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Robots vs Humans: An Examination of Emotional and Cognitive Responses in Up-Selling and Cross-Selling

Purpose – Besides the mainstream discussion around customer expectation, this study reviews would customer surprise be influential in up-and cross-selling. Although hotel customers are becoming more used to robotic services, due to a negative impression of the robot's lack of warmth, other customers still prefer the human-to-human services. Thus, what happens when up-and cross-selling are delivered by a robot versus human salesperson?

Design/methodology/approach – This study designs 3-experiment to investigate how guests would be surprised by a human or robot salesperson when checking in following a scenario of up-and cross-selling. This study has 3-study and data were collected through an online survey with the United States residents (n=270).

Findings – This study validates that when up-and cross-selling are conducted separately, a human salesperson performs a better job in terms of achieving higher customer surprise, satisfaction, perceived value, and reuse intention. When promoting both up-and cross-selling together, a robot salesperson has a more competitive performance in all examined measures.

Research limitations/implications – This study contributes elucidations on a theoretical conception of Appraisal Tendency Framework and extends the idiomatic impression that humans are more favorable than robots when an intensive personal interaction is involved.

Practical implications –This study inspires hospitality practitioners an optimal strategy in adopting human or robot employees for up-and cross-selling. Suggestions for marketing management and service operation with analytical methods are elucidated.

Originality/value - This study not just fills all indicated knowledge voids but proffers theoretical and practical insights.

Keywords:

Upselling, Cross-selling, Robot, Customer surprise

Article Type: Research paper

1. Introduction

Upselling and cross-selling are essential revenue-generating techniques in the hospitality industry, aimed at boosting both profits and guest satisfaction without coming across as pushy. Upselling typically involves encouraging guests to upgrade their reservations to higher-tier options, while cross-selling promotes ancillary services or products that complement the guests' stay (Guillet, 2020). Given the prevalence of online reservations, front desk agents play a pivotal role in these techniques, leveraging the initial face-to-face interaction upon guests' arrival to upsell or cross-sell effectively (Guillet, 2020). Successful upselling or cross-selling can lead to impromptu payments from guests, thereby improving their satisfaction and boosting the hotel's revenue metrics (Norvell et al., 2018). Hotel statistics have uncovered the financial benefits of these techniques. For instance, upselling by the front desk can contribute to a RevPAR increase of 2-5%, compared to 0.3-1% from pre-stay upselling (HospitalityNet, 2022). The hospitality literature has also explored various aspects of online upselling and cross-selling strategies in the hotel industry, such as the effectiveness of online messages for hotel bookings (Ahn et al., 2022) and the impact of exclusive discounts on additional guest consumption (Kim & Tanford, 2021a).

The rise of digitalization has driven a surge in research on online marketing strategies, including upselling and cross-selling (Corsaro & Maggioni, 2022). However, in-person upselling and cross-selling differ significantly from their online counterparts, which occur during the pre-purchase stage. In-person interactions allow salespeople to respond immediately to customer reactions, adjust their tactics, and build stronger relationships (Norvell et al., 2018). This dynamic and interactive process relies heavily on the salesperson's skills, making it a powerful tool for encouraging additional purchases (Norvell et al., 2018).

As the hospitality industry continues to evolve, the integration of advanced technologies, such as service robots, is becoming more prevalent. The potential of service robots in upselling and cross-selling at the front desk is increasingly recognized. The pandemic has heightened customer awareness of cross-contamination risks, fostering a preference for contactless services, including robots in the hospitality industry. Advances in AI technologies have transformed robotic customer service, making it more diverse and intuitive (Choi & Wan, 2021). For example, the Mandarin Oriental in Las Vegas uses Pepper, a humanoid robot, to interact with guests, answer inquiries, and promote upselling and cross-selling based on customer needs (SoftBank, 2017; SoftBank, 2023). Additionally, the hotel industry faces challenges such as labor shortages and high costs. Service robots can help mitigate these issues by reducing the reliance on human staff and saving on commission costs typically paid to front desk agents (Guillet, 2020).

Despite growing interest in service robots, most hospitality literature focuses on comparing customer expectations and perceptions, with limited discussion on surprise. Studies often measure satisfaction based on perceived ease of use and usefulness (Song et al., 2022), or warmth and competence (Liu et al., 2022), comparing these to actual service delivery (Choi et al., 2020; Zeithaml et al., 2018). However, customer surprise, which goes beyond expectations, remains underexplored (Shin, 2022). Existing studies on surprising hotel guests mainly address revenue strategies, such as the impact of surprise discounts on additional consumption and guest delight (Kim & Tanford, 2021b; Lim, 2022).

This study addresses two gaps in the literature: whether customers are more surprised by a robot or a human salesperson, and how this surprise affects their willingness to accept upselling and cross-selling offers. While hotel customers are becoming accustomed to robotic services, some still prefer human interactions for perceived warmth and empathy (Lin et al., 2022).

Using the Appraisal Tendency Framework (ATF), this study examines how emotions trigger cognitive responses impacting decision-making (Han et al., 2007). Through experiments, it investigates how guests react to upselling and cross-selling by human versus robot salespersons and how these interactions influence purchasing decisions. This research is among the first to assess the viability of robots for upselling and cross-selling in hospitality.

2. Literature review and hypotheses development

2.1 Upselling and Cross-selling in hospitality industry

Upselling and cross-selling share similar selling philosophies but employ different strategies. Upselling involves persuading customers to choose a higher-level product or service than they initially intended, enhancing their experience while also increasing profitability for the company (Guillet, 2020). For example, in the hotel industry, upselling might include offering room upgrades, such as moving from a standard room to a suite or a room with a terrace (RevenueHub, 2023).

In contrast, cross-selling focuses on selling additional related products or services without changing the customer's original purchase decision (Guillet, 2020). Hotels often use cross-selling to promote ancillary services like spa packages, transportation, and parking options that complement the guests' stay (RevenueHub, 2023).

Despite the widespread application of upselling and cross-selling in the hotel sector, there is a surprising lack of in-depth academic research on these practices (Guillet, 2020). Recent studies have primarily concentrated on online marketing strategies, pricing, and revenue management. For instance, research has explored how online upselling contributes to revenue management (Guillet, 2020), the impact of unexpected online cross-selling discounts on customer purchases (Kim & Tanford, 2021a), and how text message promotions influence consumer attitudes and purchase intentions for hotel upsells (Ahn et al., 2022). This trend reflects the growing prevalence of online hotel reservations and indicates a shift in focus toward digital strategies (Ahn et al., 2022).

However, discussions surrounding in-person selling—especially in the context of emerging AI robots and their potential roles in upselling and cross-selling—are notably scarce in empirical studies (Guillet, 2020). Addressing this gap, the current study aims to investigate how customer emotions influence their responses to different types of salespeople. Specifically, it examines how customers react to being surprised by either a robot or a human salesperson and how this affects their willingness to engage with upselling and cross-selling offers.

2.2 The Integration of Robots into Online Upselling and Cross-Selling Strategies

The integration of robots and AI into online upselling and cross-selling strategies marks a significant evolution in sales tactics within the hospitality industry. Traditionally, these methods have relied on human interaction, leveraging the personal touch and relationship-building skills of salespeople (Norvell et al., 2018). However, the advent of AI and robotic systems has introduced new dimensions to these strategies, particularly in real-time interactions between staff and customers.

AI-driven tools, such as chatbots and virtual assistants, provide personalized recommendations and real-time interactions by leveraging machine learning and natural language processing to mimic human sales techniques (Valenzuela et al., 2024). These systems offer data-driven

insights, predictive analytics, and customer segmentation, ensuring tailored and effective sales approaches in online settings. Additionally, they can handle real-time customer interactions. For instance, Connie, Hilton's robot concierge, assists guests by providing information about hotel amenities and local attractions. Connie can also suggest upgrades or additional services, such as spa treatments or dining options, thereby enhancing both upselling and cross-selling opportunities (HarvardBusinessReview, 2023).

By handling routine tasks and operating 24/7, AI and robots reduce labor costs and address staff shortages. They also complement human salespeople by augmenting their skills, allowing them to focus on relationship-building. This combination of advanced technology and human touch ultimately leads to increased revenue and enhanced customer experiences in the hospitality industry.

Although robots possess the technical capabilities to potentially replace humans in personal selling, their appearance and essence differ significantly from those of humans. Consequently, the cognitive differences in customer perceptions between human and robotic salespersons have not yet been empirically studied (Kim & Tanford, 2021b; Lim, 2022).

2.3 Customer surprise and satisfaction generated by a human vs robotic salesperson

In psychology, surprise is an emotional response that arises from the violation of expectations or the detection of novelty in one's environment (Dey et al., 2017). In the realm of business sales, customers experience surprise when they encounter products or services that differ from what they anticipated. This deviation can occur when a product or service is unexpected, highlighting a discrepancy with initial expectations (Kim & Mattila, 2010). Consequently, surprise can manifest as either positive or negative, depending on the subsequent reactions (Briñol et al., 2018; Kim & Mattila, 2010; Mende et al., 2019). In consumer behavior, surprise becomes a positive emotion when linked to favorable outcomes, such as making a purchase, while it can turn negative if followed by adverse reactions, like choosing not to buy (Briñol et al., 2018; Kim & Mattila, 2010; Mende et al., 2019). This study specifically investigates how surprise, elicited by either a human or robotic salesperson, can positively influence consumer decisions regarding upselling and cross-selling. Thus, the focus is on positive surprise, grounded in the expectancy disconfirmation model, which posits that individuals feel surprised when their experiences exceed their expectations (Yüksel & Yüksel, 2001).

Research in service management indicates that customers who experience surprise tend to report higher levels of satisfaction compared to those who do not (Barnes & Krallman, 2019; Dey et al., 2017). This heightened satisfaction is attributed to the intrinsic arousal caused by surprise, which amplifies the emotions associated with satisfaction. Despite the significance of surprise in service management, there is a scarcity of hospitality studies addressing this emotion. Previous research has examined how unexpected discounts can enhance consumer buying decisions and satisfaction (Kim & Tanford, 2021a; Lim, 2022). Similarly, Tan (2023) explored how gambled price discounts surprise consumers and attract them through quality cues of product types. These studies generally highlight the positive relationship between customer surprise and satisfaction, but they primarily focus on online contexts, leaving the phenomenon of "offline" surprise—particularly as provoked by human and robotic salespersons—largely unexplored.

Building on this existing research, the current study posits that a positive correlation between surprise and customer satisfaction will emerge in human-to-human interactions. This assumption is based on a conceptual understanding of satisfaction and the differing perceptions

of human versus robot interactions. Customer satisfaction reflects service quality and is closely tied to customer expectations and perceptions (Zeithaml et al., 2018). Expectations involve predictions about future outcomes based on past experiences or knowledge, while perceptions relate to how customers evaluate a company's performance based on their interactions (Zeithaml et al., 2018).

2.4 Customers' emotional response in a human vs robotic setting

Numerous studies have explored the relationship between customer satisfaction and the adoption of service robots, particularly in the hospitality sector. These studies highlight the positive impact of humanoid robots on service delivery, drawing on the concept of anthropomorphism, which refers to the tendency to attribute human emotions to non-human entities (Epley et al., 2007). In basic service operations—such as hotel check-ins, restaurant ordering, and delivery—research indicates that greater anthropomorphism leads to increased trust (Choi et al., 2019; Lu et al., 2021) and satisfaction (Qiu et al., 2020). For example, Liu et al. (2022) found that hotel customers interacting with childlike and adult-like robots perceive warmth and competence, respectively. This perception is linked to customer expectations, associating childlike robots with hedonic dominance and adult-like robots with utilitarian dominance. Additionally, Seo (2022) examined how a service robot's gender influences customer pleasure and satisfaction, revealing that customers report higher levels of satisfaction when interacting with female robots, likely due to stereotypes that women are perceived as warmer and more expressive.

However, service robots are not universally appreciated. The uncanny valley theory posits that highly humanlike robots can evoke feelings of eeriness or discomfort (Mori et al., 2012). In service management, the violation of expectation hypothesis suggests that uncanny features may signal a lack of appropriateness and interpersonal skills, creating a gap between the robot's appearance and expected behavior (Lin et al., 2022). This gap can lead customers to perceive the robot as lacking in interpersonal skills. For instance, during service recovery interactions, which require a higher level of personalization, studies show that customers are less likely to accept a robot's apology compared to that of a human employee, especially after a service failure (Hu et al., 2021).

While previous research presents varied perspectives on the role of robots in service delivery, a common finding is that customers generally hold a positive impression of robots in simple operations. However, as the level of interaction increases, customers tend to prefer human agents. Given that upselling and cross-selling require more personal interaction than basic hotel operations, a negative impression may arise due to the robot's perceived lack of communication skills. Therefore, the first hypothesis is proposed as follows:

> H1: When selling to customers, a human salesperson can generate a higher (a) customer surprise and (b) satisfaction than a robot salesperson.

2.5 Customers' perceived value and reuse intention in a human vs robotic setting

Customers' perceived value and their intention to reuse services are positively correlated in a consequential relationship. Perceived value is defined as the customer's overall assessment of consumption utility, based on what is received versus what is sacrificed (Zeithaml et al., 2018). This sacrifice encompasses more than just monetary costs; it includes non-monetary factors such as negotiation, uncertainty, and time invested during consumption (Zeithaml et al., 2018).

What customers receive includes not only the utilitarian benefits of the service or product but also psychological benefits from hedonic consumption, which evoke feelings of delight, pleasure, and surprise (Oliver et al., 1997). Empirical studies in hospitality have shown that perceived value is positively influenced by the relationship between service quality and customer engagement (Itani et al., 2019; Li, 2021).

Customer engagement describes the emotional, cognitive, and behavioral connections customers have with a company (Kumar & Pansari, 2016). The emotional aspect reflects a customer's concern for the company; the cognitive aspect pertains to their thought processes and evaluations; and the behavioral aspect relates to the time, cost, and effort they invest (Vivek et al., 2012). In service delivery, when customers perceive their interactions as pleasant and satisfying, their perceived value increases during direct interactions with the provider (Itani et al., 2019). A positive perceived value subsequently enhances post-purchase intentions, including referrals, repurchases, and reuse (Itani et al., 2019; Kumar & Pansari, 2016; Lei et al., 2021).

This study examines whether a human salesperson can be substituted by a robot, focusing on customers' reuse intentions. Reuse intention refers to the decision to continue using or repurchasing a good or service after initial consumption (Lei et al., 2021). It reflects the potential to translate attitudes and beliefs about a product or service into actual behavior. Research indicates that a customer's intention to reuse a product or service is often linked to the skills of the salesperson, who serves as the primary interface (Lei et al., 2021; Meyer-Waarden et al., 2020). This is particularly relevant in the context of upselling and cross-selling, which extend beyond initial consumption expectations and rely heavily on trust and relationship building.

Consequently, similar to the first hypothesis, the dynamics of upselling and cross-selling are examined within the framework of customer engagement, considering the active interactions involved and the robots' perceived lack of interpersonal skills (Lin et al., 2022). Thus, the second hypothesis is formulated as follows:

> H2: Customers who are promoted by a human salesperson will have higher (a) perceived value and (b) reuse intention than that of a robot salesperson.

2.6 Conceptualization of Appraisal Tendency Framework in up-and cross-selling

This study investigates the connection between customer emotions and cognitive responses in the context of upselling and cross-selling, specifically comparing interactions with human versus robot salespersons. The ATF posits that emotions are intricately linked to immediate cognitive responses, or interpretations, which ultimately guide decision-making processes (Han et al., 2007). By emphasizing incidental emotions—those that arise from external stimuli rather than the core experience—the ATF suggests that each emotion is associated with specific cognitive responses that shape judgments about a situation (Han et al., 2007).

In this context, emotions such as surprise can significantly influence customer behavior. When a salesperson introduces an unexpected element, it can trigger an emotional response that impacts the customer's subsequent actions. If this surprise elicits a positive emotional reaction, it can enhance the customer's satisfaction with the interaction (Han et al., 2007). The ATF further posits that emotions play a crucial role in value assessment; a positive emotional response, such as satisfaction, can elevate the perceived value of a product or service, making it more likely for customers to view it as a favorable deal (Han et al., 2007).

Moreover, the ATF suggests that emotions directly affect decision-making. When customers experience positive emotions, their perceived value of the offering increases, thereby enhancing the likelihood of making a purchase decision. This study hypothesizes that satisfaction and perceived value act as serial mediators in this process, influencing post-purchase intentions. This conceptual model aligns with previous research that supports the idea that emotional responses can shape customer behavior and decision-making in sales contexts.

By incorporating the principles of the ATF, this study seeks to clarify how emotional responses, especially those elicited by surprise, can enhance satisfaction and perceived value, thereby influencing customers' intentions to reuse or repurchase. This framework offers a thorough understanding of the dynamics involved when customers interact with human versus robotic salespersons, emphasizing the critical role of emotional and cognitive interplay in shaping consumer behavior. Previous studies have supported this hypothetical relationship. Consequently, the third hypothesis is proposed as follows

> H3: The effect of selling delivered by a human salesperson on a customer's reuse intention will be serially mediated by perceived value and satisfaction.

Predicated on the discussed literature review and the theoretical underpin of the ATF, the conceptual model (Figure 1) depicts all hypothetical psychological processes guiding this study. The three main hypotheses developed are investigated in three scenario studies. A summary list of all hypotheses in each study is presented in Table 3.

2.7 Hypotheses summary

Predicated on the discussed literature review and the theoretical underpin of the ATF, the conceptual model (Figure 1) depicts all hypothetical psychological processes guiding this study. The three main hypotheses developed are probed in three scenario studies. A summary list of all hypotheses in each study is presented below.

3. Methodology and Rationale

This study employed a video-based experimental approach to test hypotheses across three studies: Study 1 focused on upselling, Study 2 on cross-selling, and Study 3 on both up-and cross-selling. This method was selected for its effectiveness in controlling hypothetical scenarios and its alignment with the ATF, which posits that emotional responses significantly influence decision-making (Beisiegel et al., 2018). Unlike text-based descriptions, videos enhance participant immersion, leading to more accurate responses. Participants were randomly assigned to one of two conditions, watching two to three-minute video clips designed to evoke relevant emotions before completing an online survey. The survey included manipulation checks, measures of dependent and mediating variables, and attention check questions to ensure data reliability. Three experienced hospitality researchers reviewed the video content to establish face validity. However, the artificial nature of video experiments may lead participants to recognize they are part of an experiment, potentially influencing their behavior and responses. To mitigate this, a diverse participant pool was used to minimize demographic biases, enhancing the generalizability of the findings.

3.1 Visual stimuli, manipulation, and pilot test

All three studies share the same scenario background for a visual stimulus. The experimental scenarios depict a hotel guest, imagined by the participant, who plans to celebrate their birthday with a hotel stay. Upon check-in, the guest encounters a front desk agent—either a human or a robot—without initially disclosing the purpose of their visit. The agent discovers from the guest's passport that their birthday is the following day. To surprise the guest, the agent offers a ballpoint pen as a gift and a one-hour complimentary late check-out. The ballpoint pen serves as a tangible surprise, while the late check-out represents an intangible one, encompassing both types of surprises (Clarke, 2013). This dual approach is intentional to prevent participants from identifying any specific preferred type of surprise that is not the focus of this study. To ensure the birthday gift is perceived as neither too extravagant nor too trivial, a medium-value ballpoint pen was selected. All scripts were carefully crafted to maintain content-related validity, utilizing only relevant content without distractions (Spooren et al., 2013).

To ensure that each participant's awareness aligns with the condition to which they were exposed, several manipulation questions were incorporated into the survey (Hauser et al., 2018). This study's approach to manipulation checks deviates from traditional methods, which typically aim to verify if experimental manipulations have the desired impact on participants (Hauser et al., 2018). For example, a traditional check might ask, "*To what extent do you think this is a robot shown in the scenario? (1: strongly disagree to 7: strongly agree)*". However, this study included the following questions instead: *"In the clip, who is the front desk agent serving you?", "What is the reason for your hotel stay?", "Did you receive any gifts in the scenario? If yes, what was it?", and "Apart from the gift, did the front desk agent offer anything else?*". Participants who failed to answer the manipulation check were directed to the end of the survey, and their responses were excluded from further analyses. This approach is justified and endorsed by Hauser et al. (2018) in their study on experimental manipulation. They highlight that a key limitation of traditional manipulation checks is the potential for distraction. Given that traditional manipulation checks require participants to indicate their level of agreement (e.g. "strongly agree," "neutral," or "disagree,"). The cognitive effort required to interpret the wording and select a suitable response could divert their focus from the main task, which could potentially compromise the validity of the research (Hauser et al., 2018). Hence, this study applied a more straightforward approach instead of the traditional manipulation check. This approach is increasingly recognized by numerous researchers in their recent publications (Aronow et al., 2019; Varaine, 2023).

Additionally, hypothesis testing was conducted to examine the effectiveness of upselling and cross-selling strategies. The following hypotheses were formulated: Null Hypothesis (H0): There is no significant difference in customer surprise and satisfaction between those upsold or cross-sold by a human salesperson and those served by a robot. Alternative Hypothesis (H1): Customers upsold by a human salesperson will report higher levels of surprise and satisfaction compared to those upsold by a robot (HU1a/b and HC1a/b). To test these hypotheses, the study involved two groups of customers—one receiving upselling from a human and the other from a robot. Independent samples t-tests were performed to compare the means of customer surprise and satisfaction. If the p-values obtained were less than 0.05, the null hypothesis would be rejected, indicating that human salespeople significantly enhance customer experience in upselling and cross-selling scenarios.

Prior to the main study, a pilot test was conducted with 30 participants (N=10 for each of the three studies), sourced from Amazon Mechanical Turk (MTurk). The pilot test results indicated successful manipulation, as all participants correctly identified the expected type of salesperson depicted in the video clips. Additionally, realism check questions raised no concerns regarding

perceived authenticity. With successful pilot testing and all research quality checks completed, the main data collection for the three experimental studies commenced.

3.2 Measures

In relation to the performance of upselling and cross-selling, participants were required to answer two questions. Firstly, they indicated their intention to purchase using a binary choice (yes = purchase, no = not purchase), and secondly, they rated the likelihood of purchasing the suggested items on a seven-point Likert scale from 1 (extremely unlikely) to 7 (extremely likely) (Kim & Tanford, 2021a). Subsequently, participants responded to the main questions concerning their emotions of surprise, satisfaction, perceived value, and reuse intention on a seven-point Likert scale. The Cronbach's alpha values (α) for all variables were sufficiently high, demonstrating the internal consistency of the measures. Detailed results are presented below.

Customer surprise was measured with five items: "*Based on the video clip, (1) The experience surpassed all my expectations, (2) The service transmitted positive feelings, (3) The service was amazing, (4) The service was overwhelming* and*, (5) The service left me surprised.*" (αStudy 1 = 0.71, αStudy 2 = 0.75 and αStudy 3 = 0.77; (Dey et al., 2017)). Customer satisfaction that is inclusive of delight emotion was evaluated by seven items: "*Based on the video clip, (1) The service provided by the front desk staff met my expectations, (2) I believe I received reasonable services offered by the front desk staff, (3) The hotel front desk staff is competent, (4) The service provided by that hotel front desk staff is memorable, (5) The service provided by that hotel front desk staff is unique, (6) The hotel front desk staff provided high-level customer support,* and *(7) The hotel front desk staff provided extensive service* ". (αStudy 1 = 0.84, αStudy 2 = 0.81 and αStudy 3 = 0.84; (Roberts-Lombard & Petzer, 2018))

The customer perceived value was assessed by four items: *"Based on the video clip, (1) the service provided by front desk staff is value for money, (2) I consider the room upgrade price is reasonable, (3) Staying at this hotel with this front desk staff is a right decision when price and other costs are considered, and (4) Staying at this hotel with this front desk staff is a right decision when the overall quality of service delivery is considered."* (αStudy 1 = 0.77, αStudy 2 = 0.73 and αStudy 3 = 0.83; (Roberts-Lombard & Petzer, 2018)). The customer's reuse intention was appraised by three items*: "Based on the video clip, (1) If possible, I intend to communicate with this front desk staff again in the future, (2) I predict I will make enquiries with this hotel staff in the future,* and *(3) I will continue to use the customer service provided by this staff in the future."* (αStudy 1 = 0.73, αStudy 2 = 0.72 and αStudy 3 = 0.77; (Lei et al., 2021)).

Scenario realism was assessed with one question: *"Based on the video clip, I think there can be such situations like that in reality."* (1=not at all, 4=neutral, 7=very much; Arikan et al. (2023)).

3.3 Samples and procedures

The main data were collected from MTurk until February 2024. The total sample sizes for the three studies were 615, which included N=205 for each study. All sample sizes were calculated by an apriori analysis using G*Power software (Faul et al., 2009). The results for each study showed that the required sample size required for each group was 200 when using the parameters α = 0.05, β = 0.94, and effective size f = 0.25. All input parameters were determined

with the references suggested by Faul et al. (2009) for psychological experiment studies. Finally, 615 responses were collected for analysis that was processed by IBM SPSS Statistics 29.0.

4. Results

4.1 Demographics, purchase decision and realism checks

Table 1 presents the distribution of the participants' demographics and their service robot experience. All demographics from the three studies exhibited a similar distribution. Participants were 33.6 years old on average (Standard Deviation [SD] = 7.6), 33.4 years old ([SD] =8.6) and 33.8 years old ([SD] =8.3) for Study 1, 2, and 3, respectively. Participants were mostly willing to purchase the suggested consumption in three scenarios, the acceptance percentage is Study 1: 92.7%, Study 2: 96.1% and Study 3: 96.6%. Participants generally found the experimental scenarios realistic, given the mean value for the variable of realism is higher than the neutral point of 4 (Study 1 = 5.5, Study 2 = 5.37 and Study 3 = 5.65, all $p < 0.01$).

4.2 Hypotheses testing

4.2.1 Study 1: Upselling

To test HU1, a one-way ANOVA showed that the upselling delivered by human salesperson has a positive relationship between (a) customer surprise ($M_{human} = 5.88$, $M_{robot} = 5.61$; F (1, 203) = 8.88, $p < 0.01$) and (b) satisfaction ($M_{human} = 5.94$, $M_{robot} = 5.67$; F (1, 203) = 8.47, $p < 0.01$). Thus, HU1a and HU1b are both supported. With regard to HU2, a one-way ANOVA showed that the upselling delivered by human salesperson has a positive association of (b) customer perceived value ($M_{human} = 5.90$, $M_{robot} = 5.56$; F (1, 203) = 10.85, $p < 0.01$) and c) reuse intention ($M_{human} = 5.98$, $M_{robot} = 5.70$; F (1, 203) = 5.76, $p < 0.05$). Hence, all HU2a and HU2b are supported. Concerning HU3, a mediation model (PROCESS Model 6; bias-corrected bootstraps = 5,000; Hayes, 2022, Table 3) was run. The indirect effect of upselling delivered by a human salesperson on the customer's reuse intention is significantly mediated by satisfaction, and perceived value ($\beta = 0.088$, SE = 0.499, 95% CI = [0.0199, 0.298], $p < 0.05$). Thus, HU3 is supported.

4.2.2 Study 2: Cross-selling

To check HC1, a one-way ANOVA showed that the cross-selling delivered by human salesperson has a positive relationship of (a) customer surprise ($M_{human} = 5.89$, $M_{robot} = 5.64$; F (1, 203) = 7.85, $p < 0.01$) and (b) satisfaction ($M_{human} = 5.87$, $M_{robot} = 5.65$; F (1, 203) = 6.78, $p < 0.05$). Thus, HC1a and HC1b are both supported. Referring to HC2, a one-way ANOVA showed that the cross-selling delivered by a human salesperson has a positive association of (a) customer perceived value ($M_{human} = 5.86$, $M_{robot} = 5.63$; F (1, 203) = 5.42, $p < 0.05$) and (b) reuse intention ($M_{human} = 5.97$, $M_{robot} = 5.67$; F (1, 203) = 10.88, $p < 0.01$). Thus, both HC2a and HC2b are supported.

About HC3, a mediation model (PROCESS Model 6; bias-corrected bootstraps = 5,000; Hayes, 2022, Table 3) was run. The indirect effect of cross-selling delivered by human salesperson on customer's reuse intention is significantly mediated by satisfaction, and perceived value ($\beta = 0.104$, SE = 0.046, 95% CI = [0.0211, 0.2062], $p < 0.01$). Thus, HC3 is supported.

4.2.3 Study 3: Up and Cross-selling

To assess HUC1, a one-way ANOVA showed that the up and cross-selling delivered by human salesperson has a negative relationship of (a) customer surprise (M_{human} = 5.58, M_{robot} = 5.80; F (1, 203) = 4.25, $p < 0.05$) and (b) satisfaction (M_{human} = 5.63, M_{robot} = 5.89; F (1, 203) = 6.07, $p < 0.05$), thus HUC1a and HUC1b are both unsupported. Relating to HUC2, a one-way ANOVA exhibited that the upselling and cross-selling delivered by a human salesperson has a negative association of (a) customer perceived value (M_{human} = 5.35, M_{robot} = 5.82; F (1, 203) = 13.25, $p < 0.01$) and (b) reuse intention (M_{human} = 5.50, M_{robot} = 5.91; F (1, 203) = 10.78, $p < 0.01$). Thus, both HUC2a and HUC2b under a human salesperson's condition are not supported, while the robot salesperson has a positive influence on customer perceived value and reuse intention when delivering both up and cross-selling to hotel guests.

Regarding HUC3, a mediation model (PROCESS Model 6; bias-corrected bootstraps = 5,000; Hayes, 2022, Table 3) was run. The findings indicated that the indirect effect of up-selling and cross-selling, delivered by the service agent type, significantly mediates the customer's reuse intention through satisfaction and perceived value (β = -0.118, SE = 0.53, 95% CI = [-0.2286, -0.231], p < 0.05). HUC3 predicts that the indirect effect of up-selling and cross-selling, delivered by a human salesperson, on the customer's reuse intention is mediated by satisfaction, perceived value, and the main effect. However, the main effect results shown in a one-way ANOVA indicate that a robot salesperson performs better than a human salesperson in this scenario. Therefore, HUC3 is only partially supported. In other words, the indirect effect of up-selling and cross-selling, delivered by the service agent type, on the customer's reuse intention is significant as it is mediated by satisfaction and perceived value. Specifically, this effective relationship occurs only with a robot salesperson, and not with a human salesperson.

4.3 Hypotheses analysis and summary

The study reveals key insights into upselling and cross-selling in hospitality. All hypotheses from Study 1 (Upselling) and Study 2 (Cross-selling) were supported, showing that human salespersons outperform robots in customer surprise, satisfaction, perceived value, and reuse intention when these strategies are used individually. This aligns with the study's objective of exploring customer reactions to different salespersons.

However, Study 3, which combined upselling and cross-selling, showed that robots outperformed humans in all measures. This suggests that robotic efficiency and consistency may enhance customer perceptions when both strategies are used together, challenging the initial hypothesis that humans would elicit greater surprise and positive emotional responses. This indicates a complex interplay between customer expectations and the effectiveness of robotic sales techniques.

The ANOVA results presented in Table 2 and visualized in Figure 3 provide a detailed statistical analysis of these findings, while the serial mediation model results summarized in Table 3 further elucidate the mechanisms at play. The simple effects analysis across all three studies (see Figure 2, 2a–d) highlights the nuanced interactions between the type of salesperson and customer responses, reinforcing the importance of emotional engagement in decision-making processes. These findings contribute significantly to the existing literature by addressing the gaps identified in the research objectives. Specifically, they illustrate that while customers may initially prefer human interactions due to perceived warmth and empathy, the increasing familiarity with robotic services can lead to a shift in preferences, particularly when both upselling and cross-selling are involved. This aligns with previous research indicating that

hotel customers are becoming more accustomed to robotic services (Lin et al., 2022). By employing the ATF, this study underscores how emotional responses can trigger immediate cognitive reactions that influence purchasing decisions, thereby enhancing our understanding of consumer behavior in the context of modern sales strategies.

5. Discussion and implication

This study tackles the existing voids in hospitality research, specifically focusing on the domains of robotic applications and suggestive selling. This study, through three studies, reveals that while human salespeople excel at individual upselling and cross-selling strategies, robots demonstrate competitive performance when both strategies are employed together, influencing customer surprise, satisfaction, perceived value, and reuse intention. In summary, this study provides theoretical implications and practical insights.

5.1 Theoretical implications

This study enriches the recent hospitality literature with the infrequently discussed emotional factor of surprise and the exploration of robotic up-and cross-selling (Ivanov et al., 2019; Sun et al., 2024). Unlike most extant literature, which primarily focuses on comparing customer expectations and perceptions, this study posits that unexpected customer surprise is a critical factor in sales and service management. Through experimental investigations of up-selling and cross-selling, this research provides concrete examples of positive experiences driven by the psychological form of surprise and demonstrates how this emotion can be implemented and assessed in a measurable manner.

In relation to the ATF, this study offers detailed insights into settings involving both robots and humans. The ATF elucidates how emotions can trigger rapid cognitive reactions that influence judgment (Han et al., 2007). However, existing studies applying ATF predominantly focus on negative emotions, such as how consumer anger or fear leads to cognitive responses that affect decision-making (Bigné et al., 2023; Chen & Farn, 2020). These studies typically examine how negative user-generated content induces negative emotions and subsequently impacts online consumer judgment. As a result, the potential application of ATF from a positive perspective remains largely unexplored. By applying a different emotional basis, this study validates the positive emotion of surprise and examines its influence on up-selling and cross-selling. In the realm of psychology, surprise is an emotion typically elicited by an unexpected event or the detection of novelty in one's surroundings (Dey et al., 2017). This approach not only broadens the applicability of ATF but also advances its conceptual direction, potentially inspiring other researchers to explore how ATF could be applied in other positive emotional contexts and how such applications could transform individual decision-making processes.

Furthermore, this study challenges the prevailing notion that humans are inherently more favorable than robots in situations requiring intensive personal interaction. Previous research has indicated that customers are often less willing to engage with robots during service recovery processes (Hu et al., 2021; Lin et al., 2022). Theoretically, Choi et al. (2021) discuss the Uncanny Valley Theory, which suggests that as robots become more humanlike, they can evoke feelings of eeriness or discomfort if they do not perfectly mimic human behavior. Additionally, Chang et al. (2024) reference the Expectancy Violations Theory, which focuses on how individuals respond to unexpected behaviors in social interactions. When customers expect warmth and empathy during service recovery, the failure of robots to meet these

expectations can lead to dissatisfaction and reluctance to engage. Scholars generally attribute this reluctance to the perceived lack of warmth and empathetic capabilities in robots (Lin et al., 2022).

While this study acknowledges that humans may be perceived as more amiable, it highlights that human salesperson conducting upselling and cross-selling lead to positive emotions, cognitive responses, and favorable purchase decisions (Studies 1 and 2). Interestingly, robot salespersons perform exceptionally well in all areas when both strategies are implemented together. This suggests that while robots might be less favored during negative emotional situations, they can be highly effective when customers experience positive emotions, like surprise. In these instances, interacting with robots can be as impactful, or even more so, than with human salespersons during suggestive selling.

5.2 Practical implications

The results of this study provide insights into management, marketing, and operations for the hospitality and service industries. They guide the allocation of human and robotic resources. While human salespeople are effective in upselling and cross-selling, robot salespeople also show promising potential. The study found that when upselling and cross-selling are performed separately by a human salesperson, the outcomes in terms of positive emotions, perceived value, and intention to reuse are superior to those of a robot. However, robot salespeople also demonstrate satisfactory performance in these scenarios. Notably, when both upselling and cross-selling are implemented, robots outperform humans. These findings underscore the potential and practicality of employing service robots in upselling and cross-selling.

Regarding marketing management, this underscores the potential of utilizing service robots in diverse promotional endeavors. It delves into the application of robot salespeople in direct customer interactions. Given the encouraging results, the incorporation of robots into service operations emerges as a feasible strategy. Various hotel sales departments can consider deploying service robots for upselling or cross-selling initiatives. For example, a service robot could be implemented in a restaurant environment. As customers place orders with robots, the robots can pinpoint potential upselling or cross-selling prospects based on the customer's choices. The advantages of employing robot salespeople over their human counterparts go beyond substantial savings in manpower costs. In case of a rejection, customers are likely to experience less embarrassment when dealing with a robot than a human, thereby improving the overall customer experience.

These findings have broader implications for public policy and societal attitudes toward automation in service roles. As robotic technology becomes more prevalent, policymakers may need to consider regulations that ensure ethical deployment, addressing concerns about job displacement while promoting the benefits of enhanced service efficiency. Additionally, educational institutions can incorporate these insights into curricula, preparing future hospitality professionals to work alongside robotic systems and understand their role in customer interactions.

In conclusion, this research suggests that both human and robot salespeople can effectively facilitate upselling and cross-selling in service operations. Human salespeople offer flexibility and interpersonal skills, while robots provide consistent stability. Operations managers should assign tasks flexibly: human salespeople during non-peak seasons and robots during peak seasons. The key to success is to ensure customers do not feel pressured or uncomfortable.

6. Limitations and future research

The current study used an experiment to ensure the internal validity of its findings. Despite G*Power analyzing the sample sizes used to compute effect sizes for reliable interpretation, it is possible that participants may perceive or behave differently in different circumstances. For example, might the hotel guests staying with a companion, such as a family member or partner, have a different decision-making process for the suggested upselling and cross-selling? In this connection, further investigations should be conducted with other hotel departments or other service industries. The findings from this study are based on customers from the United States, most of whom have experienced service robots. Future studies in other countries that warrant cross-cultural similarities, and an undeveloped prevalence of robotic solutions are recommended for further examinations.

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