
Redesigning the Hotel Breakfast Servicescape: Integrating Emotional Insights and Staff Perspectives

Brina Maria Antunez Pineda¹ , Álvaro E. Arrieta-Valle¹ 

¹ CETT Barcelona School of Tourism, Hospitality, and Gastronomy, University of Barcelona

While emotions are central to hospitality experiences, the buffet breakfast, an emotionally charged and frequent guest touchpoint, remains underexplored in this sense. This study investigates how both physical and social elements of the breakfast servicescape influence guest emotions, and whether targeted redesigns can improve the emotional quality of the experience. Conducted at the Alimara Hotel in Barcelona, the study applies a triangulated, mixed-method approach that integrates emotional tracking using non-intrusive neurosensors, staff input gathered through co-creation sessions and structured questionnaires, and principles from evidence-based design. Emotional and cognitive data were collected before and after a spatial redesign and product improvement intervention. Findings show that prior to the intervention, guests predominantly experienced disappointment and disinterest. Post-intervention, neutral and satisfied emotional states arose and staff reported workflow improvement. This study contributes to hospitality research by demonstrating how emotional data and staff perspectives can inform the redesign of high-autonomy service settings.

Introduction

Emotions are central to the hospitality experience. Unlike purely functional services, hospitality encounters are inherently affective, shaped by the physical and social environments in which they occur. Guests' emotional responses play a critical role in shaping satisfaction, memory, and loyalty (Mano & Oliver, 1993; Liljander & Strandvik, 1997). In this context, the servicescape, including both physical design and human interactions, becomes key for influencing customer emotions (Bitner, 1992; Line & Hanks, 2020). As prior literature in hospitality and service design suggests, the emotional valence of these experiences not only reflects the quality of service delivery but also acts as a predictor of future behavioral intentions.

Given this centrality of emotions, a pressing challenge for hoteliers is how to proactively design or redesign hospitality spaces to elicit more positive emotional responses. While traditional approaches often rely on architects' or designers' intuition, this method may lack empirical grounding and fail to capture the dynamic and subjective nature of emotional experience. Instead, we propose that hospitality spaces can be redesigned more effectively through a triangulation method that integrates real-time emotional tracking of guests, staff perspectives, and principles of evidence-based spatial design. Triangulation involves examining the same phenomenon or research question using multiple sources of data to enhance the depth and validity of findings (Decrop, 1999).

To explore the practical application of this triangulated approach, the study focuses on a real-world case: the breakfast buffet restaurant of a four-star urban hotel in Barcelona, the Alimara Hotel. Using a mixed-method design, it combines second-by-second guest emotional tracking via non-intrusive neuromarketing sensors, staff insights, and a spatial redesign informed by both data streams and grounded on evidence-based design principles.

A post-intervention phase assessed the emotional and operational impact of the changes. Through this case, the study evaluates whether emotionally driven, co-created redesigns can meaningfully enhance guest experience and offer a scalable model for other hospitality settings.

Next, the paper reviews the relevant literature on emotions in service experiences, with a particular focus on hotel breakfasts, and defines relevant interdisciplinary fields grounded in neuroscience that offer a framework for understanding how environmental stimuli shape emotions in real time. The methodology section presents a triangulated approach that combines real-time emotional tracking via neuromarketing sensors, staff insights gathered through co-creation sessions, and evidence-based design principles. The paper concludes by discussing the outcomes of the redesign, practical implications for hospitality managers, and directions for future research on emotion-driven service environments.

Related Literature

Emotions in Customer Experience

Emotions are recognized as key elements of the perceived quality of service experiences. To understand how experiences generate value, it is essential to define the emotional processes involved. Emotions are mental states elicited by cognitive appraisals of events or thoughts (Bagozzi et al., 1999), and, as embodied physiological responses, they often manifest through facial expressions and bodily reactions. Pine and Gilmore (1998) conceptualize the experience economy as one in which companies design services as theatrical performances, where services are the stage and goods function as instruments to create emotionally charged and memorable encounters. These experiences engage customers on a personal level, prompting subjective interpretations and responses. Consequently, the value of an experience lies in the emotional sensations it evokes. As Poulsson and Kale (2004) argue, the perceived utility of an experience is shaped by both the intensity of the encounter and the degree of emotional resonance it generates for the individual consumer.

Beyond shaping the service experience itself, emotions also play a critical role in post-consumption evaluations, most notably in determining customer satisfaction. According to Ali et al. (2016), emotions are strong determinants of guest satisfaction in resort hotels settings, aligning with Mano and Oliver (1993) view of satisfaction not as a singular affective response, but as a complex emotional state influenced by other positive and negative emotions. Expanding on this perspective, Liljander and Strandvik (1997) argue that negative emotions strongly influence satisfaction outcomes. Their findings indicate that while moderate emotional responses may have little impact, intense negative emotions tend to significantly diminish satisfaction. In contrast, even strong positive emotions do not necessarily produce a corresponding increase in satisfaction, suggesting an imbalance in the emotional contribution to customer satisfaction.

Breakfast as an Emotional Experience

Within the context of hotel stays, meals, and particularly breakfast, are emotionally significant experiences that shape guest perceptions and satisfaction. Leite-Pereira et al. (2019) emphasize that meals contribute to both positive and negative emotional memories, which subsequently influence overall evaluations of the stay. Subsequent research by Leite-Pereira et al. (2022) further reinforces the importance of hotel breakfasts by demonstrating that they play a role not only in guest satisfaction but also in hotel choice and customer loyalty. Given that breakfast is frequently included in the accommodation rate, its perceived importance is elevated.

Moreover, Leite-Pereira et al. (2020) found that breakfast is mentioned in more than half of guest reviews on booking platforms, underscoring its prominence in post-stay reflections through electronic word-of-mouth. These online reviews are crucial in shaping consumer decision-making, as they help reduce information asymmetry between prospective guests and hospitality service providers (Mo et al., 2015; Manes & Tchetchik, 2018).

Existing research has examined hotel breakfast primarily from the perspectives of pricing, product offerings, and guest behavior. Anguera-Torrell and Nicolau (2025) demonstrated that the likelihood of booking a breakfast-included hotel room is dependent on the accommodation rate. Illescas-Manzano et al. (2025) further found that hotel category and online reputation enable managers to set higher breakfast prices. Shifting focus from pricing to product offering, Lee et al. (2018) identified guest preferences for specific food and beverage breakfast items such as fruit bowls, waffles, scrambled eggs, and coffee. Expanding on this, Leite-Pereira et al. (2023) identified differences in terms of breakfast product preferences based on demographic factors such as age, gender, and country of origin. Another critical area of research is the food waste in buffet-format hotel breakfasts. Juvan et al. (2018) identified concrete guest and breakfast characteristics that lead to higher food waste, such as buffet layout, crowdedness, and guest nationality. Despite these diverse lines of research, emotional responses during the hotel breakfast experience remain largely underexplored.

Earlier studies have demonstrated that both physical and social elements of the servicescape can shape the dining experience, particularly in fast-casual restaurant settings (Line & Hanks, 2020). Bitner (1992) conceptualized the servicescape as the set of environmental features in which a service encounter occurs. These features encompass both physical components (e.g. layout, lighting, and ambiance) and social components, including human presence and interpersonal interactions. Staff performance has been identified as a core element of service delivery in economic exchanges, directly influencing customer perceptions and satisfaction (Grandey et al., 2005). Hotel buffet breakfasts present a distinct setting characterized by high guest autonomy and self-service dynamics. These intrinsic features make the breakfast setting particularly relevant for studying how physical and social factors shape real-time guest emotional responses. Emerging fields such as neuromarketing and neuroarchitecture offer potential frameworks for decoding emotional responses that traditional guest satisfaction measures may overlook.

Neuromarketing and Neuroarchitecture

Neuroscience becomes particularly relevant within the servicescape framework where fields such as neuromarketing and neuroarchitecture help explain how design and sensory cues drive emotional responses. While neuromarketing applies neuroscientific methods to analyze human behavior regarding marketing exchanges (Lee et al., 2007), neuroarchitecture integrates them to investigate how the built environment influences human cognition, emotions, and behavior (Lee et al. 2022). These interdisciplinary fields, including physiological and neurological measurement methodologies, can generate evidence-based insights for the design of spaces that support health, performance, aesthetics, and emotional wellbeing.

Previous studies underscore the applied value of integrating neuro-based insights in designing different servicescapes. Vecciato et al. (2015) explored, through brain activity measurements, emotional and physical responses from individuals towards architectural environments, contributing a space design more oriented to pleasantness and comfort. Also, Rosebaum et al. (2019), by performing an EEG study, they were able to show that biophilic retail design triggers positive neural responses such as reduced stress, increased engagement and attention, and excitement.

The following study builds on this potential by using neuro-sensor technology to examine guest emotional responses within the breakfast servicescape. A mixed-method approach combines neurophysiological tracking with staff input to capture how physical and social features influence guest experience. This enables a more nuanced understanding of emotional dynamics and supports evidence-based improvements to space and service redesign.

Methodology

The methodology followed consisted of several phases:

Phase 1: Data Collection Through Neuromarketing Sensors

Emotional and behavioral data were collected between October and November 2024 using an observational methodology based on second-by-second emotion tracking in a real-world buffet breakfast setting at the Alimara Hotel in Barcelona, Spain. Emotional responses were captured using non-intrusive neuroanalysis sensors powered by an artificial intelligence engine (Golineuro AI). The sensors were installed at strategic locations at the breakfast restaurant of the hotel. These sensors detect microexpressions and convert them into binary-coded data representing discrete emotional and cognitive states, including their corresponding intensity levels. These sensors do not store video images, thereby preserving guest anonymity and ensuring ethical compliance. The emotional data is complemented by contextual observations.

This data collection was followed by an aggregated-level analysis to identify the patterns of use, perceptions, and interactions that serve as a basis for improving both guest satisfaction and operational efficiency. After this, to further estimate the effect of physical and social elements of the servicescape on guest emotions, exploratory regressions were estimated on a subsample of guests to examine whether specific physical and social elements of the servicescape were related to guests' emotional responses. Using OLS with guest-level fixed effects, the models included variables indicating guest activities, visual focus, and position, as well as staff activities, staff position, and buffet fullness. Interactions between buffet fullness and guest visual focus categories were also tested, along with a measure of stay progress.

Phase 2: Staff and Stakeholders Insights Collection for Redesign

In this phase, the intervention team actively incorporated staff perspectives as a key input to the spatial redesign of the buffet area. Kirillova et al. (2018) argue that aesthetic pleasure derived from workplace design is positively linked to employee subjective well-being, especially when employees perceive the space as unified, varied, and moderately typical. Thus, before executing any spatial modifications, a focus group gathering staff members from the buffet restaurant to understand how the existing design affected their workflow and perceived guest reactions. These insights helped ensure that the redesign was not only guest-centric, but also staff-inclusive and psychologically supportive.

Phase 3: Implementation of the Redesign

The spatial redesign was implemented based on the triangulation of three key inputs: (1) aggregated emotional and attentional data from guests captured via the neuroanalysis sensors in Phase 1, (2) insights and practical suggestions gathered from the staff in Phase 2, and (3) design principles aligned with evidence-based hospitality architecture.

Phase 4: Post-Implementation Staff Feedback and Final Analysis

A new round of data collection was conducted to evaluate the impact of the intervention. This involved two parallel strategies:

- Quantitative replication of neuromarketing sensor analysis: Emotional and attentional data from guests were collected again, using the same measurement instruments and placement protocols from Phase 1, ensuring methodological consistency. This allowed for a pre/post comparison of guest emotional and cognitive responses to the redesigned environment.
- Qualitative feedback from staff: Employees who had been involved in the initial consultation were asked to provide feedback on the functionality, emotional climate, and guest reactions they observed in the new setting. This was done through a structured anonymous questionnaire. Staff were invited to comment not only on their own workflow but also on perceived guest behaviors (e.g., hesitation, satisfaction, frustration) as observed during service.

Results

In the initial data capture using neuromarketing sensors, the predominant guest emotion during the breakfast experience was disappointment. Although guests entered the space with positive anticipation, emotional tracking revealed a decline as they interacted with the buffet and spatial elements, ending the experience with disinterest. The most intense drop occurred at the buffet, suggesting unmet expectations in food variety or presentation. This aligns with Bitner's (1992) conceptualization of the servicescape, where environmental design elements shape emotional responses during the service encounter. Similarly, lighting (natural and artificial) and furniture contributed to negative emotional responses. Conversely, social interactions presented a more positive emotional landscape. Engagements with staff were frequently associated with emotions of interest and joy, and guest-to-guest interactions similarly demonstrated a predominance of positive affect, which aligns with the argument of Grandey et al., (2005) on the influence of customer-staff interactions and their impact on customer satisfaction. Three recurring guest friction points emerged: (1) the reception desk visually blocked part of the buffet, complicating orientation; (2) negative emotions were observed during the consumption of coffee and juice, possibly linked to quality; and (3) visual rejection was noted toward cold cuts, likely due to presentation.

To further inspect these relationships, second-by-second exploratory regression analyses were conducted on emotional activation levels regarding disinterest and disappointment using a subsample of guests. Models included individual-level fixed effects and clustered robust standard errors. In the case of disinterest, activation levels were significantly higher when guests were wandering ($\beta = 0.254, p < 0.1$) and lower when staff were clearing tables ($\beta = -0.260, p < 0.05$). While no guest position or visual focus variables reached individual significance, an interaction effect revealed that guests looking at coffee when the buffet was full exhibited reduced disinterest ($\beta = -0.814, p < 0.1$). In the case of disappointment, no predictors reached significance.

The implemented redesign of the buffet breakfast restaurant reflected the insights from both neuroanalytic tracking and co-creation with hotel staff and project stakeholders, which provided concrete, actionable inputs. The central buffet was relocated to the back wall and was consolidated into a single gastronomic offer zone, improving circulation and enabling immediate overview of the gastronomic offer. On the product side, robusta was replaced by arabica coffee and fresh orange juice substituted the concentrated version, addressing triggers of negative emotions identified earlier. These interventions directly responded to the emotional and operational insights

identified in the baseline and co-creation phases, aiming to reinforce guest satisfaction and staff functionality while ensuring spatial coherence.

Following implementation, emotional and behavioral data were recollected in June 2025. Neutral emotions were detected more predominantly during the post-implementation. Compared to the baseline, neutral emotions became more prevalent, and guests experienced satisfaction before exiting the buffet breakfast restaurant. Negative emotions regarding lighting and furniture were substituted by more neutral evaluations. Emotional responses during social interactions remained consistent: interest and joy continued to dominate both guest-staff and guest-guest encounters. However, some friction remained in relation to coffee, marking it as an ongoing area for potential refinement.

As part of the post-implementation evaluation, staff perceptions were captured through a structured questionnaire to complement guest emotional data. Staff reported the new buffet layout as more accessible, and the table layout facilitated service and movement. They also perceived increased guest satisfaction, though opinions on the new coffee were mixed, confirming the persistence of some friction around this product. This final assessment was critical to understanding whether the intervention had led to lasting improvements in the guest experience and employee well-being.

Conclusions

This study contributes to the growing body of research on emotions in hospitality by examining how physical and social elements of the breakfast servicescape shape guest experiences in real time. By triangulating guest emotional data, staff voice, and spatial redesign, this study illustrates how hospitality environments can be systematically evaluated and improved.

The findings confirm that environmental features such as buffet layout, lighting, and product quality exert measurable influence on guest emotions. At the same time, social interactions with staff consistently generated positive emotional responses, underscoring the central role of human engagement in hospitality service encounters. While exploratory regression analyses revealed limited statistical significance, they highlighted the complexity of modeling real-time affective states and pointed to the need for further methodological refinement.

The redesign phase demonstrated the value of integrating guest emotion tracking with staff voice. Relocating the buffet, adjusting furniture and lighting, and improving product quality reduced sources of negative emotion and supported smoother operations. Post-implementation data showed an increase in neutral and satisfied emotional states among guests, while staff confirmed greater efficiency and accessibility.

Implications for Hospitality and Tourism Research and Practice

This study demonstrates the potential of combining neuromarketing tools, observational methods, and staff perspectives to capture emotions in real service contexts. The exploratory regression analysis highlights both the promise and the limitations of modeling second-by-second emotional responses, pointing to the need for methodological refinement and replication across different hospitality settings. By focusing on the breakfast buffet, the research extends the literature on servicescapes to a touchpoint that is frequent, emotionally charged, and underexplored. Future research should build on this approach by refining methods for capturing real-time emotional dynamics and by examining how design interventions at other key hotel touchpoints shape both guest experiences and staff workflows.

The project shows how evidence-based redesign can address sources of guest dissatisfaction while supporting staff efficiency and well-being. The relocation of the buffet, adjustments to lighting and furniture, and upgrades in product quality reduced negative emotions and improved guest satisfaction at a key moment of the stay. At the same time, staff reported greater ease of movement and more positive guest reactions. For managers, the findings underline the importance of linking physical design decisions with both guest emotional data and employee voice to create sustainable improvements. More broadly, the study illustrates a replicable approach that hotels can adopt to balance operational functionality with affective value, thereby strengthening satisfaction and loyalty.

Acknowledgements

This project has received funding from the Ministry of Industry and Tourism through the grants for digitalization projects of «Última Milla» in companies in the tourism sector, LINE 2.

References

- Ali, F., Hussain, K., & Omar, R. (2016). Diagnosing customers experience, emotions and satisfaction in Malaysian resort hotels. *European Journal of Tourism Research*, 12(1), 25-40.
- Anguera-Torrell, O., & Nicolau, J. L. (2025). Unveiling customer choice with salience theory: The link between room price and breakfast demand. *International Journal of Hospitality Management*, 124, 103968.
- Bagozzi, R. P., Gopinath, M., & Nyer, P. U. (1999). The role of emotions in marketing. *Journal of the Academy of Marketing Science*, 27(2), 184-206.
- Bitner, M. J. (1992). Servicescapes: The impact of physical surroundings on customers and employees. *Journal of Marketing*, 56(2), 57-71.
- Decrop, A. (1999). Triangulation in qualitative tourism research. *Tourism Management*, 20(1), 157-161.
- Grandey, A. A., Fisk, G. M., Mattila, A. S., Jansen, K. J., & Sideman, L. A. (2005). Is “service with a smile” enough? Authenticity of positive displays during service encounters. *Organizational Behavior and Human Decision Processes*, 96(1), 38-55.
- Hirschman, E. C., & Holbrook, M. B. (1982). Hedonic Consumption: Emerging Concepts, Methods and Propositions. *Journal of Marketing*, 46(3), 92–101.
- Illescas-Manzano, M. D., Martínez-Puertas, S., Sánchez-Pérez, M., & Marín-Carrillo, M. B. (2025). Explaining hotel breakfast pricing under spatial heterogeneity and competitive environments. *Review of Managerial Science*, 1-35.
- Juvan, E., Grün, B., & Dolnicar, S. (2018). Biting off more than they can chew: Food waste at hotel breakfast buffets. *Journal of Travel Research*, 57(2), 232-242.
- Kirillova, K., Fu, X., & Kucukusta, D. (2020). Workplace design and well-being: aesthetic perceptions of hotel employees. *The Service Industries Journal*, 40(1-2), 27-49.
- Lee, N., Broderick, A. J., & Chamberlain, L. (2007). What is ‘neuromarketing’? A discussion and agenda for future research. *International Journal of Psychophysiology*, 63(2), 199-204.
- Lee, S. H., Lee, J., & Neilson, S. M. (2018). Exploring guest preferences of breakfast menu: conjoint analysis. *Journal of Culinary Science & Technology*, 16(2), 149-164.
- Lee, S., Shin, W., & Park, E. J. (2022). Implications of neuroarchitecture for the experience of the built environment: a scoping review. *Archnet-IJAR: International Journal of Architectural Research*, 16(2), 225-244.
- Leite-Pereira, F., Brandão, F., & Costa, R. (2019). Role of breakfast in hotel selection: systematic review. *International Journal of Culture, Tourism and Hospitality Research*, 13(2), 204-217.

Leite-Pereira, F., Brandão, F., & Costa, R. (2020). Is breakfast an important dimension in hotel selection? An analysis of online reviews. *Revista Turismo & Desenvolvimento (RT&D)/Journal of Tourism & Development*, (34).

Leite-Pereira, F., Brandão, F., & Costa, R. (2022). The role of breakfast in hotel selection, satisfaction and intention to return: a two-fold approach looking at guests and managers' perspectives. *GeoJournal of Tourism and Geosites*, 44(4), 1472-1481.

Leite-Pereira, F., Brandão, F., & Costa, R. (2023). Guest's Preferences for Different Foods at Hotel's Breakfast: Results of an on-line Survey. *GeoJournal of Tourism and Geosites*, 50(4), 1546-1554.

Liljander, V., & Strandvik, T. (1997). Emotions in service satisfaction. *International Journal of Service Industry Management*, 8(2), 148-169.

Line, N. D., & Hanks, L. (2020). A holistic model of the servicescape in fast casual dining. *International Journal of Contemporary Hospitality Management*, 32(1), 288-306.

Manes, E., & Tchetchik, A. (2018). The role of electronic word of mouth in reducing information asymmetry: An empirical investigation of online hotel booking. *Journal of Business Research*, 85, 185-196.

Mano, H., & Oliver, R. L. (1993). Assessing the dimensionality and structure of the consumption experience: evaluation, feeling, and satisfaction. *Journal of Consumer Research*, 20(3), 451-466.

Mo, Z., Li, Y. F., & Fan, P. (2015). Effect of online reviews on consumer purchase behavior. *Journal of Service Science and Management*, 8(03), 419.

Pine, B. J., & Gilmore, J. H. (1998). *Welcome to the experience economy* (Vol. 76, No. 4, pp. 97-105). Cambridge, MA, USA: Harvard Business Review Press.

Poulsson, S. H., & Kale, S. H. (2004). The experience economy and commercial experiences. *The Marketing Review*, 4(3), 267-277.

Rosenbaum, M. S., Ramírez, G. C., & Matos, N. (2019). A neuroscientific perspective of consumer responses to retail greenery. *The Service Industries Journal*, 39(15-16), 1034-1045.

Vecchiato, G., Tieri, G., Jelic, A., De Matteis, F., Maglione, A. G., & Babiloni, F. (2015). Electroencephalographic correlates of sensorimotor integration and embodiment during the appreciation of virtual architectural environments. *Frontiers in Psychology*, 6, 1944.