



When Ethics Meets Innovation: How Customers' Moral Judgments Drive Hotel Service Differentiation via Robots.

Abstract

This research investigates the influence of customers' ethical perceptions of service robots on hotel service differentiation through the dual mediating roles of luxury-technology fit and task-technology fit. Grounded in ethics position theory and dual-congruity perspectives, the study employs a cross-cultural comparative analysis between hotel customers from Taiwan (n=556) and the United States (n=551) to elucidate cultural variations in the pathway from ethical perceptions of service robots to anticipated hotel service differentiation.

Findings demonstrate that ethical perceptions positively affect performance expectancy and perceived importance across both cultures, albeit with differing magnitudes. The relationship between ethical perceptions and performance expectancy remains consistent across countries, whereas the impact on perceived importance is significantly stronger in the United States compared to Taiwan, reflecting American cultural individualism. Notably, task-technology fit serves as a significant mediator between performance expectancy and service differentiation across cultural contexts, while luxury-technology fit does not demonstrate the hypothesized mediating effect. The mediating function of task-technology fit between perceived importance and service differentiation is particularly pronounced in Taiwan, consistent with its cultural emphasis on practical harmony and contextual adaptation.

Key Words

Service Robots; Ethics; Luxury–Technology Fit; Task–Technology Fit; Ethics Position Theory; Dual-Congruity Theory

Track

Technology

Focus of the Paper

Theoretical/Academic

Type of Submission

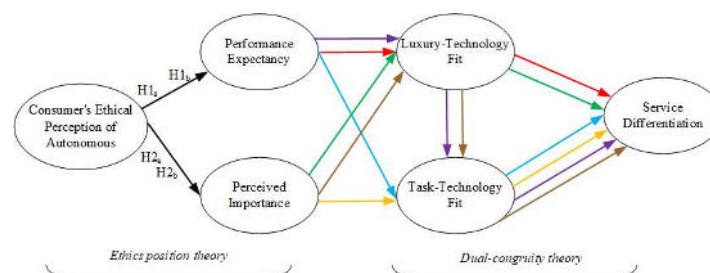
Paper

Introduction

The hospitality industry increasingly adopts service robots to enhance operational efficiency, improve customer experiences, and achieve service differentiation in a competitive marketplace (Guo et al., 2024; Ku et al., 2024). These automated machines perform routine tasks such as check-in processes and room deliveries, allowing staff to focus on high-touch interactions while offering novel experiences for guests (Song et al., 2023; Rana et al., 2024). Despite growing implementation, critical research gaps persist regarding service robots' contribution to hotel service differentiation, particularly concerning customers' ethical perceptions across cultural contexts.

Current literature inadequately addresses ethical considerations in hotel service contexts (de Boissieu & Baudier, 2023), with limited understanding of guests' ethical perceptions during actual robot interactions (Lin et al., 2024). The unique ethical challenges emerging from guest-robot encounters in hotel environments remain insufficiently explored (Koseoglu et al., 2024). Furthermore, few studies examine how varying cultural contexts influence customers' ethical perceptions of service robots between Eastern and Western societies (Li et al., 2024; Said et al., 2024), despite cultural values significantly shaping ethical judgments and technology acceptance.

This study investigates how customers' ethical perceptions of service robots influence hotel service differentiation through luxury-technology fit and task-technology fit, comparing Taiwan and the United States. These countries represent distinct cultural orientations: Taiwan's collectivist, high-context culture with Confucian values versus America's individualistic, low-context society (Wu et al., 2022). The research examines relationships between ethical perceptions, performance expectancy, perceived importance, and service differentiation, addressing existing gaps through cross-cultural analysis to advance both theoretical understanding and practical implementation of service robots in hospitality settings.



Note: → H3_a H3_b; → H4_a H4_b; → H5_a H5_b; → H6_a H6_b; → H7_a H7_b; → H8_a H8_b

Figure 1. Proposed research framework

Theoretical background and hypothesis

Drawing on an Ethics of Performance Technology (EPT) perspective, our research posits that customers' evaluations of autonomous service technologies are driven not only by utilitarian performance but also by normative judgments concerning harm, fairness, and contextual appropriateness (Forsyth, 1980). When these technologies are perceived to align with ethical principles—by mitigating negative outcomes, respecting relational norms, and maintaining transparency—they become both morally justified and practically valuable. This dual appraisal is hypothesized to enhance performance expectancy and perceived importance (Wang et al., 2024; Ladeira et al., 2023).

Cultural dimensions further nuance these evaluations. In Taiwan's collectivist, high power distance environment, ethical assessments are deeply interwoven with cultural imperatives such as group harmony, hierarchical respect, and situational sensitivity (Wu et al., 2022). Here, when autonomous services are implemented in ways that uphold these values, customers expect reliable performance and attach significant importance to the technology. In contrast, the U.S.—characterized by individualism, low power distance, and lower uncertainty avoidance—emphasizes individual rights, fairness, and transparency (Yeganeh, 2023). Thus, American customers' ethical evaluations similarly enhance performance expectancy and the perceived significance of technological innovations.

Extending this framework, dual-congruity theory suggests that the influence of ethical perceptions on service outcomes is mediated by two distinct but complementary constructs: luxury-technology fit and task-technology fit. Luxury-technology fit refers to the alignment between the aspirational, high-status values embodied by advanced technologies and customers' self-concepts. In the hospitality context, where service differentiation often depends on symbolic cues and experiential quality, this mediator transforms elevated performance expectancy and perceived importance into markers of luxury and distinctiveness (Sirgy, 1986; Tuškej et al., 2013). Accordingly, we hypothesize that ethical perceptions are positively related to performance expectancy (H1a for Taiwan, H1b for the U.S.) and perceived importance (H2a for Taiwan, H2b for the U.S.), and that luxury-technology fit mediates the relationships between these antecedents and service differentiation (H3a/H3b and H4a/H4b, respectively).

H1: Customers' ethical perceptions of service robots are positively related to performance expectancy in Taiwan (H1a) and the U.S. (H1b).

H2: Customers' ethical perceptions of service robots are positively related to their perceived importance in Taiwan (H2a) and the U.S. (H2b).

H3: Luxury–technology fit mediates the relationship between performance expectancy and service differentiation in Taiwan (H3a) and the U.S. (H3b).

H4: Luxury–technology fit mediates the relationship between perceived importance and service differentiation in Taiwan (H4a) and the U.S. (H4b).

Complementing the symbolic mediator, task-technology fit captures the degree to which a technology's functional capabilities align with the specific operational demands of service tasks (Samli & Sirgy, 1981; Suh et al., 2010). While performance expectancy indicates customers' belief in the technology's efficacy, task-technology fit ensures that such efficacy translates into tangible operational advantages. Thus, it is posited to mediate the impact of performance expectancy (H5a for Taiwan, H5b for the U.S.) and perceived importance (H6a for Taiwan, H6b for the U.S.) on service differentiation.

H5: Task–technology fit mediates the relationship between performance expectancy and service differentiation in Taiwan (H5a) and the U.S. (H5b).

H6: Task–technology fit mediates the relationship between perceived importance and service differentiation in Taiwan (H6a) and the U.S. (H6b).

Furthermore, a sequential mediation model is proposed whereby performance expectancy and perceived importance influence service differentiation through a dual-stage process. Initially, luxury-technology fit validates the symbolic and identity-relevant attributes of the technology; subsequently, task-technology fit confirms its functional appropriateness (Wang & Cheung, 2024). This sequential mechanism is articulated in

hypotheses H7a/H7b for performance expectancy and H8a/H8b for perceived importance. Collectively, these propositions provide an empirically grounded rationale for anticipating that ethical perceptions—filtered through both cultural and dual-mediation lenses—transform autonomous service technologies into strategically differentiated offerings.

H7: Luxury-technology fit and task-technology fit sequentially mediate the relationship between performance expectancy and service differentiation in Taiwan (H7a) and the U.S. (H7b). Specifically, it is a sequential mediation mechanism from performance expectancy, luxury-technology, and task-technology fit to service differentiation.

H8: Luxury-technology fit and task-technology fit sequentially mediate the relationship between perceived importance and service differentiation in Taiwan (H8a) and the U.S. (H8b). This process involves a sequential mediation mechanism from perceived importance, luxury-technology fit, and task-technology fit to service differentiation.

Methodology

This cross-cultural study employed two distinct data collection processes. The Taiwanese sample ($n=556$) was obtained through Meta Survey Marketing Research in November 2023, utilizing Facebook, Instagram, LINE@, and the agency's website. For the U.S. sample ($n=551$), Cloud Research's Connect platform was employed. Eligibility criteria for all participants included prior experience with hotel service robots and ChatGPT usage. Taiwanese respondents received LINE Points as compensation, while U.S. participants received \$2 with potential additional bonuses for supplementary responses. This dual-platform approach with targeted incentive structures ensured methodological rigor and cross-cultural representativeness, yielding high-quality data essential for analyzing customer interactions with hospitality technologies across different cultural contexts.

Results

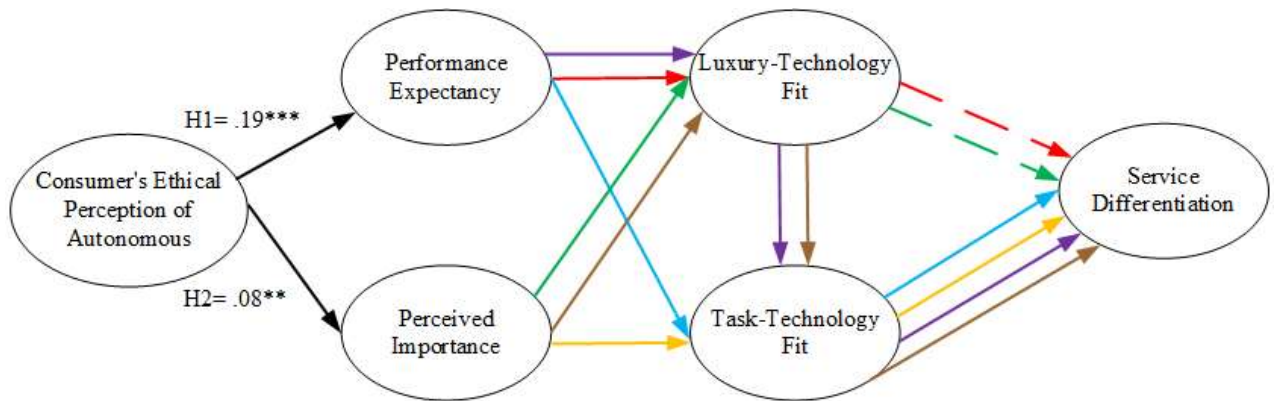
This study employed SmartPLS following Henseler et al. (2016) to assess model fit and test hypotheses. An SRMR value of 0.07 indicated acceptable model fit (Hair et al., 2023). The R^2 values demonstrated varying explanatory power across constructs: performance expectancy (0.08), perceived importance (0.004), luxury-technology fit (0.58), task-technology fit (0.7), and service differentiation (0.27). Positive Q^2 values confirmed the model's predictive relevance.

Hypothesis testing revealed significant positive relationships between customer ethical perception and performance expectancy for both Taiwan ($\beta = .13$, $p < .01$) and the USA ($\beta = .25$, $p < .001$), supporting H1a and H1b. Customer ethical perception positively influenced perceived importance only in the USA ($\beta = .22$, $p < .001$), with nonsignificant effects in Taiwan ($\beta = 0.06$), providing partial support for H2.

Mediation analysis using bias-corrected bootstrapping with 5,000 resamples showed that luxury-technology fit did not significantly mediate either performance expectancy or perceived importance's effects on service differentiation across both samples, failing to support H3 and H4. Conversely, task-technology fit significantly mediated the relationship between performance expectancy and service differentiation in both samples (indirect effects = 0.12, $p < .01$), supporting H5. The mediating effect of perceived importance on service differentiation via task-technology fit was significant only in Taiwan (indirect effect = 0.09, $p < .001$), partially supporting H6.

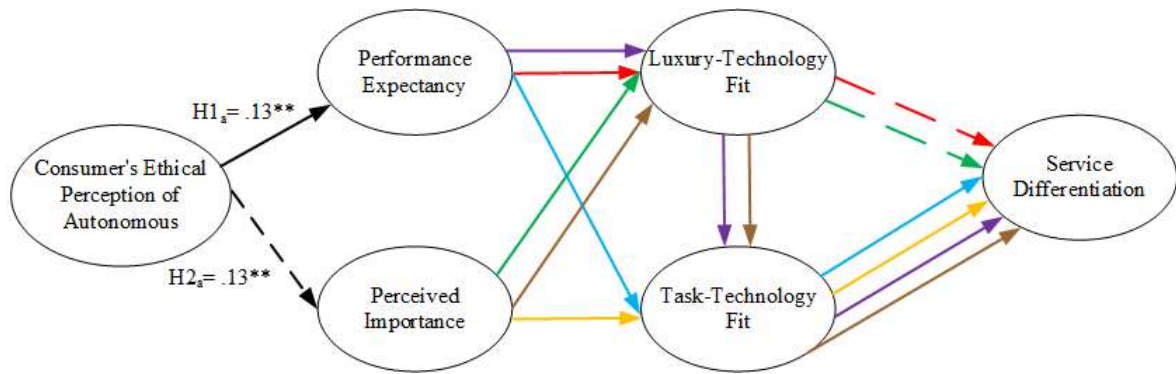
Sequential mediation analysis confirmed significant pathways from performance expectancy through luxury-technology fit and task-technology fit to service differentiation across both samples (indirect effects: Taiwan = 0.07, $p < .01$; USA = 0.10, $p < .001$). Similarly, the sequential mediation from perceived importance through

luxury-technology fit and task-technology fit to service differentiation was supported in both Taiwan (indirect effect = 0.09, $p < .001$) and the USA (indirect effect = 0.03, $p < .01$), confirming H7 and H8 respectively.



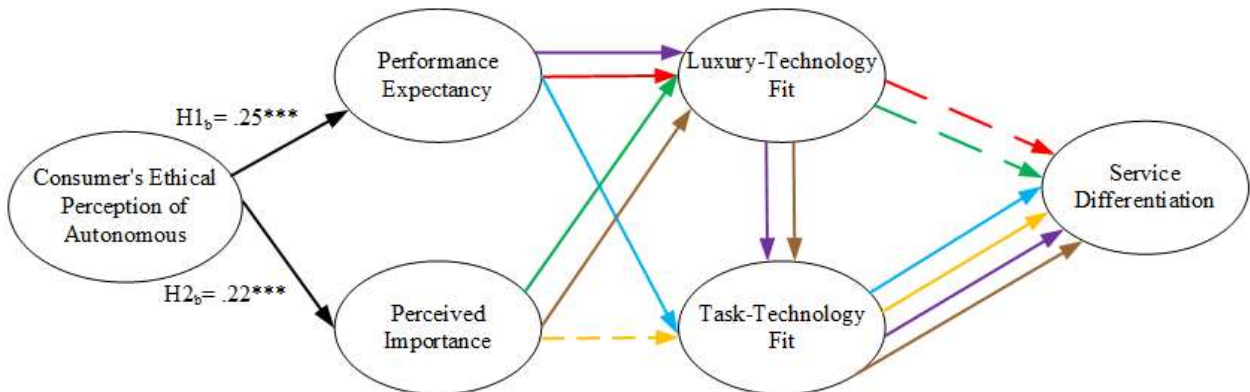
Note: ** $p < .01$; *** $p < .001$.

Figure 2. Results of all samples all samples in Taiwan and the U.S.



Note: ** $p < .01$; *** $p < .001$.

Figure 3. Results of samples in Taiwan



Note: ** $p < .01$; *** $p < .001$.

Figure 4. Results of samples in the U.S.

Discussion and conclusion

This study makes significant theoretical contributions to understanding service robots in hospitality contexts. First, it extends ethics position theory by empirically validating ethical perceptions' role in technology-enabled service differentiation. Unlike previous research focused primarily on moral implications of AI design (de Boissieu & Baudier, 2023), our study demonstrates how customers' ethical perceptions directly influence acceptance and evaluation of service robots during actual service interactions. Second, we introduce a novel theoretical framework integrating dual-congruity perspectives with technology acceptance models. By demonstrating how luxury-technology fit and task-technology fit sequentially mediate the relationship between ethical perceptions and service differentiation, we provide a more nuanced understanding of how hotels achieve service differentiation through robotic technology, revealing the interdependent nature of these fits. Third, through cross-cultural comparison between Taiwan and the United States, we contribute to technology adoption literature by revealing that while ethical perceptions consistently affect performance expectancy across cultures, their impact on perceived importance varies significantly. The stronger effect of task-technology fit in Taiwan's collectivist context provides novel insights into how cultural values shape service differentiation mechanisms. Fourth, we advance understanding of service differentiation in the digital age by demonstrating how ethical considerations interact with both performance expectations and perceived importance, highlighting how hotels can achieve differentiation through ethically aligned deployment that resonates with cultural values. For hotel managers implementing service robots, our findings emphasize the importance of culturally aligned ethical implementation strategies. Hotels in collectivist cultures should frame robotic services within narratives of community benefit, while those in individualistic cultures should highlight personal autonomy and customization options. Additionally, hotels must balance luxury positioning with technological functionality, ensuring robotic implementation enhances rather than diminishes their luxury image while maintaining operational efficiency. This requires attention to both aesthetic and functional design elements. Furthermore, hotels should establish clear metrics for monitoring robot performance and guest satisfaction, using data analytics to continuously refine their robotic services. Finally, ethical transparency in robot implementation is crucial, with proactive communication about data privacy and the complementary role of robots in enhancing human service delivery.

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