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Chatbot Self-Presentation Strategies and Customer Service Satisfaction in E-Commerce: The Dual Mediating Roles of Perceived Competence and Perceived Warmth

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Abstract. The proliferation of AI-powered chatbots as the dominant customer service interface in e-commerce—spanning banking, retail, and travel sectors—has intensified scholarly and managerial interest in how these agents can simultaneously project professional competence and interpersonal warmth. Yet how specific self-presentation strategies shape these two critical user perceptions, and through them customer service satisfaction (CSS), remains underexplored. This study proposes and tests a dual-mediation model in which two chatbot self-presentation strategies—self-promotion (SP) and self-deprecation (SD)—exert differential, and partially opposing, effects on CSS through the parallel mediating pathways of perceived competence (PC) and perceived warmth (PW). Grounded in impression management theory (IMT) and the stereotype content model (SCM), six directional hypotheses are derived and tested via a between-subjects experimental survey administered in an e-commerce product-recommendation context. Results confirm an asymmetric competence–warmth trade-off: SP positively predicts PC but negatively predicts PW; SD negatively predicts PC while positively predicting PW; both PC; and PW positively predict CSS. The findings extend IMT and the SCM to AI-mediated e-commerce service and provide context-sensitive design prescriptions for practitioners deploying adaptive chatbot customer service systems.

Keywords: chatbot, customer service satisfaction, self-promotion, self-deprecation, perceived competence, perceived warmth, impression management.

1. Introduction

The rapid integration of AI-driven conversational agents—commonly termed chatbots—into e-commerce customer service represents one of the most consequential technological shifts in contemporary digital commerce (Xiao & Jinghong, 2026). Across banking, online retail, and travel platforms, chatbots now function as the primary point of contact for millions of daily interactions involving order enquiries, product recommendations, complaint resolution, and transaction processing (Khoa, 2025; Khoa & Anh, 2024). Despite their pervasiveness, a persistent dissatisfaction paradox endures: consumers frequently characterise chatbot interactions as impersonal, transactional, and lacking the relational warmth they associate with high-quality human service (Markovitch *et al.*, 2024; Nguyen *et al.*, 2023).

Research has responded to this dissatisfaction through the lens of chatbot humanisation—introducing anthropomorphic design cues such as names, avatars, humour, and empathetic language to create more lifelike interactions (Levine & Shin, 2025; Shams *et al.*, 2024; Shin *et al.*, 2022). A critical limitation persists, however: humanisation research has predominantly examined static design features and has rarely distinguished the specific evaluative outcomes—competence and warmth—through which different cues operate, making it difficult to identify precisely which design lever should be activated under which service conditions (Ezzedine *et al.*, 2026).

Self-presentation—the deliberate verbal framing of an agent's capabilities or limitations at the opening of a service interaction—offers a tractable alternative. Two archetypal strategies define this space: self-promotion (SP), in which the chatbot asserts superior expertise (e.g., 'I am equipped with the most advanced AI algorithms'), and self-deprecation (SD), in which the chatbot acknowledges limitations while signalling cooperative intent (e.g., 'I am still learning, but I will do my very best to help you'). IMT (Goffman, 2023; Sezer, 2022) predicts that SP raises perceived competence (PC) but depresses perceived warmth (PW), while SD raises PW but lowers PC. The SCM (Fiske *et al.*, 2018) provides structural support through its orthogonality claim—warmth and competence are independently responsive to different social signals. Both PC and PW are established antecedents of customer service satisfaction (CSS), suggesting that the two self-presentation strategies produce divergent, partially opposing pathways to CSS.

2. Literature Review

2.1. Chatbot Customer Service in E-Commerce

The deployment of AI-driven chatbots in e-commerce customer service spans three major sectors: online retail, digital banking, and travel platforms. In each context, chatbots serve as front-line agents handling high-volume, repetitive interactions—product enquiries, order tracking, payment processing, and complaint management—at a scale and speed that human agents cannot match (Song *et al.*, 2022). The information systems (IS) literature has conceptualised chatbot effectiveness along two dimensions: utilitarian effectiveness, capturing the chatbot's ability to resolve service tasks accurately and efficiently, and hedonic effectiveness, capturing the quality of the relational experience it generates (Gursoy *et al.*, 2019). Both dimensions contribute to customer service satisfaction (CSS), but through different evaluative pathways: utilitarian effectiveness operates primarily through users' perceptions of the chatbot's competence, while hedonic effectiveness operates primarily through perceptions of its warmth and interpersonal connection (Xu *et al.*, 2023; Zhu *et al.*, 2023).

Research has documented that chatbots which fail on either dimension produce systematically lower CSS. Chatbots perceived as incompetent generate distrust, task abandonment, and negative service evaluations (Khoa, 2021; Kim & Hur, 2023; Wang *et al.*, 2023). Chatbots perceived as cold or impersonal produce disengagement and lower repurchase intentions, even when their technical performance is adequate (Markovitch *et al.*, 2024). This dual requirement—for both competence and warmth—creates a design tension that conventional humanisation research has not fully resolved,

because it has primarily treated humanisation as a unidimensional improvement rather than as a potential trade-off between two distinct evaluative dimensions. The present study addresses this gap by examining how two self-presentation strategies differentially activate PC and PW pathways.

2.2. Theoretical Foundations: IMT and the SCM

Impression management theory proposes that social actors—human or artificial—strategically regulate the impressions they create in the minds of interaction partners through verbal and nonverbal communication (Goffman, 2023; Sezer, 2022). In service contexts, two polar self-presentation strategies have been extensively studied: self-promotion and self-deprecation. Self-promotion involves the proactive assertion of positive attributes, expertise, and achievements, with the goal of raising the perceiver's appraisal of the actor's ability. Self-deprecation involves the strategic acknowledgement of limitations, imperfection, or modest self-assessments, with the goal of enhancing interpersonal likeability and relational closeness (Kale & Sayin, 2024; Wald *et al.*, 2024).

The stereotype content model provides a structural complement to IMT by organising social evaluation along two orthogonal dimensions: warmth and competence (Fiske *et al.*, 2018). Warmth reflects perceptions of friendliness, sincerity, and benevolent intent; competence reflects perceptions of capability, intelligence, and efficiency. The SCM's core proposition—that warmth and competence are orthogonal—implies that stimuli can independently vary along each dimension, and that interventions designed to raise one dimension may leave the other unchanged or even reduce it. This orthogonality prediction has been empirically supported in person perception research and, more recently, in chatbot humanisation research (Ezzedine *et al.*, 2026; Kim & Hur, 2023).

The CASA (Computers Are Social Actors) framework provides the bridge between IMT/SCM and chatbot contexts: it demonstrates that people apply social cognitive schemas to AI agents as naturally as to humans, processing their verbal outputs using the same evaluative heuristics they apply to human communication (Nass & Moon, 2002). This means that when a chatbot makes a self-promotional or self-deprecating statement, users are likely to process it using human-derived impression management heuristics, producing evaluative consequences analogous to those observed in human interactions.

2.3. Hypothesis Development

Figure 1 presents the proposed research model. Self-promotion (SP) and self-deprecation (SD) constitute the two independent variables. Perceived competence (PC) and perceived warmth (PW) are the two mediating variables. Customer service satisfaction (CSS) is the dependent variable. Six directional hypotheses specify the relationships among these constructs.

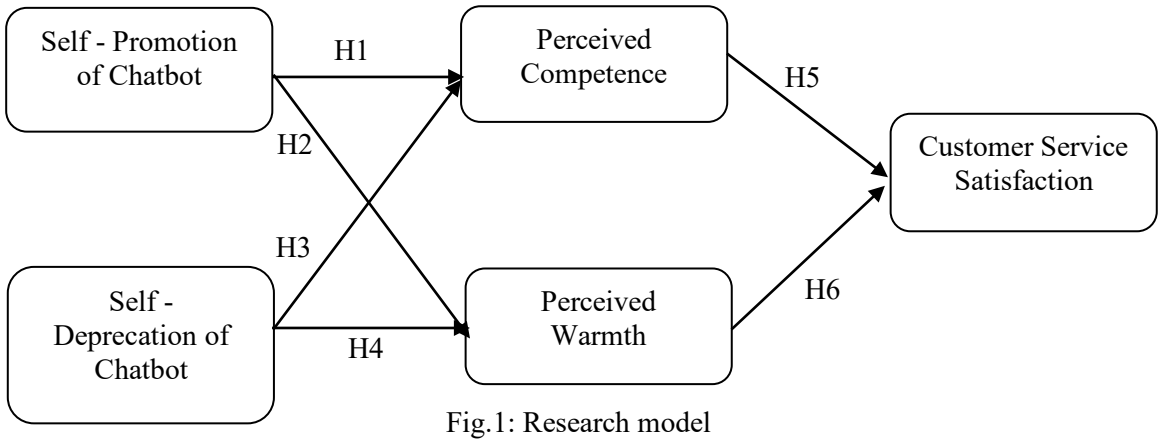

Fig.1: Research model

The theoretical rationale for H1 rests on the competence-signalling function of self-promotional statements. By asserting superior algorithmic capability, high accuracy, and problem-solving

efficiency, SP provides users with an explicit, task-relevant competence signal that directly activates favourable capability attributions (Hayashi *et al.*, 2024; Sezer, 2022). In the CASA framework, users process this signal using the same schemas they apply to human experts who make equivalent capability claims, attributing high PC to the chatbot. In e-commerce contexts specifically—where users are often uncertain about a chatbot's ability to handle their specific query accurately—SP's explicit competence claim reduces this uncertainty and elevates PC perceptions (Giedrius & Jolanta, 2024; Huynh & Khoa, 2025).

H1: Self-Promotion of Chatbot positively impacts Perceived Competence in e-commerce customer service.

While SP elevates PC through its competence signal, IMT research predicts that self-promotional assertions frequently trigger modesty-norm violations—the social expectation that capable actors should not need to publicly announce their superiority (Guo & Ren, 2024; Hayashi *et al.*, 2024). When a chatbot opens with statements like 'I am the most advanced AI you will ever encounter,' users may perceive this as boastful, self-centred, and lacking in relational sensitivity—qualities that directly reduce PW (Puja & Dipendra, 2025). This mechanism is consistent with the SCM's warmth dimension, which reflects benevolent intent and interpersonal attentiveness; a chatbot focused on asserting its own superiority appears less oriented toward the user's relational needs (Khoa *et al.*, 2026).

H2: Self-Promotion of Chatbot negatively impacts Perceived Warmth in e-commerce customer service.

Self-deprecation's primary function in IMT is warmth enhancement through the strategic acknowledgement of limitations. However, this same acknowledgement carries an inherent competence cost: when a chatbot admits that it 'may not always be right' or is 'still learning,' it provides users with diagnostic information that supports lower ability attributions (Wald *et al.*, 2024). The competence cost of SD is particularly salient in task-oriented e-commerce contexts—such as financial product queries, logistics tracking, or return policy clarifications—where users are highly motivated to assess the chatbot's ability to resolve their problem accurately (Cuong *et al.*, 2025). When ability admissions are perceived as extensive or directly relevant to the task at hand, SD may meaningfully depress PC.

H3: Self-Deprecation of Chatbot negatively impacts Perceived Competence in e-commerce customer service.

In contrast to its competence cost, SD reliably elevates PW through multiple social-psychological mechanisms. By acknowledging limitations and signalling cooperative intent, SD reduces the social distance inherent in human-AI interaction, projecting approachability and relational openness (Kale & Sayin, 2024; Shin *et al.*, 2022). SD's humble tone also signals that the chatbot prioritises the user's needs over its own image maintenance—a form of benevolent orientation that is central to warmth perception in the SCM. Furthermore, SD's implicit invitation for user input and patience ('I'll do my very best to help you') fosters a collaborative, co-operative interaction frame that elevates relational comfort.

H4: Self-Deprecation of Chatbot positively impacts Perceived Warmth in e-commerce customer service.

Perceived competence is a fundamental antecedent of CSS in service contexts because it directly addresses users' primary utilitarian goal in customer service interactions: obtaining accurate, efficient problem resolution (Kim & Hur, 2023; Wang *et al.*, 2023). When users perceive a chatbot as highly competent—capable, intelligent, and efficient—they trust its outputs, comply with its guidance, and form positive expectations about interaction quality (Thanh *et al.*, 2025). This trust and positive expectation formation produces higher CSS through both cognitive (accurate task evaluation) and

affective (confidence and reduced anxiety) routes. In e-commerce contexts spanning banking, retail, and travel, where the stakes of incorrect information can be significant (financial losses, booking errors, unprocessed returns), PC's contribution to CSS is particularly strong.

H5: Perceived Competence positively impacts Customer Service Satisfaction in e-commerce.

Perceived warmth contributes to CSS through the hedonic dimension of service quality—the relational experience generated by the interaction, independent of its technical accuracy. When users perceive a chatbot as friendly, warm, kind, and sociable, they experience lower social distance, greater rapport, and a more pleasant overall interaction, all of which elevate CSS (Markovitch *et al.*, 2024; Xu *et al.*, 2023). PW's contribution to CSS is particularly important in e-commerce contexts where the service interaction involves emotional complexity—such as complaint handling, where users may feel frustrated or anxious, or personalised recommendation, where users seek both accurate information and the feeling of being understood. PW also serves as a buffer against the negative emotional consequences of service imperfections: a warm chatbot that makes an error is more readily forgiven than a cold one.

H6: Perceived Warmth positively impacts Customer Service Satisfaction in e-commerce.

3. Research Methodology

3.1. Research Design

To test H1–H6, we employed a between-subjects experimental survey design with three conditions: self-promotion (SP), self-deprecation (SD), and a neutral baseline (NB) (absence of self-presentation). Although the primary theoretical model specifies SP and SD as the two independent variables of interest, the NB condition was included as a structural comparison anchor to confirm that each strategy's effects on PC and PW are directionally consistent with the hypothesised mechanisms. Participants were randomly assigned to one of three conditions and exposed to a standardised chatbot dialogue representing a common e-commerce interaction: an AI chatbot assistant providing running shoe product recommendations to a consumer. After reading the dialogue, participants completed a self-report questionnaire measuring CSS, PC, PW, and a manipulation check item.

The product recommendation scenario was selected for three reasons: (a) it represents a high-frequency, ecologically valid e-commerce interaction across retail platforms; (b) it involves both task accuracy (recommending the right product) and relational engagement (understanding user preferences), making both PC and PW theoretically relevant; and (c) it allows clean experimental manipulation of the chatbot's self-presentation opening without altering the product information content of the recommendation response. Across all three conditions, the chatbot provided identical recommendations (three shoes with identical specifications); only the self-presentation framing of the opening statement differed.

3.2. Experimental Stimuli and Manipulation

In the SP condition, the chatbot opened with a confident assertion of expertise: 'Nobody knows shoes better than me. My recommendations are always spot-on.' This statement was designed to signal high capability and algorithmic superiority, consistent with the SP construct. In the SD condition, the chatbot opened with a humble acknowledgement of limitations: 'Maybe try this one—I'm not always right, but I'll do my best to help.' This statement was designed to signal relational approachability and cooperative intent, consistent with the SD construct. In the NB condition, AI-chatbot proceeded immediately to product recommendations without any self-referential opening content, representing the absence of self-presentation as a structural baseline. These stimuli were adapted from the validated scenarios used by Ezzedine *et al.* (2026) and refined for the product recommendation context through iterative pre-testing with five independent reviewers.

Manipulation validity was assessed using a seven-point bipolar scale (1 = very humble, 7 = very boastful). One-sample t-tests against the neutral midpoint (4.0) confirmed that the SP condition was perceived as significantly more boastful ($M = 3.89$, $SD = 1.19$; $t(82) = 6.77$, $p < .001$), the SD condition as significantly more humble ($M = 2.13$, $SD = 1.41$; $t(81) = -6.87$, $p < .001$), and the NB condition as neutral ($M = 3.05$, $SD = 1.06$; $t(78) = 0.42$, $p = .67$). These results confirm the successful manipulation of the self-presentation strategy variable.

3.3. Sample and Data Collection

Data were collected from an online consumer panel administered through a professional survey platform. Inclusion criteria required participants to: (a) be at least 18 years of age; (b) have engaged in at least one online shopping transaction in the preceding three months; and (c) report prior experience with chatbot-based customer service, either in a retail, banking, or travel context. These criteria ensure that participants represent the target population of actual e-commerce chatbot users, who can engage meaningfully with the experimental scenario based on prior experience. Participants were randomly assigned to conditions by the platform's randomisation module, and condition assignment was balanced across the three groups.

After excluding participants who failed the manipulation check ($n = 12$) or completed the survey in fewer than 90 seconds ($n = 8$), a final sample of $N = 244$ participants was retained (SP: $n = 83$; SD: $n = 82$; NB: $n = 79$). The sample was 41.4% female, with a mean age of 35.15 years ($SD = 14.53$, range = 16–68). All participants reported prior chatbot interaction experience, consistent with the inclusion criteria. A post-hoc power analysis confirmed that this sample provides greater than 80% power to detect medium effect sizes ($f^2 \geq 0.15$) in mediation analyses at $\alpha = .05$ (Cohen, 2013; Hayes, 2013), satisfying the minimum power requirements for the planned analytical strategy.

3.4. Measurement

All constructs were operationalised using validated multi-item scales on five-point Likert response formats (1 = strongly disagree, 5 = strongly agree).

Customer Service Satisfaction (CSS, $\alpha = .89$): Four items adapted from Xie *et al.* (2024): 'Overall, I am satisfied with this chatbot's service'; 'I am pleased with the chatbot's recommendations'; 'The chatbot's service met my expectations'; 'I feel content with this chatbot interaction.'

Perceived Competence (PC, $\alpha = .87$): Four items adapted from Kim and Hur (2023): 'This chatbot appears to be competent'; 'This chatbot appears to be intelligent'; 'This chatbot appears to be capable'; 'This chatbot appears to be efficient.'

Perceived Warmth (PW, $\alpha = .88$): Four items adapted from Kim and Hur (2023): 'This chatbot appears to be friendly'; 'This chatbot appears to be warm'; 'This chatbot appears to be kind'; 'This chatbot appears to be sociable.'

Self-Promotion (SP, $\alpha = .86$): Four items adapted from Ezzedine *et al.* (2026); Guo and Ren (2024): “The chatbot appears confident about its capabilities”; “The chatbot actively promotes its strengths and expertise”; “The chatbot presents itself as highly competent and superior”; “The chatbot communicates in a self-assertive, boastful manner.”

Self-Deprecation (SD, $\alpha = .85$): Four items adapted from Ezzedine *et al.* (2026); Kale and Sayin (2024): “The chatbot acknowledges its own limitations and imperfections”; “The chatbot communicates with humility and modesty”; “The chatbot presents itself as approachable and non-threatening”; “The chatbot signals effort and willingness to help despite limitations.”

Table 1. Measurement Summary

Construct	Representative Items	Source
PC*	Competent / Intelligent / Capable / Efficient	Kim and Hur (2023)
PW*	Friendly / Warm / Kind / Sociable	
CSS*	Overall satisfied / Pleased / Expectations met / Content	Xie *et al.* (2024)
SP	Confidence/ Promotion/ Superiority/ Boasting	Ezzedine *et al.* (2026); Guo and Ren (2024)
SD	Limitations/ Humility/ Approachability/ Effort	Ezzedine *et al.* (2026); Kale and Sayin (2024)
Manipulation Check	Very humble—very boastful (1 bipolar item, 7-pt scale)	Ezzedine et al. (2026)

Note. *All multi-item scales scored on 5-point Likert formats

3.5. Construct Validity

Confirmatory factor analysis (CFA) was conducted to assess measurement quality. The three-factor model (PC, PW, CSS) demonstrated acceptable fit: $\chi^2(51) = 94.37$, CFI = .96, TLI = .95, RMSEA = .059, SRMR = .052. Convergent validity was supported by composite reliability (CR) values of .91 (PC), .92 (PW), and .92 (CSS), all exceeding the .70 threshold (Hair et al., 2019), and average variance extracted (AVE) values of .72, .74, and .74, respectively, all exceeding the .50 threshold. Discriminant validity was supported by the Fornell–Larcker criterion: the square root of each construct's AVE (.85, .86, .86) exceeded all inter-construct correlations (maximum r = .54, CSS–PC). Common method bias was assessed using Harman's single-factor test; the single-factor model explained 32.4% of total variance, well below the 50% threshold, indicating that common method bias is unlikely to critically distort the findings (Podsakoff *et al.*, 2003). Table 2 presents the full descriptive statistics, reliability indices, and construct correlation matrix.

Table 2. Descriptive Statistics, Reliability Indices, and Construct Correlations

Construct	M	SD	α	CR	AVE	sqr(AVE)	1	2	3
1. Perceived Competence (PC)	3.71	0.92	.87	.91	.72	.85	—		
2. Perceived Warmth (PW)	3.58	1.04	.88	.92	.74	.86	.31**	—	
3. Customer Service Satisfaction (CSS)	3.70	1.05	.89	.92	.74	.86	.54**	.48**	—

*Note. M = mean; SD = standard deviation; α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted; sqr(AVE) = square root of AVE (diagonal in the Fornell–Larcker matrix). Off-diagonal values are Pearson correlations. The low PC–PW correlation (r = .31) supports the SCM's orthogonality claim. ** p < .01 (two-tailed).*

The six hypotheses were tested using two complementary analytical approaches. First, path-level hypotheses (H1–H4) were tested using ordinary least squares regression, estimating the effect of each self-presentation condition (SP vs. NB; SD vs. NB; SP vs. SD, dummy-coded) on PC and PW separately. Second, H5 and H6, along with the indirect (mediated) effects of SP and SD on CSS through PC and PW, were tested using the PROCESS Macro (Hayes, 2013), Model 4, with 5,000 bootstrap resamples and 95% bias-corrected confidence intervals (BCCIs). An indirect effect is deemed significant when its BCCI excludes zero. All analyses were conducted in SPSS 27.0.

4. Results

4.1. Manipulation Check

Table 3 presents the manipulation check results. One-sample t-tests against the neutral midpoint (4.0) confirmed that SP was perceived as boastful ($M = 3.89$, $SD = 1.19$; $t(82) = 6.77$, $p < .001$) and SD as humble ($M = 2.13$, $SD = 1.41$; $t(81) = -6.87$, $p < .001$), while NB was neutral ($M = 3.05$, $SD = 1.06$; $t(78) = 0.42$, $p = .67$). In addition, one-way ANOVA confirmed significant between-condition differences on the perception check scales: $F(2, 241) = 87.32$, $p < .001$, $\eta^2 = .42$ for the boastful–humble bipolar item.

Table 3. Manipulation Check Results by Experimental Condition

Condition	n	M	SD	t	df	p
Self-Promotion (SP)	83	3.89	1.19	6.77	82	< .001
Self-Deprecation (SD)	82	2.13	1.41	−6.87	81	< .001
Neutral Baseline (NB)	79	3.05	1.06	0.42	78	.67 (ns)

Note. t-test against neutral midpoint = 4.0 (7-point bipolar scale: 1 = very humble, 7 = very boastful). Between-condition ANOVA: $F(2, 241) = 87.32$, $p < .001$, $\eta^2 = .42$. ns = not significant.

4.2. ANOVA: Condition Effects on CSS

A one-way ANOVA revealed significant between-condition differences in CSS, $F(2, 241) = 9.39$, $p < .001$, $\eta^2 = .07$ (Table 4). Post-hoc Tukey's HSD tests showed that SP ($M = 4.05$, $SD = 0.90$) produced significantly higher CSS than SD ($M = 3.72$, $SD = 1.12$; mean difference = 0.33, $p < .05$) and NB ($M = 3.33$, $SD = 1.14$; mean difference = 0.72, $p < .001$). SD also produced significantly higher CSS than NB (mean difference = 0.39, $p < .05$).

Table 4. One-Way ANOVA: Customer Service Satisfaction by Condition

Condition	n	M	SD	F	df	p	η^2	Post-hoc Differences (Tukey's HSD)
Self-Promotion (SP)	83	4.05	0.90	9.39	2,241	< .001	.07	SP > SD ($p < .05$); SP > NB ($p < .001$)
Self-Deprecation (SD)	82	3.72	1.12					SD > NB ($p < .05$)
Neutral Baseline (NB)	79	3.33	1.14					Reference

Note. CSS = customer service satisfaction (5-pt Likert scale). η^2 = partial eta-squared. Post-hoc comparisons via Tukey's HSD.

4.3. OLS Regression

Table 5 presents the regression results for H1–H6. Regarding H1, SP significantly and positively predicted PC ($b = 0.60$, $SE = 0.14$, $\beta = .32$, $p < .001$), confirming that chatbot self-promotion elevates perceived competence. H1 is supported. Regarding H2, when SP was compared directly with SD, SP had a significant negative effect on PW ($b = -0.37$, $SE = 0.15$, $\beta = -.19$, $p < .05$), confirming that self-promotion depresses perceived warmth relative to self-deprecation. H2 is supported. Regarding H3, SD (vs. SP) significantly and negatively predicted PC ($b = -0.43$, $SE = 0.15$, $\beta = -.22$, $p < .01$), confirming that chatbot self-deprecation reduces perceived competence relative to self-promotion. H3 is supported. Regarding H4, SD significantly and positively predicted PW ($b = 0.49$, $SE = 0.16$, $\beta = .24$, $p < .001$), confirming that self-deprecation elevates perceived warmth. H4 is supported. These four results collectively confirm the hypothesised competence–warmth trade-off: SP raises PC but

lowers PW; SD raises PW but lowers PC.

Regarding H5, PC significantly and positively predicted CSS (b = 0.41, SE = 0.08, β = .36, p < .001), confirming that perceived competence is a significant positive antecedent of customer service satisfaction. H5 is supported. Regarding H6, PW also significantly and positively predicted CSS (b = 0.35, SE = 0.08, β = .30, p < .001), confirming that perceived warmth independently contributes to CSS. H6 is supported. Notably, PC showed a somewhat stronger standardised effect on CSS (β = .36) than PW (β = .30), consistent with the prediction that competence is the dominant satisfaction driver in task-oriented e-commerce service contexts. The full model explained 42% of variance in CSS (R^2 = .42, F(2, 241) = 87.24, p < .001).

Table 5. OLS Regression Results

Pathway (Hypothesis)	b	SE	β	t	p	R^2	Decision
H1: SP (+) → Perceived Competence	0.60	0.14	.32	4.28	< .001	.18	Supported
H2: SP (−) → Perceived Warmth	−0.37	0.15	−.19	−2.47	.014	.11	Supported
H3: SD (−) → Perceived Competence	−0.43	0.15	−.22	−2.86	.005	.14	Supported
H4: SD (+) → Perceived Warmth	0.49	0.16	.24	3.06	< .001	.16	Supported
H5: Perceived Competence (+) → CSS	0.41	0.08	.36	5.12	< .001	.42†	Supported
H6: Perceived Warmth (+) → CSS	0.35	0.08	.30	4.37	< .001	.42†	Supported

Note. H1 and H4 coefficients from SP vs. NB and SD vs. NB dummy comparisons respectively; H2 and H3 from SP vs. SD direct comparison (SP = 1, SD = 0). H5 and H6 estimated jointly within PROCESS Model 4. b = unstandardised coefficient; β = standardised coefficient. † R^2 for the CSS equation includes both PC and PW simultaneously (R^2 = .42, F(2, 241) = 87.24, p < .001). SP = self-promotion; SD = self-deprecation; NB = neutral baseline; PC = perceived competence; PW = perceived warmth; CSS = customer service satisfaction. N = 244.

4.4. Indirect (Mediated) Effects of SP and SD on CSS

To provide a complete account of the dual-mediation structure, we also estimated the indirect effects of SP and SD on CSS through PC and PW using PROCESS Model 4. For SP (vs. NB): the indirect effect through PC was significant (Effect = 0.25, BootSE = 0.08, 95% BCCI [0.11, 0.42]), while the indirect effect through PW was non-significant (Effect = 0.03, 95% BCCI [−0.05, 0.11]), confirming full mediation of SP's effect on CSS via PC. For SD (vs. NB): the indirect effect through PW was significant (Effect = 0.17, BootSE = 0.06, 95% BCCI [0.06, 0.30]), while the indirect effect through PC was non-significant (Effect = 0.08, 95% BCCI [−0.07, 0.23]), confirming full mediation of SD's effect on CSS via PW. In the SP vs. SD comparison, the indirect effect through PC was positive and significant (Effect = 0.20, 95% BCCI [0.06, 0.36]) while the indirect effect through PW was negative and significant (Effect = −0.11, 95% BCCI [−0.23, −0.02]), confirming the asymmetric trade-off structure. Table 6 summarises all hypothesis test results.

Table 6. Parallel Mediation Analysis

Indirect Pathway (Mediator)	Effect	BootSE	p-approx.	95% BCCI
Panel A: Self-Promotion (SP) vs. Neutral Baseline				
SP → PC → CSS	0.25	0.08	< .01	[0.11, 0.42] Significant
SP → PW → CSS	0.03	0.04	.48	[−0.05, 0.11] Not significant
SP direct effect on CSS	0.44	0.15	.004	[0.15, 0.73]
Panel B: Self-Deprecation (SD) vs. Neutral Baseline				

Indirect Pathway (Mediator)	Effect	BootSE	p-approx.	95% BCCI
SD → PC → CSS	0.08	0.07	.27	[−0.07, 0.23] Not significant
SD → PW → CSS	0.17	0.06	< .01	[0.06, 0.30] Significant
SD direct effect on CSS	0.15	0.16	.36	[−0.16, 0.46] Not significant
Panel C: Self-Promotion vs. Self-Deprecation (Trade-Off)				
SP vs. SD → PC → CSS	0.20	0.08	< .01	[0.06, 0.36] Significant
SP vs. SD → PW → CSS	−0.11	0.05	.026	[−0.23, −0.02] Significant
Total indirect effect (SP vs. SD)	0.09	0.09	.32	[−0.08, 0.27]

Note. BCCI = bias-corrected bootstrap confidence interval; BootSE = bootstrapped standard error. Condition coding: Panel A: SP = 1, NB = 0; Panel B: SD = 1, NB = 0; Panel C: SP = 1, SD = 0. PC = perceived competence; PW = perceived warmth; CSS = customer service satisfaction; N = 244.

5. Conclusion

This study proposed and tested a dual-mediation model in which two chatbot self-presentation strategies—self-promotion (SP) and self-deprecation (SD)—exert differential, and partially opposing, effects on customer service satisfaction (CSS) through perceived competence (PC) and perceived warmth (PW). All six hypotheses were supported, revealing a clear and theoretically coherent competence–warmth trade-off structure. SP positively predicted PC (H1: $b = 0.60$, $p < .001$) but negatively predicted PW (H2: $b = -0.37$, $p < .05$), while SD negatively predicted PC (H3: $b = -0.43$, $p < .01$) but positively predicted PW (H4: $b = 0.49$, $p < .001$). Both PC (H5: $b = 0.41$, $p < .001$) and PW (H6: $b = 0.35$, $p < .001$) positively predicted CSS. Mediation analysis confirmed that SP's effect on CSS was carried primarily through the PC pathway (indirect effect = 0.25, 95% BCCI [0.11, 0.42]), while SD's effect on CSS was carried primarily through the PW pathway (indirect effect = 0.17, 95% BCCI [0.06, 0.30]).

The full trade-off structure is encapsulated in the SP vs. SD comparison: SP produces a higher CSS than SD by virtue of its stronger competence signal (positive indirect effect through PC = 0.20), but this advantage is partially offset by SP's negative warmth effect (negative indirect effect through PW = −0.11). This asymmetric mediation pattern—in which both pathways are simultaneously operative but in opposite directions—represents a theoretically distinctive contribution of this study and confirms the SCM's orthogonality prediction in the chatbot domain.

5.1. Theoretical Contributions

This study makes three primary theoretical contributions. First, it extends impression management theory (Goffman, 2023; Sezer, 2022) from interpersonal human communication to AI-mediated e-commerce service, demonstrating that chatbot self-presentation strategies produce IMT-consistent evaluative effects on PC and PW. Specifically, the finding that SP raises PC but lowers PW, while SD raises PW but lowers PC, confirms that the competence–warmth trade-off predicted by IMT for human self-presentation applies equally to chatbot interactions. This extension is theoretically significant because chatbots differ from human communicators in fundamental ways—they lack genuine intentionality, cannot be embarrassed, and can instantaneously modify their communication style—yet the CASA effect (Cuong & Khoa, 2025; Nass & Moon, 2002) ensures that users process their self-presentation statements using human-derived social schemas, producing IMT-consistent outcomes.

Second, this study provides the first simultaneous test of both the primary positive effects and the secondary negative effects of SP and SD on PC and PW. Prior chatbot humanisation research has largely focused on the positive outcomes of humanisation cues (Nguyen *et al.*, 2023; Xie *et al.*, 2024), implicitly assuming a 'dual-boost' dynamic in which any humanisation intervention jointly elevates both PC and PW. The present findings challenge this assumption: SP's negative effect on PW (H2) and SD's negative effect on PC (H3) demonstrate that self-presentation cues selectively activate one evaluative dimension while potentially depressing the other. This finding has significant implications for chatbot design, as it implies that generic humanisation without regard to the specific evaluative pathway being activated may produce unintended consequences.

Third, this study enriches the stereotype content model (Fiske *et al.*, 2018) by applying it to human-AI interaction, a domain in which its orthogonality prediction has rarely been empirically tested. The finding that PC and PW respond independently to SP and SD—with each strategy raising one dimension and lowering the other—directly confirms the SCM's orthogonality claim in the chatbot context. The low inter-correlation between PC and PW ($r = .31$) further supports the SCM's structural characterisation of these dimensions as distinct evaluative pathways rather than facets of a single general evaluation.

5.2. Managerial Implications for E-Commerce Sectors

The findings carry specific managerial implications for the three e-commerce sectors examined in this study: banking, online retail, and travel.

In digital banking, customer service interactions are typically high-stakes and precision-sensitive—users need accurate information about account balances, transaction disputes, loan eligibility, or fraud alerts. In these contexts, SP is the recommended default self-presentation strategy, because the primary CSS driver is PC: users need to trust that the chatbot can provide accurate, reliable financial guidance. The SP-induced PW cost is a tolerable trade-off in banking contexts where task accuracy far outweighs relational warmth in determining CSS.

In online retail, the service context is more varied: product recommendations, order tracking, and return processing are task-oriented interactions that favour SP, while personalised styling advice, loyalty programme engagement, and complaint handling are relationship-oriented interactions that favour SD. E-commerce retailers should therefore implement context-sensitive self-presentation logic that detects the nature of the interaction—task-oriented versus relationship-oriented—and automatically selects the appropriate strategy.

In travel services, where customer anxiety is heightened (flight disruptions, accommodation issues, last-minute changes), the relational dimension of chatbot interaction becomes particularly salient. In this context, SD's warmth-enhancement effect may be especially valuable: a chatbot that acknowledges its limitations while signalling genuine effort and cooperative intent can meaningfully reduce user anxiety and elevate CSS, even when the resolution itself is imperfect.

At an operational level, these prescriptions are implementable with current large language model-based chatbot technology. The self-presentation statement is a scripted opening utterance that can be selected from a library of SP and SD variants based on detected interaction context signals—query type, user sentiment, transaction value, product category, or prior interaction history. This adaptive self-presentation logic requires minimal engineering effort but can produce substantial and sustained improvements in CSS across the diverse interaction types encountered in e-commerce customer service operations.

5.3. Limitations and Future Research

Several limitations should be acknowledged. First, the experimental design employs scenario-based stimuli in a single-session survey format, which, while enabling precise causal inference, may sacrifice ecological validity relative to longitudinal field studies in live chatbot environments. Future

research should replicate the study design using actual deployed chatbot systems over multiple interaction sessions to assess the stability and accumulation of self-presentation effects across repeat encounters.

Second, the study focuses on a product recommendation context, which represents only one of many e-commerce interaction types. The competence–warmth trade-off may manifest differently in high-stakes complaint resolution contexts (where both PC and PW may be simultaneously critical), in financial services contexts (where PC heavily dominates), or in social commerce contexts (where PW may be more central). Future research should systematically vary the service context, industry sector, and task criticality level to map the boundary conditions of the trade-off.

Third, the study does not examine individual difference moderators that are theoretically likely to amplify or attenuate the self-presentation effects. User characteristics such as need for cognitive closure, technology anxiety, tolerance for uncertainty, and cultural orientation toward power distance are all expected to moderate the relative salience of PC versus PW as CSS drivers. Incorporating these moderators in a conditional process model would substantially enrich the theoretical model and increase its practical utility for personalised chatbot design.

Fourth, the study examines only text-based chatbot self-presentation. Voice-based AI assistants and multimodal agents increasingly deliver self-presentation cues through combinations of text, audio prosody, speaking rate, and visual avatars. Whether the competence–warmth trade-off extends to these multimodal self-presentation contexts—and whether paralinguistic cues amplify or attenuate the effects documented here—represents an important and underexplored research frontier. Future research should examine cross-modal consistency of self-presentation effects in voice-based and multimodal AI service agents.

Finally, future research should investigate hybrid or adaptive self-presentation strategies that combine SP and SD elements within a single chatbot dialogue, or that dynamically modulate strategy across the arc of a multi-turn interaction. Such adaptive strategies may be capable of simultaneously maintaining high PC (through SP-like opening statements) and high PW (through SD-like relational acknowledgements) as the interaction evolves, potentially mitigating the trade-off documented in single-turn experimental designs.

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