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CUSTOMER LOYALTY IN THE MANICURE INDUSTRY: THE ROLE OF SERVICESCAPE AND EXPECTATION MANAGEMENT

Mei-Hui Fu*
Graduate School of Technological and Vocational Training,
National Yunlin University of Science and Technology
Department of Hair Styling and Salon Management, Shu-Te University
Ba22922980@stu.edu.tw

* Corresponding author: Mei-Hui Fu
Address: No. 59, Hengshan Rd., Yanchao District, Kaohsiung City 82445, Taiwan
E-mail: Ba22922980@stu.edu.tw

Abstract

In the increasingly competitive beauty services market—particularly within Taiwan's rapidly expanding manicure industry—understanding the factors that influence customer loyalty has become a strategic priority. While past studies have explored the impact of the physical environment in hospitality and retail contexts, research systematically examining how environmental cues affect loyalty in personal care services is limited. This study investigates the relationship between the physical service environment and customer loyalty in manicure settings, emphasizing the mediating role of expectancy disconfirmation. Grounded in Expectancy Disconfirmation Theory (EDT), this study developed a conceptual framework incorporating three core constructs: the physical environment, expectancy disconfirmation, and customer loyalty. We administered a structured questionnaire to consumers in Kaohsiung, Taiwan, who had recently received manicure services. A total of 318 valid responses were collected through purposive and convenience sampling. The development of the measurement items was guided by established service quality and customer behavior frameworks. The measurement items were adapted from validated scales from past studies, and statistical analysis was conducted using SPSS and PROCESS Macro. Descriptive statistics showed that respondents rated their experiences with high favorability across all constructs. ANOVA and t-tests revealed significant differences in perceptions and behaviors across gender, age, income, and education, indicating that consumer evaluations of service environments are contingent on demographic variables. Multiple regression analyses confirmed that the physical environment significantly and positively affected customer loyalty and expectancy disconfirmation. Expectancy disconfirmation was found to be a strong predictor of loyalty. Empirically, media-

tion analysis using the bootstrapping method revealed that expectancy disconfirmation partially mediated the relationship between the physical environment and customer loyalty. While the physical environment directly enhanced loyalty, its indirect effect—via the customer's evaluation of whether expectations were exceeded—was also crucial. The findings empirically support all seven study hypotheses (H1–H7). The theoretical contributions extend servicescape and expectancy disconfirmation models to the manicure industry, an underexplored yet significant segment of the beauty service sector. This study provides empirical insight from an Asian consumer context, supporting the generalizability of Western-derived service marketing theories in emerging markets. From a managerial perspective, the findings underscore the importance of designing aesthetically appealing service environments and strategically managing customer expectations. Beauty salon operators are encouraged to enhance environmental stimuli (e.g., lighting, scent, music, layout) while delivering personalized service experiences that exceed customer expectations to foster greater loyalty and competitive differentiation.

Key words: customer loyalty, physical environment, expectancy disconfirmation, manicure services, servicescape, consumer behavior.

Introduction

The global beauty industry has experienced rapid growth in recent years, driven by rising consumer demand for personal care, self-expression, and wellness-oriented services. Within this sector, the manicure and nail care segment has emerged as a vibrant subindustry, particularly in Asia, where rising income levels, urbanization, and the proliferation of beauty culture have fueled exponential growth in demand. In Taiwan, the manicure industry has become increasingly competitive, with salons offering not only nail services but also integrating fashion aesthetics, relaxation experiences, and lifestyle branding, appealing to a diverse customer base. Recent studies have shown that beauty consumption, particularly in Asian countries, is closely tied to identity expression and social media influence (Lee & Kim, 2021). In Taiwan, consumer expectations toward personalized, immersive service experi-

ences have further intensified competition within the manicure industry (Chen & Lin, 2022).

As consumer choices expand, customer loyalty has become essential to business sustainability and growth in the service sector. Retaining loyal customers reduces marketing costs, increases customer lifetime value, and strengthens brand equity. Particularly in service industries such as beauty and wellness— where switching costs are low and alternatives are readily available— customer loyalty is critical to ensuring long-term profitability. Past research highlights the importance of service quality, perceived value, and emotional connection in building loyalty (Zeithaml, 1988; Oliver, 1999). Recent research further supports that cultivating emotional attachment and perceived value are key to driving loyalty in beauty services (Pereira & de Farias, 2023; Wang & Wu, 2020), especially in high-contact service settings

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where customers seek affective and personalized interactions.

However, in experiential services such as manicure salons, where the consumer's experience is shaped not only by the outcome but also by the ambiance and interaction, other factors must be considered.

The physical environment remains one of the most influential yet understudied factors in shaping customer experience. Often referred to as the "servicescape" (Bitner, 1992), the physical surroundings in which a service is delivered—including lighting, scent, music, spatial layout, cleanliness, and décor—play a critical role in shaping customer perceptions and emotional responses. While Bitner's (1992) foundational concept of "servicescape" remains relevant, more recent studies emphasize that atmospheric cues—such as music, lighting, and spatial layout—directly impact customer emotions and behavioral intentions in wellness-related services (Yoon & So, 2021; Li & Yu, 2022). These findings are particularly applicable in high-contact settings like manicure salons. In high-contact service environments like nail salons, servicescape functions as more than a backdrop; it actively communicates quality, influences mood, and impacts overall satisfaction. While the concept of servicescape has been widely explored in hospitality and retail contexts (Baker, 1987; Ryu & Han, 2011), a research gap in its application to the personal care and beauty industry remains.

Concurrently, the role of customer expectations in post-service evaluation has gained increasing attention in the consumer behavior literature. Introduced by Oliver and Desarbo (1988), Expectancy Disconfirmation Theory (EDT) provides a foundational framework for understanding how customers compare their pre-service expectations with actual service performance. Positive disconfirmation—when experiences exceed expectations—increases satisfaction and loyalty, whereas negative disconfirmation contributes to dissatisfaction and attrition. While numerous studies have applied EDT in retail, hospitality, and healthcare sectors, fewer have investigated its role in aesthetic-driven, emotionally charged services like manicures. Contemporary applications of Expectancy Disconfirmation Theory (EDT) continue to validate its explanatory power in personal care services (Kang & Namkung, 2020; Ahmad & Al-Badarneh, 2023), highlighting how expectation-experience gaps influence not only satisfaction but also loyalty and repurchase intentions.

Given the multidimensional nature of service evaluation, this study proposes a model integrating the physical environment and expectancy disconfirmation to explain customer loyalty in manicure services. The study augments the service marketing literature by highlighting how atmospheric and cognitive-emotional variables jointly influence loyalty behavior. Specifically, the study investigates the following: (1) the direct effect of the physical environment on customer loyalty, (2) the effect of the physical environment on expectancy disconfirmation, (3) the mediating role of expectancy disconfirmation in the relationship between

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physical environment and loyalty. The study explores whether there are demographic differences in terms of consumer evaluations, providing practical implications for market segmentation strategies.

This research is particularly relevant in Taiwan's manicure industry, where service providers increasingly seek ways to differentiate themselves beyond technical expertise. By examining how environmental cues and expectation management shape loyalty, this study provides actionable insights for practitioners while contributing to theory. The study addresses a critical research gap by applying established models in a new and culturally specific context, providing empirical evidence from an emerging Asian market.

This study seeks to answer the following research questions:
1. Do consumer perceptions of the physical environment, expectancy disconfirmation, and loyalty vary across demographic characteristics?
2. How does the physical environment influence expectancy disconfirmation and customer loyalty?
3. Does expectancy disconfirmation mediate the relationship between the physical environment and loyalty?

Using a structured survey and statistical analysis, this study deepens the understanding of the mechanisms underlying customer loyalty in manicure services, offering both theoretical contributions and managerial implications.

Literature Review and Hypothesis Development

Differences Across Demographic Variables

Past research indicates that consumer perceptions of service environments, satisfaction, and loyalty vary across demographics such as gender, age, education, and income level (Parasuraman et al., 1985; Petrick et al., 2001). For instance, younger consumers are often more responsive to aesthetic and experiential cues, while older consumers may emphasize reliability and consistency (Kim & Hall, 2020). Further, research suggests that women tend to place higher importance on the sensory and emotional aspects of services, such as ambiance and decor, particularly in personal care settings (Lee & Lee, 2020).

In the context of beauty and wellness services, demographic segmentation is critical for effective service design and marketing. Lin and Mattila (2021) found that environmental stimuli are interpreted differently depending on individuals' backgrounds, with high-income and highly educated customers demonstrating greater sensitivity to atmosphere and branding cues. Thus, tailoring physical space design and service delivery to differing customer groups can significantly impact satisfaction and loyalty.

Based on the above, the following hypotheses are proposed:

H1: There are significant differences in perceptions of the physical environment across consumer demographic variables.

H2: There are significant differences in expectancy disconfirmation across consumer demographic variables.

H3: There are significant differences in customer loyalty across consumer demographic variables.

Main Effects

Physical Environment and Customer Loyalty.

The physical service environment—commonly referred to as the "servicescape"—has been widely recognized as a critical determinant of customer experience and behavioral intentions. Kotler (1973) first introduced the concept of atmospherics as a marketing tool to influence purchase behavior. Bitner (1992) later conceptualized the servicescape framework, including ambient conditions, spatial layout, and symbolic cues influencing customers and employees.

Empirical studies continually support the impact of the physical environment on customer loyalty. For instance, Ryu and Han (2011) found that in restaurant settings, environmental factors such as lighting, music, and scent directly influence customer satisfaction and intention to return. In beauty services, Lee and Lee (2020) highlighted that customers' perceptions of salon atmosphere significantly affect their repurchase intentions. Lin and Mattila (2021) extended this notion by emphasizing utilitarian and hedonic elements of the service environment, noting that experiential cues (e.g., artistic design, pleasant fragrance) are critical in settings such as spas and salons, where the service is both functional and emotional.

Thus, in the manicure industry, where customers spend extended time in close physical settings, atmosphere plays a crucial role in shaping customer retention and brand preference.

H4: The physical environment has a positive and significant effect on customer loyalty.

Physical Environment and Expectancy Disconfirmation.

Recent developments in service marketing and consumer experience research continue to validate the applicability of Expectancy Disconfirmation Theory (EDT) across various high-contact service settings, including hospitality, healthcare, and tourism (Kim & Hall, 2020; Han et al., 2021). However, its extension to aesthetic and emotionally immersive services, particularly within the beauty sector, remains underexplored. In services such as manicure treatments—where multisensory cues, interpersonal dynamics, and aesthetic satisfaction often play more prominent roles than technical outcomes—traditional cognitive evaluations of service quality must be complemented by affective and environmental considerations.

In the beauty and wellness domain, customer expectations are shaped not only by explicit service promises or product specifications, but also by prior experiences, peer recommendations, and online reviews—introducing a subjective and interpretive layer to service evalua-

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tion. Thus, disconfirmation in these settings may hinge on functional performance along with sensory delight, emotional resonance, and atmospheric congruity. Furthermore, Lin and Mattila (2021) argue that when experiential cues such as ambient design, scent, and spatial aesthetics elicit emotional engagement, even moderate service performance can lead to favorable disconfirmation outcomes. This implies that the consumer's psychological response to the environment can significantly shape satisfaction and loyalty judgments. Moreover, research suggests that customer disconfirmation evaluations are increasingly shaped by emotional and atmospheric signals rather than solely by cognitive performance assessments. In high-contact service environments such as beauty salons, the physical setting often becomes intertwined with the perception of service efficacy itself. Pullman and Gross (2004) found that experiential design elements—such as ambient lighting, color schemes, and soundscapes—trigger emotional responses and heighten the likelihood of perceived over-performance, reinforcing positive disconfirmation.

The expectancy formation process in such contexts tends to be fluid and socially constructed. Mano and Oliver (1993) found that emotions generated during the consumption experience can retroactively alter perceived expectations; this means that a well-designed environment may not only elevate perceived performance but also recalibrate initial expectations upward. This dynamic underscores the dual role of the physical environment—as both a precursor to ex-

pectation formation and a stimulus for disconfirmation judgments.

Thus, within the manicure service context, environmental aesthetics and sensory cues may be subtle yet powerful contributors to satisfaction via emotional resonance and cognitive contrast. Integrating these insights strengthens the theoretical model of this study by situating EDT within a more comprehensive view of service experience, wherein atmosphere, affect, and expectation jointly shape post-consumption evaluations.

This study employs the EDT framework to test linear relationships while accounting for the nuanced interplay between physical stimuli and cognitive–affective appraisal processes. Aligning with contemporary perspectives of the customer experience, this study positions the physical environment as both a signal and a stimulus that influences how service performance is interpreted against prior expectations. The novelty of applying EDT in the manicure context lies in its ability to capture how intangible and affective service elements—often overlooked in traditional models—can mediate customer perceptions and drive loyalty behavior.

By integrating atmospheric and emotional variables into the expectancy disconfirmation process, this study expands the theoretical reach of EDT while addressing the mounting need to understand loyalty formation in design-intensive, experience-centric services. This refined application offers valuable insights into how service environments function as strategic and psychological

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tools to manage consumer expectations and foster brand attachment. The following hypothesis is proposed accordingly.

H5: The physical environment has a positive and significant effect on expectancy disconfirmation.

Expectancy Disconfirmation and Customer Loyalty.

Several studies support the proposition that expectancy disconfirmation influences customer loyalty. For instance, Bearden and Teel (1983) found that satisfaction mediates the relationship between expectation–performance gaps and repeat purchase behavior. Studies such as Oliver (1999) and Kim and Hall (2020) confirm that when expectations are exceeded, customers are more likely to exhibit loyal behaviors, such as repurchasing, recommending the service, and showing resistance to switching.

In experiential service settings such as nail salons, loyalty is often emotional and relationship-driven. Customers who receive services that exceed expectations not only return but also develop brand attachment, which is challenging for competitors to disrupt. The following hypothesis is proposed accordingly.

H6: Expectancy disconfirmation has a positive and significant effect on customer loyalty.

Mediating Effect

Mediation analysis can uncover the mechanisms through which one variable influences another. Baron and Kenny (1986) first introduced the classic mediation testing method, which was refined by Hayes (2013) by introducing the PROCESS Macro and bootstrapping techniques. These models are widely used to explain indirect effects in consumer behavior, particularly in service marketing.

This study proposes that expectancy disconfirmation serves as a mediator between the physical environment and customer loyalty. In other words, the physical service setting first influences how customers interpret their experiences relative to expectations; this interpretation then influences their likelihood of remaining loyal to the brand or service provider.

This indirect pathway has been observed in other service settings. For instance, Choi et al. (2021) found that restaurant ambiance affected revisit intentions through emotional satisfaction. In the beauty service industry, similar mechanisms are likely to apply, given the highly sensory and immersive nature of the service experience.

H7: Expectancy disconfirmation mediates the relationship between the physical environment and customer loyalty.

Research Methodology

Research Design

This study adopted a quantitative research methodology to examine the impact of the physical service environ-

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ment on customer loyalty in the manicure industry, focusing on the mediating role of expectancy disconfirmation. The study is grounded in Expectancy Disconfirmation Theory (EDT), which posits that satisfaction and behavioral outcomes are functions of the gap between prior expectations and perceived performance (Oliver & Desarbo, 1988). The model proposed in this study includes three primary constructs: physical environment, expectancy disconfirmation, and customer loyalty.

We developed a structured questionnaire using validated scales from past studies to collect empirical data. The questionnaire was administered in a field setting, targeting consumers recently receiving manicure services in Kaohsiung, Taiwan. This urban region represents a vibrant, competitive beauty service market, making it an ideal site for examining consumer perceptions of service quality and environmental design.

Sampling and Data Collection

This study employed a non-probability sampling method using purposive and convenience sampling. The selection criteria required participants to have had at least one manicure service experience over the past three months. Questionnaires were distributed in collaboration with several local nail salons and beauty service providers to ensure access to actual customers in real service environments.

A total of 350 questionnaires were distributed, and 318 valid responses were collected, resulting in a usable response rate of 90.86%. Questionnaires with missing values, uniform responses, or inconsistent answers were excluded. The demographic sample comprised 82.4% female and 17.6% male respondents, with the majority falling within the 21–30 age group. Educational levels were predominantly university or graduate level, and income levels ranged from under NT$30,000 to over NT$70,000 monthly.

Measurement Instrument

The survey instrument was divided into four sections:
1. Demographic variables: Gender, age, education, monthly income, and frequency of manicure service use.
2. Physical environment: Measured using 15 items adapted from Bitner (1992), Baker (1987), and Ryu and Han (2011). Items assessed sensory and ambient features such as lighting, temperature, music, scent, layout, and décor.
3. Expectancy disconfirmation: Measured using six items based on Oliver and Desarbo (1988), capturing the perceived gap between expectations and actual experience.
4. Customer loyalty: Measured using seven items derived from Zeithaml et al. (1996), evaluating repurchase intention, recommendation behavior, and switching resistance.

All items were measured using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

To ensure content validity, items were reviewed by three domain experts in service marketing and consumer be-

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havior. We conducted a pilot test with 30 consumers to refine wording and improve clarity. Feedback from the pretest led to minor revisions in the phrasing of items.

Reliability and Validity

Internal consistency reliability was assessed using Cronbach's alpha. All constructs demonstrated satisfactory reliability, with alpha coefficients exceeding the recommended threshold of 0.70: physical environment ($\alpha = 0.91$), expectancy disconfirmation ($\alpha = 0.89$), and customer loyalty ($\alpha = 0.92$).

This study conducted exploratory factor analysis (EFA) to assess construct validity. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.881, and Bartlett's test of sphericity was significant ($\chi^2 = 3120.47$, df = 231, $p < 0.001$). These findings indicate that the data were suitable for factor analysis. Factor loadings for all items exceeded 0.60, supporting convergent validity. Items with cross-loadings or low communalities were removed.

Next, we performed confirmatory factor analysis (CFA) using AMOS to verify the measurement model's fit. Fit indices exhibit a good model fit (χ^2/df = 2.15, RMSEA = 0.059, CFI = 0.945, TLI = 0.932). Composite reliability (CR) values exceeded 0.80 for all constructs; average variance extracted (AVE) values were above 0.50, further confirming convergent and discriminant validity (Fornell & Larcker, 1981).

Data Analysis Techniques

This study conducted data analysis using SPSS 26.0 and AMOS 24.0. Descriptive statistics were used to summarize demographic variables and response distributions. We performed independent samples t-tests and one-way ANOVA to assess differences in perceptions of physical environment, expectancy disconfirmation, and customer loyalty across demographic groups (H1–H3).

Multiple linear regression analysis was employed to examine the direct effects of the physical environment on customer loyalty and expectancy disconfirmation (H4 and H5) and the effect of expectancy disconfirmation on loyalty (H6). Multicollinearity was checked via the variance inflation factor (VIF); all VIF values were below 2.0, indicating no multicollinearity concerns.

To test the mediating effect of expectancy disconfirmation between the physical environment and customer loyalty (H7), we applied a bootstrapping method using the PROCESS Macro Model 4 (Hayes, 2013). A total of 5,000 bootstrap samples were generated to produce bias-corrected confidence intervals. If the 95% confidence interval for the indirect effect did not contain zero, mediation was considered significant. The analysis revealed partial mediation, as the direct and indirect effects remained statistically significant.

Summary

This methodological framework provides a rigorous empirical foundation for examining the dynamics among the physical environment, customer expecta-

tions, and loyalty in service industries. The use of validated measurement instruments, robust sampling procedures, and advanced analytical techniques strengthens the reliability and validity of the findings, enhancing their generalizability to similar beauty service contexts in other urban settings.

Empirical Analysis Results

This section presents the empirical findings based on data collected from 318 valid responses. The analysis proceeded in several stages: descriptive statistics, demographic group comparisons (H1–H3), regression analyses (H4–H6), and mediation testing (H7). Statistical tests were conducted using SPSS 26.0 and the PROCESS Macro for bootstrapping analysis.

Descriptive Statistics

The demographic profile of the respondents shows that 82.4% were female and 17.6% were male. Most respondents were between 21 and 30 years old (45%), followed by those between 31 and 40 (30%). Regarding education, 52% had attained a university degree, and 38% held a postgraduate qualification. Monthly income levels ranged from under NT$30,000 (20%) to over NT$70,000 (15%), with the largest group earning between NT$30,000–50,000 (40%). Approximately 68% of respondents reported receiving manicure services at least once every two months, indicating active engagement with the service category.

The mean scores for the primary constructs are as follows: physical envi-ronment (M = 4.13, SD = 0.51), expectancy disconfirmation (M = 3.89, SD = 0.61), and customer loyalty (M = 4.06, SD = 0.55). These results suggest generally favorable perceptions of the service experience among respondents.

Group Differences by Demographic Variables (H1–H3)

To test H1–H3, we used independent sample t-tests and one-way ANOVA to determine whether perceptions of physical environment, expectancy disconfirmation, and loyalty differed across demographic variables.

Physical Environment (H1):

The ANOVA results exhibit significant differences in perceptions of the physical environment by age group (F = 4.12, $p < 0.01$) and education level (F = 3.85, $p < 0.05$). Younger respondents (aged 21–30) and those with postgraduate education rated the environment more positively than other groups. The findings suggest that younger and more educated consumers are more sensitive to the atmospheric and aesthetic elements of the service space.

Expectancy Disconfirmation (H2):

Significant differences were observed across income level (F = 3.94, $p < 0.05$). Respondents with higher income levels (> NT$70,000) reported higher levels of positive expectancy disconfirmation. This finding implies that those with greater spending power are more likely to perceive services as exceeding expectations.

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Customer Loyalty (H3):

An independent samples t-test shows that gender had a significant effect on loyalty scores ($t = 2.35$, $p < 0.05$), with female respondents expressing greater loyalty intentions. This finding supports the notion that gender may influence affective attachment and repeat-purchase behaviors in beauty-related services.

The above results provide empirical support for H1, H2, and H3.

Regression Analysis for Direct Effects (H4–H6)

This study conducted multiple linear regression analyses to examine the direct relationships among the study constructs.

Physical Environment → Customer Loyalty (H4):

The regression analysis shows that the physical environment positively and significantly affected customer loyalty ($\beta = 0.41$, $t = 7.52$, $p < 0.001$), explaining approximately 35% of the variance in loyalty ($R^2 = 0.35$). This finding confirms H4 and supports past studies that indicate service environment is a strong predictor of affective loyalty (Bitner, 1992; Lee & Lee, 2020).

Physical Environment → Expectancy Disconfirmation (H5):

The physical environment had a significant and positive impact on expectancy disconfirmation ($\beta = 0.37$, $t = 6.64$, $p < 0.001$), explaining 29% of the variance ($R^2 = 0.29$). This finding supports

H5 and illustrates how ambient and sensory cues shape expectation–performance evaluations.

Expectancy Disconfirmation → Customer Loyalty (H6):

Expectancy disconfirmation significantly predicted customer loyalty ($\beta = 0.45$, $t = 8.01$, $p < 0.001$), confirming H6. This finding reinforces the role of perceived performance exceeding expectations as a key driver of emotional commitment and retention behavior.

Mediation Analysis (H7)

To test the mediating role of expectancy disconfirmation between physical environment and customer loyalty (H7), we applied bootstrapping using PROCESS Macro (Model 4) with 5,000 resamples and a 95% confidence level. The analysis yielded the following results:

1. Direct effect: Physical environment → Customer loyalty ($\beta = 0.41$, $p < 0.001$)
2. Indirect effect: Physical environment → Expectancy disconfirmation → Customer loyalty = 0.17
3. 95% CI for indirect effect: [0.11, 0.26] Since the confidence interval does not include zero, the mediation effect is statistically significant.

This finding indicates that expectancy disconfirmation partially mediates the relationship between physical environment and customer loyalty. In other words, the physical environment affects loyalty both directly and indirectly—

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Table 1. Summary of Hypothesis Testing

Hypothesis	Statement	Result
H1	Differences in perception of physical environment across demographic variables	Supported
H2	Differences in expectancy disconfirmation across demographic variables	Supported
H3	Differences in customer loyalty across demographic variables	Supported
H4	Physical environment → Customer loyalty	Supported
H5	Physical environment → Expectancy disconfirmation	Supported
H6	Expectancy disconfirmation → Customer loyalty	Supported
H7	Expectancy disconfirmation mediates physical environment → loyalty	Supported

through the extent to which customer expectations are met or exceeded.

*Summary of Hypothesis Testing &
Implications of Findings*

The empirical results confirm the importance of designing service environments that appeal to customer expectations and sensory perceptions. The mediating role of expectancy disconfirmation suggests that businesses must offer attractive environments and manage customer expectations proactively. These findings are particularly relevant for industries such as beauty and wellness, where emotional satisfaction is essential to brand loyalty.

Discussion and Contributions

This study investigated the effects of the physical environment on customer loyalty in the manicure industry, focusing on the mediating role of expectancy disconfirmation. Using data from 318 valid responses of respondents from Kaohsiung, Taiwan, the study tested seven hypotheses, finding full empirical support for all proposed relationships. The following section discusses the results considering prior research, highlighting its theoretical and practical contributions.

Discussion of Key Findings

Demographic Variations in Perceptions and Behaviors (H1–H3).

The demographic analysis results reveal that perceptions of the physical environment, expectancy disconfirmation, and customer loyalty significantly vary across gender, age, education, and income. Female consumers and those in the younger age groups were more positively influenced by environmental factors. This finding aligns with Lee and Lee (2020), who suggested that beauty service environments particularly appeal to women due to their attention to aesthetics and sensory details. Similarly, respondents with higher education and

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income levels reported stronger expectancy disconfirmation and loyalty, likely reflecting their greater experience with service standards and refined expectations.

The findings imply that service operators should not adopt a one-size-fits-all strategy. Rather, segmenting customers based on demographic profiles and customizing service environment features may result in more effective consumer engagement.

Direct Effects of the Physical Environment (H4–H5).

The physical environment was found to have a significant and positive effect on customer loyalty and expectancy disconfirmation. This finding aligns with the servicescape theory proposed by Bitner (1992) and is supported by recent findings in hospitality and wellness research (Lin & Mattila, 2021; Ryu & Han, 2011). In experiential service industries such as nail salons, the tangible environment—including ambient elements, visual aesthetics, and spatial arrangements—strongly influences emotional evaluations and brand preference.

When customers perceive the manicure environment as pleasant, well-designed, and relaxing, they are more likely to feel emotionally connected to the service provider. This connection promotes loyalty behaviors such as repeat visits, willingness to pay premium prices, and word-of-mouth referrals. These results reinforce the notion that investment in physical design and sensory appeal can yield substantial long-term returns.

Expectancy Disconfirmation as a Mediator (H6–H7).

This study has confirmed that expectancy disconfirmation significantly mediates the relationship between the physical environment and customer loyalty. This finding extends the application of Expectancy Disconfirmation Theory (EDT) (Oliver & Desarbo, 1988) to the manicure industry and highlights its relevance in aesthetic-driven service contexts. When the actual experience surpasses expectations—whether through superior service quality, ambiance, or personalized attention—customers exhibit higher satisfaction, which translates into loyalty.

This finding aligns with Kim and Hall (2020), who showed that expectation–performance gaps critically shape loyalty in cosmetic medical services. Han et al. (2021) emphasized that service environments must not only meet baseline expectations but also exceed them to foster emotional and behavioral bonds. Thus, in a highly competitive and experience-oriented market like the beauty industry, managing and exceeding expectations is a strategic imperative.

Theoretical Contributions

This study contributes to the relevant literature in several important ways:

Contextual Extension of Servicescape Theory.

While the concept of servicescape has been widely applied in hospitality, retail, and healthcare sectors, its application in the manicure and beauty industry remains limited. This study extends the theory by demonstrating that physical environment elements, such as lighting, scent, music, temperature, and décor, play a critical role in driving customer outcomes in nail salons. This contextual contribution addresses a research gap while highlighting the importance of aesthetic-driven service environments.

Integration of Expectancy Disconfirmation Theory in Personal Care Services.

By integrating Expectancy Disconfirmation Theory as a mediating framework, this study provides a nuanced understanding of how and why physical environments impact loyalty. It goes beyond simple cause-and-effect relationships and introduces an emotional–cognitive mechanism (expectancy disconfirmation) that connects environmental cues to loyalty behavior. This theoretical insight can inform future models in consumer behavior, particularly in experience-centric services.

Empirical Evidence from an Emerging Market.

Past studies on service environment and loyalty are concentrated in Western or developed markets. By focusing on consumers in Taiwan, this study contributes valuable insights from an Asian service context, where cultural norms, aesthetic preferences, and service expectations differ. The findings expand the generalizability of service marketing theories across diverse cultural settings.

Practical Contributions

From a managerial perspective, the findings of this study provide actionable insights for practitioners in the manicure and broader beauty service industries, detailed below.

Invest in Sensory and Aesthetic Design.

Salon operators should prioritize investments in lighting, ambient music, temperature control, interior design, and scent branding. These physical elements can significantly shape the customer experience, enhancing perceived value and encouraging repeat patronage.

Manage and Exceed Customer Expectations.

Understanding customer expectations and designing services that deliberately exceed them—through surprise amenities, personalized gestures, or premium touches—can increase positive disconfirmation. This psychological uplift serves as a powerful driver of customer loyalty and retention.

Segment Marketing and Service Design.

Given the observed differences across demographics, service providers should tailor their marketing and operational strategies accordingly. For instance, younger female customers may be more responsive to trend-driven designs and social media-friendly spaces. In contrast, older and higher-income customers may

value privacy, professionalism, and luxury aesthetics.

Feedback Loops to Monitor Expectation Alignment.

Incorporating mechanisms such as post-service surveys, feedback-integrated loyalty programs, or digital reviews can help businesses monitor whether they are meeting or exceeding customer expectations. Real-time data collection enables timely adjustments to the physical environment and service delivery.

Summary

The findings of this study reaffirm the importance of the physical service environment in shaping customer perceptions and behaviors. The mediating role of expectancy disconfirmation underscores the psychological complexity of customer loyalty. This represents a reaction to the environment and a reflection of how experiences align with or exceed expectations. For practitioners and researchers, the findings provide a roadmap for designing high-impact, customer-centric service environments that foster sustainable loyalty in the competitive beauty services market.

Limitations and Future Research

While this study offers valuable insights into the impact of the physical environment and expectancy disconfirmation on customer loyalty in the manicure industry, we acknowledge the following limitations. First, this study employed a cross-sectional design based on self-reported data collected from consumers in Kaohsiung, Taiwan. This geographic and cultural specificity may limit the generalizability of the findings to other regions or countries. Future research should adopt a broader sampling approach, e.g., respondents from multiple cities or different cultural contexts, to enhance external validity.

Second, the study relied on convenience and purposive sampling, which may introduce selection bias. While efforts were made to ensure demographic diversity, the sample may not fully represent the larger population of manicure service consumers. Future studies would benefit from employing random sampling techniques or stratified sampling to increase representativeness.

Third, this study focused exclusively on consumer perspectives and did not incorporate salon operators' or employees' viewpoints. Including multiple stakeholder perspectives could offer a more comprehensive understanding of how servicescape design and expectation management are implemented in practice. Qualitative interviews or mixed-method designs may also provide richer contextual insights.

Fourth, the measurement model evaluated general constructs of the physical environment without differentiating between specific dimensions such as ambience, design, or social factors. Future research should examine these sub-dimensions in greater detail to identify which environmental components most strongly affect consumer outcomes.

Finally, the model tested in this study was limited to direct and mediating relationships. Future studies should explore moderating effects, such as emotional involvement, service frequency, or cultural orientation, which might shape how customers interpret their service experiences. Longitudinal studies could also be conducted to observe changes in customer perceptions and loyalty behavior over time.

By addressing the above limitations, future research can build on the current findings to deepen the theoretical understanding and strengthen the practical relevance of service environment management in the beauty and wellness industry.

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