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Artificial intelligence service reduces customer citizenship behavior for warm brands versus competent brands

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Chatbot services powered by artificial intelligence (AI) have begun to replace staff on the frontline in various industries. This research examined how AI service affects customer citizenship behavior. Drawing on emotional spillover theory, we conducted two experiments (*N*s = 140 and 200). The results demonstrated there was a negative effect of AI (vs. human) service on customer citizenship behavior and identified positive emotion as the underlying mechanism of this effect (Study 1). Additionally, brand stereotypes were found to moderate the relationship between service type and positive emotions (Study 2). Specifically, the relationship became weaker for competent (vs. warm) brand service. These findings contribute to promoting customer citizenship behavior in unmanned contexts and provide insights for the application of AI services in frontline operations.

Keywords
artificial intelligence, brand stereotype, customer citizenship behavior, positive emotion

Article Highlights

- Artificial intelligence service was found to reduce customer citizenship behavior.
- Positive emotion was identified as an underlying process of the effect of artificial intelligence service.
- Brand competence alleviated the effect of artificial intelligence service on customers' emotions.

Artificial intelligence (AI) chatbots have been developed as digital agents to enhance customer experience through instant interactions (Song et al., 2022). They have begun to replace traditional staff in various industries, such as online retailing, tourism, and hospitality (Song et al., 2022). For example, Marriott has employed Aloft's ChatBotlr for customer consulting service during hotel stays. The global chatbot industry is expected to reach USD 3.99 billion by 2030, expanding at a compound annual growth rate of 25.7% from 2022 to 2030 (Grand View Research, Inc., 2022). While most previous research in this area has focused on enhancing customer acceptance of chatbots (Song et al., 2022), as their use grows there is an urgent need to consider the carry-over effect on customer response, including customer citizenship behavior. *Customer citizenship behavior* refers to extrarole behaviors (e.g., offering suggestions) that provide additional value to businesses (Gong & Yi, 2021), which is crucial for sustainable company development (Vargo & Lusch, 2017).

Existing research has focused primarily on customers' cognitive attitude toward and response to chatbots, such as perceived effectiveness and satisfaction (Zhu et al., 2022). Few studies have paid attention to the impact of chatbots on customer emotions and their citizenship behaviors following use of the service. To address this gap, we proposed a framework (see Figure 1) based on emotional spillover theory, which posits that emotions generated in one role may

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engender spillover effects in another role (X. Zhou et al., 2022). Accordingly, we proposed that AI (vs. human) service would influence consumers' positive emotion, leading to spillover effects on their customer citizenship behavior. As a result, our study contributes to the extant literature in several ways. First, while most existing research has examined the influence of macro-organizational factors on customer citizenship behavior, such as corporate social responsibility (Abdelmoety et al., 2022), limited attention has been given to the influence of micro-organizational factors. Therefore, we explored this aspect, starting from the service agent, to deepen understanding of customer citizenship behavior. Second, customer responses to AI agents are often emotional (Huang & Rust, 2021), yet most studies have focused on customers' cognitive evaluation (Zhu et al., 2022). Our research broadens the perception of AI services to include emotional evaluation. Last, we argued that the desirability of AI service would be context-dependent (Ruan & Mezei, 2022). Thus, we sought to advance theoretical understanding by delineating the effect boundaries and providing management implications for service providers.

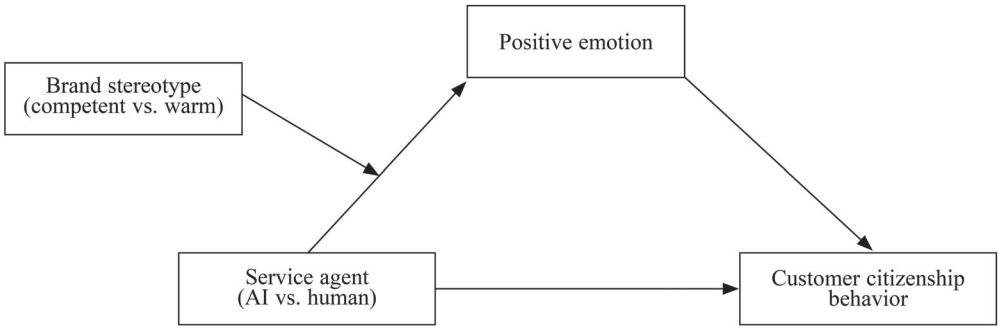

Figure 1. *Theoretical Model*
Note. AI = artificial intelligence.

AI service poses a challenge to businesses because customers generally prefer human agents compared to AI agents (Schmitt, 2020). Scholars have attributed this negative attitude to a lower expectation of ability (Aeschlimann et al., 2020) and outgroup bias (Schmitt, 2020), which decrease customers' positive emotion regarding AI (vs. human) service. Meanwhile, positive emotion can be derived from interpersonal interactions, while the absence of social contacts in AI service attenuates customers' positive emotion (Tussyadiah, 2020; Yun et al., 2021). According to emotional spillover theory, emotions experienced in one context can spill over and have both positive and negative effects on emotions in another context (X. Zhou et al., 2022). Scholars have advanced this theory by demonstrating a link between positive emotion and supportive behaviors in the external environment (Qin et al., 2019), thereby prompting individuals to engage in more prosocial behavior (Xu et al., 2022). Research has also revealed that customers tend to be curt and behave less cooperatively in AI (vs. human) service settings (Aeschlimann et al., 2020; Luo et al., 2019), and neuroimaging findings have shown that brain areas linked with prosociality are not activated in AI service but are activated in human service settings (Yun et al., 2021). We anticipated that the lower positive emotion experienced by customers of AI service would have a negative impact on their subsequent prosocial behavior. Customer citizenship behavior can be viewed as a prosocial behavior, as it is a voluntary and discretionary type of behavior that is not required for service delivery but benefits the whole organization (Gong & Yi, 2021). Thus, we formed the following hypotheses:

Hypothesis 1: Artificial intelligence (vs. human) service will have a negative effect on customer citizenship behavior.

Hypothesis 2: Positive emotion will mediate the relationship between service agent type (artificial intelligence vs. human) and customer citizenship behavior, with lower positive emotion occurring in artificial intelligence (vs. human) agent settings.

Emotional spillover theory also suggests that the process of individuals' emotional response to the external environment can be moderated by their perception (Liu et al., 2020). Therefore, *brand stereotype*, as a form of customer perception

toward a brand (Kervyn et al., 2012), will influence the impact of a service agent on the customer's positive emotions. Brand stereotype includes two fundamental dimensions: warmth and competence. *Competent brands* prioritize functional value, while *warm brands* emphasize affective and social value (Kolbl et al., 2020). The perceived cold efficiency of AI service agents (Wirtz et al., 2018) can create a psychological discrepancy for customers when the brand with which the agent is associated is perceived as warm. Interacting with an AI agent contradicts the warm brand image that emphasizes human warmth, leading to a decrease in customers' positive emotion. In contrast, for competent brands, customers adopt a utilitarian-oriented thinking mode (Kolbl et al., 2020). The absence of human warmth from the AI agent becomes less significant and customers perceive little difference between human and AI agents. Therefore, the type of service agent has minimal impact on their positive emotions. Accordingly, we proposed the following hypothesis:

Hypothesis 3: Brand stereotype will moderate the relationship between service type (artificial intelligence vs. human) and positive emotion, such that the relationship will be weaker for competent compared to warm brands.

Study 1

Method

Participants

To examine the effect and sufficiency of the sample size, we used G*Power software with a parameter for effect size of 0.25 at $\alpha = .05$ and power = .80 (Robiady et al., 2021). Using this method, we determined that 128 was the minimum sample size. Thus, we recruited 140 participants (M_{age} = 27.91 years, SD = 7.01) from www.sojump.com, which is one of the biggest online survey companies in China. Demographic details are shown in Table 1. Participants were randomly assigned to one of two conditions: (1) AI service (n = 70) and (2) human service (n = 70).

Table 1. *Participants' Demographic Profile*

Baseline characteristic		Study 1 (n = 140)	Study 2 (n = 200)
Gender	Male	79 (56.43%)	94 (47.00%)
	Female	61 (43.57%)	106 (53.00%)
Age (years)	18–24	50 (35.71%)	87 (43.50%)
	25–34	72 (51.43%)	80 (40.00%)
	35–50	16 (11.43%)	28 (14.00%)
	51 and above	2 (1.43%)	5 (2.50%)
Education background	High school graduate or below	20 (14.29%)	48 (24.00%)
	College or bachelor's degree	104 (74.29%)	129 (64.50%)
	Master's degree or above	16 (11.43%)	23 (11.50%)
Annual household income	Less than CNY60,000	18 (12.86%)	41 (20.50%)
	CNY60,000–CNY149,999	69 (49.29%)	64 (32.00%)
	CNY150,000–CNY299,999	36 (25.71%)	35 (17.50%)
	CNY300,000–CNY499,999	13 (9.29%)	26 (13.00%)
	CNY500,000–CNY999,999	3 (2.14%)	21 (10.50%)
	CNY1,000,000	1 (0.71%)	13 (6.50%)

Note. Numbers in parentheses are the percentage of the total sample. CNY 1.00 = USD 0.14.

Procedure

Participants were initially measured for positive emotion ($\alpha = .89$; see Appendix A) before the test and were instructed to imagine themselves on vacation, having just arrived at the destination on their own. Then, participants in the two different service modes were instructed to act as the protagonist in the respective scenarios. AI service was indicated by a robot head portrait and preset replies (see Figure 2), while human service was indicated by a human head portrait (see Figure 3).

Afterward, participants reported their customer citizenship behavior, for which we used a five-item scale adapted from Yi and Gong (2013). A sample item is "If I have a useful idea on how to improve service, I let an employee know." Responses are rated on a 7-point Likert scale, where 1 = *very unlikely* and 7 = *very likely*. In our study Cronbach's alpha was .89.

Positive emotion was measured with a four-item scale adapted from Sherman et al. (1997). A sample item is "To what extent are you feeling the following emotions: happy/satisfied/pleased/hopeful?" Responses are rated on a 7-point Likert scale, where 1 = *not at all* and 7 = *an extreme amount*. In our study Cronbach's alpha was .92.

Subsequently, a manipulation check for the service agent type was conducted using a two-item scale, $r = .94$. One of the items is "What is the possibility you thought the service was provided by AI?" Responses are rated on a 7-point Likert scale, where 1 = *very unlikely* and 7 = *very likely*.

Finally, participants provided their demographic information. All participants signed a written consent form before the experiment and received compensation (USD 0.50) for their participation (as for Study 2). We obtained ethical approval for the research from an appropriate committee in our institution.

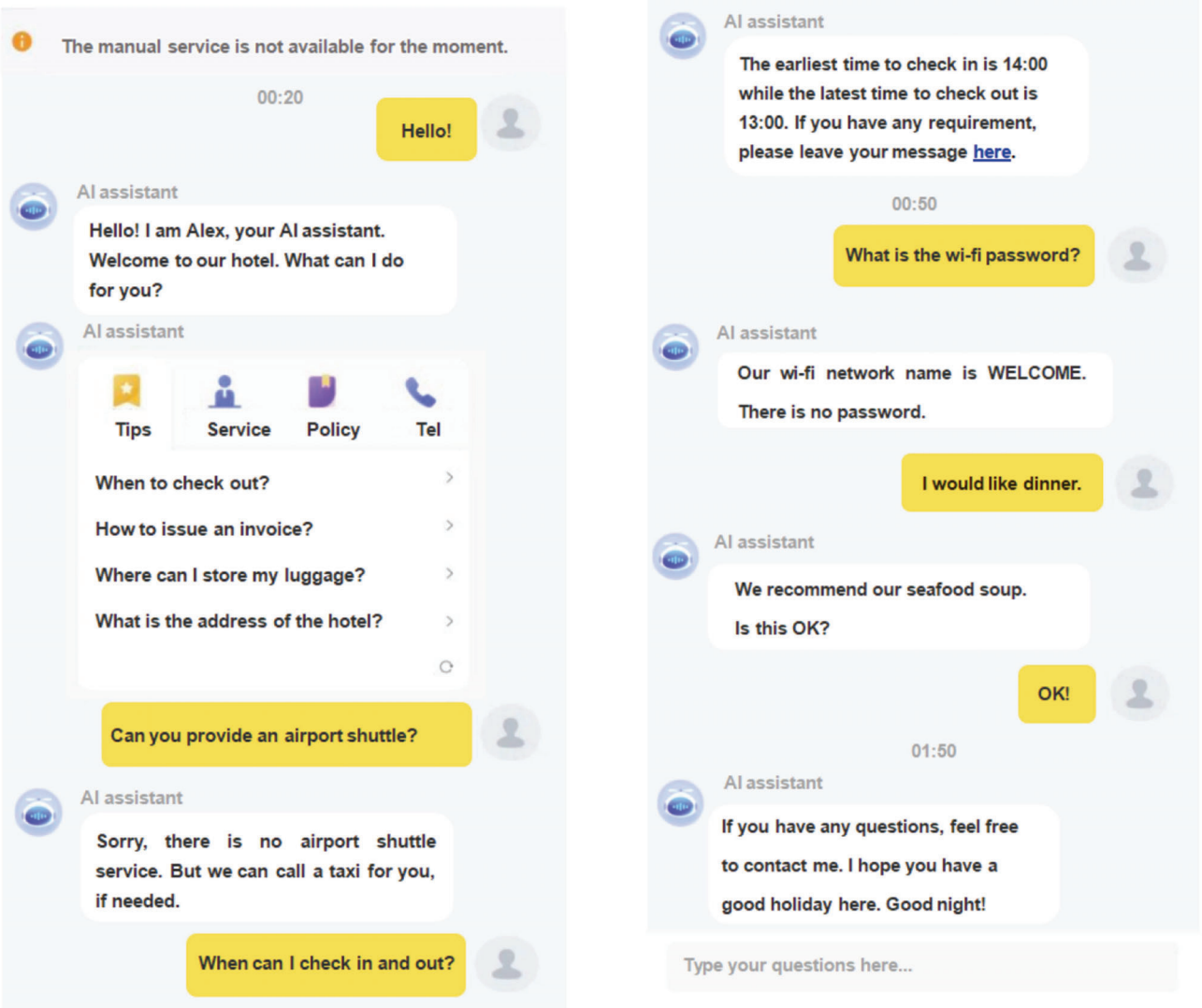

Figure 2. *Artificial Intelligence Service Scenario*

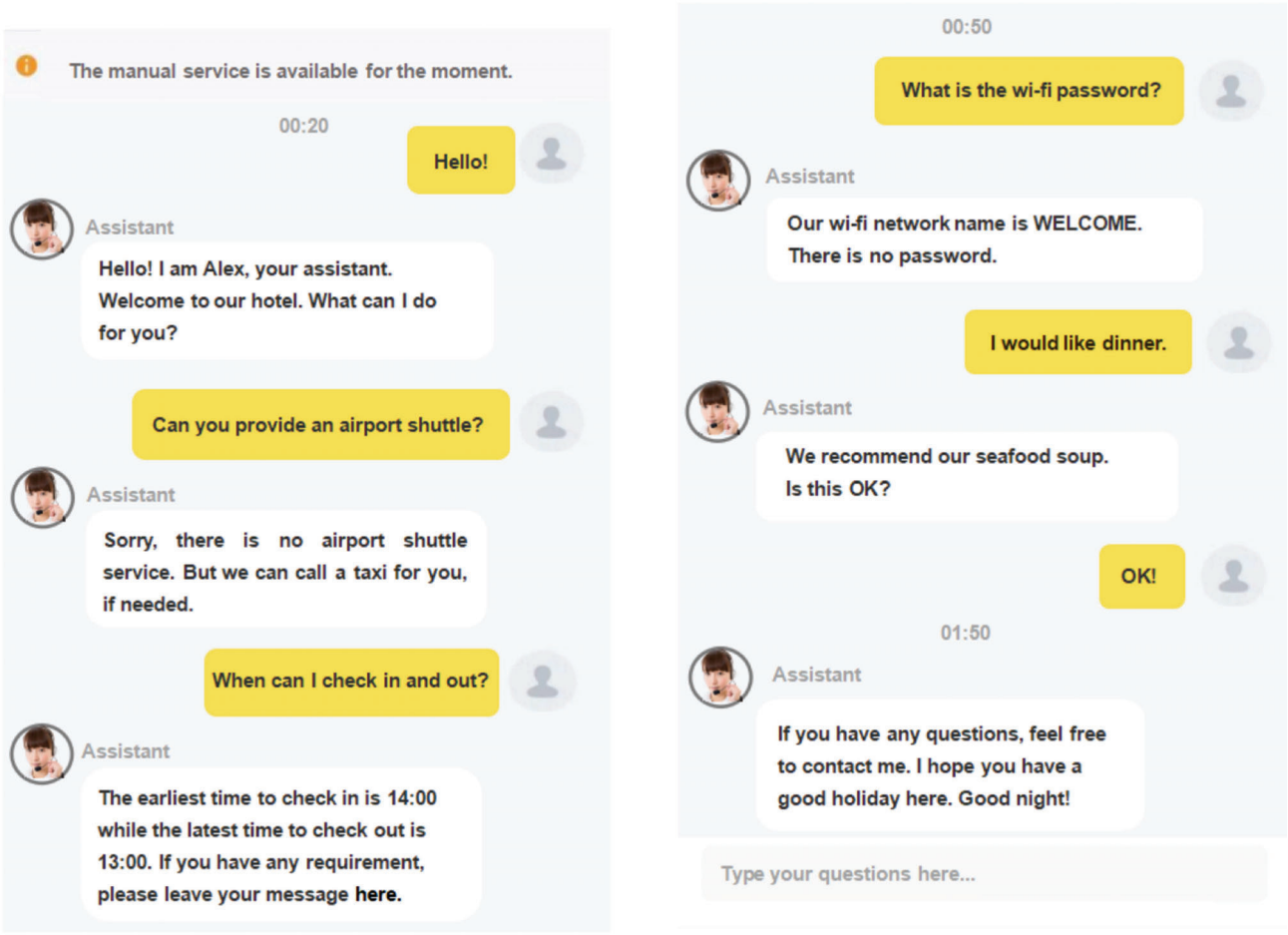

Figure 3. *Human Service Scenario*

Results

The results of an independent-samples t test showed that participants perceived higher humanless interaction in the AI service setting, $M = 6.10$, $SD = 0.66$, than in the human service setting, $M = 3.42$, $SD = 0.53$, $t = 26.43$, $p < .01$, $d = 4.48$. Thus, the manipulation was effective.

After controlling for baseline emotion (as for Study 2), the results of a one-way analysis of covariance (ANCOVA) showed that participants in the AI service setting showed significantly less customer citizenship behavior, $M = 4.87$, $SD = 0.88$, than did those in the human service setting, $M = 5.85$, $SD = 0.78$, $F(1, 138) = 66.22$, $p < .01$, $\eta^2 = .33$. Participants also showed lower positive emotion in the AI setting, $M = 4.99$, $SD = 0.91$, than in the human service setting, $M = 5.56$, $SD = 0.93$, $F(1, 138) = 20.33$, $p < .01$, $\eta^2 = .13$. Therefore, Hypothesis 1 was supported (see Figure 4).

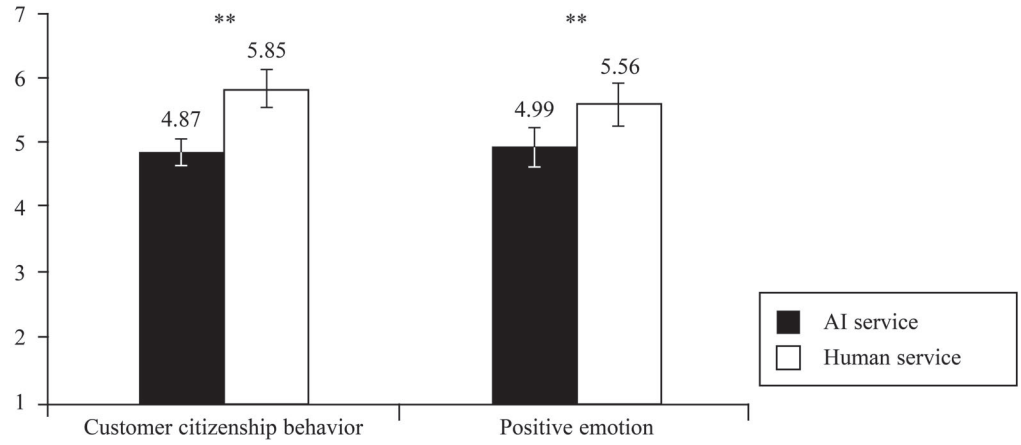

Figure 4. *Results of Study 1*
Note. AI = artificial intelligence.

** $p < .01$.

A bootstrapped mediation analysis was conducted with 5,000 resamples using Model 4 of the PROCESS macro (Hayes, 2012), with the service agent type as the independent variable, positive emotion as the mediator, customer citizenship behavior as the dependent variable, and baseline emotion as the covariate. The result revealed a significant mediating effect of positive emotion on the relationship between service agent and customer citizenship behavior, $\beta = -.28$, $SE = 0.10$, 95% confidence interval (CI) [−0.52, −0.12] (see Figure 5 and Appendix B). Therefore, Hypothesis 2 was supported.

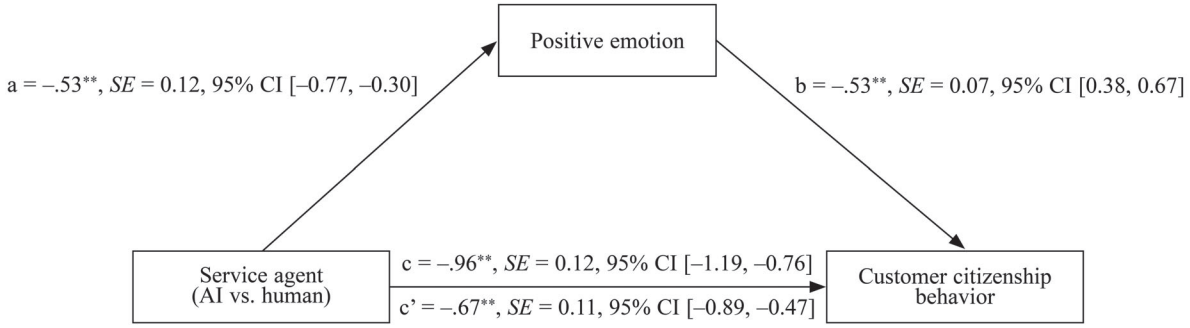

Figure 5. *Process Model of Study 1*
Note. AI = artificial intelligence.

Study 2

In Study 2 we examined whether the effect of AI service on customer citizenship behavior was moderated by brand stereotype.

Method

Participants

This experiment used a 2 (service agent: AI vs. human) × 2 (brand stereotype: competent vs. warm) between-groups design. G*Power software with a parameter for effect size of .25 at $\alpha = .05$ and power = .80 (Robiady et al., 2021) was used to calculate the effect and sufficiency of the sample size. The result showed that 179 was the minimum sample size. Therefore, we recruited 200 participants, comprising 106 (53%) women and 94 (47%) men ($M_{age} = 28.11$ years, $SD = 7.93$) from the online survey platform www.credamo.com and randomly assigned each participant to one of the four experimental scenarios. Demographic details of participants are shown above, in Table 1.

Procedure

The warm-oriented brand was introduced in a personalized way (see Figure 6), while the competent-oriented brand was advertised as efficiency-oriented (see Figure 7).

MEMORY is a hotel brand run by local villagers who advocate for a humanistic lifestyle. We hope you will enjoy your holiday here. MEMORY is committed to providing customers with home-like products and services, including comfortable pillows, soft quilts, handmade breakfasts, and personalized service. Before your arrival we carefully clean and decorate your room. During your stay all services will be provided by our villagers so you can experience our hospitality. MEMORY strives to be your trusted partner and hopes you will enjoy the journey!

Figure 6. *Warm Brand Advertisement*

SMART is a leading chain hotel brand in the region. Designed by internationally famous architects and IT experts, the hotel includes internet thinking, big data cloud services, and cutting-edge intelligent equipment. We create an efficient service mode and provide a modern accommodation experience. Recognition technology enables you to check in quickly and efficiently without complicated procedures; online customer service agents provide real-time responses. We advocate for the brand vision of "intelligent life enabled by technology," and provide convenient accommodation services for fashionable urban business travelers, which is favored by the younger generations.

Figure 7. *Competent Brand Advertisement*

Participants first reported their baseline emotions (see Appendix A), then they were instructed to imagine that they were planning to have a holiday and had booked a hotel on the platform. As they arrived late, they picked up the phone and tried to consult with the details on the App (see Figures 2 and 3). As in Study 1, participants reported their customer citizenship behavior ($\alpha = .83$) and positive emotion ($\alpha = .91$). The manipulation check for the service agent type was measured with a two-item scale ($r = .90$, as in Study 1), while the check for the brand stereotype manipulation was conducted using two four-item scales (competence: $\alpha = .83$; warm: $\alpha = .82$) adapted from Fiske et al. (2002): "Please rate the brand's capability/competence/efficiency/intelligence/friendliness/good nature/kindness/warmth." The first four items assessed brand competence and the latter four assessed brand warmth. Responses were rated on a 7-point Likert scale (1 = *not at all*, 7 = *an extreme amount*). Finally, the participants reported their demographic information.

Results

The results of an independent-samples *t* test showed that participants perceived higher humanless interaction in the AI service setting, $M = 5.93$, $SD = 0.67$, than in the human service setting, $M = 3.24$, $SD = 0.55$, $t = 31.03$, $p < .05$, $d = 4.39$. In addition, participants' evaluation of brand competence was significantly higher for the competent-oriented brand, $M = 5.76$, $SD = 1.02$, than for the warm-oriented brand, $M = 5.04$, $SD = 0.67$, $t = 5.90$, $p < .01$, $d = 0.83$. Finally, participants' evaluation of brand warmth was significantly higher for the warm-oriented brand, $M = 5.86$, $SD = 0.94$, than for the competent-oriented brand, $M = 4.99$, $SD = 0.66$, $t = 7.49$, $p < .05$, $d = 1.07$. Thus, both manipulations were successful.

Supporting Hypothesis 1, a two-way ANCOVA demonstrated that AI service led to lower customer citizenship behavior, $M = 5.72$, $SD = 0.60$, compared to human service, $M = 6.11$, $SD = 0.67$, $F(1, 196) = 20.32$, $p < .01$, $\eta^2 = .09$. AI service also led to lower positive emotion, $M = 5.60$, $SD = 0.83$, compared to human service, $M = 5.87$, $SD = 0.86$, $F(1, 196) = 5.80$, $p < .05$, $\eta^2 = .03$. In addition, the interaction term of service type × brand stereotype had a significant effect on both positive emotion, $F(1, 196) = 22.00$, $p < .01$, $\eta^2 = .10$, and customer citizenship behavior, $F(1, 196) = 10.78$, $p < .01$, $\eta^2 = .05$. The results of a one-way ANCOVA revealed that when the brand was warm-oriented, participants reported significantly lower positive emotion for the AI service setting, $M = 5.46$, $SD = 0.94$, than for the human service setting, $M = 6.26$, $SD = 0.69$, $F(1, 98) = 23.02$, $p < .01$, $\eta^2 = .19$. Participants also reported lower customer citizenship behavior for the AI service setting, $M = 5.66$, $SD = 0.71$, than for the human service setting, $M = 6.33$, $SD = 0.27$, $F(1, 98) = 39.92$, $p < .01$, $\eta^2 = .29$. When the brand was competent-oriented, positive emotion did not significantly differ whether service was provided by AI, $M = 5.73$, $SD = 0.69$, or human service agents, $M = 5.49$, $SD = 0.85$, $F(1, 98) = 3.01$, $p = .09$, $\eta^2 = .03$. Customer citizenship behavior likewise did not significantly differ whether service was provided by AI, $M = 5.79$, $SD = 0.47$, or human service agents, $M = 5.90$, $SD = 0.86$, $F(1, 98) = 0.60$, $p = .44$. For details see Figure 8.

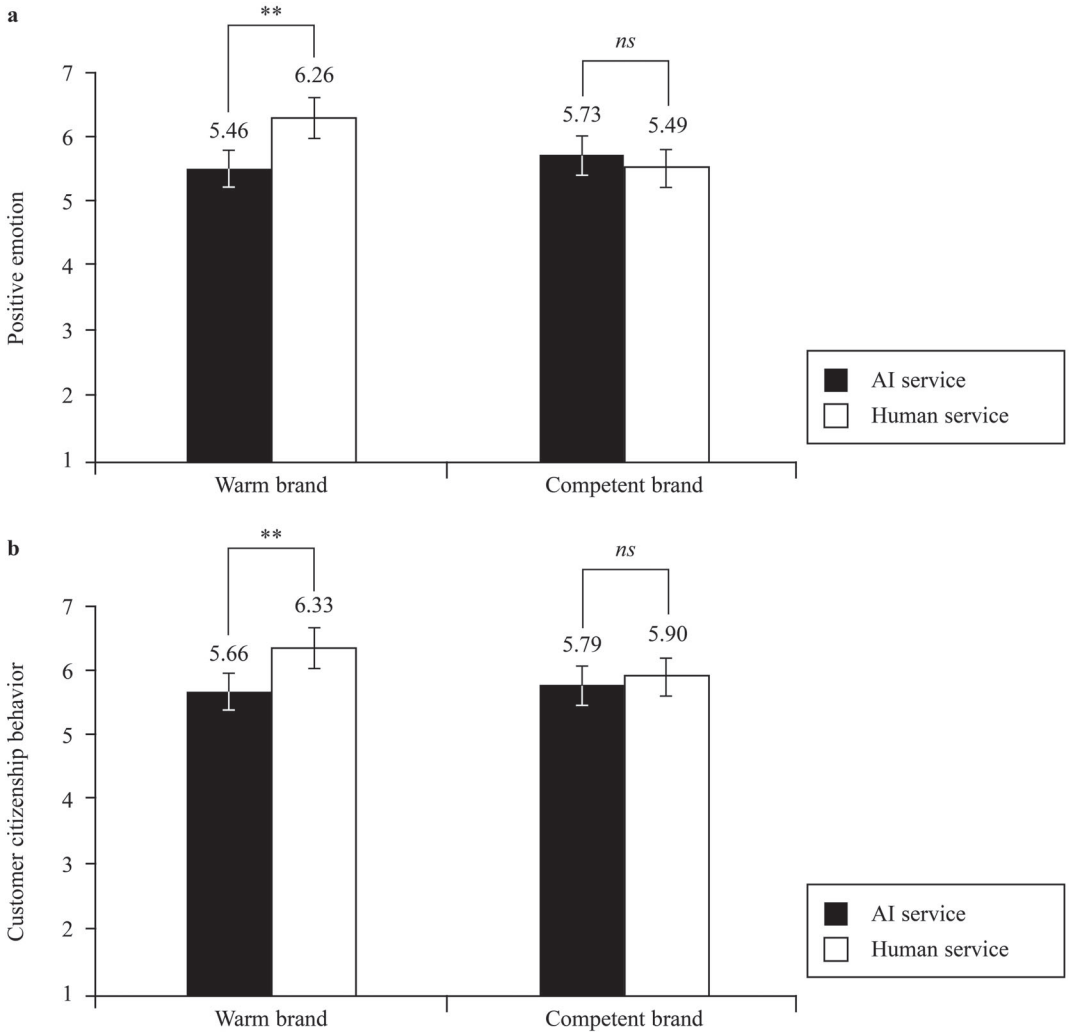

Figure 8. *Results of Study 2*
Note. AI = artificial intelligence.
** $p < .01$.

Moreover, to check whether the interplay between service agent type and brand stereotype affected customer citizenship behavior through positive emotion, we conducted a moderated mediation analysis using Model 7 of the SPSS PROCESS macro with 5,000 bootstrapped resamples (Hayes, 2015). We set the service agent as the independent variable (1 = AI service, 0 = human service), brand stereotype as the moderator (1 = competent, 0 = warm), positive emotion as the mediator, and customer citizenship behavior as the dependent variable. The results indicated there was a significant indirect effect of positive emotion, Index = .36, *SE* = 0.13, 95% CI [0.14, 0.64]. For the warm-oriented brand, the mediating effect of positive emotion was significant, β = −.27, *SE* = 0.09, 95% CI [−0.46, −0.11]. For the competent-oriented brand, the mediating effect of positive emotion was nonsignificant, β = −.09, *SE* = 0.06, 95% CI [−0.01, 0.23]. Therefore, Hypothesis 3 was supported.

General Discussion

The prevalence of AI services has aroused the interest of both business and academia. The majority of existing research has focused on consumers' attitude and behavioral intention toward AI services, such as consumer preference and adoption intentions (Zhu et al., 2022). While this body of literature has provided valuable insights, there has been limited research on how AI services shape consumer extrarole behaviors. Scholars have also called for further studies of the behavioral consequences of AI services (Fan et al., 2022). Building upon existing research, we have shed light on how AI services affect consumer psychological states and social behaviors. The two empirical studies in this paper consistently demonstrate that there is a negative correlation between AI services and consumer citizenship behaviors, which supports the findings of Y. Zhou et al. (2022) that human–chatbot interaction impairs charitable donation. These results suggest that AI chatbots cannot fully replace the role of human agents, which aligns with the findings of Fan et al. (2022) regarding the potential dark side of AI services.

In addition, we have demonstrated the mechanism of this effect based on positive emotion, using emotional spillover theory. This expands the explanatory path of customer citizenship behavior from cognitive processing (Song et al., 2022) to mental processing. Furthermore, this study contributes to understanding of customers' emotional response to AI services by investigating brand stereotype as a boundary condition. The AI–warmth paradox presents a significant challenge in marketing experience products that are consumed primarily for the experiential value they provide, rather than for their functional utility, as AI chatbots are driven by technology, which is often perceived as competent and cold (Wirtz et al., 2018). This lack of human touch calls for complementation from the brand's value. Our study aligns with the work of Ruan and Mezei (2022) in exploring the effectiveness of AI chatbots in experience product settings, considering the interplay with brand characteristics.

This study also has critical implications for practice. While previous research has emphasized that brand warmth has a stronger impact on consumer behaviors than does brand competence (Kolbl et al., 2020), our findings demonstrate that brand competence is particularly helpful for AI services. The negative effects of AI service on customers' positive emotion and behavior are mitigated when the brand is perceived as competent rather than warm. Established warm brands can consider reserving human service for high-contact positions if they choose to adopt AI services. On the other hand, start-up companies can advertise their brands as competent to emphasize the fully automatic nature of their services. Regardless of the situation, service providers should strive to compensate for the loss of social contact in AI services to enhance customer well-being.

There are several limitations to this research. First, we considered only the binary interaction between consumers and service providers. With the emergence of the service triad (Odekerken-Schröder et al., 2021), future studies could explore whether the combination of human staff and AI chatbot can provide a better service experience. Second, we focused primarily on customer citizenship behavior. Future studies could examine the generalizability of these findings to green customer citizenship behavior (Zhang et al., 2022). Additionally, the perception of interaction with AI services can vary among individuals. For instance, individuals with a tendency toward social avoidance, which is characterized by a desire to avoid being with other people (Watson & Friend, 1969), may have stronger positive emotion toward AI service. Therefore, future research could explore the boundaries of this effect among different individuals.

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Appendix A

Differences in Emotion at Pre- and Posttest

For Study 1

Descriptives

		N	*M*	*SD*
Pretest emotion	Human service	70	5.5179	0.88907
	AI service	70	5.4679	1.03378
Posttest emotion	Human service	70	5.5571	0.92683
	AI service	70	4.9929	0.91284

ANOVA

		Sum of squares	*df*	Mean square	*F*	*p*
Pretest emotion	Between groups	0.088	1	0.088	0.094	.759
	Within groups	128.280	138	0.930		
Posttest emotion	Between groups	11.145	1	11.145	13.171	< .001
	Within groups	116.768	138	0.846		

For Study 2

Descriptives

		N	*M*	*SD*
Pretest emotion	0	100	5.3250	1.14840
	1	100	5.2675	1.15921
Posttest emotion	0	100	5.8700	0.86419
	1	100	5.5950	0.83089

ANOVA

		Sum of squares	*df*	Mean square	*F*	*p*
Pretest emotion	Between groups	0.165	1	0.165	0.124	.725
	Within groups	263.594	198	1.331		
Posttest emotion	Between groups	3.781	1	3.781	5.262	.023
	Within groups	142.283	198	0.719		

Note. AI = artificial intelligence.

Appendix B

Conditional Indirect Effects of the Moderated Mediation Model

Variables	Indirect effects	Brand stereotype (moderator)	
		Warm brand	Competent brand
Service agent (AI vs. human)	Service agent → Positive emotion → Customer citizenship behavior	β = −.27, 95% CI [−0.46, −0.11]	β = −.09, 95% CI [−0.01, 0.23]
	Index of moderated mediation	Index = 0.36, 95% CI [0.14, 0.64]	

Note. AI = artificial intelligence.