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Asymmetric effects of music preference on emotional and behavioral responses: a reference dependence framework

Abstract

Purpose: This study explores how liking music shapes customer behavior in foodservice settings by addressing three central questions: (1) To what extent do positive emotions from liking music influence time spent, choice of establishment, and spending? (2) How do asymmetries between positive and negative emotional deviations from expected emotions affect these behaviors? (3) Does the influence of liking music vary across foodservice settings such as bars/cafés and restaurants?

Design/methodology/approach: Using the stimulus–organism–response (S–O–R) model, the study explores how emotional responses triggered by liking music affect behavior. The concept of segment-specific thresholds is introduced, examining direct effects on behavior and asymmetric impacts due to emotional deviations. Regression analyses assess significant effects on time, choice, and spending.

Findings: The results reveal significant relationships between liking music and customer behavior across different foodservice settings, underscoring the distinct role of emotions and the need to consider contextual and segment-specific nuances. Notably, the study highlights asymmetric effects, where negative emotional deviations exert a stronger influence on behavior compared to positive deviations.

Originality: This research contributes to the hospitality literature by integrating a reference-dependence framework with the S–O–R model, emphasizing social comparisons and emotional asymmetry. The study provides insights into how music can strategically shape consumer decision-making.

Practical implications: The findings suggest that managers could promote customer engagement by tailoring music experiences to match segment preferences. Collaborations with music providers may further support targeted musical environments, enhancing brand differentiation.

Keywords: foodservice, liking music, emotions, behavioral responses, decision making, hospitality

1. Introduction

Music is frequently used in distribution as an environmental variable shaping the atmosphere of an establishment (Biswas *et al.*, 2019). Background music influences customers' affective and behavioral reactions in different retail settings (Biswas *et al.*, 2019; Jeon *et al.*, 2016; Lee *et al.*, 2016; Pantoja and Borges, 2021). Systematic reviews, including meta-analyses (Garlin and Owen, 2006; Roschk *et al.*, 2017) and literature reviews (Jain and Bagdare, 2011; Michel *et al.*, 2017) have synthesized key findings in this area. However, the meta-analysis by Trompeta *et al.* (2022) reflected the impact of music in tourism and hospitality settings by reviewing 56 studies, showing that liking music in hedonic settings has a greater impact than tempo, volume, and congruence.

Liking music refers to customers' subjective enjoyment of background music played in the service setting. Trompeta *et al.* (2022, p. 136) defined liking music as "the listener's liking for a given musical selection," and Michel *et al.* (2017, p. 23) defined it as the "overall assessment and knowledge about a musical piece." The effects of liking or disliking music on customers have been investigated in advertising in relation to brand attitudes and preferences (Blair and Shimp, 1992) and in retail in relation to shopping intentions (Broekemier *et al.*, 2008) and time and money spent (Herrington and Capella, 1996). For example, global coffeehouse chains like Starbucks strategically use music to create a welcoming atmosphere and encourage longer stays, fostering their "Third Place" concept (Li, 2024). Given its relevance in the tourism and hospitality setting, Trompeta *et al.* (2022) called for further research that relates liking music with affective reactions and behavioral responses.

Although prior research confirms music's influence on consumer behavior, asymmetries in how positive and negative emotional reactions affect behavior remain unexamined. Emotional reactions are often disproportionate—negative emotions may carry more weight in shaping consumer decisions than positive ones, impacting customer satisfaction efforts or service recovery strategies. This gap presents an opportunity for additional research examining how emotional responses, particularly those that diverge from anticipated standards, affect consumer behavior in hospitality settings (Jang and Namkung, 2009). Regarding asymmetries based on the sign of emotional responses, and utilizing the principles of prospect theory (Kahneman and Tversky, 1979), favorable reactions to music may promote extended durations or increased consumption, whereas adverse emotions can produce more intense behavioral reactions. In high-end restaurants, for instance, carefully curated playlists such as classical or instrumental music are often used to enhance fine dining experiences, complementing the atmosphere and encouraging additional spending on desserts or drinks (Magnini and Thelen, 2008). This study investigates how deviations from expected emotional parameters (i.e., emotional reactions that diverge from segment-specific norms) produce asymmetric effects on behavior. Particular emphasis was placed on the stronger influence of negative emotional disparities on consumer decision-making, building on the work of Baumeister *et al.* (2001) and their findings on the greater power of bad events in psychological phenomena.

The aim of this paper is therefore threefold. First, it analyzes to what extent emotions generated by liking music exert an influence on in-establishment behavior in a reference-dependence framework. Specifically, the study examines behavior in the form of time spent in an establishment, choice of establishment, and spending. The present study draws on the stimulus–organism–response (S–O–R) model proposed by Mehrabian and Russell (1974). We posit that when customers like the music played in a foodservice setting, this element (stimulus) triggers emotional responses within the individual (organism) that influence the individual's behavior within the establishment (response). For example, in fast-paced foodservice environments such as bars or cafés, music aligned with customer preferences may enhance social interactions and increase spending. Conversely, in restaurants, although music is secondary to elements like food quality and service, liking music can still influence table duration and additional purchases. These distinctions are relevant in industry practices where optimizing dwell time and spending are key performance indicators.

Second, this work explores the impact of emotional differences, emphasizing the asymmetric effects of positive and negative deviations in emotional expectations (benchmark) on customer behavior. Specifically, negative emotional differences—when customers dislike the

music more than their segment's average—may elicit stronger behavioral responses than positive deviations (Mittal *et al.*, 1998). In foodservice, this may result in shorter stays or lower consumption. For example, a negative reaction to music in a bar/café could result in the customer leaving earlier or choosing not to return to the establishment, thereby impacting revenue. Similarly, in restaurants, music that fails to match expectations could detract from the intended relaxed ambiance, influencing customers to shift to competing venues.

Third, based on Michel *et al.* (2017) and Roschk *et al.* (2017), the study considers two settings: restaurants and bars/café. This grouping responds to the similarity between bars and cafés, compared with restaurants, in terms of the pace of consumption, social interactions, and purpose of the visit (Álvarez-Ondina, 2024). Consequently, this study sheds light on the nuanced relationships between music, emotions, and customer decision-making processes in these two settings. For example, bars and cafés, which often prioritize creating vibrant, social atmospheres, are more likely to use music as a strategic tool to drive customer engagement. This behavior contrasts with restaurants, where the formal dining experience often places greater emphasis on culinary quality and service, making the role of music more complementary than central.

A key contribution of this study is the use of a reference-dependence framework that proposes the existence of segment-specific thresholds to evaluate consumer emotional responses to liking background music. These thresholds determine individuals' tolerance to emotional responses evoked by liking background music, extending beyond individual experiences to also depend on the influence of social comparisons within groups or segments. Informed by theoretical foundations such as Weber's Law, assimilation–contrast theory, adaptation-level theory, social comparison theory, and prospect theory, the study provides valuable insights into the asymmetric nature of the benchmarking process, where negative discrepancies from the segment average generate stronger behavioral responses compared with positive differences. This novel framework advances the existing S–O–R model widely used in this context (Moreno-Lobato *et al.*, 2023) and offers a deeper understanding of how emotions shaped by music influence consumer behavior in hospitality settings.

2. Theoretical background

2.1. Liking music as an explanatory factor of customer behavior in foodservice settings

Sensory marketing is an important aspect of various hospitality sectors, including hotels and restaurants (Chang and Cheng, 2023; Fong *et al.*, 2022). Heung and Gu (2012) suggest that foodservice managers should be able to generate and sell sensory (memorable) experiences. Food and drink constitute the central element of these establishments. However, background music is one of the intangible atmospheric elements that can contribute to that goal (Liu and Jang, 2009b). Controlling this variable is remarkably easy (Jeon *et al.*, 2016). Trompeta *et al.* (2022) conducted a meta-analysis of the effects of music in tourism and hospitality settings. They identified 25 articles in the restaurant setting (dining facility and food tastings), 10 articles in bars (clubs, drinking places, and drink tastings) and eight articles in cafés. Based on this exhaustive review, Table 1 in the supplementary material shows the studies that have expressly included liking music or musical preference as an explanatory variable in a similar setting to the one chosen for the present study (i.e., restaurants, bars, and cafés). Liking music (or a similar variable) has been examined in only eight studies. This scarcity of research highlights the need for further investigation into this topic, as suggested by Trompeta *et al.* (2022). Specifically, our study contributes to the research area by analyzing the relationship between emotions and behavioral outcomes in a reference-dependence framework.

The present study examines the effect of liking music on three dependent variables. These variables are time spent at an establishment (length of stay), choice of establishment, and money spent at the establishment, which have been examined in different settings (Herrington and Capella, 1996). Length of stay is an important indicator of customer loyalty and satisfaction. If customers enjoy the music and the overall atmosphere of a foodservice establishment, they are more likely to stay for longer (Caldwell and Hibbert, 2002). Liking music also affects customers' decision-making processes when selecting a foodservice setting. When the music matches their preferences, it evokes positive emotions, enhances mood, and creates a more enjoyable and engaging atmosphere. This emotional connection can lead customers to perceive an establishment more favorably, making it more appealing than others (Demoulin, 2011). Finally, liking

background music can increase spending (Caldwell and Hibbert, 2002). When customers feel happier and more relaxed due to the music, they are more likely to have a favorable perception of the establishment and to indulge in higher-priced menu items or additional services. Liking music can also influence social dynamics and social interactions within a foodservice setting. When customers share similar music preferences, it can create a sense of connection and camaraderie. This social role of music can encourage group spending as customers engage in shared experiences or order more items.

2.2. Relationship between liking music, affective reactions, and behavioral responses

The influence of music on human emotions has been a subject of extensive research in various disciplines, particularly within consumer behavior and environmental psychology. Numerous studies have consistently demonstrated that music can shape mood and evoke emotions, in turn influencing behavior (Caldwell and Hibbert, 2002; Demoulin, 2011; Herrington and Capella, 1996; Heung and Gu, 2012; North and Hargreaves, 1996). However, although existing literature has predominantly focused on aspects like tempo and volume, there is limited exploration of how *liking music* specifically impacts consumer emotions and behaviors within foodservice settings. Addressing this gap, the present study examines whether the liking of background music can play a critical role in shaping customer behavior in these environments.

Theoretically, this study applies the S–O–R model from environmental psychology (Mehrabian and Russell, 1974). We propose that when customers like the music played in a foodservice setting (stimulus), they develop an emotional response (organism). This emotional response, combined with the pleasant ambiance created by the music, influences their in-establishment behavior (response). Past research indicates that liking music or familiarity with music significantly explains customers' emotions (Lin and Mattila, 2010). This positive emotional reaction has been identified as a key determinant of customer satisfaction (Lin, 2010) and promotes behaviors such as loyalty or patronage (Garlin and Owen, 2006; Liu and Jang, 2009a).

Our study addresses the under-researched area of how liking music affects emotions and decisions specifically in foodservice settings such as restaurants and bars/cafés. Hyun and Kang (2014) examined the internal mechanism through which the emotional reaction to liking music influences customer behavior. The authors showed that ambient conditions such as liking music induce patrons' arousal, subsequently impacting pleasure. Pleasure, in turn, exerts a positive influence on behavioral intentions in the form of intention to recommend and revisit. In our study context, liking music may induce a sense of pleasure among customers, influencing their emotional state positively. Simultaneously, the music can modulate arousal levels, creating an atmosphere that enhances patrons' overall experience. The following hypothesis is therefore proposed:

Hypothesis 1. Emotions generated by liking music affect in-establishment behavior.

2.3. Asymmetric effects of music preference on emotional and behavioral responses

Although extensive research has examined music's influence on emotions and consumer behavior, this study explores how segment-specific emotional thresholds and benchmarks impact customer reactions. The objective is to understand how variations in emotional intensity affect behavior, especially when these emotions deviate from segment norms, offering a unique perspective on the asymmetric effects of positive and negative emotional experiences of liking music within foodservice settings.

The theoretical foundation of this study draws from Weber's law (Weber, 1978), which proposes a proportional relationship between the magnitude of a stimulus and the amount that must be added for individuals to perceive a change. Applied to the study context, this law suggests that individuals from different segments may have unique thresholds for emotional responses to liked music, beyond which their behavior is affected. This threshold concept aligns with social comparison theory (Festinger, 1954) and reference-dependence in behavioral economics (Tversky and Kahneman, 1991), indicating that customers' emotional responses are influenced by the average reaction within their segment, which serves as a reference point for evaluating personal experiences.

Additionally, assimilation–contrast theory (Sherif and Hovland, 1961) and adaptation-level theory (Helson, 1964) suggest that customers' reactions are influenced by their personal

experiences and contextual norms (Kőszegi and Rabin, 2006). Also, according to prospect theory (Kahneman and Tversky, 1991), individuals respond more strongly to negative deviations from a reference point than to positive ones—a concept known as loss aversion, wherein individuals exhibit heightened sensitivity to losses (bad emotional experiences) compared with equivalent benefits (positive feelings). This study applies loss aversion in a novel way, proposing that when customers' emotional responses fall below their segment's average enjoyment of music, the impact on behavior is stronger than for positive deviations. This asymmetry in emotional responses aligns with the findings of Baumeister *et al.* (2001), who demonstrated the greater power of negative events in various psychological phenomena, and indicates that negative emotional discrepancies can have a pronounced effect on consumer decision-making.

Prospect theory—particularly loss aversion—has been widely applied to explain findings (Clark *et al.*, 2023) and explore conjectures in the hospitality and tourism literature (Han *et al.*, 2024). This approach, further informed by Sellers and Nicolau's (2023) work on reference-dependent satisfaction in hospitality, emphasizes the relevance of benchmarks in shaping consumer behavior. Research has provided evidence of similar thresholds for perceived price and behaviors derived from price changes (Cheng and Monroe, 2013). These concepts underscore the importance of studying segment-specific thresholds and asymmetric responses to emotional deviations, particularly within foodservice settings where ambient factors like music are pivotal to customer experience.

We therefore propose the following hypotheses:

Hypothesis 2a. The effect of emotions generated by liking music on behavior is influenced by segment-specific thresholds.

Hypothesis 2b. The effect of emotions generated by liking music on behavior depends on a benchmark, with asymmetric effects for positive and negative differences.

2.4. Differential effects by foodservice setting

The literature suggests that the impact of background music may be influenced by contextual factors such as the establishment's atmosphere, purpose of visit, social dynamics, and consumption pace (Roschk *et al.*, 2017). This study examines how emotional responses induced by liking music may lead to distinct consumer behaviors within bars/cafés and restaurants, acknowledging the unique affordances and social expectations of each setting (Helal, 2023; Kalnaovakul *et al.*, 2025; Ray *et al.*, 2024).

This proposal is grounded in Gibson's (1977) affordance theory, which emphasizes the perceived possibilities for action that the environment offers to an individual. Bars and cafés, characterized by a more casual, social, and leisure-oriented atmosphere, provide affordances conducive to social interactions and relaxation (Álvaro-Ondina, 2024). Music, an integral low-level atmospheric element in these environments, may directly engage patrons' sensory and emotional responses, enhancing behaviors like prolonged stay and increased spending (Lee *et al.*, 2016). The affordances of bars and cafés amplify the role of music in shaping customer experiences because the ambiance aligns with patrons' expectations for leisure and socialization.

Conversely, in restaurants, the dining experience is often more formal and structured, prioritizing high-level atmospherics such as food quality, service, and overall ambiance (Kwon *et al.*, 2020). Here, music is expected to support, rather than dominate, the environment, making the influence of liking music less pronounced relative to other factors that define the dining experience. Kwon *et al.* (2020) found that customers in restaurants are particularly influenced by food quality and service factors, which often overshadow the impact of background music on behavior. In this context, affordances center around the culinary and service aspects, potentially diminishing music's importance in shaping patrons' choices and experiences.

Further insight is provided by expectancy-value theory (Atkinson, 1957), which suggests that behavior is influenced by expectations of achieving desirable outcomes and the value associated with them. In bars and cafés, where social interactions are a core expectation, liked music directly aligns with patrons' values and contributes positively to their experience, enhancing behaviors like time spent and spending (Caldwell and Hibbert, 2002). In restaurants, however, the expectancy-value dynamics may prioritize other high-level atmospheric elements over music because patrons often expect a formal experience centered on food and service quality

(Kwon *et al.*, 2020). The differential impact of liking music is therefore likely to reflect the distinct expectations and values within each setting.

Therefore, the following hypothesis is proposed:

Hypothesis 3. The effect of emotions generated by liking music on behavior differs depending on the setting (bars or cafés vs. restaurants).

3. Method

3.1. Data collection

The survey was distributed through convenience sampling methods, via social media and email between April 19 and April 26, 2021. Incomplete responses were removed. This approach facilitated rapid data collection and allowed access to a broad demographic within the target population. The use of convenience sampling is justified due to the exploratory nature of the study. Prior to starting the survey, participants were informed of the study's aims/objectives and the right to refuse participation or withdraw from the study at any time. The authors confirm that this study adheres to the relevant ethical guidelines for human subjects, and that the anonymity and confidentiality of the participants were maintained throughout the study. This study's procedures were reviewed and approved by the university's Ethics Review Board. To enhance the validity of the sample, a screening question was asked at the beginning of the survey to ensure participants had relevant experience with the type of establishments under study before the pandemic. Participants who did not meet this criterion were excluded from the study. Incomplete responses and those that failed to meet the inclusion criteria were removed, resulting in a final sample size of 215¹. To address potential recall biases due to COVID-19 restrictions still in place at the time of data collection, which affected consumer behavior (Safavi *et al.*, 2023), respondents were provided with a standardized description of bars, cafés, and restaurants before completing the questionnaire. This description was included to ensure that responses accurately referenced the appropriate type of establishment. Participants were also instructed to answer the questionnaire based on their usual behavior before the pandemic. These steps aimed to minimize the impact of contextual factors, ensuring that the collected data accurately reflected the study's scope and objectives.

3.2. Measures

We used different scale types for dependent and independent variables to minimize the potential sources of common method bias (CMB) (Podsakoff *et al.*, 2003). Five-point Likert-type scales ranging from 1 (totally disagree) to 5 (totally agree) were employed to measure the dependent variables time spent ("You stay longer in an establishment where you like the music"), choice of establishment ("The music influences your choice of establishment"), and spending ("You spend more money in an establishment where you like the music"). A distinction was made between bars/cafés (B&C) and restaurants (R). The independent variables consisted of emotions when the music in the establishment matched the individual's musical preferences (EM). We use two variables to measure "Emotions": (1) "Emotions when you like the music in bars and cafés (EM_1)," and (2) "Emotions when you like the music in restaurants (EM_2)." These variables were measured using a five-point semantic differential scale (unhappy/happy, irritated/pleased, annoyed/contented, and bad mood/good mood) adapted from Mehrabian and Russell (1974). This scale has been widely validated in environmental psychology and consumer behavior studies (Donovan *et al.*, 1994). To address potential concerns about CMB, Harman's one-factor test was performed following Podsakoff and Organ (1986). The first factor explained 35.65% of the total variance, which is below the 50.0% threshold, indicating that CMB is not a problem in this study. In addition, the variance inflation factor (VIF) was evaluated to detect any multicollinearity problems. All VIF values were within the acceptable range of 3.0 (Hair *et al.*, 2019).

The items' reliability was assessed. Table 2 in the supplementary material shows that all loadings were above 0.5 as Hair *et al.* (2019) recommended. Next, we assessed internal consistency reliability by examining Cronbach's alpha (α) and composite reliability (CR), with

¹ The original sample consisted of 279 observations, and after removing incomplete responses, we retained 215 respondents. The margin of error for the final sample size of 215 is approximately 6.69%, compared with 5.87% for the original sample of 279 respondents. Given the small difference in the margin of error (6.69% vs. 5.87%), the remaining sample size is sufficiently large for the analysis and the robustness of the findings.

the conventional thresholds set at 0.70 (Hair *et al.*, 2019). All α and CR values exceeded these thresholds. Then, we assessed convergent validity by analyzing average variance extraction (AVE) values. AVE values ranged from 0.695 to 0.863, higher than the set threshold of 0.50 (Fornell and Larcker, 1981). Additionally, the heterotrait–monotrait (HTMT) method was used to verify discriminant validity, as described by Henseler *et al.* (2015), with all HTMT values being below the 0.85 threshold (Henseler *et al.*, 2015). These methodological choices ensure the robustness of the constructs used in the study.

The differences between an individual’s emotions generated by liking music and those expressed by the individual’s segment (DEM) were measured. A distinction was made between positive differences (DEMP) and negative differences (DEMN). To determine the effect of differences between individuals’ emotions and those of peers in the same market segment, the sample was first segmented according to these emotions using hierarchical cluster analysis. Two criteria defined by Lewis and Thomas (1990) were applied. The first was that the optimal number of segments must explain at least 65% of the variance. The second was that each additional segment must reflect a minimum 5% increase in the explained variance. The optimal number of segments was four. For each segment, the average emotion was calculated to compare it with each individual’s emotion. Thus, the emotion intensity generated by the musical preference of individual i was identified and compared with the emotion intensity generated by the musical preference in the individual i ’s segment. Musical habits were included as control variables (5 items, HAB_1 to HAB_5). Respondents were asked to rate on a scale ranging from 1 (never or almost never) to 6 (daily) how frequently they listened to music at home (HAB_1), attended concerts and other musical events (HAB_2), listened to music outdoors (HAB_3), attended music-themed establishments (HAB_4), and paid to listen to music (HAB_5). Including these control variables ensures that external factors influencing music preference are accounted for, enhancing the reliability of the results. Table 1 presents the descriptive statistics.

The survey included 118 women, 94 men, and 2 non-binary or third-gender individuals (one person preferred not to specify). Most respondents (91.6%) were aged between 18 and 54 years, with the largest group (42.8%) being 18 to 24 years. Respondents were generally well-educated, with 45.3% having completed higher education or university and 22.4% postgraduate studies. Approximately 28.4% of respondents had musical training or played an instrument regularly, while the majority (71.4%) did not. Regarding music preferences, 61.9% indicated pop music, followed by rock/punk/metal (36.7%) and Latin/reggaeton (29.8%).

[Table 1 around here]

3.3. Model

Classical regression analysis was used for the analysis. To analyze whether emotions influenced time spent in an establishment, choice of establishment, and spending in an establishment, the following basic model was first estimated:

$$TSE_i = \alpha + \beta_{EM} \cdot EM_i + \sum_{h=1}^H \gamma_h \cdot CV_{i,h} + \varepsilon_i \quad (1)$$

The dependent variable TSE_i was a threefold variable. One equation was estimated for each of time spent, choice, and spending. EM_i represents emotion, CV_i is a set of H control variables (musical habits), and ε_i is the error term. The term α is the constant, β reflects the effect of the emotion on each dimension, and γ_h shows the effect of control variable h on time spent, choice, and spending.

For further analysis of the difference between emotions and expected emotions, a new variable DEM_i was created. It was defined as the difference between the emotion that individual i experienced and the expected emotion for the same individual i . This expectation was measured as the average emotion for individual i ’s segment. This approach is in line with Sharma *et al.* (2019).

In this context, the segment average acts as a threshold, determining whether the individual’s experienced emotion exceeds or falls below the segment’s expected level. This segmentation-based influence allowed us to examine how the relationship between emotions and the dependent variables varied depending on the individual’s relative position within their segment. Accordingly, Equation 1 became

$$TSE_i = \alpha + \beta_{EM} \cdot EM_i + \beta_{DEM} \cdot DEM_i + \sum_{h=1}^H \gamma_h \cdot CV_{i,h} + \varepsilon_i \quad (2)$$

Finally, to explore potential asymmetric effects, the differences alluded to in the previous model were divided into positive and negative differences. $DEMP_i$ was defined as the difference between individual i 's experienced emotion and expected emotion when this difference was positive. $DEMN_i$ was the difference between individual i 's experienced emotion and expected emotion when this difference was negative.

$$TSE_i = \alpha + \beta_{EM} \cdot EM_i + \beta_{DEMP} \cdot DEMP_i + \beta_{DEMN} \cdot DEMN_i + \sum_{h=1}^H \gamma_h \cdot CV_{i,h} + \varepsilon_i \quad (3)$$

To summarize: i) Model 1 examined the linear effect of the main independent variables (emotion-based) on the dependent variable, ii) Model 2 introduced a reference-dependent pattern by incorporating the difference between experienced and expected emotions to analyze deviations from segment expectations, and iii) Model 3 extended the analysis to explore asymmetric effects by separately modeling positive and negative deviations, allowing us to test for the presence of loss aversion.

4. Results

The results are summarized in Table 2 (time spent), Table 3 (choice), and Table 4 (spending). Model 1 was used to test Hypothesis 1 and determine whether emotions influence time spent, choice, and spending in foodservice establishments. Model 2 was used to test Hypothesis 2a and determine whether a significant difference occurs between expected and actual emotion intensities. Model 3 was used to test Hypothesis 2b to explore the existence of potential asymmetric effects. The three models were examined separately for bars/cafés and restaurants to test Hypothesis 3.

As shown in Table 2, in bars and cafés, emotions generated from liking music had a significant positive effect on time spent in establishments ($\beta = 0.219$; $p = 0.001$; Hypothesis 1). The more customers liked the music played, the more time they spent in bars/cafés. The results also indicate that the effect of emotions generated from liking music on time spent at an establishment was influenced by segment-specific thresholds, supporting Hypothesis 2a ($\beta = 0.471$; $p = 0.0004$). This finding suggests that when individuals exceed the threshold of tolerance within their segment, their emotional responses to liking music have an impact on time spent in the establishment. The results also reveal an asymmetric effect. When the emotion intensity experienced by individuals differed from the expected emotion intensities for the segment they belong to, a change occurred in individuals' willingness to spend more time at the establishment. A significant effect was observed only in the case of negative differences when an individual's emotion intensities were lower than those of the individual's segment ($\beta = 0.637$; $p = 0.006$; Hypothesis 2b). For restaurants, the results were similar. The inclusion of variables capturing differences between an individual's emotions and those of their segment provided greater explanatory power compared with using the absolute value of individual emotions. Hence, rather than simply observing their emotions in absolute terms, individuals implicitly tend to compare their perceived emotions with the expected emotion intensities for their segment.

[Table 2 around here]

Table 3 shows the results for choice of establishment. In the case of choice of bars and cafés, emotions did not seem to play a role. By contrast, for restaurants, the results suggest similar behavior to time spent. Emotions generated by liking music had a significant positive effect on choice of establishment. The results also reveal that the relationship between emotions generated by liking music and behavior was influenced by segment-specific thresholds. Finally, an asymmetric effect was observed for negative differences. Similar results were observed for spending (Table 4).

[Table 3 around here]

Finally, in the case of bars and cafés, emotions seemed to influence only the willingness to stay longer. In the case of restaurants, however, emotions influenced the willingness to stay longer, choice of establishment, and spending when an individual liked the music played at an establishment. These differences in the results for bars/cafés and restaurants confirm Hypothesis 3 (the different significance levels—significant vs nonsignificant—are found in the parameters). These findings provide valuable insights into the interplay between liking music, emotions, and decision-making processes in relation to foodservice establishments.

[Table 4 around here]

Our regression models did not meet the assumption of normality of the residuals. To address this issue, we applied the indicator saturation method to control for potential outliers, which cause deviations from normality. After applying this method, we found that the significance and sign of the main parameters of interest remained the same. We are therefore confident that the conclusions of the study remain robust despite the normality issue.

5. Discussion and conclusions

This study provides valuable insights into the influence of liking background music on consumer behavior across distinct foodservice settings. Using a reference-dependence framework and the S–O–R model, the study examined how deviations from expected emotional benchmarks impacted consumer decision-making. The results reveal that positive emotions generated by liking music significantly increase the time consumers spend in both bars/cafés and restaurants. However, music preferences notably influence establishment choice and spending primarily in restaurants. The study also uncovers an asymmetric effect of emotional deviations: negative emotional differences—when an individual’s emotion intensities are lower than those of the individual’s segment—result in more pronounced behavioral changes. These negative discrepancies particularly affect spending and establishment choice, with consumers showing a higher tendency to stay longer and spend more in restaurants where they enjoy the music. Overall, the findings reveal that customers’ emotional responses to music are not only important in enhancing their experience but also serve as a powerful driver of economic outcomes, especially when there are negative deviations from segment-based emotional expectations. This aligns with prior research that highlights the sensory environment’s influence on consumer decision-making (Chang and Cheng, 2023), underscoring music as an atmospheric cue that can significantly impact emotional responses (Vella *et al.*, 2024) and behavior (Trompeta *et al.*, 2022).

5.1. Theoretical implications

This study has theoretical implications. Whereas previous research has focused on widely examined dimensions of music such as tempo and volume, this study focuses on the under-researched dimension of liking music in the context of tourism and hospitality (Trompeta *et al.*, 2022). The use of the S–O–R model supports the first research question because it helps explain how liking the music played in an establishment triggers positive emotional responses that subsequently influence customer behavior. The study reveals that positive emotions from liking music lead to increased time spent in bars/cafés and restaurants. However, the choice of establishment and spending behaviors are positively influenced only within restaurant contexts. This differentiation emphasizes the importance of context-specific applications of the S–O–R model, extending its utility beyond general sensory stimuli to specific, subjective elements like music preference.

The concept of segment-specific thresholds and the asymmetric effects of emotional deviations offer valuable insights into the second research question, which explores the impact of positive and negative emotional differences on behavior. Segment-specific thresholds determine individuals’ tolerance to the emotional responses evoked by liking music. Customers implicitly compare their emotional responses to the expected emotion intensities of their segment or group. This comparison also shapes their behavior. By introducing this segment-based emotional benchmarking, the study contributes to the literature on reference-dependent behavior in consumer decision-making, particularly by demonstrating its relevance to hedonic contexts such as foodservice settings where music plays a key role in shaping customer experiences. The findings suggest that customers’ responses are more pronounced when experiencing emotions below the average intensity expected for their segment, supporting the idea of asymmetric effects. Specifically, the results show that deviations from the emotions that an individual within a given market segment is expected to feel affect the willingness to spend more time in an establishment. This effect is pronounced when individuals experience negative differences (i.e., when their emotions are more negative than those typically associated with their segment).

As with time spent, the results show that customers who experience negative differences in emotions are more inclined to choose restaurants where they enjoy the music and tend to spend more in restaurants where they like the music. This finding aligns with previous findings on customer sensitivity to negative satisfaction deviations (Sellers and Nicolau, 2023) and extends this understanding by highlighting the influence of segment-based emotional benchmarks in the

decision-making process within foodservice environments.

Finally, the study provides further insights by examining the differential effects of liking music in bars/cafés versus restaurants. Bars and cafés, often characterized by a more relaxed and socially oriented atmosphere, show a strong positive correlation between music liking and the length of stay. By contrast, although liking music in restaurants also affects the duration of stay, it has an even stronger influence on spending and establishment choice in these contexts. This differentiation between foodservice settings contributes to the literature by demonstrating that the impact of music on customer behavior is context-dependent.

5.2. Practical implications

The findings of this study could contribute to a better understanding of the importance of emotions derived from liking music in shaping customer behavior in different foodservice settings. First, the study underscores that although music is often secondary to other key factors like product and service quality, it remains a valuable tool in creating a positive atmosphere in foodservice settings. Managers can use music strategically to enhance brand recognition and brand equity (Yalch and Spangenberg, 1993), a cost-effective tactic that is especially beneficial in competitive industries like restaurants (Helal, 2023). For bars and cafés, where positive emotions from liking music were linked to increased time spent and potentially higher spending, managers might consider innovative approaches to customizing the musical environment. Exploring customer-controlled music selection methods, akin to traditional jukeboxes, is one possibility, although digital jukebox solutions such as PLAYIt or Jukmob are not yet prevalent in the industry. Managers could leverage customizable music platforms as a differentiating competitive factor, creating a more personalized and engaging customer experience. Recent research suggests that letting customers interact with music can enhance their engagement (Hwang and Oh, 2020). Additionally, there is scope for collaboration with music providers such as Spotify. Geolocation data can potentially be used for the seamless integration of music choices with specific customer profiles in these settings. Partnering with music providers could provide access to curated playlists and exclusive content, benefiting all parties. This strategy could also be used as a key differentiating factor in a highly competitive market. By strategically selecting and curating music that resonates with their brand image and target customer segments, businesses can create a distinctive and memorable atmosphere. This integration could not only enhance the customer experience but also provide managers with data-driven insights into customer preferences, helping to optimize music strategies across segments.

Additionally, the findings suggest that understanding segment-specific music preferences can help managers mitigate negative customer responses and foster positive engagement. By tailoring music selections to better match the expectations of specific customer segments, managers can reduce the likelihood of negative discrepancies that may detract from the customer experience. In restaurants, however, where liking music was associated with longer stays but not necessarily higher spending, this insight poses a unique challenge related to table turnover. Managers aiming to maximize turnover may need to balance the atmospheric benefits of well-liked music with operational goals, ensuring that extended stays do not hinder customer flow.

5.3. Limitations and future research

This research has several limitations. First, the study relied on self-reported data. Such data may suffer from social desirability bias or memory recall bias. Thus, future research could include field experiments where the music customers hear is manipulated. Alternatively, in-person surveys could be used immediately after customers visit establishments, allowing real-time feedback on customer experiences in real-world settings. Another potentially valuable approach would be to combine in-person surveys with data from customers' physiological responses. This technique has already been employed in food research (Verastegui-Tena *et al.*, 2019). Future research could also explore the role of social media in shaping customer expectations and emotions derived from music (Wareebor *et al.*, 2025). For example, it would be of interest to analyze whether online reviews and ratings of establishments' music affect customers' behavior in these establishments. Studies could also examine how the use of social media to share experiences and opinions of music in these establishments influences customer emotions and behavior.

The emotion scale utilized was borrowed from psychology, and it may not necessarily be tailored to the context of hospitality and tourism in relation to music preference. To improve upon this limitation, future research should prioritize the development of emotion scales that are specifically applicable to liking music in foodservice settings (Tuerlan *et al.*, 2021). Moreover, the study only considered the effect of music on three dependent variables (time spent, choice of establishment, and spending). Other potential outcomes such as loyalty and satisfaction, and other mediators and moderators could also be considered. Examples include perceived authenticity and group composition (family or friends), which were recently examined in the context of ethnic restaurants (Wen *et al.*, 2020). In addition, this research recognizes the need to explore how the relationship between music liking and behavioral responses may evolve over time. Using a longitudinal model rather than a cross-sectional approach is recommended to capture dynamic changes and provide deeper insights into this relationship. Finally, the study only focused on two types of establishments (bars/cafés and restaurants). Future research could investigate different types of establishments such as high-end restaurants versus fast-food chains.

The authors report that they have no competing interests to declare.

References

- Álvarez-Ondina, P. (2024), *Snapshot of the catering sector in Spain: from bars to Michelin stars*, CaixaBank Research, available at: <https://www.caixabankresearch.com/en/sectoral-analysis/tourism/snapshot-catering-sector-spain-bars-michelin-stars> (accessed 25 February 2025).
- Atkinson, J.W. (1957), "Motivational determinants of risk-taking behavior", *Psychological Review*, Vol. 64 No. 6 Pt. 1, pp.359-372. <https://doi.org/10.1037/h0043445>
- Baumeister, R.F., Bratslavsky, E., Finkenauer, C. and Vohs, K.D. (2001), "Bad is stronger than good", *Review of General Psychology*, Vol. 5 No. 4, pp.323-370. <https://doi.org/10.1037/1089-2680.5.4.323>
- Biswas, D., Lund, K. and Szocs, C. (2019), "Sounds like a healthy retail atmospheric strategy: effects of ambient music and background noise on food sales", *Journal of the Academy of Marketing Science*, Vol. 47 No. 1, pp.37-55. <https://doi.org/10.1007/s11747-018-0583-8>
- Blair, E. and Shimp, T.A. (1992), "Consequences of an unpleasant experience with music: a second-order negative conditioning perspective", *Journal of Advertising*, Vol. 21 No. 1, pp.35-43. <https://doi.org/10.1080/00913367.1992.10673358>
- Broekemier, G., Marquardt, R. and Gentry, J.W. (2008), "An exploration of happy/sad and liked/disliked music effects on shopping intentions in a women's clothing store service setting", *Journal of Services Marketing*, Vol. 22 No. 1, pp.59-67. <https://doi.org/10.1108/08876040810851969>
- Caldwell, C. and Hibbert, S.A. (2002), "The influence of music tempo and musical preference on restaurant patrons' behavior", *Psychology & Marketing*, Vol. 19 No. 11, pp.895-917. <https://doi.org/10.1002/mar.10043>
- Chang, K.C. and Cheng, Y.S. (2023), "How sensory perceptions and sensory brand experience influence customer behavioral intentions in the context of cartoon-themed restaurants", *International Journal of Hospitality Management*, Vol. 115, 103604. <https://doi.org/10.1016/j.ijhm.2023.103604>
- Cheng, L.L. and Monroe, K.B. (2013), "An appraisal of behavioral price research (part 1): price as a physical stimulus", *AMS Review*, Vol. 3 No. 3, pp.103-129. <http://dx.doi.org/10.1007/s13162-013-0041-1>
- Clark, M., Kang, B. and Calhoun, J.R. (2023), "Green meets social media: young travelers' perceptions of hotel environmental sustainability", *Journal of Hospitality and Tourism Insights*, Vol. 6 No. 1, pp.36-51. <https://doi.org/10.1108/JHTI-03-2021-0062>
- Demoulin, N. (2011), "Music congruency in a service setting: the mediating role of emotional and cognitive responses", *Journal of Retailing and Consumer Services*, Vol. 18 No. 1, pp.10-18. <https://doi.org/10.1016/j.jretconser.2010.08.007>
- Donovan, R.J., Rossiter, J.R., Marcoolyn, G. and Nesdale, A. (1994), "Store atmosphere and purchasing behavior", *Journal of Retailing*, Vol. 70 No. 3, pp.283-294. [https://doi.org/10.1016/0022-4359\(94\)90037-X](https://doi.org/10.1016/0022-4359(94)90037-X)

- Festinger, L. (1954), "A theory of social comparison processes", *Human Relations*, Vol. 7 No. 2, pp.117-140. <https://doi.org/10.1177/001872675400700202>
- Fong, L.H.N., Lei, S.S.I., Chow, C.W. and Lam, L.W. (2022), "Sensory marketing in hospitality: a critical synthesis and reflection", *International Journal of Contemporary Hospitality Management*, Vol. 35 No. 8, pp.2916-2928. <https://doi.org/10.1108/IJCHM-06-2022-0764>
- Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp.39-50. <https://doi.org/10.1177/002224378101800104>
- Garlin, F.V. and Owen, K. (2006), "Setting the tone with the tune: a meta-analytic review of the effects of background music in retail settings", *Journal of Business Research*, Vol. 59, pp.755-764. <https://doi.org/10.1016/j.jbusres.2006.01.013>
- Gibson, J.J. (1977), "The theory of affordances", in Shaw, R. and Bransford, J. (Eds.), *Perceiving, Acting, and Knowing: Toward an Ecological Psychology*, Erlbaum, Hillsdale, NJ, pp.67-82.
- Hair, J.F., Risher, J.J., Sarstedt, M. and Ringle, C.M. (2019), "When to use and how to report the results of PLS-SEM", *European Business Review*, Vol. 31 No. 1, pp.2-24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Han, W., Ozdemir, O. and Agarwal, S. (2024), "Linking social media marketing to restaurant performance—the moderating role of advertising expenditure", *Journal of Hospitality and Tourism Insights*, Vol. 7 No. 4, pp.1852-1870. <https://doi.org/10.1108/JHTI-03-2023-0217>
- Helal, M.Y.I. (2023), "The role of customer orientation in creating customer value in fast-food restaurants", *Journal of Hospitality and Tourism Insights*, Vol. 6 No. 5, pp.2359-2381. <https://doi.org/10.1108/JHTI-08-2022-0394>
- Helson, H. (1964), *Adaptation-level theory: an experimental and systematic approach to behavior*, Harper and Row, New York, NY.
- Henseler, J., Ringle, C.M. and Sarstedt, M. (2015), "A new criterion for assessing discriminant validity in variance-based structural equation modelling", *Journal of the Academy of Marketing Science*, Vol. 43 No. 1, pp.115-135. <https://doi.org/10.1007/s11747-014-0403-8>
- Herrington, J.D. and Capella, L.M. (1996), "Effects of music in service environments: a field study", *Journal of Services Marketing*, Vol. 10 No. 2, pp.26-41. <https://doi.org/10.1108/08876049610114249>
- Heung, V.C.S. and Gu, T. (2012), "Influence of restaurant atmospherics on patron satisfaction and behavioral intentions", *International Journal of Hospitality Management*, Vol. 31, pp.1167-1177. <https://doi.org/10.1016/j.ijhm.2012.02.004>
- Hwang, A.H.C. and Oh, J. (2020), "Interacting with background music engages E-customers more: the impact of interactive music on consumer perception and behavioral intention", *Journal of Retailing and Consumer Services*, Vol. 54, pp.101928. <https://doi.org/10.1016/j.jretconser.2019.101928>
- Hyun, S.S. and Kang, J. (2014), "A better investment in luxury restaurants: environmental or non-environmental cues?", *International Journal of Hospitality Management*, Vol. 39, pp.57-70. <http://dx.doi.org/10.1016/j.ijhm.2014.02.003>

- Jain, R. and Bagdare, S. (2011), "Music and consumption experience: a review", *International Journal of Retail & Distribution Management*, Vol. 39 No. 4, pp.289-302. <https://doi.org/10.1108/09590551111117554>
- Jang, S. and Namkung, Y. (2009), "Perceived quality, emotions, and behavioral intentions: application of an extended Mehrabian–Russell model to restaurants", *Journal of Business Research*, Vol. 62, pp.451-460. <https://doi.org/10.1016/j.jbusres.2008.01.038>
- Jeon, S., Park, C. and Yi, Y. (2016), "Co-creation of background music: a key to innovating coffee shop management", *International Journal of Hospitality Management*, Vol. 58, pp.56-65. <https://doi.org/10.1016/j.ijhm.2016.07.006>
- Kahneman, D. and Tversky, A. (1979), "Prospect theory: an analysis of decision under risk", *Econometrica*, Vol. 47, pp.263-291. <https://doi.org/10.2307/1914185>
- Kalnaovakul, K., Balasubramanian, K. and Chuah, S.H.W. (2025), "Service quality, customer sentiment and online ratings of beach hotels: an analysis of moderating factors", *Journal of Hospitality and Tourism Insights*, Vol. 8 No. 3, pp.988-1009. <https://doi.org/10.1108/JHTI-06-2024-0591>
- Kőszegi, B. and Rabin, M. (2006), "A model of reference-dependent preferences", *The Quarterly Journal of Economics*, Vol. 121 No. 4, pp.1133-1165. <https://doi.org/10.1093/qje/121.4.1133>
- Kwon, W., Lee, M. and Back, K.J. (2020), "Exploring the underlying factors of customer value in restaurants: a machine learning approach", *International Journal of Hospitality Management*, Vol. 91, 102643. <https://doi.org/10.1016/j.ijhm.2020.102643>
- Lee, D., Moon, J., Rhee, C., Cho, D. and Cho, J. (2016), "The effect of visual and auditory elements on patrons' liquor-ordering behavior: an empirical study", *International Journal of Hospitality Management*, Vol. 55, pp.11-15. <https://doi.org/10.1016/j.ijhm.2016.01.011>
- Lewis, P. and Thomas, H. (1990), "The linkage between strategy, strategic groups, and performance in the UK retail grocery industry", *Strategic Management Journal*, Vol. 11, pp.385-397. <https://doi.org/10.1002/smj.4250110505>
- Li, Y. (2024), "Application and impact of the 'Third Place' concept — Starbucks as an example", *Finance & Economics*, Vol. 1 No. 9. <https://doi.org/10.61173/f7mj1943>
- Lin, I.Y. (2010), "The combined effect of color and music on customer satisfaction in hotel bars", *Journal of Hospitality Marketing & Management*, Vol. 19 No. 1, pp.22-37. <https://doi.org/10.1080/19368620903327675>
- Lin, I.Y. and Mattila, A.S. (2010), "Restaurant servicescape, service encounter, and perceived congruency on customers' emotions and satisfaction", *Journal of Hospitality Marketing & Management*, Vol. 19 No. 8, pp.810-841. <https://doi.org/10.1080/19368623.2010.514547>
- Liu, Y. and Jang, S.S. (2009a), "The effects of dining atmospherics: an extended Mehrabian–Russell model", *International Journal of Hospitality Management*, Vol. 28 No. 4, pp.494-503. <https://doi.org/10.1016/j.ijhm.2009.01.002>
- Liu, Y. and Jang, S.S. (2009b), "Perceptions of Chinese restaurants in the US: what affects customer satisfaction and behavioral intentions?", *International Journal of Hospitality Management*, Vol. 28 No. 3, pp.338-348. <https://doi.org/10.1016/j.ijhm.2008.10.008>

- Magnini, V.P. and Thelen, S.T. (2008), "The influence of music on perceptions of brand personality, décor, and service quality: the case of classical music in a fine-dining restaurant", *Journal of Hospitality & Leisure Marketing*, Vol. 16 No. 3, pp.286-300. <https://doi.org/10.1080/10507050801946866>
- Mehrabian, A. and Russell, J.A. (1974), *An Approach to Environmental Psychology*, The MIT Press, Cambridge, MA.
- Michel, A., Baumann, C. and Gayer, L. (2017), "Thank you for the music – or not? The effects of in-store music in service settings", *Journal of Retailing and Consumer Services*, Vol. 36, pp.21-32. <https://doi.org/10.1016/j.jretconser.2016.12.008>
- Mittal, V., Ross Jr, W.T. and Baldasare, P.M. (1998), "The asymmetric impact of negative and positive attribute-level performance on overall satisfaction and repurchase intentions", *Journal of Marketing*, Vol. 62 No. 1, pp.33-47. <https://doi.org/10.1177/002224299806200104>
- Moreno-Lobato, A., Di-Clemente, E., Hernández-Mogollón, J.M. and Campón-Cerro, A.M. (2023), "How emotions sound: a literature review of music as an emotional tool in tourism marketing", *Tourism Management Perspectives*, Vol. 48, 101154. <https://doi.org/10.1016/j.tmp.2023.101154>
- North, A.C. and Hargreaves, D.J. (1996), "The effects of music on responses to a dining area", *Journal of Environmental Psychology*, Vol. 16, pp.55-64. <https://doi.org/10.1006/jev.1996.0005>
- Pantoja, F. and Borges, A. (2021), "Background music tempo effects on food evaluations and purchase intentions", *Journal of Retailing and Consumer Services*, Vol. 63, 102730. <https://doi.org/10.1016/j.jretconser.2021.102730>
- Podsakoff, P.M. and Organ, D.W. (1986), "Self-reports in organizational research: problems and prospects", *Journal of Management*, Vol. 12 No. 4, pp.531-544. <https://doi.org/10.1177/014920638601200408>
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp.879-903. <https://doi.org/10.1037/0021-9010.88.5.879>
- Ray, A., Das, B. and She, L. (2024), "What affects consumers' choice behaviour towards organic food restaurants? By applying organic food consumption value model", *Journal of Hospitality and Tourism Insights*, Vol. 7 No. 5, pp.2582-2602. <https://doi.org/10.1108/JHTI-04-2023-0238>
- Roschk, H., Loureiro, S.M.C. and Breitsohl, J. (2017), "Calibrating 30 years of experimental research: a meta-analysis of the atmospheric effects of music, scent, and color", *Journal of Retailing*, Vol. 93 No. 2, pp.228-240. <https://doi.org/10.1016/j.jretai.2016.10.001>
- Safavi, H.P., Bouzari, M. and Foroutan, T. (2023), "Restaurants under COVID-19 knife", *Journal of Hospitality and Tourism Insights*, Vol. 6 No. 5, pp.2506-2524. <https://doi.org/10.1108/JHTI-05-2022-0202>
- Sellers, R. and Nicolau, J.L. (2023), "Satisfaction and expenditure in wineries: a prospect theory approach", *Journal of Hospitality & Tourism Research*, Vol. 47 No. 2, pp.354-374. <https://doi.org/10.1177/10963480211031407>

- Sherif, M. and Hovland, C.I. (1961), *Social Judgment: Assimilation and Contrast Effects in Communication and Attitude Change*, Yale University Press, New Haven, CT.
- Trompeta, M.A., Karantinou, K., Koritos, C. and Bijmolt, T.H.A. (2022), "A meta-analysis of the effects of music in tourism and hospitality settings", *Journal of Business Research*, Vol. 138, pp.130-145. <https://doi.org/10.1016/j.jbusres.2021.08.067>
- Tuerlan, T., Li, S. and Scott, N. (2021), "Customer emotion research in hospitality and tourism: conceptualization, measurements, antecedents and consequences", *International Journal of Contemporary Hospitality Management*, Vol. 33 No. 8, pp.2741-2772. <https://doi.org/10.1108/IJCHM-11-2020-1257>
- Tversky, A. and Kahneman, D. (1991), "Loss aversion in riskless choice: a reference-dependent model", *The Quarterly Journal of Economics*, Vol. 106 No. 4, pp.1039-1061. <https://doi.org/10.2307/2937956>
- Vella, E.J., McDonough, C. and Goldstein, H. (2024), "Musical mood induction: the relative influences of music type and the importance of music preference", *Psychology of Music*, pp.1-12. <https://doi.org/10.1177/03057356241254361>
- Verastegui-Tena, L., van Trijp, H. and Piqueras-Fiszman, B. (2019), "Heart rate, skin conductance, and explicit responses to juice samples with varying levels of expectation (dis)confirmation", *Food Quality and Preference*, Vol. 71, pp.320-331. <https://doi.org/10.1016/j.foodqual.2018.08.011>
- Wareebor, S., Suttikun, C. and Mahasuweerachai, P. (2025), "Exploring the influence of online restaurant promotions on consumer behavioral intentions", *Journal of Hospitality and Tourism Insights*, Vol. 8 No. 3, pp.1095-1113. <https://doi.org/10.1108/JHTI-05-2024-0511>
- Weber, E.H. (1978), *The Sense of Touch (De Tactu, transl. by Ross, H.E.; Der Tastsinn, transl. by Murray, D.J.)*, Academic Press, New York, NY.
- Wen, H., Leung, X. and Pongtornphurt, Y. (2020), "Exploring the impact of background music on customers' perceptions of ethnic restaurants: the moderating role of dining companions", *Journal of Hospitality and Tourism Management*, Vol. 43, pp.71-79. <https://doi.org/10.1016/j.jhtm.2020.02.007>
- Yalch, R.F. and Spangenberg, E. (1993), "Using store music for retail zoning: a field experiment", *Advances in Consumer Research*, Vol. 20, pp.632-636.

Table 1. Descriptive statistics of the dependent and independent variables.

Variable	Mean	SD
Dependent variables		
Time spent at bars and cafés (B&C)	4.258	0.865
Choice of establishment (B&C)	3.724	1.071
Spending at establishment (B&C)	3.502	0.990
Time spent at restaurants (R)	3.661	0.940
Choice of establishment (R)	3.253	1.117
Spending at establishment (R)	3.121	1.072
Variables of interest		
EM (B&C)	4.416	0.858
DEM (B&C)	0.0002	0.531
DEMP (B&C)	0.222	0.222
DEMN (B&C)	-0.222	0.365
EM (R)	4.238	0.888
DEM (R)	-0.0001	0.699
DEMP (R)	0.299	0.338
DEMN (R)	-0.299	0.440
Control variables (Musical habits)		
HAB_1 (Listening to music)	5.674	0.794
HAB_2 (Attending concerts)	2.469	1.003
HAB_3 (Listening to music outdoors)	5.251	1.371
HAB_4 (Attending music-themed establishments)	2.320	1.382
HAB_5 (Paying for the music you listen to)	2.544	1.810

Source: Developed by authors. Note: EM=Emotions generated by liking music; DEM=Differences between an individual's emotions generated by liking music and those expressed by the individual's segment; DEMP=DEM positive differences; DEMN=DEM negative differences.

Table 2. Impact of variables on time spent at establishments.

Variable	Bars and cafés (B&C)			Restaurants (R)		
	Model 1 Coefficient (SD)	Model 2 Coefficient (SD)	Model 3 Coefficient (SD)	Model 1 Coefficient (SD)	Model 2 Coefficient (SD)	Model 3 Coefficient (SD)
C	2.014*** (0.465)	2.812*** (0.502)	3.045*** (0.569)	1.558*** (0.527)	2.542*** (0.608)	2.949*** (0.612)
EM	0.219*** (0.066)	0.037 (0.081)	0.021 (0.083)	0.292*** (0.072)	0.021 (0.113)	-0.027 (0.112)
DEM		0.471*** (0.130)			0.439*** (0.144)	
DEMP			0.216 (0.320)			-0.134 (0.238)
DEMN			0.637*** (0.230)			0.939*** (0.219)
HAB_1	0.101 (0.075)	0.100 (0.073)	0.098 (0.073)	0.111 (0.083)	0.141* (0.082)	0.157* (0.081)
HAB_2	-0.075 (0.064)	-0.082 (0.063)	-0.090 (0.063)	-0.109 (0.075)	-0.127* (0.074)	-0.126* (0.073)
HAB_3	0.121*** (0.044)	0.128*** (0.043)	0.119*** (0.044)	0.057 (0.050)	0.066 (0.049)	0.062 (0.048)
HAB_4	0.083* (0.045)	0.074* (0.044)	0.077* (0.044)	0.111** (0.051)	0.105** (0.050)	0.118** (0.049)
HAB_5	0.025 (0.033)	0.029 (0.032)	0.030 (0.032)	-0.023 (0.037)	-0.020 (0.036)	-0.015 (0.035)

Source: Developed by authors. Note: EM=Emotions generated by liking music; DEM=Differences between an individual's emotions generated by liking music and those expressed by the individual's segment; DEMP=DEM positive differences; DEMN=DEM negative differences.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Table 3. Impact of variables on choice of establishment.

Variable	Bars and cafés (B&C)			Restaurants (R)		
	Model 1 Coefficient (SD)	Model 2 Coefficient (SD)	Model 3 Coefficient (SD)	Model 1 Coefficient (SD)	Model 2 Coefficient (SD)	Model 3 Coefficient (SD)
C	1.442** (0.588)	1.963*** (0.650)	1.707** (0.737)	1.068* (0.637)	2.517*** (0.729)	2.827*** (0.743)
EM	0.116 (0.083)	-0.002 (0.105)	0.016 (0.108)	0.324*** (0.087)	-0.075 (0.136)	-0.112 (0.136)
DEM		0.308* (0.168)			0.645*** (0.172)	
DEMP			0.586 (0.412)			0.209 (0.289)
DEMN			0.125 (0.298)			1.026*** (0.266)
HAB_1	0.210** (0.095)	0.210** (0.095)	0.212* (0.095)	0.168* (0.101)	0.211** (0.098)	0.223 (0.098)
HAB_2	-0.025 (0.081)	-0.029 (0.081)	-0.021 (0.082)	-0.034 (0.091)	-0.060 (0.089)	-0.059 (0.088)
HAB_3	0.034 (0.056)	0.039 (0.056)	0.049 (0.057)	-0.028 (0.061)	-0.015 (0.059)	-0.018 (0.059)
HAB_4	0.179*** (0.057)	0.172*** (0.057)	0.169*** (0.057)	0.054 (0.062)	0.044 (0.060)	0.055 (0.060)
HAB_5	0.018 (0.041)	0.020 (0.041)	0.018 (0.041)	-0.015 (0.044)	-0.010 (0.043)	-0.006 (0.043)

Source: Developed by authors. Note: EM=Emotions generated by liking music; DEM=Differences between an individual's emotions generated by liking music and those expressed by the individual's segment; DEMP=DEM positive differences; DEMN=DEM negative differences.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Table 4. Impact of variables on spending at establishments.

Variable	Bars and cafés (B&C)			Restaurants (R)		
	Model 1 Coefficient (SD)	Model 2 Coefficient (SD)	Model 3 Coefficient (SD)	Model 1 Coefficient (SD)	Model 2 Coefficient (SD)	Model 3 Coefficient (SD)
C	2.286*** (0.542)	2.661*** (0.602)	2.627*** (0.683)	1.655*** (0.619)	2.663*** (0.718)	3.026*** (0.732)
EM	0.127 (0.077)	0.041 (0.097)	0.043 (0.100)	0.304*** (0.085)	0.020 (0.136)	-0.031 (0.137)
DEM		0.221 (0.155)			0.457*** (0.171)	
DEMP			0.258 (0.382)			-0.023 (0.284)
DEMN			0.197 (0.276)			0.900*** (0.270)
HAB_1	0.022 (0.088)	0.021 (0.088)	0.021 (0.088)	0.046 (0.097)	0.077 (0.096)	0.092 (0.096)
HAB_2	-0.073 (0.075)	-0.077 (0.075)	-0.075 (0.076)	0.084 (0.088)	0.069 (0.087)	0.073 (0.087)
HAB_3	0.015 (0.052)	0.018 (0.052)	0.020 (0.053)	-0.067 (0.059)	-0.055 (0.058)	-0.057 (0.058)
HAB_4	0.153*** (0.053)	0.149*** (0.053)	0.148*** (0.053)	0.024 (0.060)	0.019 (0.059)	0.033 (0.059)
HAB_5	0.111*** (0.038)	0.113*** (0.038)	0.112*** (0.038)	-0.001 (0.043)	0.002 (0.042)	0.006 (0.042)

Source: Developed by authors. Note: EM=Emotions generated by liking music; DEM=Differences between an individual's emotions generated by liking music and those expressed by the individual's segment; DEMP=DEM positive differences; DEMN=DEM negative differences.

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Supplementary material for the article “Asymmetric effects of music preference on emotional and behavioral responses: a reference dependence framework”

Table S1. Summary of previous studies examining liking music in foodservice settings. Source: Authors own work

Reference	Study setting	Explanatory variables related to liking music/musical preference	Dependent variables	Findings related to liking music/musical preference
Caldwell and Hibbert (2002)	Restaurants	Liked/familiar music	Time spent Perceived time spent Money spent Experience evaluations	More liked/familiar music associated with more time, more money spent, and more positive experiences
Demoulin (2011)	Restaurants	Music congruence (incongruence) with servicescape	Emotional responses Quality perceptions Patronage intentions	Congruent music leads to high pleasure and low arousal and subsequently increases patronage intentions
Harris and Ezeh (2008)	Restaurants	Liking music	Loyalty	No effect
Heung and Gu (2012)	Restaurants	Background music is pleasing (integrated within the construct “facility aesthetics”)	Return intention Intention to spread positive word-of-mouth Willingness to pay more	Facility aesthetics positively affects the three dependent variables
Hyun and Kang (2014)	Restaurants	Background music is pleasing (integrated within the construct “ambient conditions”)	Arousal Pleasure Behavioral intentions	Direct effect on arousal and indirect effect on pleasure and behavioral intentions
Jang and Namkung (2009)	Restaurants	Background music is pleasing (integrated within the construct “atmospherics”)	Emotions (positive and negative) Behavioral intentions	Direct effect on positive emotions and behavioral intentions
North and Hargreaves (1996)	Cafeterias	Liking music	Willingness to return Willingness to interact with others	Liking the music increases the willingness to return and interact with others
Wilson (2003)	Restaurants	Liked/familiar music (appropriate/fit)	Satisfaction Amount of money spent	More liked/familiar music associated with more satisfaction and money spent

Table S2. Reliability and convergent validity. Source: Authors own work.

Constructs	loadings	Cronbach's alpha	Composite reliability (rho a)	Composite reliability (rho c)	Average variance extracted (AVE)
Emotions at Bars & Cafés (B&C) when you like the music playing.					
EM_1 (1)	0.635				
EM_1 (2)	0.894				
EM_1 (3)	0.929	0.846	0.866	0.9	0.695
EM_1 (4)	0.846				
Emotions at Restaurants (R) when you like the music playing.					
EM_2 (1)	0.739				
EM_2 (2)	0.937				
EM_2 (3)	0.924	0.907	0.934	0.936	0.786
EM_2 (4)	0.931				

References of the supplementary material

- Caldwell, C. and Hibbert, S.A. (2002), "The influence of music tempo and musical preference on restaurant patrons' behavior", *Psychology & Marketing*, Vol. 19 No. 11, pp.895-917. <https://doi.org/10.1002/mar.10043>
- Demoulin, N. (2011), "Music congruency in a service setting: the mediating role of emotional and cognitive responses", *Journal of Retailing and Consumer Services*, Vol. 18 No. 1, pp.10-18. <https://doi.org/10.1016/j.jretconser.2010.08.007>
- Harris, L.C. and Ezech, C. (2008), "Servicescape and loyalty intentions: an empirical investigation", *European Journal of Marketing*, Vol. 42 Nos. 3/4, pp.390-422. <https://doi.org/10.1108/03090560810852995>
- Heung, V.C.S. and Gu, T. (2012), "Influence of restaurant atmospherics on patron satisfaction and behavioral intentions", *International Journal of Hospitality Management*, Vol. 31, pp.1167-1177. <https://doi.org/10.1016/j.ijhm.2012.02.004>
- Hyun, S.S. and Kang, J. (2014), "A better investment in luxury restaurants: environmental or non-environmental cues?", *International Journal of Hospitality Management*, Vol. 39, pp.57-70. <https://doi.org/10.1016/j.ijhm.2014.02.003>
- Jang, S. and Namkung, Y. (2009), "Perceived quality, emotions, and behavioral intentions: application of an extended Mehrabian–Russell model to restaurants", *Journal of Business Research*, Vol. 62, pp.451-460. <https://doi.org/10.1016/j.jbusres.2008.01.038>
- North, A.C. and Hargreaves, D.J. (1996), "The effects of music on responses to a dining area", *Journal of Environmental Psychology*, Vol. 16, pp.55-64. <https://doi.org/10.1006/jevp.1996.0005>
- Wilson, S. (2003), "The effect of music on perceived atmosphere and purchase intentions in a restaurant", *Psychology of Music*, Vol. 31 No. 1, pp.93-112. <https://doi.org/10.1177/0305735603031001327>