly effective for estimating complex structural relationships within specialized datasets, prioritizing the explanation of variance in dependent variables. Initially, the study evaluated the Measurement Model to confirm the constructs' reliability and validity, after which the Structural Model was being analyzed to test the proposed hypotheses.

Despite the methodological rigor employed, several limitations should be acknowledged. First, the use of non-probability purposive sampling and the focus on a single fandom-based event (Comic Frontier) limit the generalizability of the findings to other types of events or broader consumer populations. Second, the data were collected using a hybrid approach combining on-site and post-event responses, which may introduce temporal variation in emotional reporting, as immediate experiences during the event may differ from retrospective evaluations. Finally, this study relies on self-reported data, which may be subject to recall bias and social desirability effects.

4. FINDINGS AND DISCUSSION

4.1 Measurement Model Assessment (Outer Model)

The Measurement Model Assessment began by confirming internal consistency and convergent validity of the reflective constructs. Internal consistency ensures that the indicator items measuring a single construct are reliable and highly correlated with each other. Convergent validity confirms that the indicators, which are meant to measure a particular construct, are sufficiently correlated to that construct and that the construct successfully captures the variance in its items. The structural model is being shown in Figure 1.

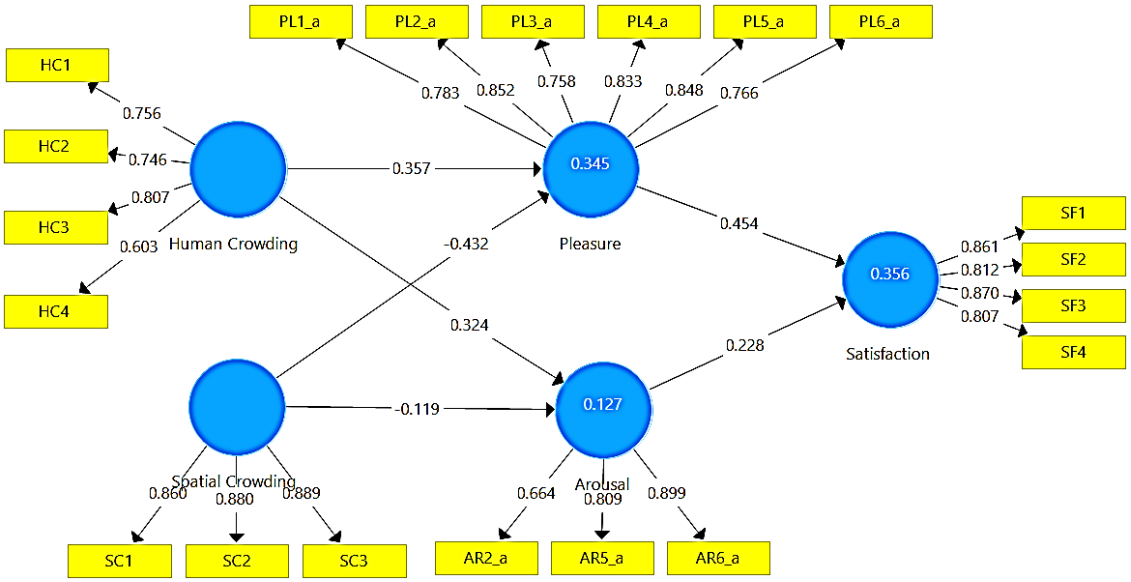

Figure 1. Research Structural Model
Source: Researchers (2025)

Evaluating internal consistency and convergent validity for the study is being done by assessing the metrics such as Outer Loadings, Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). All items were assessed using data from 112 respondents, with the outcomes presented in Table 1.

Table 1. Measurement Model Assessment

Factors and Items	Outer Loading	Cronbach's alpha	Composite Reliability	AVE
Human Crowding		0.738	0.821	0.536
There was much traffic at the event	0.756			
There were a lot of people at the event	0.746			
The event was a little too busy	0.807			
The event seems very crowded to me	0.603			
Spatial Crowding		0.849	0.908	0.768
I felt suffocated at the event venue	0.860			
I felt cramped at the event venue	0.880			
Moving around at the event venue was inconvenient	0.889			
Pleasure		0.893	0.918	0.652
Happy-unhappy	0.783			
Pleased-annoyed	0.852			
Satisfied-unsatisfied	0.758			
Contented-melancholic	0.833			

Factors and Items	Outer Loading	Cronbach's alpha	Composite Reliability	AVE
Hopeful-despairing	0.848			
Relaxed-bored	0.766			
Arousal		0.710	0.837	0.635
Excited-calm	0.664			
Wide awake-sleepy	0.809			
Aroused-unaroused	0.899			
Satisfaction		0.860	0.904	0.702
Overall, I am satisfied with my experience at the event	0.861			
My decision to shop at this event was a wise one	0.812			
I enjoyed shopping at the event venue	0.870			
This event venue met my expectations	0.807			

Source: Researchers (2025)

Outer Loadings of all indicator items are being examined. Although the preferred standard for loadings is 0.70, indicators with loadings below this value were considered for retention if their removal did not lead to an improvement in Composite Reliability or when they were deemed important for preserving the content validity of the construct, according to Hair et al. (2016). All indicators retained in the final model met acceptable loading standards.

Cronbach's Alpha and Composite Reliability (CR) was being used to analyze the reliability of the constructs. Cronbach's Alpha and Composite Reliability (CR) for all constructs surpassed the 0.70 benchmark, which indicates that the constructs have strong internal consistency. Convergent validity was assessed through the Average Variance Extracted (AVE), with all constructs surpassing the 0.50 threshold, showing that each construct explains more than half of the variance in its indicators. Discriminant validity, ensuring that each construct is distinct from the others, was being assessed using the Heterotrait-Monotrait Ratio (HTMT). As shown in Table 2, all HTMT values fell below 0.85, confirming that none of the latent variables were excessively correlated. This successful assessment verifies that the measurement scales employed are both reliable and valid.

Table 2. Heterotrait-Monotrait Ratio (HTMT)

	Arousal	Human Crowding	Pleasure	Satisfaction	Spatial Crowding
Arousal					
Human Crowding	0.413				
Pleasure	0.581	0.419			
Satisfaction	0.542	0.349	0.623		
Spatial Crowding	0.191	0.220	0.527	0.291	

Source: Researchers (2025)

4.2 Structural Model Assessment (Inner Model)

The explanatory power of the model was assessed through the coefficient of determination (R^2), reflecting the extent to which the predictors account for variance in the endogenous variables. The findings are summarized in Table 3.

Table 3. Coefficient of Determination (R^2)

	R^2	R^2 Adjusted
Arousal	0.127	0.111
Pleasure	0.345	0.333
Satisfaction	0.356	0.344

Source: Researchers (2025)

The results show that the model exhibits moderate predictive power for both Satisfaction and Pleasure, with R^2 of 0.356 and 0.345. According to guidelines by Hair et al. (2021), R^2 values of 0.25 are considered weak, 0.50 moderate, and 0.75 substantial. This indicates that the constructs of Crowding and Emotions successfully explain approximately 35% of the variance in attendee Pleasure and Satisfaction. However, the R^2 for Arousal of 0.127 falls into the weak category, suggesting that while crowding significantly influences arousal, a large portion of the variance in attendee arousal is influenced by factors external to the model.

4.3 Hypothesis Testing

To test the significant relationship of the proposed direct pathways, a bootstrapping procedure with 5,000 subsamples was conducted to obtain t-values and p-values. A path was deemed significant if the p-value was below 0.05 or the t-value exceeded the critical threshold of 1.96 at a 5% significance level. The results of the bootstrapping analysis are presented in Table 4.

Table 4. Hypothesis Testing (Direct Effect)

Hypothesis	Path	Path Coefficient	t-statistics	p-value	Decision
H1a	Human Crowding → Pleasure	0.357	4.062	0.000	Supported
H1b	Human Crowding → Arousal	0.324	3.466	0.001	Supported
H2a	Spatial Crowding → Pleasure	-0.432	7.520	0.000	Supported
H2b	Spatial Crowding → Arousal	-0.119	1.138	0.255	Not Supported
H3	Pleasure → Satisfaction	0.454	5.661	0.000	Supported
H4	Arousal → Satisfaction	0.228	2.332	0.020	Supported

Source: Researchers (2025)

4.3.1 The Effect of Perceived Crowding to Emotions

The results provide strong support for Hypothesis H1a, indicating that Perceived Human Crowding positively affects Pleasure, with a path coefficient of 0.357 and a p-value of less than 0.001. This finding aligns with the literature on "positive crowding" in hedonic environments, where social density can be interpreted as stimulating rather than constraining. In the context of Comic Frontier, the presence of attendees who share similar interests appears to enhance the social atmosphere, making the crowd itself part of the enjoyment. This findings mirrors research on leisure and festival studies, where a large number of participants enhances the liveliness and emotional appeal of the event (Kim et al., 2016). The result differs from traditional retail research, where human crowding often decreases pleasure due to blocked goals or restricted movement (Hui & Bateson, 1991; Machleit et al., 2000). However, research shows that crowd evaluations are context-dependent: in voluntary, entertainment-driven activities, crowding may be interpreted as lively and socially rewarding (Das & Varshneya, 2017; Li et al., 2009). Thus, in the context of Comic Frontier, human crowding contributed positively to pleasure.

Hypothesis H1b, which proposed that Perceived Human Crowding positively influences Arousal, was also significantly supported, with path coefficient of 0.324 and p-value less than 0.05. The result suggests that being surrounded by many people heightened feelings of excitement and alertness among attendees. The result is consistent with studies showing that social density in hedonic settings functions as a powerful environmental stimulus that energizes the experience (Li et al., 2009). Although earlier work suggested that crowding can increase tension and arousal (Stokols, 1972), more recent studies emphasize that, in entertaining environments, such arousal is often

evaluated positively (Das & Varshneya, 2017). Findings from festivals and event contexts reports that human crowding enhances emotional activation and contributes to an engaging atmosphere (Kim et al., 2016). In the Comic Frontier context, human crowding appears to generate an optimal level of arousal without becoming overwhelming or unpleasant.

Hypothesis H2a, which proposed that Perceived Spatial Crowding negatively influences Pleasure, was significantly supported, with path coefficient of -0.432 and p-value less than 0.001. This finding reinforces previous findings in environmental and consumer behavior literature, where spatial constraints tend to trigger negative emotional responses by restricting individual movement. Prior studies consistently demonstrate that physical restriction, which is caused by narrow pathways, dense layouts, or obstructive fixtures reduces positive emotions in retail and consumption settings (Hui & Bateson, 1991; Machleit et al., 2000). Similar results from Li et al. (2009) further show that spatial crowding reduces positive feelings by hindering mobility and browsing. In the context of Comic Frontier, restricted spatial capacity in high-traffic zones, particularly within merchandise aisles and queueing areas, appears to reduce enjoyment by creating discomfort and limiting navigation.

Hypothesis H2b, which proposed that Perceived Spatial Crowding negatively influences Arousal, was not supported, with p-value of 0.255. Although spatial restrictions clearly lowered pleasure, they did not noticeably affect attendees' excitement or activation levels in the context of Comic Frontier. A plausible explanation lies in the nature of high-density experiential events, where arousal is driven by multiple stimuli beyond spatial conditions. In the context of Comic Frontier, elements such as social interaction, product discovery, and event atmosphere may serve as dominant sources of stimulation, potentially offsetting the negative effects of spatial restriction. As a result, while attendees may feel physically constrained, their overall level of excitement remains sustained by other environmental and social factors.

This finding aligns with the relatively low explanatory power of the model for arousal ($R^2 = 0.127$), indicating that crowding alone is insufficient to predict arousal in complex event environments. It also supports prior arguments that arousal is a context-dependent and multidimensional construct, which may not respond uniformly to environmental constraints such as spatial density. This contrasts with earlier findings indicating that spatial crowding can decrease arousal by generating frustration or tension (Li et al., 2009; Machleit et al., 2000). However, research also highlights that emotional responses to crowding are highly context-dependent (Das & Varshneya, 2017). Therefore, spatial crowding may primarily influence evaluative emotions such as pleasure, rather than activation-based responses like arousal.

4.3.2 The Effect of Emotions to Satisfaction

The analysis confirmed Hypothesis H3, with a path coefficient of 0.454 and a p-value under 0.001, demonstrating that pleasure significantly enhances satisfaction. This outcome is in line with studies across retail, tourism, and event domains, which identify pleasure as a crucial emotional contributor to overall satisfaction (Bigné et al., 2005; Carneiro et al., 2019; Walsh et al., 2011). Prior studies note that enjoyable environments, fun activities, and positive emotional states enhance evaluative judgment of the experience, often more strongly than cognitive factors (Mattila & Enz, 2002; Westbrook, 1987). In the context of Comic Frontier, attendees experience pleasure from discovering unique merchandise, interacting with creators, and engaging with other fans who share

similar interests. As pleasure rises, attendees feel more satisfied with their participation. Thus, similar to previous findings in cultural and entertainment settings, pleasure acts as an emotional driver in shaping positive evaluations of the overall Comic Frontier experience.

Hypothesis H4 was also supported, with path coefficient of 0.228 and p-value less than 0.05, indicating that arousal positively influence satisfaction. Although prior findings regarding arousal have been mixed, some studies report a significant positive effect (Li et al., 2009; H. Song et al., 2019), while others find no direct influence (Bigné et al., 2005; Carneiro et al., 2019; Walsh et al., 2011). The current result reflects contexts in which stimulation and excitement enhance the experience. Comic Frontier is characterized by energetic crowds, dynamic interactions, and anticipation surrounding limited merchandise, which can elevate alertness and excitement without becoming overwhelming. This resembles findings in shopping environments where moderate levels of arousal contribute positively to satisfaction, whereas overly intense or under-stimulating conditions reduce enjoyment (S. A. Eroglu et al., 2005). In the context of Comic Frontier, attendees appear to interpret heightened stimulation as part of the appeal, especially as participation is voluntary and highly goal-oriented. Therefore, arousal is valued as a performance cue that elevates the emotional intensity and memorability of the experience, contributing positively to overall satisfaction.

4.3.3 Mediating Effect of Emotions

To examine whether emotional states (pleasure and arousal) mediate the relationship between perceived crowding (both human and spatial) and satisfaction, a bootstrapping procedure with 5,000 resamples was employed at a two-tailed 0.05 significance level. Following Hair et al. (2016), bias-corrected and accelerated (BCa) bootstrap confidence intervals were used to assess the significance of indirect effects. This method does not require the normality assumption in the sampling distribution of indirect effects and offers greater accuracy and statistical power than traditional approaches such as the Sobel test (Hayes, 2017; Hayes & Scharkow, 2013). An indirect effect is deemed significant if the 95% BCa confidence interval does not contain zero. Hence, in this study, interpretation of mediation significance is based primarily on BCa confidence intervals, while t-statistics and p-values are reported only for completeness (Hair et al., 2016). The bootstrapping result for indirect effect will be shown in Table 5.

Table 5. Hypothesis Testing (Indirect Effect)

Path	Path Coefficient	t-statistics	p-values	95% BCa Confidence Interval	Significance
Specific Indirect Effects					
H5a: Human Crowding → Pleasure → Satisfaction	0.148	2.882	0.004	[0.060, 0.253]	Supported
H5b: Spatial Crowding → Pleasure → Satisfaction	-0.184	3.870	0.000	[-0.291, -0.102]	Supported
H6a: Human Crowding → Arousal → Satisfaction	0.071	1.703	0.089	[0.006, 0.162]	Supported (CI excludes zero)
H6b: Spatial Crowding → Arousal → Satisfaction	-0.027	0.916	0.360	[-0.107, 0.015]	Not Supported
Total Indirect Effects					
Human Crowding → Satisfaction	0.219	3.612	0.000	[0.092, 0.326]	Supported
Spatial Crowding → Satisfaction	-0.211	3.953	0.000	[-0.316, -0.108]	Supported

Source: Researchers (2025)

The mediation analysis strongly indicates that emotions are the crucial link connecting perceived crowding to satisfaction. The specific indirect effects through emotional states were significant for most paths. Pleasure significantly mediates the relationship between both human and spatial crowding and satisfaction, as confirmed by the BCa confidence intervals not containing zero. Therefore, H5a and H5b were supported. These findings suggest that attendees' perceived enjoyment transformed crowding experiences into satisfaction.

Similarly, the human crowding → arousal → satisfaction path was also supported, despite a marginal p-value of 0.089, as the BCa confidence interval did not include zero. This indicates significance under the bootstrapping criterion (Hair et al., 2021), supporting H6a. However, the spatial crowding → arousal → satisfaction path was not supported, as the BCa confidence intervals includes zero and p-value of 0.360, indicating that arousal induced by spatial constraints may not necessarily lead to satisfaction.

Furthermore, both total indirect effects of Human Crowding to Satisfaction and Spatial Crowding to Satisfaction were significant, with path coefficients of 0.219 and -0.211. This confirms that perceived crowding influences satisfaction only through emotional responses rather than direct perceptual evaluation.

5. CONCLUSION

This study was conducted to explore the psychological processes connecting perceived crowding and satisfaction at the Comic Frontier event, utilizing the Stimulus-Organism-Response (S-O-R) framework. The findings highlighted a clear differentiation between human crowding and spatial crowding. Human Crowding was confirmed to be a source of positive engagement, significantly increasing both Pleasure and Arousal. Conversely, Spatial Crowding negatively and significantly affected Pleasure, confirming that the physical restriction diminishes enjoyment. Furthermore, both Pleasure and Arousal were validated as direct, positive drivers of overall Satisfaction.

The findings indicate that emotional responses, especially pleasure, serve as important mediators linking crowding to satisfaction. This supports recent studies in experiential and leisure contexts, which emphasize that affective responses, particularly pleasure-based emotions such as joy, play a central role in translating environmental stimuli into evaluative outcomes (Stemmer et al., 2024). Both human and spatial crowding affect satisfaction indirectly through pleasure, implying that attendees' emotional experiences can convert potentially negative perceptions of crowding into positive outcomes when the event environment is engaging and enjoyable. In contrast, arousal showed a weaker and inconsistent mediating effect, indicating that heightened stimulation does not always translate into satisfaction in highly crowded environments. The indirect effect for both human and spatial crowding on satisfaction were significant, supporting the notion that the influence of crowding channeled through emotional mechanisms (the S-O-R framework).

Practically, the findings give valuable insights for event organizers and venue managers on how to manage crowding more strategically. Spatial crowding reduced pleasure when movement felt restricted. This means event planning must carefully consider how people circulate through the venue, how queues are organized, and how space is allocated. Providing wider pathways, directional flow planning, real-time crowd monitoring, and clear signage can reduce congestion without diminishing the vibrant social atmosphere of the event. In short, density should be managed, not eliminated. A crowded space can remain enjoyable when attendees feel they can move freely, explore

booths, and engage with others. Event success relies on maintaining this balance, where the presence of many people enhances the atmosphere, while spatial constraints are minimized to preserve comfort and emotional experience.

Despite these contributions, this study is subject to several limitations that should be considered when interpreting the findings. First, the research focuses on a single fandom-based creative event, which may limit the generalizability of the findings to other types of events or consumer settings. Second, the sample consists of attendees from one event with relatively homogeneous interests and motivations, which may not reflect broader consumer populations. Third, the use of a hybrid data collection method (on-site and post-event) introduces potential temporal bias, as emotional responses may differ between real-time experiences and retrospective evaluations. Fourth, although measurement validity and reliability thresholds were met, several indicators exhibited lower outer loadings below the recommended threshold of 0.7, possibly due to unequal exposure to environmental stimuli across respondents. Fifth, the model did not incorporate moderating variables such as crowding tolerance, task orientation, or time pressure, which may explain variations in emotional and satisfaction responses. Lastly, the reliance on self-reported data introduces the possibility of recall bias and social desirability effects, potentially affecting the accuracy of reported experiences.

Building on these limitations, several directions for future research are proposed. Future research should extend the model across diverse event contexts, such as exhibitions, food festivals, or beauty conventions, to examine the robustness and contextual consistency of crowding effects in how it affects satisfaction. Comparative studies across different types of experiential environments would provide deeper insights into whether the positive perception of human crowding is unique to fandom-based communities or generalizable to other settings. Additionally, future research should incorporate moderating variables, such as individual crowding tolerance, motivation, or time pressure to better explain heterogeneous responses to crowding. Introducing these moderators into the model will clarify under what conditions crowding leads to negative emotional outcomes (such as reduced Pleasure) or if attendees employ coping strategies, thus providing a more comprehensive theoretical understanding of consumer responses to density.

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