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Robots with Hearts: How In-Store AI's Task Types Impact Brand Attitude and Ethicality

1. Introduction

Artificial Intelligence (AI) is transforming business practices across industries, with the global AI market projected to reach $72.22 billion by 2029 (Mordor Intelligence, 2024). Recent innovations in robotics and chatbots have dramatically expanded AI's capabilities to handle complex service interactions. As traditional service retail evolves, businesses increasingly rely on AI technologies, such as chatbots, robots, and kiosks, to support or replace human service employees (HSEs) (Huang & Rust, 2018; Sullivan & Wamba, 2022). These AI tools offer efficiency and personalization at scale (Davenport & Ronanki, 2018), while recent advances in conversational AI (e.g., ChatGPT) promise human-like emotional responsiveness, opening new possibilities for customer-facing roles (Jakesch et al., 2023; Roy & Naidoo, 2021).

Despite such technological promise, businesses face a growing challenge: how should they allocate tasks between AI and human employees in ways that preserve consumer trust and brand values? AI's capability for emotional intelligence is growing and is increasingly used for social or emotional tasks; however, there are many instances where AI struggles to perform basic mechanical or physical actions in unstructured environments (Harding, 2024). This raises concerns that humans may end up performing mechanical, repetitive tasks while AI takes up more meaningful, emotionally intelligent work, reversing traditional assumptions about automation (Pugh, 2024; Ackerman, 2023).

In practice, AI automation of tasks can either replace or support human workers in physical stores (Larivière et al., 2017). Implementing this automation can lead to unintended consequences when it goes beyond the mechanical and analytical tasks traditionally assigned to machines. Frontline service activities that require social or emotional intelligence, such as greeting, comforting, or empathizing with customers, carry symbolic meaning and are deeply connected to consumers' moral expectations of human care and authenticity (van Doorn et al., 2017; Mende et al., 2019). When AI assumes these roles, it can blur the moral boundaries between humans and machines, creating ethical and relational dilemmas for brands. Understanding how consumers respond to such task allocations is, therefore, essential for managing trust and preserving perceived brand integrity. Specifically, these responses are critical because shifts in brand ethicality and brand attitudes translate into tangible marketplace outcomes such as purchase behavior, loyalty, and word-of-mouth (Singh et al., 2012, Robinson et al., 2020). Thus, determining when AI enhances versus harms consumers' moral and relational evaluations of a brand is both a pressing theoretical question and a high-stakes managerial challenge.

However, the ethical and psychological implications of this division of labor remain underexplored. Consumers have shown discomfort with AI in emotionally sensitive situations (Kim et al., 2022) and often prefer human interaction due to concerns about empathy, judgment, or authenticity (Mende et al., 2019; Granulo et al., 2021; Markovitch et al., 2024). Nonetheless, they may tolerate AI when objectivity, efficiency, or anonymity is prioritized (Longoni & Cian, 2022; Holthöwer & Van Doorn, 2023). What remains unclear is how specific task allocations, particularly assigning empathetic vs. mechanical roles to AI or humans, affect consumer perceptions of brand ethicality and attitudes – two key constructs for maintaining trust and long-term brand equity in technology-mediated service settings

(Singh et al., 2012; Faircloth et al., 2001). Conceptually, brand ethicality captures consumers' moral evaluations of firms' technological and operational decisions, particularly when AI collaborates with humans or replaces them in socially or emotionally significant contexts (Luchs et al., 2009; Malle & Scheutz, 2020). These evaluations influence consumers' trust, perceived authenticity, and relational commitment toward brands that deploy AI (Singh et al., 2012). Brand attitude, in turn, integrates both functional and moral appraisals, reflecting consumers' overall assessment of the brand (Ostrom et al., 2015). Studying these two outcomes together enables us to bridge research on the moral judgment of technology with that on consumer–brand relationships.

Managerially, these constructs are essential because firms increasingly face trade-offs between automation efficiency and maintaining an image of care, empathy, and ethical conduct (Frolick et al., 2024). Understanding how AI task allocation influences brand ethicality and attitude provides actionable insights for managers seeking to automate service delivery without damaging consumer trust or long-term brand equity.

Few studies have directly examined how task type influences ethical evaluations of brands, particularly in human-AI collaboration scenarios (McLeay et al., 2021; Giroux et al., 2022). We provide a comprehensive summary of key studies in this domain in Table 1.

Table 1: AI vs. Humans In-store: Review of Key Literature

Author(s)	In-store AI Context	Task being automated/replaced	Method	Key Findings
Belanche et al. (2020)	Service robot (both humanoid and mechanical) vs. Human	Interaction with hotel staff (receptionists' tasks), Waiter tasks	Experiments	Consumers tend to hold HSE more responsible for service failures than robots and attribute greater responsibility to the company when a robot provides the service, regardless of success or failure.
Castelo et al. (2023)	Human vs. Humanoid service robot vs. Chatbot	Greeting customers and taking orders (Coffee shop)	Experiments	Consumers rate robot-provided services lower than human-provided services, as they perceive robot use as motivated by the company's goals (like profit and cost-cutting) rather than improving service quality for customers.

Desideri et al. (2019)	Humanoid robot vs. Human	Brief cognitive testing (Mental health care)	Experiments	Participants showed no difference in emotional responses (positive or negative) when interacting with a humanoid robot compared to HSE but showed higher gaze aversion to HSE than a robot.
Dietvorst & Bartels (2022)	Algorithm vs. Human	Buying insurance policy	Experiments	Consumers believe that algorithms (vs. humans) make decisions to maximize predetermined outcomes, and this effect is strengthened when consumers see the decision in question is more morally relevant. Brands should use humans to make maximization decisions since consumers tolerate better when these decisions come from humans (vs. algorithms).
Giroux et al. (2022)	Humanoid AI robot vs. Self-service machine vs. Human	Billing/check-out tasks (i.e. mechanical) (Food service and Retail store)	Experiments	Consumers are less likely to report errors at AI checkouts than at human checkouts.
Granulo et al. (2021)	Robot/machine vs. Human	Tattoo (inking vs. removing), Production (handmade vs. machine-made) of office decoration and eyeglasses	Experiments	Consumers favor humans (vs. AI) for products or services with high symbolic value.
Kim et al. (2022)	AI vs. Human	Medical diagnosis session, Product recommendations, Casual conversation in mental health counselling, Photo selection, Online retail	Experiments	Consumers prefer to share sensitive or highly concerning information with AI rather than with HSE, as they perceive AI to lack judgmental capabilities.
Leung et al. (2018)	Automated products vs. Human	Driving, Biking, Fishing, Cooking	Survey Experiments	Consumers who strongly identify with certain activities often resist automation in products, viewing it as "cheating" when it automates skills central to their identity.
Liu et al. (2023)	Service robot (humanoid and machine-like) vs. Human	N/A Context is service exclusion (Food service and Hotel)	Experiments	Consumers engage in more unethical behavior when excluded by a human agent compared to a robot, but show more unethical behavior with a robot when included.
Liu et al. (2024)	Chatbots vs. Human	Product recommendations for health insurance (China and the US)	Experiment	Chinese consumers express more privacy concerns with chatbots than HSE, while U.S. consumers show no such difference.
Longoni et al. (2019)	AI vs. Human	Diagnosis of stress level, Skin cancer prevention, diagnosis, and treatment	Experiments	Consumers are generally unwilling to use or pay more for AI medical providers, even if AI performs better than humans. Resistance to AI is stronger among consumers who view themselves as unique, as they feel AI may not adequately address individual characteristics
McLeay et al. (2021)	Service robot	Check-in tasks	Experiments	Replacing HSE negatively affects the perceived ethical and societal reputation of the HSE only. The negative impact on the robot's perceived

	vs. (AND) Human vs. self-service machine	(Airport, retail, and food service)		reputation is significant only in substitution scenarios.
Markovitch, Stough & Huang (2024)	Chatbot vs. Human	Holiday reservation handling, Interaction relating to smartphone repair request	Experiments	Consumers experience significantly lower satisfaction, recommendation acceptance, and intention to recommend to others when interacting with chatbots compared to HSE, regardless of service outcome quality.
Mende et al. (2019)	Humanoid robot vs. Human	Taking temperature, pulse, and blood pressure, Providing instructions in an online lab, Introducing cheese tasting, Taking food order, Taking the customers to tables	Experiments	Consumers experience greater discomfort, including feelings of threat to human identity and eeriness, when interacting with humanoid service robots.
Pozharliev et al. (2021)	Service robot vs. Human	Hotel check-in (i.e. mechanical)	Experiments	Consumers with low anxious attachment toward material objectives react negatively to robot agents in service settings, as they experience greater pleasantness and empathy when interacting with HSE compared to robots.
Ruan & Mezei (2022)	Chatbots vs. Human	Communications with consumers (online retail)	Experiment	Consumers are more satisfied with HSE than with chatbots when dealing with experiential product attributes, as they perceive HSE to provide higher-quality information and arousal.
Singh et al. (2021)	Humanoid robot vs. Human	Conference registration task	Experiments	Consumers report higher satisfaction with service encounters involving human employees compared to humanoid robots due to the social presence of human employees.
Zhang, Tan & Lee (2024)	AI vs. Human doctor	Medical diagnostics	Experiments	Although there is no significant difference in well-being between receiving highly personalized medical consultations from AI and human doctors, consumers prefer human doctors for follow-up consultations due to their perceived empathy.
This study	Humanoid AI robot & Human (in different combinations of task allocation)	Mechanically Intelligent tasks, Emotionally intelligent tasks (Food and hotel service retail)	Experiments	When an AI and a human are working together, allocating empathetic tasks to AI (while allocating mechanical tasks to humans) negatively affects consumers' brand attitudes because consumers believe that allocating empathetic tasks to AI robots is unethical. This effect is more pronounced for small-sized brands (compared to large brands)

To address this gap, we conducted four experiments in service retail settings. We demonstrate that consumers respond negatively when brands assign empathetic tasks to AI while delegating mechanical tasks to humans, a configuration perceived as ethically questionable. These effects are amplified for small brands, suggesting that brand characteristics moderate the consequences of AI-human task allocation.

We term this phenomenon the *Service Automation Dilemma (SAD)*: a reversal of expectations where AI is assigned roles requiring social and emotional intelligence, capabilities once thought to be uniquely human, while HSEs are assigned routine, mechanical tasks. Consumers generally hold implicit role associations for humans and machines in service encounters, expecting machines to perform precise, rule-based, and efficiency-driven tasks, and humans to provide warmth, empathy, and social connection (van Doorn et al., 2017; Mende et al., 2019). When these boundaries blur, it can disrupt consumers' moral intuitions about care and authenticity in service contexts. Consequently, such automation patterns may not only undermine the relational and communal experiences that consumers increasingly associate with physical retail environments but also risk diminishing perceptions of brand ethicality (Breugelmans et al., 2023).

Our research makes three key contributions. First, we enrich the literature on consumer responses to AI by demonstrating that not only the presence of AI but the type of task it performs critically shapes brand evaluations. This adds to prior work by highlighting the ethical and symbolic consequences of task assignment, especially in human-AI collaboration. Second, we position perceived brand ethicality as a key explanatory mechanism linking AI task allocation to brand attitudes, an area previously underexplored in in-store contexts. Third, we show that this effect is moderated by brand size, with small brands more susceptible to negative perceptions. This suggests that AI deployment strategies must

consider not only functionality but also brand positioning and consumer expectations about fairness, respect, and authenticity. Overall, our findings offer novel insights for both AI ethics scholarship and retail managers designing hybrid service environments.

2. Theoretical Background

2.1.Co-presence of In-store AI and Human Employees

The growing integration of artificial intelligence (AI) into service settings is reshaping how organizations structure the roles of HSEs. Two dominant perspectives have emerged to explain this shift: automation and augmentation (Davenport & Kirby, 2016; Raisch & Krakowski, 2021). The automation perspective posits that AI will progressively replace human labor, starting with routine tasks and eventually extending into more complex, empathy-driven domains (Huang & Rust, 2018). Conversely, the augmentation perspective envisions AI and humans as collaborators, with both offering complementary strengths toward shared service goals (Davenport & Kirby, 2015, 2016; Wang et al., 2020).

As roles continue to change (Einola & Khoreva, 2023), it remains uncertain whether automation or augmentation will define the future of service retail. Nonetheless, the co-presence of both AI and HSEs in physical stores is already a reality, raising important questions about how their roles are defined and perceived by consumers (Petrescu et al., 2024). Strategic task allocation, i.e., assigning AI and HSEs to roles that match their respective strengths, and clarifying the role of AI in service settings, are increasingly critical in such environments (Sowa et al., 2021; Petrescu et al., 2024).

While prior research has shown that consumer responses to AI vary depending on usage context and AI characteristics (e.g., Longoni et al., 2019; Markovitch, Stough, & Huang, 2024), less attention has been paid to how the division of labor between AI and human

employees shapes consumer perceptions of brand values. Specifically, we argue that how social and emotional tasks are allocated between humans and AI can shape consumers' perceptions of whether a brand is acting in ethically appropriate and human-centered ways.

2.2. AI Task Types

We build on the service AI typology discussed in Huang et al. (2019) and Huang and Rust (2021), which classifies AI capabilities into three types of intelligence: mechanical, thinking, and feeling. Mechanical intelligence refers to standardized, routine tasks (Sternberg, 1999) that prioritize efficiency (e.g., scanning items, delivering orders), whereas feeling intelligence (i.e., empathetic intelligence) enables emotionally resonant interactions such as offering comfort, expressing care, or resolving concerns. Although thinking intelligence, defined as data processing and analytical support, plays a crucial role in backend decision-making, it is largely invisible to consumers in in-store environments. For this reason, our research focuses on *mechanical* and *empathetic tasks*, which are both visibly performed in physical service settings and directly interpreted by consumers.

In service contexts such as restaurants, hotels, and retail stores, consumers regularly observe HSEs engaging in both mechanical (e.g., taking orders) and empathetic (e.g., offering assistance) interactions. Empathetic tasks are not merely operational; they represent relational and moral exchanges that communicate a brand's respect, care, and authenticity. Prior research on frontline automation suggests that substituting human empathy with programmed responses can disrupt consumers' sense of social connection and moral order (Huang & Rust, 2021; Mende et al., 2019). Understanding how the allocation of empathetic tasks influences perceived ethicality is therefore essential to explaining consumer reactions to AI deployment in service environments. The growing use of service robots and kiosks to perform such tasks

raises a critical question: How do consumers respond when emotionally intelligent roles are assigned to AI instead of HSEs? As AI's capacity to simulate emotional expression through verbal and non-verbal cues continues to improve (Dwivedi et al., 2023; Noble & Mende, 2023), the boundaries between human and machine roles have become increasingly blurred.

To explain how consumers interpret these role assignments, we draw on mind perception theory (Gray et al., 2007), which posits that individuals evaluate social entities, including nonhuman ones, along two dimensions: agency (the ability to act intentionally) and experience (the ability to feel and empathize). Empirical findings show AI is typically perceived as high in agency but low in experience (Huebner, 2009), making it well-suited for rule-based or mechanical tasks but ill-equipped for emotionally sensitive roles that require genuine empathy. Humans, in contrast, are attributed as high in both agency and experience, enabling them to connect with others on an emotional and intuitive level.

This divergence in perceived abilities shapes expectations regarding task assignment. Consumers are more likely to view AI as appropriate for mechanical roles and humans for empathetic ones. When these expectations are violated, for instance, when AI performs emotionally charged tasks while human workers are relegated to routine tasks, consumers may feel discomfort and question the brand's ethical judgment. This is because empathy is often seen as a moral act rooted in genuine emotional capacity (Zhang et al., 2024), and its simulation by AI may be perceived as inauthentic or ethically tone-deaf.

Prior research supports these expectations. Consumers prefer HSEs for roles requiring emotional sensitivity (Zhang et al., 2024), and trust in AI decreases when it is perceived as lacking emotional depth (Markovitch, Stough & Huang, 2024). These findings suggest that AI-human task allocation is not just a functional decision, but it also signals brand values and ethical intent.

H1: Consumers evaluate brands less favorably when AI (vs. human) is assigned relatively empathetic service tasks compared to when it is assigned relatively mechanical tasks.

2.3.Mediating Role of Perceived Brand Ethicality

We define perceived brand ethicality as consumers' evaluations of a brand's adherence to ethical principles such as care, fairness, honesty, responsibility, and respect for stakeholders and society (Brunk, 2012). Brands act as moral agents and are judged accordingly for their intentions and actions (Tang & Gray, 2018; Monroe & Malle, 2019). These judgments are tied to brand identity and reputation (Bendixen & Abratt, 2007), shaping consumer expectations that firms will uphold ethical standards in their decision-making (Brusoni & Vaccaro, 2017). When brands violate these expectations, consumers may see their actions as unethical, which can harm brand attitudes (Utkutug, 2022).

In service contexts where AI technologies are deployed, ethical responsibility is typically attributed to the company using AI, rather than the technology itself or its developers (Taddeo & Floridi, 2018; Sullivan & Wamba, 2022). As consumers increasingly encounter AI in frontline roles, understanding how they evaluate the ethicality of brands' AI use becomes critical.

To unpack these evaluations, we draw on Moral Foundations Theory (MFT; Graham et al., 2013; Haidt & Graham, 2007), which explains how moral intuitions inform ethical judgments. Among the five foundational dimensions proposed by MFT, we focus on care/harm and loyalty/betrayal, as these are especially relevant to the allocation of service tasks between AI and HSEs.

The care/harm foundation holds that people evaluate moral behavior by whether it reflects compassion and avoids causing harm. In service settings, empathetic tasks such as responding to emotional customer needs are typically associated with genuine human care. However, consumers often see AI as incapable of authentic empathy (Markovitch, Stough & Huang, 2024). As a result, when brands assign emotionally meaningful tasks to AI, consumers may perceive this as a failure to provide sincere care, thus violating moral expectations associated with the care foundation. Moreover, consumers who tend to feel discomfort or unease when interacting with AI (Mende et al., 2019; Singh et al., 2021) may further perceive the brand's actions as ethically insensitive.

The loyalty/betrayal foundation is rooted in group-based morality, where loyalty to one's group (e.g., fellow humans) is highly valued. Assigning empathetic roles to machines, the roles that traditionally signal human dignity, social connection, and emotional intelligence, may be perceived as betraying human workers and diminishing their unique social contributions (Tilton et al., 2024). From this perspective, consumers may morally object to AI replacing humans in meaningful, emotionally engaging roles, especially when they see AI as an outgroup member (Leung et al., 2018). This perceived betrayal of human roles and the loss of social identity can lead to the brand's negative ethical evaluations.

These two moral foundations together help explain why brands may be perceived as less ethical when they assign relatively empathetic tasks to AI while keeping humans for mechanical roles. In contrast, assigning mechanical, routine tasks to AI while reserving emotionally engaging roles for humans aligns more closely with both care and loyalty expectations, thus supporting more positive ethical appraisals. While other moral foundations may be relevant in some AI contexts (e.g., fairness in algorithmic bias), they are less central in our setting, which specifically involves the symbolic and relational meaning of task

assignment. Our focus on care and loyalty offers a parsimonious, theory-driven explanation for how consumers form ethical judgments in service AI deployment scenarios. This framework aligns with prior consumer research showing that individuals' moral intuitions, especially those linked to care and loyalty, shape their evaluations of brand actions (Winterich, Mittal, & Aquino, 2016).

In sum, assigning AI to emotionally sensitive roles may violate expectations linked to care and loyalty, reducing perceived brand ethicality. In contrast, using AI for routine tasks while reserving interpersonal roles for humans aligns with these foundational norms, thereby bolstering moral perceptions of the brand.

H2: Perceived brand ethicality mediates the effect of AI task assignment on brand attitude, such that assigning relatively empathetic tasks to AI (compared to assigning relatively mechanical tasks to AI) leads to lower perceived brand ethicality, and in turn, more negative brand attitudes.

2.4.Moderating Role of Company Size

Consumers often have different expectations for small versus large brands, shaped by underlying relational norms. From a communal relationship perspective (Aggarwal & Law, 2005; Clark & Mills, 1993), small brands are perceived as more intimate, authentic, and people-oriented. These brands foster closer emotional bonds and are expected to deliver personalized, human-driven service. Small brands often project sincerity and warmth, and thus their actions are judged more harshly when they appear inauthentic or mechanized (Aaker, Fournier, & Brasel, 2004). Yang and Aggarwal (2019) expand on this notion by showing that small brands are often cognitively categorized under a communal schema, where actions are evaluated by warmth, intent, and care rather than efficiency. Accordingly,

small brands are held to higher interpersonal standards, and their use of AI in emotionally sensitive roles may be interpreted as a violation of consumers' relational expectations.

When small brands assign empathetic tasks to AI, this can create a schema mismatch—where the mechanized interaction contradicts the human warmth expected from a communal brand. This aligns with research showing that automated social presence can be jarring or inauthentic when it violates consumers' expectations for human contact (van Doorn et al., 2017). Consumers may feel the brand has deprioritized emotional authenticity in favor of operational efficiency, undermining their trust and evaluations. This mismatch leads to greater disappointment and more negative brand attitudes, especially when the task is perceived as requiring emotional intelligence.

Large brands are typically perceived as lower in communion, i.e., as less considerate and more self-focused, whereas small brands are viewed as warmer and more relational (Yang & Aggarwal, 2019). From this perspective, consumers tend to expect large firms to act pragmatically, prioritizing efficiency and operational optimization over interpersonal care (Scherer & Ross, 1990). As a result, when large brands assign empathetic tasks to AI, such decisions appear consistent with their perceived identity rather than violating moral expectations. Consumers may even interpret this automation as a rational business choice that enhances consistency or frees human employees for other high-value tasks.

In sum, brand size moderates the effect of AI task assignment on brand attitude: for small brands, empathetic AI could violate communal expectations and undermine brand evaluations; for large brands, this same decision is more aligned with exchange expectations and thus less damaging to consumer perceptions.

H3: Brand size moderates the effect of AI task assignment on brand attitude, such that the negative effect of assigning relatively empathetic tasks to AI (vs. relatively mechanical tasks) is stronger for small brands than for large brands.

3. Methodology

We conducted four studies to test our hypotheses. Study 1 tests our main effect hypothesis (H1). Study 2 tests the main and mediation effects (H1 and H2). Studies 3 and 4 test the moderating effect of brand size (H3) using fictional and real brands, respectively. Participants are recruited from Prolific and Cloud Research. We used attention checks to ensure data quality (see Appendix A) and conducted power analysis using G Power to ensure sufficient power for each study (Kang, 2021).

3.1.Study 1: Effect of AI Task Type on Attitudes towards Brands

3.1.1. Aim

The objective of Study 1 is to examine whether assigning empathetic (vs. mechanical) tasks to AI influences consumers' attitudes toward the brand (H1). To test this hypothesis, we employ a restaurant context as outlined in Appendix B.

3.1.2. Data Collection, Procedure, Stimuli, and Measures

We recruited 163 participants (54.5% female, mean age = 37.56 years) from Prolific in exchange for compensation. They were randomly assigned to one of the two conditions regarding tasks performed by AI and HSE: (1) AI task = empathetic, HSE task = mechanical vs. (2) AI task = mechanical, HSE task = empathetic. Participants were asked to imagine visiting a fine-dining restaurant called Lettuce Eat with a friend. Upon entering, they see AI robots and humans working together. In Condition 1 (empathetic AI condition), participants read that robots are performing following tasks: (a) greeting customers, smiling at them and

guiding them to the table; and (b) chatting with customers to understand their taste preferences, while humans are performing following mechanical tasks: (a) taking customer orders and bringing the food to the table; and (b) maintaining cash registers. Tasks were swapped in Condition 2 (mechanical AI), with AI performing mechanical tasks and humans performing empathetic tasks, respectively. We pretested these tasks separately for empathetic and mechanical intelligence and perceived realism in restaurant contexts. Note that manipulation was designed to activate relative perceptions of task type rather than absolute categorical distinctions (Perdue & Summers, 1986). Participants then rated their attitudes towards the restaurant using a 3-item scale (7-point bipolar choice), adapted from Aggarwal (2014): "Bad-Good," "Unfavorable-Favorable," and "Dislike-Like" followed by two manipulation check questions including the extent to which the tasks assigned to the AI in the restaurant involved (1) mechanical skills and (2) empathetic skills (1 = not at all, 7 = very much). To ensure conceptual clarity, participants were provided with definitions of empathetic and mechanical tasks, adapted from Huang and Rust (2018) (see Appendix F). Lastly, participants provided demographic information (age, gender, and frequency of dining out (1 = not at all, 7 = frequently)).

3.1.3. Manipulation Check Results

Participants in the empathetic AI condition reported that robots performed significantly more empathetic tasks than those in the mechanical AI condition (M_{emp} = 5.34, SD = 1.93 vs. M_{mech} = 3.13, SD = 1.69; $F(1,161) = 60.49$, $p < 0.001$, $\eta^2 = 0.271$). Conversely, participants in the mechanical AI condition reported that robots performed more mechanical tasks than those in the empathetic AI condition (M_{emp} = 4.36, SD = 1.85 vs. M_{mech} = 5.94, SD = 1.39; $F(1,161) = 38.47$, $p < 0.001$, $\eta^2 = 0.191$). Thus, our manipulation was successful.

3.1.4. Direct Effect Results

We calculated a composite attitude score by averaging responses to the three attitude items ($\alpha = 0.978$). A one-way analysis of variance (ANOVA) revealed a significant difference in participants' attitudes towards the restaurant based on task allocation. Specifically, participants in the empathetic AI condition reported significantly lower brand attitudes compared to those in the mechanical AI condition ($M_{emp} = 3.58$, $SD = 1.43$ vs. $M_{mech} = 4.11$, $SD = 1.49$; $F(1,161) = 5.35$, $p = 0.022$, $\eta^2 = 0.032$). There were no significant differences in the frequency of dining out between the conditions ($M_{emp} = 4.34$, $SD = 1.40$ vs. $M_{mech} = 4.40$, $SD = 1.38$; $F(1,161) = 0.082$, $p = 0.787$, $\eta^2 = 0.001$).

3.1.5. Discussion

Study 1 provides initial support for H1, indicating that consumers' attitudes towards the brand are negatively affected when AI performs empathetic tasks rather than mechanical ones. This aligns with the hypothesis that assigning tasks based on their nature (empathetic versus mechanical) affects consumer perceptions of the brand. Next, we build on this study to test the mediating role of the perceived ethicality of the brand.

3.2. Study 2: Direct Effects and Mediating Role of Perceived Brand Ethicality

3.2.1. Aim

Study 2 aims to examine the direct effect of AI task types on brand attitudes (H1) and the mediating role of perceived brand ethicality (H2). We used hotel services as the study context (see Appendix C).

3.2.2. Data Collection, Procedure, Stimuli, and Measures

We developed and pretested a series of tasks for both conditions (i.e., AI performing empathetic and AI performing mechanical tasks) to ensure realism and found no significant

difference in perceived plausibility. For the main study, we recruited 180 participants (42% female, mean age = 43.38 years) from Cloud Research in exchange for compensation. As in Study 1, participants were randomly assigned to one of the two conditions regarding tasks performed by AI and HSE.

Participants were asked to imagine planning a holiday and looking for a hotel at their destination. They booked the Maple & Pine Hotel after getting a fair deal. When they visited the hotel, they noticed humans and AI robots working together. In the empathetic AI condition, AI robots handled emotionally engaging tasks such as (a) listening to guests attentively and using soothing and comforting tones, (b) responding thoughtfully to guests' needs and providing a warm and personalized service experience. Whereas HSEs were responsible for mechanical tasks such as (a) managing check-in and check-out processes, cleaning rooms, and restocking supplies, (b) completing tasks with consistency, following standardized procedures, and ensuring smooth and timely service.

Like in Study 1, participants were provided definitions of empathetic and mechanical tasks adapted from Huang and Rust (2018) for conceptual clarity. Participants then rated their attitudes toward the hotel using a 4-item scale (7-point bipolar choice), adapted from Aggarwal (2014): "Bad-Good", "Unfavorable-Favorable", "Dislike-Like", "Positive-Negative" followed by a 5-item perceived brand ethicality scale (7-point bipolar choice) ("Maple & Pine is socially responsible", "Maple & Pine supports good causes", "Maple & Pine cares for society", "Maple & Pine demonstrates integrity in its practices", "Maple & Pine cares for its employees"). Next, participants completed two manipulation check questions, including the extent to which the tasks assigned to the AI robot in the hotel involved (1) mechanical skills and (2) empathetic skills (1 = not at all, 7 = very much).

Lastly, participants provided demographic information (age, gender, and frequency of staying in hotels (1 = not at all, 7 = frequently).

3.2.3. Manipulation Check Results

Participants in the empathetic AI condition reported that robots performed significantly more empathetic tasks than those in the mechanical AI condition (M_{emp} = 5.95, SD = 1.55 vs. M_{mech} = 2.08, SD = 1.56; $F(1,178) = 276.97$, $p < 0.001$, $\eta^2 = 0.607$). Conversely, participants in the mechanical AI condition reported that robots performed more mechanical tasks than those in the empathetic AI condition (M_{mech} = 6.46, SD = 0.94 vs. M_{emp} = 3.07, SD = 1.99; $F(1,178) = 213.28$, $p < 0.001$, $\eta^2 = 0.544$). Thus, our manipulation was successful.

3.2.4. Direct Effect Results

We computed a composite attitude score by averaging responses to the four attitude items ($\alpha = 0.985$). A one-way analysis of variance (ANOVA) revealed a significant difference between participants' attitudes towards the hotel across two conditions. Specifically, participants in the empathetic AI condition reported significantly lower brand attitudes compared to those in the mechanical AI condition (M_{emp} = 3.88, SD = 1.67 vs. M_{mech} = 4.93, SD = 1.49; $F(1, 178) = 20.06$, $p < 0.001$, $\eta^2 = 0.101$).

Next, we computed a composite perceived brand ethicality score by averaging responses to the five attitude items ($\alpha = 0.950$). A one-way analysis of variance (ANOVA) revealed a significant difference between participants' perceived ethicality towards the hotel across two conditions. Specifically, participants in the empathetic AI condition perceived the brand as less ethical than those in the mechanical AI condition (M_{emp} = 3.80, SD = 1.25 vs. M_{mech} = 4.66, SD = 1.22; $F(1,178) = 21.75$, $p < 0.001$, $\eta^2 = 0.108$).

There were no significant differences in the frequency of staying in hotels between the conditions (M_{emp} = 3.64, SD = 1.22 vs. M_{mech} = 3.74, SD = 1.40; $F(1,178) = 0.262$, p = 0.610, η^2 = 0.001) or the extent to which participants were in favor of use of AI in retail (M_{emp} = 4.17, SD = 1.68 vs. M_{mech} = 4.27, SD = 1.69; $F(1,178) = 0.145$, p = 0.704, η^2 = 0.001).

3.2.5. Mediation Analysis Results

Using Hayes' PROCESS macro (Model 4) (Hayes, 2018), we conducted a mediation analysis with perceived brand ethicality as the mediator and brand attitudes as the dependent variable (see Figure 1). Results revealed a significant indirect effect of AI task type on brand attitudes through perceived brand ethicality (β = 0.9566, SE = 0.1962, 95% CI: [0.5714, 1.3367]). The direct effect of task type on brand attitudes became insignificant when the mediator was included (β = 0.1011, SE = 0.1243, 95% CI: [-0.1441, 0.3463], p > 0.05), indicating full mediation (see Figure 1). Specifically, when AI performed mechanical rather than empathetic tasks, consumers perceived the brand as more ethical and reported improved overall attitudes toward it.

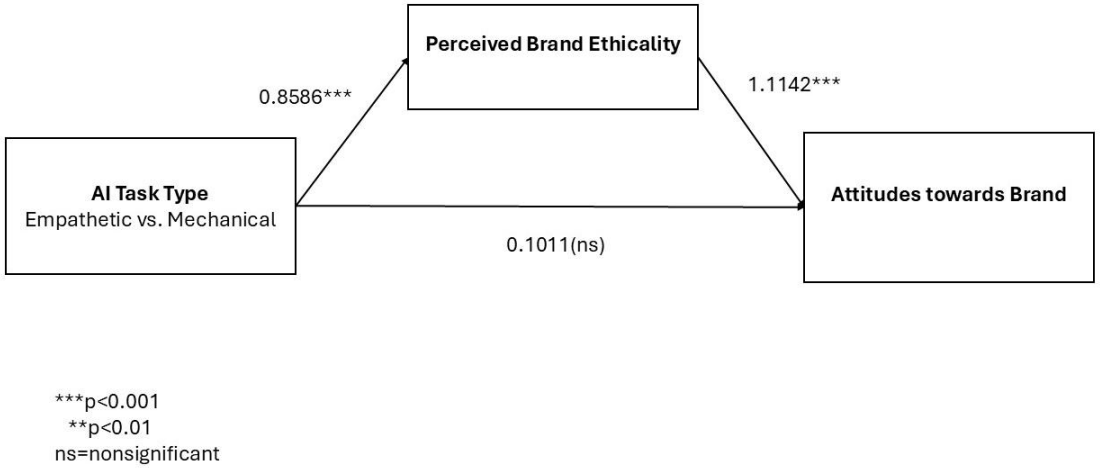

Figure 1. Mediation Effect of Perceived Brand Ethicality (Study 2)

3.2.6. Discussion

The findings of Study 2 support both H1 and H2. When consumers saw AI performing empathetic tasks (as opposed to mechanical tasks, with humans performing the opposite), they perceived the brand as less ethical. This decrease in perceived ethicality negatively impacted their overall attitudes towards the brand. These results emphasize the critical role of perceived brand ethicality in shaping consumer responses to AI task allocations and offer insights into how task type influences brand perceptions.

3.3.Study 3: **Moderating** *Effect of Brand Size (Fictional Brand)*

3.3.1. Aim

Study 3 examines whether the impact of AI task type (empathetic vs. mechanical) on brand attitudes is moderated by brand size (large vs. small). Specifically, we hypothesized that smaller companies will be judged more negatively than larger companies when AI performs empathetic tasks compared to mechanical tasks (H3).

3.3.2. Data Collection, Procedure, Stimuli, and Measures

We designed the study scenario based on Yang and Aggarwal's (2019) framework, manipulating brand size using objective indicators (i.e., number of stores, overall revenue, and employee count). A coffee shop context was selected, employing a 2 (AI task type: empathetic vs. mechanical) × 2 (company size: small vs. large) between-subjects design. A total of 324 participants (59% female; mean age = 39.57 years) were recruited through Prolific and randomly assigned to one of the four conditions. Participants first read a news report about three coffee brands: Café Serenade, Latte Lush, and our focal brand, Bean & Blossom (see Appendix D). In the small company condition, Bean & Blossom was described as having the lowest revenue, the fewest stores, and the fewest employees. Conversely, in the

large company condition, it was presented as having the largest number of stores, revenue, and employees. Participants were then asked to imagine visiting Bean & Blossom, observing AI-HSE co-presence. In the empathetic AI conditions, robots performed tasks such as (a) greeting customers, smiling, and guiding them to their table, (b) chatting with customers to understand their coffee preferences. Meanwhile, humans handled tasks like: (a) taking customer orders and serving coffee at tables or for takeout, (b) managing the cash register. In the mechanical AI conditions, the tasks were reversed, with robots handling order-taking and cash management while humans performed empathetic tasks. Participants then completed the brand attitudes scale used in previous studies, and Sierra et al.'s (2017) 5-item scale of perceived brand ethicality adapted for the context ("This coffee company is socially responsible", "This coffee company cares for its employees", "This coffee company supports good causes", "This coffee company cares for society", "This coffee company is a good brand" (1 = Totally Disagree to 7 = Totally Agree)). Subsequently, they answered manipulation check questions assessing perceptions of AI task type (same as in previous studies), and company size "Bean & Blossom is a comparatively (1 = large, 2 = small, 3 = none of the above) coffee company" and coffee shop visit frequency (1 = Not at All to 7 = Very Much) and demographic questions (age and gender). As in previous studies, participants read the definition of mechanical and empathetic tasks.

3.3.3. Manipulation Check Results

Participants in the empathetic AI condition reported that robots performed more empathetic tasks compared to those in the mechanical AI condition (M_{emp} = 4.33, SD = 1.91 vs. M_{mech} = 3.12, SD = 1.80; $F(1,322) = 34.51$, $p < 0.001$, $\eta^2 = 0.097$). Similarly, participants in the mechanical AI condition reported that robots performed more mechanical tasks than

those in the empathetic condition (M_{mech} = 5.40, SD = 1.49 vs. M_{emp} = 4.53, SD = 1.74; $F(1,322) = 23.25$, $p < 0.001$, $\eta^2 = 0.067$). Thus, our manipulation was successful.

Furthermore, the results of the chi-square test of independence, examining the relationship between experimental conditions (company size: small vs. large) and participants' actual perception of brand size, revealed that there was a significant association between the actual and the perceived size ($\chi^2(2, N = 324) = 304.32$, $p < 0.001$). Thus, participants in the small-company conditions were significantly more likely to identify the brand as small, whereas those in the large-company conditions identified it as large, indicating that our manipulation of company size was successful.

3.3.4. Direct Effect Results

A one-way ANOVA revealed a significant main effect of AI task type on brand attitudes, with participants in the empathetic AI condition reporting lower brand attitudes than those in the mechanical AI condition (M_{emp} = 3.50, SD = 1.55 vs. M_{mech} = 4.09, SD = 1.63; $F(1,322) = 11.11$, $p < 0.001$, $\eta^2 = 0.033$). There was no significant main effect of company size on brand attitudes (M_{small} = 3.81, SD = 1.61 vs. M_{large} = 3.80, SD = 1.63; $F(1,322) = 0.001$, $p = 0.980$, $\eta^2 = 0.000$).

A one-way ANOVA revealed a marginally significant effect of AI task type on perceived brand ethicality, with participants in the empathetic AI conditions reporting lower perceived ethicality of brand than those in the mechanical AI conditions (M_{emp} = 3.32, SD = 1.25 vs. M_{mech} = 3.49, SD = 1.27; $F(1,322) = 3.59$, $p = 0.06$, $\eta^2 = 0.011$). There was no significant main effect of company size on perceived brand ethicality (M_{small} = 3.49, SD = 1.29 vs. M_{large} = 3.42, SD = 1.24; $F(1,322) = 0.235$, $p = 0.628$, $\eta^2 = 0.001$).

3.3.5. Moderation Effect Results

A univariate ANOVA revealed a significant interaction between AI task type and company size on brand attitudes ($F(1,320) = 4.102$, $p < 0.05$, $\eta^2 = 0.013$) (see Figure 2). Simple effects analyses indicated that for small brands, assigning empathetic tasks to AI led to lower brand attitudes compared to assigning mechanical tasks to AI ($M_{emp} = 3.33$, $SD = 1.35$ vs. $M_{mech} = 4.28$, $SD = 1.70$; $F(1,161) = 15.33$, $p < 0.001$, $\eta^2 = 0.087$). For large brands, the difference between empathetic and mechanical AI task assignments was not significant ($M_{emp} = 3.68$, $SD = 1.73$ vs. $M_{mech} = 3.91$, $SD = 1.54$; $F(1,161) = 0.801$, $p = 0.372$, $\eta^2 = 0.005$). Pairwise comparisons (Bonferroni-adjusted) confirmed that the difference in brand attitudes between empathetic and mechanical AI tasks was significant for small brands ($p < 0.001$), but not for large brands ($p = 0.372$).

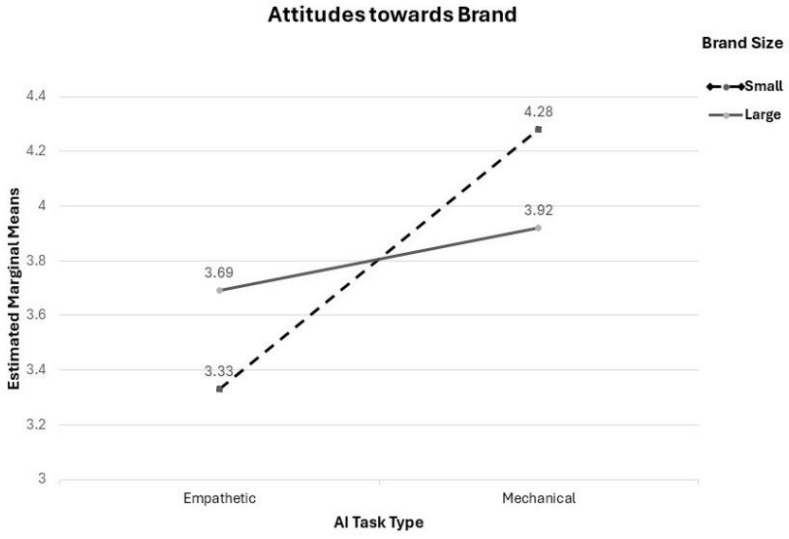

Figure 2. Interaction effect of AI task types and company size (Study 3)

3.3.6. Discussion

Study 3 supports the idea that the impact of AI task type on brand attitudes depends on brand size. Specifically, smaller brands are more negatively evaluated when AI performs empathetic tasks than when it performs mechanical ones, while this difference is less

pronounced for larger brands. These results support our hypothesis (H3), emphasizing the importance of brand context when deploying AI technologies, especially in tasks requiring empathy, and highlight the ethical implications for smaller firms.

3.4. Study 4: Moderating Effect of Brand Size (Real Brands)

3.4.1. Aim

Study 4 builds on Study 3 by increasing ecological validity using real-world brands. Specifically, we examine whether brand size (large vs. small) moderates the effect of AI task type (empathetic vs. mechanical) on brand attitudes.

3.4.2. Data Collection, Procedure, Stimuli, and Measures

We recruited 362 UK-based participants (49% female; mean age = 43.64 years) through Prolific in exchange for monetary compensation. The study employed a 2 (AI task type: empathetic vs. mechanical) × 2 (brand size: large vs. small) between-subjects design.

To operationalize brand size, we used Costa Coffee (the largest coffee chain in the UK; Statista, 2024) as the large brand condition, and participants were asked to identify a small, local coffee shop they are familiar with as the small brand condition (see Appendix E). Prior to the experimental manipulation, participants reported their familiarity, baseline attitudes, and perceived brand size for the selected brand (Costa Coffee or their chosen small coffee shop). Participants then read a news-style article about the selected brand (Costa Coffee for the large-brand condition or their chosen local coffee shop for the small-brand condition). The article described the brand as one of the largest (vs. smallest) coffee companies in the UK and introduced service robots performing tasks in the store. In the empathetic AI condition, robots performed emotionally engaging tasks, while HSEs performed mechanical tasks; the roles were reversed in the mechanical AI condition (using the same tasks as in

Study 3). As in previous studies, participants were shown the definition of empathetic and mechanical tasks.

After reading the article, participants completed brand attitude measures, the perceived brand ethicality scale (same as previous studies), manipulation checks for the independent variables, and control variables (e.g., frequency of coffee shop visits, general attitudes toward AI in retail). Finally, demographic information (age and gender) was collected.

3.4.3. Manipulation Check Results

Participants in the empathetic AI condition reported significantly higher perceptions of robots performing empathetic tasks compared to the mechanical AI condition (M_{emp} = 4.19, SD = 2.09 vs. M_{mech} = 2.62, SD = 1.82; $F(1,360) = 58.47$, $p < 0.001$, $\eta^2 = 0.140$). Conversely, participants in the mechanical AI condition reported higher perceptions of robots performing mechanical tasks (M_{mech} = 6.10, SD = 1.40 vs. M_{emp} = 5.37, SD = 1.17; $F(1,360) = 28.65$, $p < 0.001$, $\eta^2 = 0.074$).

To assess the effectiveness of the brand size manipulation on a continuous scale, participants reported their perception of the selected brand's size. A one-way ANOVA showed that those in the large brand condition (Costa Coffee) perceived the brand as significantly larger than those in the small brand condition (self-identified local shop) (M_{large} = 6.31, SD = 0.802 vs. M_{small} = 2.54, SD = 1.83; $F(1,360) = 646.76$, $p < 0.001$, $\eta^2 = 0.642$). Thus, both the AI task-type and brand size manipulations were successful.

3.4.4. Direct Effects Results

We conducted one-way ANOVAs to examine the main effects of AI task type and brand size on brand attitudes and perceived brand ethicality.

Brand Attitudes

There was a significant main effect of AI task type on brand attitude, with participants evaluating brands using empathetic AI less favorably than those using mechanical AI (M_{emp} = 3.60, SD = 1.63 vs. M_{mech} = 4.47, SD = 1.69; $F(1,360) = 24.68$, $p < 0.001$, $\eta^2 = 0.064$).

Similarly, a significant main effect of brand size emerged such that participants reported a more favorable attitude toward the small brand than the large brand (M_{large} = 3.59, SD = 1.54 vs. M_{small} = 4.50, SD = 1.77; $F(1,360) = 26.60$, $p < 0.001$, $\eta^2 = 0.069$).

Perceived Brand Ethicality

The main effect of AI task type on perceived brand ethicality was not significant (M_{emp} = 4.04, SD = 1.48 vs. M_{mech} = 4.16, SD = 1.38; $F(1,360) = 0.607$, $p = 0.437$, $\eta^2 = 0.002$). Similarly, there was no significant main effect of brand size on perceived ethicality (M_{large} = 4.10, SD = 1.21 vs. M_{small} = 4.10, SD = 1.63; $F(1,360) = 0.6000$, $p = 0.988$, $\eta^2 = 0.000$).

3.4.5. Moderation Effects Results

A univariate ANOVA revealed a significant interaction between AI task type and brand size on brand attitudes ($F(1,360) = 18.64$, $p < 0.001$, $\eta^2 = 0.049$) (see Figure 3).

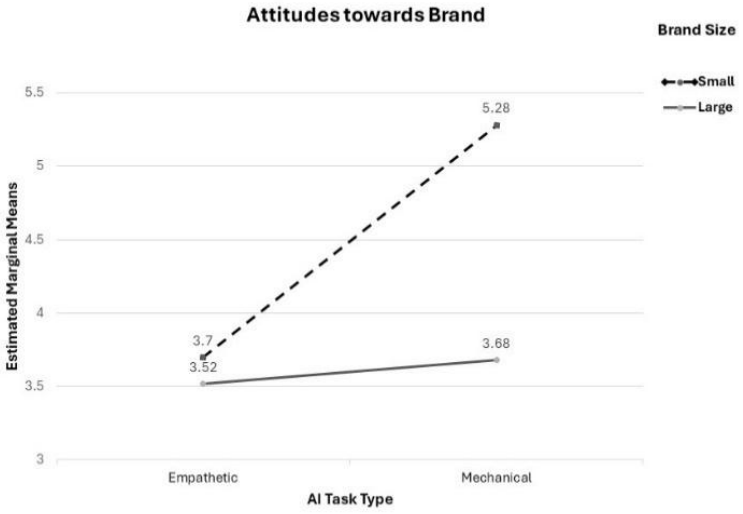

Figure 3. Interaction effect of AI task types and company size on brand attitude (Study 4)

Simple effects analyses demonstrated that among small brands, assigning empathetic tasks to AI led to significantly lower brand attitudes than assigning mechanical tasks (M_{emp} = 3.69, SD = 1.68 vs. M_{mech} = 5.27, SD = 1.49; $F(1,177) = 44.25$, $p < 0.001$, $\eta^2 = 0.200$). For large brands, the difference between empathetic and mechanical AI task assignments was not significant (M_{emp} = 3.52, SD = 1.58 vs. M_{mech} = 3.67, SD = 1.51; $F(1,177) = 0.463$, $p = 0.678$, $\eta^2 = 0.003$). Bonferroni-adjusted pairwise comparisons confirmed that the difference in brand attitudes between AI task types was significant for small brands ($p < 0.001$), but not for large brands ($p = 0.678$).

3.4.6. Discussion

Study 4 confirmed that brand size moderates the relationship between AI task type and brand attitudes. Specifically, our findings reinforce that brand size moderates not only brand attitudes post-exposure, but also the direction and magnitude of attitudinal change depending on the AI's assigned role. Small brands faced more negative evaluations when assigning empathetic tasks to AI, while large brands were unaffected by task type.

4. General Discussion

As businesses increasingly integrate AI into service roles, consumers now regularly encounter AI and human service employees (HSEs) working side by side. To optimize efficiency, organizations often allocate tasks based on whether they are mechanical or empathetic. This research explored how such task allocation affects consumer perceptions of brand ethicality and brand attitudes. Across four studies, we found that consumers respond more favorably when AI handles mechanical tasks and HSEs perform empathetic ones.

Conversely, assigning empathetic tasks to AI results in lower perceptions of brand ethicality and brand attitudes.

Importantly, this effect is stronger for smaller brands, suggesting that brand size moderates consumer tolerance for AI in emotionally sensitive roles. While perceived brand ethicality consistently operated in the predicted direction, its strength varied across studies. In Study 2, ethicality was a strong mediator of the AI task type effect. However, in Studies 3 and 4, this effect depended on brand size. For small brands, assigning empathetic tasks to AI was seen as ethically questionable, whereas for large brands, such automation aligned with efficiency expectations and thus elicited weaker moral concerns. Together, these findings suggest that the ethical implications of AI use depend not only on task type but also on brand context, highlighting brand size as a key boundary condition shaping consumer moral judgment.

4.1.Theoretical Implications

This research contributes to the growing body of literature on AI ethics and consumer perceptions by exploring the nuanced implications of task allocation between in-store AI and HSEs. First, our findings demonstrate that perceived brand ethicality mediates consumer responses to in-store AI-HSE collaborations (Kopalle et al., 2022; Belk, 2021). Our research highlights that task allocation affects not just operational outcomes but also consumers' ethical evaluations of the brand. Specifically, when mechanical tasks are assigned to HSEs while AI performs empathetic tasks, consumers see this task distribution as unfair, leading to lower ethical evaluations of the brand. This finding emphasizes the ethical challenges of deploying AI in service settings and its broader implications for organizational responsibility and stakeholder trust.

Second, we extend the AI task typology proposed by Huang et al. (2019) and Huang and Rust (2021) beyond individual task categories by examining the combinations of task allocation when humans and AI collaborate. While previous research examined attitudes towards various types of AI automation, we investigated how consumer perceptions differ across scenarios of in-store AI-HSE co-presence. In particular, our findings reveal the ethical and perceptual risks of delegating even simple empathetic tasks, such as greeting or smiling at customers, to in-store AI (e.g., Kim et al., 2022), while humans are assigned mechanical tasks. These results emphasize the importance of reserving empathetic or "feeling tasks" for humans, aligning with Huang and Rust's (2021) assertion that such tasks are better suited to human execution, particularly for maintaining the experiential and community values of physical service retail (Breugelmans et al., 2023).

Third, we integrate insights from AI research with brand management literature by examining the moderating role of brand size. Our findings reveal that small companies are perceived as less ethical than larger ones when empathetic tasks are delegated to AI. This suggests that such practices violate consumer expectations of smaller brands' communal and human-centric orientation. Empirically, we extend prior research showing that consumer expectations differ by brand size, with smaller companies associated with closer, more personal relationships (Aaker, Fournier & Brasel, 2004; Swaminathan, Page & Gürhan-Canli, 2007).

Collectively, these theoretical contributions enhance our understanding of how task allocation between AI and HSE shapes consumer perceptions of ethicality, advancing the discourse on AI ethics, brand management, and the interplay between technological adoption and organizational characteristics.

4.2.Managerial Implications

As AI adoption continues to grow across service retail sectors such as food and hospitality, concerns about its ethical implications persist. Consumers often see AI as a cost-saving tool rather than a means to enhance experiences (Castelo et al., 2023). Our findings highlight how task allocation between AI and human service employees (HSEs) directly influences ethical perceptions and overall brand evaluations. We offer several practical recommendations for managers integrating AI into service environments.

First, social and empathetic tasks, such as welcoming or assisting customers, should be assigned to HSEs. While AI may signal innovation (McLeay et al., 2021), emotionally sensitive interactions are best handled by humans (Kim et al., 2022; Mende et al., 2019). Consumers feel more comfortable and trusting when humans are present. A dual-channel model allowing consumers to choose between AI and HSE can enhance autonomy, reduce discomfort, and increase satisfaction, especially in emotionally charged settings.

Second, task allocation choices should be guided not only by efficiency but also by ethical considerations. Assigning only mechanical tasks to HSEs risks reducing their perceived value and dignity (Tilton et al., 2024), which can negatively influence consumer perceptions of fairness and brand ethics (Singh et al., 2012). Brands should clearly communicate AI's supportive role, emphasizing how it alleviates repetitive tasks rather than replaces human roles. This narrative can enhance trust and demonstrate organizational responsibility in managing workforce transitions.

Third, smaller brands must be especially cautious when deploying AI in customer-facing, empathetic roles. Our results suggest that consumers hold small brands to higher relational standards and expect more personal, human-centered service. When AI performs empathetic tasks in these contexts, it may appear incongruent with brand identity, triggering

ethical concerns. Although larger brands are somewhat insulated from this effect, they too must consider how AI use aligns with their customer-centric positioning and values.

Across all brand types, ethical task design and transparent communication are key to avoiding consumer backlash. Managers should carefully evaluate not just what tasks AI performs, but how and why those decisions are made visible to consumers. Highlighting employee well-being, customer choice, and AI-human collaboration can help position the brand as both innovative and ethically grounded.

In sum, AI adoption must go beyond technical integration and address the symbolic and relational meanings of task assignment. By aligning deployment strategies with consumer expectations of fairness, empathy, and brand authenticity, managers can build stronger, ethically resonant service experiences.

4.3.Limitations and Future Research

This research has several limitations that guide future research inquiries. First, although we drew on Moral Foundations Theory (MFT) to explain consumers' ethical responses, our focus was limited to the dimensions of care and loyalty. We selected these dimensions because they best align with the relational and symbolic meaning of task assignment in service contexts. However, future work could explore how other moral foundations, such as fairness or authority, might influence perceptions of AI deployment, particularly in contexts involving algorithmic bias, social equity, or power asymmetries.

While the strength of the task-type manipulation varied slightly across studies, the consistent pattern of results supports the robustness of our findings. In line with Perdue and Summers (1986), we interpret manipulation checks as indicators of construct activation rather than strict prerequisites for effect size or significance. To further assess the reliability of our

effects across different manipulations and samples, we conducted a single-paper meta-analysis. This analysis yielded a weighted average effect size of d = 0.69, indicating a robust and consistent influence of AI task assignment on brand ethicality and attitudes across studies. Full details of the meta-analytic procedure and results are provided in Appendix G. Future research may consider refining the manipulation wording or adjusting the contextual framing to enhance clarity in perceived task type.

Third, although we theorized direct mediation and moderation, exploratory analysis in our Study 3 revealed an interesting moderated-mediation effect (Hayes' Model 7). Since this was not predicted beforehand, we did not formally incorporate it into our model. However, future research should explore whether contextual factors such as industry type, emotional salience, or consumer-brand dynamics give rise to more complex conditional indirect effects.

Fourth, while Study 4 enhanced ecological validity by allowing participants to choose their preferred local coffee shop as a proxy for brand size, this approach introduced heterogeneity. To address this, we measured and controlled for brand familiarity and prior attitudes, but future research might explore more standardized ways to manipulate brand size that maintain realism while maintaining experimental control.

Fifth, we acknowledge the non-significant simple effect for large brands as theoretically meaningful. The absence of a significant difference suggests that well-established brands may benefit from a "credibility buffer," making consumers less sensitive to AI task assignment. This boundary condition invites future work on how brand equity moderates AI-related consumer perceptions.

Finally, future research could examine additional mediators, such as existential threat or perceived authenticity, and boundary conditions, such as customer orientation or brand

heritage. These factors may shed light on when AI deployment enhances or undermines perceived brand ethicality across diverse service contexts.

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Appendices

Appendix A. List of Attention Check Questions Used in the Studies

Study	Attention Check Question(s)
Study 1	Due to the very short survey we did not have attention check questions.
Study 2	We asked participants to select Option 5 in between scaled items of Perceived Brand Ethicality
Study 3	We asked participants to select Option 6 in between scaled items of Perceived Brand Ethicality.
Study 4	We asked participants to select Option 6 in between scaled items of Perceived Brand Ethicality.

Appendix B. Study 1: Lettuce Eat

Empathetic AI (Mechanical HSE) vs. Mechanical AI (Empathetic HSE)	
Empathetic AI	**Mechanical AI**
Suppose you are visiting a new fine dining restaurant named **Lettuce Eat** with your friend. You noticed humans and robots working together in the restaurant. Specifically, **Humans are** performing the task of (1) taking customer orders and bringing the food on the table (2) maintaining cash registers **Robots are** performing the task of (1) greeting customers, smiling at them and directing them to the right seating (2) chatting with customers to understand their taste preferences	Suppose you are visiting a new fine dining restaurant named **Lettuce Eat** with your friend. You noticed humans and robots working together in the restaurant. Specifically, **Humans are** performing the task of (1) greeting customers, smiling at them and directing them to the right seating (2) chatting with customers to understand their taste preferences **Robots are** performing the task of (1) taking customer orders and bringing the food on the table (2) maintaining cash registers

Appendix C. Study 2: Maple & Pine Hotel

Empathetic AI (Mechanical HSE) vs. Mechanical AI (Empathetic HSE)	
Empathetic AI	**Mechanical AI**
Suppose you are planning a holiday and come across the list of hotels in your destination area. You booked Maple & Pine Hotel after getting a fair deal. When you visited the hotel, you noticed humans and AI robots working together.	Suppose you are planning a holiday and come across the list of hotels in your destination area. You booked Maple & Pine Hotel after getting a fair deal. When you visited the hotel, you noticed humans and AI robots working together.
Task Assigned to AI Robot Employees AI robots are responsible for the hotel's emotionally engaging tasks. They interact with guests by listening attentively, using a soothing tone, and offering comforting words. They provide support with consistency, respond thoughtfully to guest needs, and ensure a warm and personalized service experience throughout the hotel.	**Task Assigned to Human Employees** Human staff are responsible for the hotel's emotionally engaging tasks. They interact with guests by listening attentively, using a soothing tone, and offering comforting words. They provide support with consistency, respond thoughtfully to guest needs, and ensure a warm and personalized service experience throughout the hotel.
Task Assigned to Human Employees Human staff are responsible for the hotel's mechanical tasks. They manage check-in/check-out processes, handle luggage, clean rooms, and restock supplies. Human staff complete tasks with consistency, follow standardized procedures, and ensure smooth and timely service throughout the hotel.	**Task Assigned to AI Robot Employees** AI robots are responsible for the hotel's mechanical tasks. They manage check-in/check-out processes, handle luggage, clean rooms, and restock supplies. AI robots complete tasks with consistency, follow standardized procedures, and ensure smooth and timely service throughout the hotel.

Appendix D. Study 3: Moderating Effect of the Company Size (fictional brand)

<table>
<tr><th colspan="2">Empathetic AI vs. Mechanical AI x Small Brand vs. Large Brand</th></tr>
<tr><th>Empathetic AI x Small Brand</th><th>Mechanical AI x Small Brand</th></tr>
<tr><td colspan="2">Suppose you came across the report on three coffee chains that are operating in your area.</td></tr>
<tr><td colspan="2"> 
<table>
<tr><th>Store Name</th><th>Revenue</th><th>Number of Stores</th><th>Number of Employees</th></tr>
<tr><td>Café' Serenade</td><td>£505000</td><td>115</td><td>690</td></tr>
<tr><td>Latte Lush</td><td>£120000</td><td>30</td><td>180</td></tr>
<tr><td>Bean & Blossom</td><td>£35000</td><td>3</td><td>20</td></tr>
</table>
COFFEE SHOPS IN YOUR AREA</td></tr>
<tr><td>After reading the report you decided to visit Bean & Blossom Coffee Company.

You noticed that robots were working alongside human employees.

Specifically, Robots are performing the tasks of (1) greeting customers, smiling at them and directing them to the right seating (2) chatting with customers to understand their coffee preferences

Humans are performing the tasks of (1) taking customer orders and bringing the coffee on the table or for takeaway (2) maintaining cash registers</td><td>After reading the report you decided to visit Bean & Blossom Coffee Company.

You noticed that robots were working alongside human employees.

Specifically, Robots are performing the tasks of (1) taking customer orders and bringing the coffee on the table or for takeaway (2) maintaining cash registers

Humans are performing the tasks of (1) greeting customers, smiling at them and directing them to the right seating (2) chatting with customers to understand their coffee preferences</td></tr>
</table>

Empathetic AI x Large Brand	Mechanical AI x Large Brand
Suppose you came across the report on three coffee chains that are operating in your area.	
	COFFEE SHOPS IN YOUR AREA
After reading the report you decided to visit **Bean & Blossom Coffee Company.** You noticed that robots were working alongside human employees. Specifically, **Robots are** performing the tasks of (1) greeting customers, smiling at them and directing them to the right seating (2) chatting with customers to understand their coffee preferences **Humans are** performing the tasks of (1) taking customer orders and bringing the coffee on the table or for takeaway (2) maintaining cash registers	After reading the report you decided to visit **Bean & Blossom Coffee Company.** You noticed that robots were working alongside human employees. Specifically, **Robots are** performing the tasks of (1) taking customer orders and bringing the coffee on the table or for takeaway (2) maintaining cash registers **Humans are** performing the tasks of (1) greeting customers, smiling at them and directing them to the right seating (2) chatting with customers to understand their coffee preferences

Store Name	Revenue	Number of Stores	Number of Employees
Bean & Blossom	£505000	115	690
Latte Lush	£120000	30	180
Café' Serenade	£35000	3	20

Appendix E. Study 4: Moderating Effect of the Company Size (real brand)

Empathetic AI vs. Mechanical AI x
Small Brand (participants' choice) vs. Large Brand (Costa Coffee)

Empathetic AI x Small Brand

Please enter the name of a small coffee shop in your area

You came across a recent web article on **[name of the coffee shop]** as indeed being a **SMALL** coffee company in the UK compared to other coffee company in terms of sales, number of employees and number of shops across the country. The article further mentions that as a new venture **[name of the coffee shop]** is introducing service robots in their stores.

Please carefully read the tasks performed by robots and humans:

Tasks Assigned to Robot	Tasks Assigned to Human
Greet customers entering or leaving store and direct them toward the seating area	Take coffee orders and bring coffee to customer tables or pack for takeaway
Chat with customers to understand their preference and tastes in coffee	Maintain cash registers

Mechanical AI x Small Brand

Tasks Assigned to Robot	Tasks Assigned to Human
Take coffee orders and bring coffee to customer tables or pack for takeaway	Greet customers entering or leaving store and direct them toward the seating area
Maintain cash registers	Chat with customers to understand their preference and tastes in coffee

Empathetic AI x Costa Coffee

You came across a recent web article on **Costa Coffee** as indeed being a **LARGE** coffee company in the UK compared to other coffee companies in terms of sales, number of employees and number of shops across the country. The article further mentions that as a new venture, **Costa Coffee** is introducing new service robots in their stores.

Please carefully read the tasks performed by robots and humans:

Tasks Assigned to Robot	Tasks Assigned to Human
Greet customers entering or leaving store and direct them toward the seating area	Take coffee orders and bring coffee to customer tables or pack for takeaway
Chat with customers to understand their preference and tastes in coffee	Maintain cash registers

Mechanical AI x Costa Coffee

Tasks Assigned to Robot	Tasks Assigned to Human
Take coffee orders and bring coffee to customer tables or pack for takeaway	Greet customers entering or leaving store and direct them toward the seating area
Maintain cash registers	Chat with customers to understand their preference and tastes in coffee

Appendix F. Definitions of Mechanical and Empathetic Tasks

Participants were shown the following definitions (adapted from Huang and Rust, 2018):

Mechanical tasks are routine, rule-based, and repetitive activities that emphasize efficiency and accuracy in service delivery.

Empathetic tasks are people-oriented activities that require understanding and responding to customers' social needs and emotions.

Appendix G. Single Paper Meta-Analysis

To assess the robustness of H1 across our four studies, we conducted a single-paper meta-analysis (McShane & Böckenholt, 2017). Each study tested the effect of AI task type (empathetic vs. mechanical) on brand attitudes, either directly (Studies 1–2) or through simple effects under moderation (Studies 3–4).

A random-effects meta-analysis revealed a significant and moderate overall effect of AI task type on brand attitudes, Cohen's d = 0.69, 95% CI [0.41, 0.91], SE = 0.13. This suggests that assigning mechanical tasks to AI systems consistently results in more favorable brand attitudes than assigning empathetic tasks.

These results, replicated across fictional and real brands, highlight the reputational risks of assigning emotionally sensitive tasks to AI technologies—particularly for small or lesser-known brands.