

The influence of design, ambient factors, and social interaction in food truck settings on visitors' perceptions

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Abstract

Food trucks have recently emerged as a prominent trend across a wide range of events, from culinary festivals to public gatherings. As a growing sector within the culinary industry, food truck design must balance operational efficiency with a supportive working environment. Understanding current food truck conditions is therefore essential for mapping both the physical and psychological needs of visitors. While previous studies have primarily examined layout and workflow from an employee operational standpoint, limited attention has been given to the psychological environment that shapes visitor experience. This research employs a quantitative approach using questionnaire-based visitor responses to capture perceptual evaluations without predicting or manipulating behavioral outcomes. The study began with interviews and field observations, followed by a main questionnaire in which research stimuli were presented as dependent variables and visitor perceptions of Bandung food trucks served as independent variables. Collected data were categorized and analyzed to identify key perceptual drivers. The findings indicate that design variables particularly color and form are the most significant factors influencing visitor perception, with color receiving 64% "strongly agree" and 36% "agree," and form receiving 50% "agree," 25% "strongly agree," and 25% "abstain." The implications of these findings highlight the need for food truck operators to prioritize visual coherence, brand-aligned color strategies, and well-articulated vehicle forms to enhance perceived quality and increase purchase intention. Additionally, understanding perceptual factors can guide designers and policymakers in shaping more user centered mobile culinary environments that support both commercial effectiveness and visitor comfort.

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Introduction

Food trucks in major Indonesian cities such as Jakarta and Bandung have demonstrated rapid empirical growth. Recent data indicate that the industry's market value reached USD 1.1 billion in 2024–2025 [1]. Their mobility, spatial efficiency, and low operational barriers position food trucks as competitive alternatives to traditional restaurants [2]. These factors are underpinned by urbanization trends and rising demand for quick-service meals [3]. Food trucks are defined as mobile kitchen vehicles that operate entirely from cooking to serving [4]. This operational model enables strong competitiveness in a market projected to expand through 2031 [1]. Their rising popularity, reflected in a USD 1.1 billion market valuation, presents a critical issue, consumer difficulty in evaluating and differentiating among abundant food truck options. According to Baker, perception overload in high-choice environments increases cognitive load, negatively impacting purchase intention and brand impressions [5]. Empirical evidence shows this leads to decision paralysis and reduced conversion rates in street food settings [2]. In retail and service environments, consumer perception defined as the evaluative and affective process through which individuals select, organize, and interpret environmental stimuli to form emotional responses and brand judgments, that significantly influences purchasing decisions, brand impressions, and visitor satisfaction [6]. In the context of food trucks, perception is shaped by multiple stimuli including visual design, ambient conditions, and social interaction. Consequently, understanding which environmental variables most strongly influence visitor perception has become an increasingly relevant concern in contemporary design and consumer research.

Previous studies have addressed this issue by examining food trucks primarily from operational, spatial, and ergonomic perspectives. Werdaningtyas et al. analyzed internal layout efficiency and found that optimized worker workflows reduced food preparation time [7]. Sathatip explored vehicular kitchen organization, confirming that compact designs enhanced operational productivity despite compromising worker comfort [8]. However, Kim et al. critiqued these approaches for neglecting the consumer perspective, where respondents reported that invisible internal layouts still influenced quality perceptions through service speed [9]. Research in environmental psychology and retail design further establishes that design cues, social elements, and ambient factors influence consumers evaluations, purchase intentions, and service expectations [5], [10]. Visual factors such as color, form, graphics, and menu legibility contribute substantially to initial purchasing decisions in retail environments [11], where studies report visual merchandising influencing 60% of in-store choices for apparel and grocery products [12]. However, in mobile food truck settings, this effect is moderated by spatial constraints, eye-tracking research shows shoppers allocate only 6.7 seconds to visual cues at point-of-purchase before service speed dominates decision-making [13], while social interaction indicators, particularly staff behavior, also contribute to perceived service quality [6]. Ambient conditions, including scent, lighting, and sound, have

similarly been analyzed as determinants of comfort and user experience [10]. No previous research has simultaneously examined the influence of visual design, ambient conditions, and social interaction on food truck visitors' perceptual experiences within the context of mobile culinary settings in Indonesia. While local studies have explored Bandung consumer perceptions in traditional food trucks, no integrated three variable approach within a mobile retail environment framework exists. This gap limits the extension of Baker's servicescape model from stationary retail to dynamic culinary contexts, where mobility and spatial constraints moderate standardized stimulus perception relationships. The objective is to identify which elements exert the strongest influence on visitor perceptions within the context of Bandung's rapidly expanding food truck industry, employing a quantitative approach with structured questionnaires to assess the perceptual impact of environmental factors on food truck visitor evaluations.

Method

Preliminary field observations conducted by the research team at three food truck festivals in Bandung over two weekends in September 2025 revealed that diversity of food offerings and distinctive visual truck appearances correlate with visitor dwell time and purchase inquiries. These unstructured observations, spanning 12 hours across 15 food trucks, identified the surrounding environment as a contextual factor influencing initial visitor engagement, though lacking systematic controls. The actual conditions of food trucks in Bandung, a city renowned for its rapid growth in the food truck culinary scene served as the situational reference in this questionnaire. Respondents were asked to evaluate their experiences based on actual visits or direct observations of current food truck conditions in Bandung, rather than through photographs or hypothetical scenarios. This study employed a cross-sectional quantitative descriptive design using structured questionnaires as the primary instrument to measure visitor perceptions and identify the most influential food truck environmental factors. According to Sugiyono, a questionnaire is a data collection technique in which respondents are given a written set of questions or statements to answer [14]. The questionnaire was distributed to 40 Bandung university students through purposive sampling as the main exploratory study. This sample size is justified for descriptive perceptual analysis of food truck visitors, given resource constraints and the homogeneous target population characteristics (active food truck visitors aged 19-24). The perceptual indicators were developed from literature on store environment studies, particularly Baker's framework, which identifies design, ambient, and social cues as core components influencing consumer perception and behavior [5]. Drawing from Baker's framework, three independent variables were operationalized as presented in Table 1.

Table 1. Operationalization of independent variables based on baker (2002) framework

Variable	Operational Definition	Indicators	Number of Items	Sample Likert Item (1-5)
Design - Form	Perception of food truck vehicle physical shape	Silhouette shape, proportions, exterior features	2	“The food truck shape appears professional”
Ambient - Cleanliness	Perception of operational area hygiene levels	Visible cleanliness, hygiene standards	2	“The food truck appears clean and well-maintained”
Social - Staff Interaction	Perception of personnel service quality	Staff friendliness, responsiveness	2	“Staff service is prompt and friendly”

From Baker’s framework, three independent variables were focal: form (design, 2 items), cleanliness (ambient, 2 items), and staff interaction (social, 2 items). These items were adapted from the store environment framework, translated into Indonesian for the Bandung context, and measured using a 5-point Likert scale (1=strongly disagree, 5=strongly agree). The dependent variable in this study was the perceived condition of the food truck. This study employed a pure quantitative approach with structured questionnaires as the sole primary data collection instrument. The previously mentioned field observations and operator interviews constituted pre-research exploratory activities for instrument development, not components of the main data analysis. The literature review served to construct the theoretical framework of Baker, rather than functioning as a data collection technique. Questionnaire data were analyzed using descriptive statistics in Microsoft Excel, specifically frequency distributions and percentage rankings of Likert-scale responses to identify the relative strength of perception factors (color, form, cleanliness, staff interaction) without inferential testing. Analysis results were interpreted through the lens of consumer perception theories and public facility design literature, particularly within the food truck context, to derive final conclusions and implications. This process ensured findings were not only data-driven but also theoretically anchored, enhancing their relevance for both academic inquiry and practical application.

Results and discussion

Questionnaire analysis indicates that visual appearance and surrounding environment of food trucks are considered important by visitors in forming brand perceptions and choice preferences. Six closed-ended questions examined three independent variables (design, ambient environment, social factors), with two items per variable, yielding the following composite scores (mean \pm SD, N=40):

Table 2. Composite scores of independent variables (Mean \pm SD, N=40)

Variable	M \pm SD	Composite Calculation
Design (2 items)	3.75 \pm 0.89	Average of form items
Ambient (2 items)	4.25 \pm 0.67	Average of cleanliness items
Social (2 items)	3.95 \pm 0.78	Average of staff interaction items

The results reveal that visual and environmental cues, such as color, form, and cleanliness, drive visitor perceptions, underscoring the role of environmental psychology and retail design principles in mobile culinary settings [10], [11]. This suggests that food truck operators should prioritize visually distinctive designs and high standards of cleanliness.

Design Variables

The design indicators examined two key aspects of the food truck's visual identity: color appearance and vehicle form. As shown in Figure 1, most respondents (63% "strongly agree" and 37% "agree") predominantly recognized color as an important visual factor in shaping perception, consistent with Baker's view that color functions as a visual cue influencing consumer evaluations [5]. Distinctive palettes not only attract attention but also convey brand identity, culinary style, and emotional tone. Similarly, responses regarding vehicle form (25% "strongly agree," 50% "agree," and 25% "abstain") indicate that structural design moderately affects visitor perception and engagement. Elements such as silhouette, proportions, and exterior features communicate cuisine type, professionalism, and uniqueness while influencing service interaction and perceived quality. Together, color and form serve as aesthetic and psychological instruments that define first impressions, enhance recognition, and reinforce brand identity in the competitive street-food landscape.

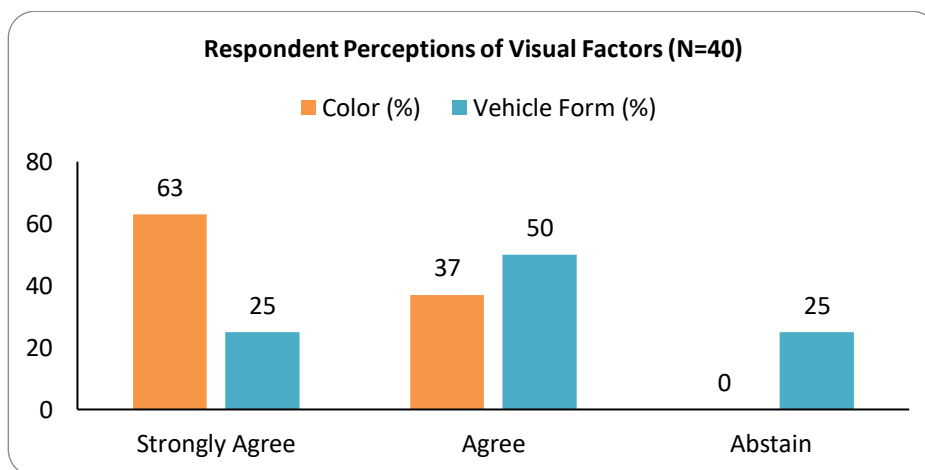


Figure 1. Results of processing data for question design variables using microsoft excel.
Source: Personal Documentation

Environmental Variables

The environmental analysis revealed contrasting influences between ambient sound and cleanliness on visitors' perceptions of food trucks. As shown in Figure 2, half of the respondents (50%) were neutral toward background noise, while only 13% "agree" or "strongly agree," suggesting that sound plays a minor role in shaping perception. These findings appear to differ from Baker's environmental framework [5], potentially due to Bandung's open-air festival settings where ambient sounds such as traffic, music, and crowd chatter are perceived by respondents as uncontrollable background elements. In contrast, cleanliness received the highest agreement, with 25% of respondents "agree" and 75% "strongly agree" that hygiene directly influences their impressions. Aligning

with Baker's emphasis on environmental hygiene, visible cleanliness functions as a key indicator of food safety, professionalism, and brand credibility [5]. A well-maintained space builds trust and comfort, enhancing aesthetic appreciation and reinforcing positive brand identity. Unlike auditory cues, cleanliness represents a tangible, manageable attribute, making it a strategic priority for influencing customer perception and purchase intention in the mobile dining context.

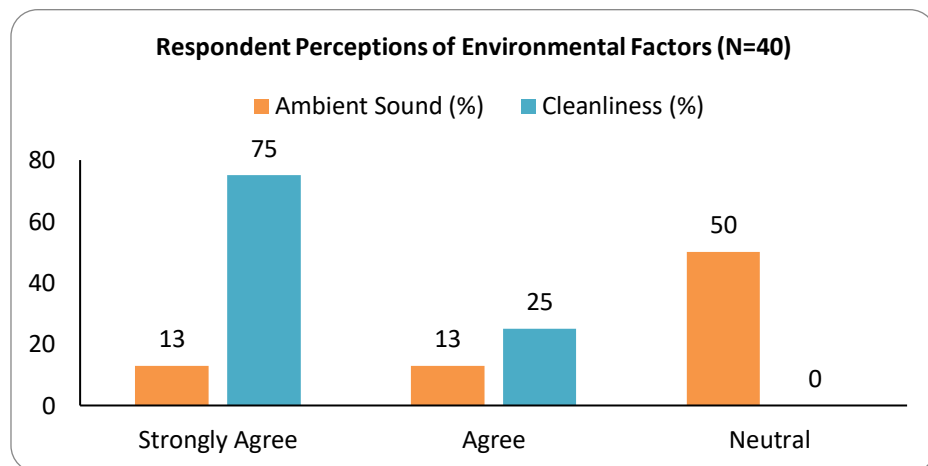


Figure 2. Results of data processing for question environmental variables using microsoft excel.
Source: Personal documentation

Social Variables

The social dimension analysis revealed that among the two factors examination of customer presence and staff service quality revealed that the latter was more frequently endorsed by respondents as influencing visitor perceptions. As illustrated in Figure 3, 60% of respondents remained neutral toward the presence or behavior of other customers, while only 32% agreed that it affected their perception, suggesting minimal social influence within food truck environments. Food truck visitors prioritized convenience and product quality over social ambiance, as indicated by respondent endorsement patterns. In contrast, 55% "agree" and 45% "strongly agree" that interactions with staff significantly shape their overall impressions. Consistent with Baker's environmental framework, service staff function as key mediators of customer experience brief yet highly personal exchanges that reflect brand professionalism and reliability [6]. Positive service interactions foster satisfaction, trust, and loyalty, reinforcing the food truck's perceived quality and reputation. Thus, while peer presence exerts minimal effect, attentive and friendly service emerges as a decisive social factor driving visitor engagement and long-term brand success in the mobile culinary context. Overall, the findings indicate that among all examined variables, color and cleanliness received the highest levels of respondent agreement regarding visitor perception, followed by staff service quality and vehicle form. These results reinforce earlier research on store environment, which consistently shows that visual and hygienic cues exert a powerful influence on consumer evaluations and purchase intentions [5].

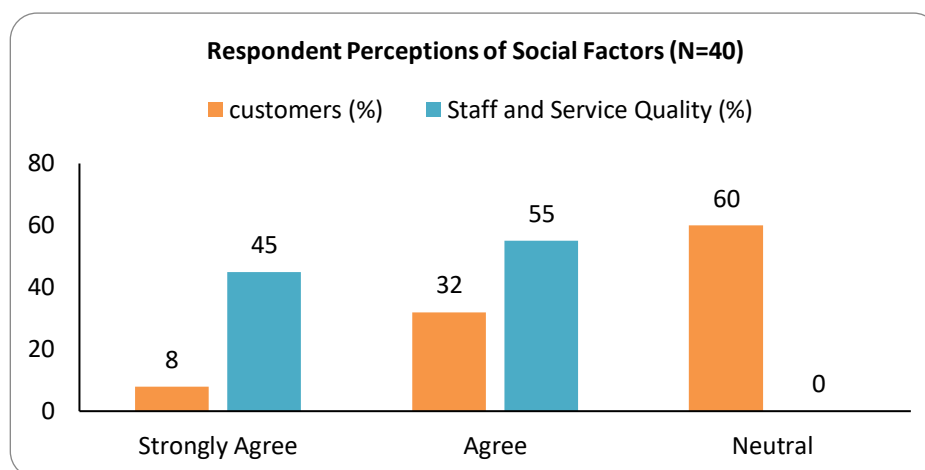


Figure 3. Results of data processing for question social variables using microsoft excel.
Source: Personal documentation

These findings also align with recent studies on store atmosphere, where visual and hygienic cues consistently influence consumer evaluations, as demonstrated by Pratama et al. [15], and El-Said & Fathy [16]. The strong impact of color highlights its ability to communicate brand identity and capture attention in competitive culinary settings, while cleanliness directly signals hygiene and food safety as a key factors when food is prepared and served on-site. Likewise, positive interactions with staff enhance trust and satisfaction, and the distinctive form of the vehicle contributes to brand differentiation and memorability. In contrast, ambient sound and the presence of other customers demonstrate comparatively weaker effects, suggesting that sensory and social cues not directly tied to food quality or service are less decisive in shaping visitor perceptions. These findings emphasize that for food truck operators seeking to strengthen brand image and drive customer engagement, strategic investment in visual design, rigorous hygiene practices, and high-quality customer service will have a more substantial impact than relying on external or uncontrollable environmental factors.

Conclusion

This study systematically investigated visitor perceptions of the physical appearance and environmental characteristics of food trucks through a detailed analysis of the primary components delineated in Baker's comprehensive store environment framework, encompassing design, ambient, social, and environmental dimensions [5]. Questionnaire findings reveal that visual design elements particularly color and form, alongside cleanliness in the surrounding environment consistently garnered the highest levels of respondent agreement concerning their perceived role in shaping visitor impressions, whereas factors such as ambient sound and the presence of other customers exhibited comparatively lower endorsement rates among participants. These descriptive patterns underscore the applicability and pertinence of traditional retail environment dimensions to the distinctive context of mobile culinary enterprises operating within Bandung's bustling open-air festival settings, without implying direct

causal linkages or statistical significance, given the purely exploratory and non-inferential nature of the research design.

Meaningful theoretical, practical, and contextual contributions emerge from the documented insights into respondent preferences. Theoretically, these findings extend and affirm the robustness of Baker's framework by demonstrating its applicability beyond conventional brick-and-mortar retail configurations to the dynamic domain of Indonesian food trucks, where visual and cleanliness cues retain their prominence across culturally distinct festival environments. Practically, food truck operators are advised to strategically prioritize the selection of striking and appealing colors for vehicle exteriors and to maintain impeccably visible cleanliness standards in operational areas as immediately actionable interventions to enhance positive visitor perceptions. Contextually, the results offer valuable illumination into the specific perceptual dynamics predominant in Bandung's festival ecosystem, wherein tangible physical and service attributes appear to supersede social crowding factors in influencing attendee evaluations. Research limitations warrant candid acknowledgment, including dependence on a relatively small and homogeneous sample of 40 university students aged 19–24 years, which inherently constrains the generalizability of findings to more diverse populations varying in age, socioeconomic status, cultural backgrounds, or consumption habits, exclusive reliance on a single theoretical framework without integrating complementary multidisciplinary lenses, and the absence of inferential statistical testing or comparative analyses. Future investigations should broaden demographic scopes to encompass varied age groups, genders, and professional profiles, adopt mixed-methods approaches combining quantitative modeling such as regression analysis with qualitative techniques like in-depth interviews, and incorporate additional theoretical perspectives including environmental psychology, service-dominant logic, or experiential marketing paradigms to generate more robust, externally valid insights that advance the multidisciplinary discourse on design strategies and consumer behavior within the rapidly evolving global landscape of mobile culinary businesses.

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