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ORIGINAL EMPIRICAL RESEARCH

Pairing up with anthropomorphized artificial agents: Leveraging employee creativity in service encounters

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Abstract

Even as artificial agents (AAs) become more prevalent in service encounters, customers continue to express generally unfavorable views of their creativity, which can lead to negative service evaluations. Drawing on anthropomorphism and group stereotyping literature, the authors propose a trait transference effect from human employees to AAs in dyadic service teams. The results of five studies confirm that an anthropomorphized (vs. nonanthropomorphized) AA paired with a creative employee boosts service evaluations, both attitudinal and behavioral. Anthropomorphism induces greater perceived entitativity of the AA–employee dyad, prompting customers to transfer the creativity exhibited by the employee to the AA and perceive the AA as more creative. This transference effect is attenuated when the temporal stability of the dyad is low, customers' lay beliefs about group entitativity are challenged, or customers have utilitarian consumption goals. These results contribute novel insights about AAs in service teams, with compelling practical implications.

Keywords Anthropomorphism · Artificial agents (AAs) · Creativity · Entitativity · Trait transference · AA–employee dyad

Creativity is essential to address customers' unique needs by offering novel ideas and solutions (Sok et al., 2018), especially in design services (e.g., fashion, interior design, art; Demirkan & Hasirci, 2009; Ekinci & Dawes, 2009), which account for substantial market value. For example, the global interior design sector alone is anticipated to grow to US$34 billion by 2027 (Technavio, 2022). In addition to the creative nature, these industries are notably reliant on advanced technology, such as artificial agents (AAs)—the physically embodied or virtual autonomous agents that facilitate service provision by performing physical or nonphysical tasks (Web Appendix A) (Blut et al., 2021; Jorling et al., 2019; Wirtz et al., 2018). For example, Stitch Fix pairs stylists with AAs to offer personalized styling services (Davenport, 2021); human composers collaborate with the AA Mubert to generate music (Mubert Team, 2019). In collaboration with humans, AAs can transform creative processes (Stoimenova & Price, 2020; Verganti et al., 2020), increase efficiency (Buffington, 2011; Thomaz et al., 2020; Wang et al., 2017), reduce costs for firms, and lessen employees' workloads (Davenport et al., 2020; Huang & Rust, 2018). For example, AAs as chatbots that provide customer service together with human employees have reduced related costs by more than US $8 billion annually across industries (Juniper Research, 2022). However, despite the prevalence and benefits of AA adoption (Puntoni et al., 2020), customers generally consider them good at handling objective, quantifiable tasks (e.g., predicting stocks; Castelo et al., 2019), but not equipped for tasks that require creativity[1] (ability to develop novel products, ideas, or solutions that are of value to customers; Hong et al., 2022). When customers are skeptical of AAs' creativity, they also discount their service outputs (Chamberlain et al., 2018), which is detrimental

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[1] In a pilot test we conducted (N=119), respondents perceived AAs as less creative (M=3.94; SD=1.68) than an average person (M=5.24, SD=1.23; $t(1, 118)$=7.24, p<.001; Web Appendix B1).

in creative industries. This research therefore provides a potential but understudied solution: pairing human employees with anthropomorphized AAs in service dyads.

Anthropomorphism entails imbuing nonhuman agents with human features, such as personalities, intentions, or minds (Epley et al., 2007), and it encourages customers to apply interpersonal heuristics, such as group stereotyping, to nonhuman entities (Aggarwal & McGill, 2007; Wan & Chen, 2021). Group stereotyping literature notes that a person's traits can transfer to other group members (e.g., attractiveness, Walther et al., 2008; intelligence, Ranganath & Nosek, 2008; political activism, Bernardo & Palma-Oliveira, 2022), but such studies refer to human groups only, and they do not address the specific trait of creativity. A few studies explore underlying mechanisms (e.g., Bernardo & Palma-Oliveira, 2022; Crawford et al., 2002) or boundary conditions (e.g., Steinmetz et al. 2020) of transference effects but have not yet established a holistic understanding of trait transference in groups, let alone in the specific context of AA–human dyads (Web Appendix C). In response, we investigate whether and how marketers might improve customers' perceptions of AAs' creativity in AA–employee dyads and service evaluations in design contexts. By bridging anthropomorphism and group stereotyping literature, we extend the social influences of the trait transference effect from human groups to AA–human dyads. Specifically, if the AA is anthropomorphized (vs. nonanthropomorphized), customers may be more likely to transfer their perceptions of creativity from the creative employee to the paired AA, which may prompt more favorable customer evaluations. We further propose that this is because anthropomorphism could increase customers' perceptions of the entitativity of the AA–employee dyad (the degree to which the dyad is perceived as possessing the quality of an entity; Campbell, 1958; Crawford et al., 2002), so that customers use the employee's creativity to infer the AA's creativity and thus perceive the AA as more creative. To provide a more nuanced, managerially relevant perspective, we also explore boundary conditions of the trait transference effect, involving both dyad-related (i.e., temporal stability) and customer-related (i.e., lay beliefs about group entitativity and consumption goals) characteristics. To capture customers' overall service evaluations and enhance the robustness of our findings, we also include both attitudinal (e.g., product evaluations, purchase intentions) and behavioral (actual purchases) service outcomes (Brady et al., 2005; Li et al., 2023). Five studies, conducted in the field and online, show consistent evidence that customers perceive the service as more creative when the AA is anthropomorphized because anthropomorphism enhances perceptions of the entitativity of the AA–employee dyad and thus of AA creativity. This effect weakens if the AA–employee dyad features low temporal stability, if customers experience a challenge to their lay beliefs that "birds of a feather flock together," or if customers have more utilitarian consumption goals. Our work contributes to extant literature in several ways. First, this study enriches insights into group stereotyping by extending investigations of the trait transference effect from purely human groups to AA–human dyads. We portray a holistic and nuanced view of this effect by revealing its underlying mechanism and boundary conditions. Second, we address calls to move beyond an exclusive focus on AAs in service encounters and investigate AA–human dyads (Arslan et al., 2021; Davenport et al., 2020; Holthöwer and van Doorn, 2022). We identify a crucial role of anthropomorphism for influencing service evaluations, through the perceived entitativity of the dyad and AA creativity. Third, and relatedly, we advance anthropomorphism research that predicts how people judge and evaluate humanized entities (Huang et al., 2019; Wan et al., 2017) by documenting that people apply group stereotyping to dyads containing a human and an anthropomorphized entity. Marketers in creative industries can use these findings to increase service performance while saving costs with the latest technology. We demonstrate the benefits of adopting anthropomorphized AAs in dyads, compared with relying on a single human employee, and also suggest several interventions to evoke more favorable service evaluations by enhancing dyads' entitativity, including emphasizing the long-term nature of AA–employee collaboration to increase dyads' temporal stability, segmenting customers according to their lay beliefs about group entitativity and implement dyads more strategically, and creating more hedonic consumption experiences.

Next, we establish the theoretical rationale for how anthropomorphism in AA–employee dyads, rather than anthropomorphism alone, can improve perceptions of AA creativity through enhancing perceived entitativity of the dyad and activating trait transference effect, which further affects customers' service evaluations of creative service outputs.

Conceptual development

Anthropomorphism and AA creativity

Anthropomorphism enhances people's perceptions of certain traits of nonhuman entities. For example, customers tolerate humanized (vs. nonhumanized) AAs in service failure contexts because they perceive AAs as more capable of experiencing feelings (Yam et al., 2021). However, some human traits, such as creativity, can be more difficult to assign to nonhuman entities (Noble et al., 2022; Ruijten et al., 2019).

Creativity implies cognitive flexibility (Hennessey & Amabile, 2009), a fundamental distinction between humans and automata (Haslam, 2016). Customers do not anticipate AAs possess creativity, and tend to assume that human employees are more capable of handling creative tasks (Huang & Rust, 2018; Kunz et al., 2022). They generally perceive AAs as rather rigid or inflexible, and therefore discount AAs' creative outputs (e.g., art; Hong & Curran, 2019). As Hong et al. (2022) show, anthropomorphism alone failed to enhance creativity evaluations of AI-composed music, and people are less willing to purchase music generated by AAs compared with human composers (Moura & Maw, 2021). Chamberlain et al. (2018) also note that perceptions of robot painters' creativity do not improve when they are anthropomorphized. Thus, anthropomorphism alone is unlikely to improve perceived AA creativity significantly, but it might represent an important intermediate step toward enhancing perceptions of AA creativity if combined with the social influence of a human employee[2].

People tend to evaluate and judge an anthropomorphized entity similar to the way they process information about another person; they prefer laptop computers with superior appearance (vs. function) when they are anthropomorphized, in line with beliefs of interpersonal judgments that "beautiful is good" (Wan et al., 2017). Customers also judge a group of humanized entities as they would a human group, such that a series of beverages in different (vs. same) sizes is preferred because it is more congruent with the schema of a human family (Aggarwal & McGill, 2007). Therefore, we propose that an anthropomorphized (vs. nonanthropomorphized) AA might be perceived as a member of a dyadic team, and customers might infer traits of the humanized AA in the same way they infer traits of a human team member. Next, we discuss how people infer group members' characteristics and explore the trait transference phenomenon.

Trait transference and perceived entitativity

Research on group stereotyping establishes that members of a cohesive human group are considered one entity, so observers define one member's traits as the group's stereotype and transfer them to other members (Crawford et al., 2002), such as physical attractiveness (Walther et al., 2008) and intelligence (Ranganath & Nosek, 2008; for a review, see Web Appendix C). Entitativity largely determines whether people form an abstract representation of all group members or establish separate representations for different group members. The more a group is perceived as entitative, the more likely people form a stereotype for all group members (Spencer-Rodgers et al., 2007), which then leads to trait transference. Entitativity perceptions result from cues such as similar appearances, common goals, shared outcomes, and interactions of group members (Hamilton, 2007; Ip et al., 2006). For example, customers perceive greater entitativity of a group of advertised products with identical appearances (Vanbergen et al., 2020) or of a sales team if the salespeople interact in a coordinated way (Wang et al., 2018).

Accordingly, we anticipate that anthropomorphism might enhance perceived entitativity by activating relevant cues. Most methods to anthropomorphize an agent involve giving it visual humanlike features (e.g., physical characteristics such as eyes and a mouth), offering verbal cues (e.g., first-person description), or using rhetorical devices (e.g., storytelling; MacInnis & Folkes, 2017). Anthropomorphized AAs that look and act like a human employee further encourages customers to imbue it with humanlike intentions, motivations, and goals (Epley et al., 2007), so they might expect the humanized AA has intentions to pursue a common goal with the human employee, seeks the same outcomes as the human teammate, and takes responsibility for their service outputs (Yam et al., 2021). All those cues, stemming from anthropomorphism, increase the perceived entitativity of the AA–employee dyad and enable trait transference from the employee to the AA, including transference of employee's creativity.

Such creativity transference in turn may influence service evaluations as creativity of the service providers is central to evaluations of design services. Prior research has established that more creative hospitality service providers enhance customers' purchase intentions (Borucki & Burke, 1999; Hon, 2013). Employees' creative service outputs also can attract customers through positive word of mouth (WOM) (Lee et al., 2022). Likewise, the creativity of advertising agencies has a positive impact on customers evaluations of the service outputs (Bachnik et al., 2018). Analogously, we expect that greater AA creativity, resulting from trait transference, would enhance customers' service

[2] To confirm this prediction and provide an initial test of whether AA creativity might increase in an AA–employee dyad due to anthropomorphism, we conducted another between-subjects pilot study (N=352; Web Appendix B2) with four conditions that refer to an interior design service: anthropomorphized AA alone, nonanthropomorphized AA alone, anthropomorphized AA–designer dyad, and nonanthropomorphized AA–designer dyad. Participants perceived the anthropomorphized (vs. nonanthropomorphism) AA as more humanlike (M_A = 2.64, SD_A = 1.16; M_{NA} = 1.68, SD_{NA} = 0.91; t(1, 348)=6.12, p<.001) but did not see the anthropomorphized AA alone as more creative (M_A = 3.86, SD_A = 1.53; M_{NA} = 3.69, SD_{NA} = 1.66; t(1, 348)=0.69, p=.493). However, anthropomorphism improved perceived creativity in AA–employee dyads (M_A = 4.59, SD_A = 1.16; M_{NA} = 3.99, SD_{NA} = 1.49; t(1, 348)=6.12, p<.001). In summary, anthropomorphized AA–designer dyad has a significantly positive effect on perceived creativity, although anthropomorphized AA alone does not seem sufficient to improve customers' perceptions of AAs' creativity.

evaluations, both attitudinal (e.g., product evaluations) and behavioral (e.g., actual purchases). Taken together, we therefore propose that an anthropomorphized (vs. nonanthropomorphized) AA–employee dyad increases customers' service evaluations, and this effect is serially mediated by customers' perceptions of the entitativity of the dyad and AA creativity. Formally:

H1 Pairing up a creative employee with an anthropomorphized (vs. nonanthropomorphized) AA in a dyadic design team increases customers' service evaluations.

H2 The effect of anthropomorphism on service evaluations is serially mediated by the perceived entitativity of the AA–employee dyad and perceived AA creativity.

Boundary conditions

We propose that anthropomorphism entails a process of trait transference triggered by enhanced entitativity of the dyad, which increases AA creativity and ultimately results in improved service evaluations. Dyad-related and customer-related characteristics that hamper perceived entitativity of the dyad should, therefore, moderate the trait transference effect. We propose three managerially and theoretically relevant boundary conditions, namely, dyads' temporal stability, customers' lay beliefs about group entitativity, and customers' consumption goals, as depicted in the conceptual framework in Fig. 1.

Dyads' temporal stability

Temporal stability, defined as "the degree to which dyad members have a history of working together in the past and an expectation of working together in the future," is a key feature of teams (Hollenbeck et al., 2012, p. 84). Dyads with low temporal stability assemble only briefly for limited engagements with relative strangers who have had few prior interactions (Devine et al., 1999; Valentine, 2018). In contrast, dyads with high temporal stability persist and engage in long-term, collective assignments with members who share a stable association and history (Joshi & Roh, 2009; Salas et al., 2008). Accordingly, if an AA–employee dyad forms only for a single design task, customers might not perceive any coherence, which would attenuate the effect of anthropomorphism on perceived entitativity and service evaluations. We predict that only when the AA–employee dyad appears long-established, with a history of collaboration, will anthropomorphism lead customers to regard the dyad as highly entitative and infer AA creativity based on the creative human employee. Formally:

H3 The temporal stability of an AA–employee dyad moderates the effect of anthropomorphism on service evaluations, through the serial mediation of perceived entitativity of the dyad and perceived AA creativity, such that the effect of anthropomorphism on perceived entitativity becomes attenuated when temporal stability is low (vs. high).

Customers' lay beliefs about group entitativity

Lay beliefs are commonsense explanations that people use to understand the world (Argyle, 2013). Altering customers' lay beliefs can affect their inferences about and evaluations of products and services (Huang & Kwong, 2016; Wan et al., 2017). Because trait transference builds on beliefs about group entitativity, we propose that people's lay beliefs about group entitativity—such as the expectation that "birds of a feather flock together"—influence whether they use group

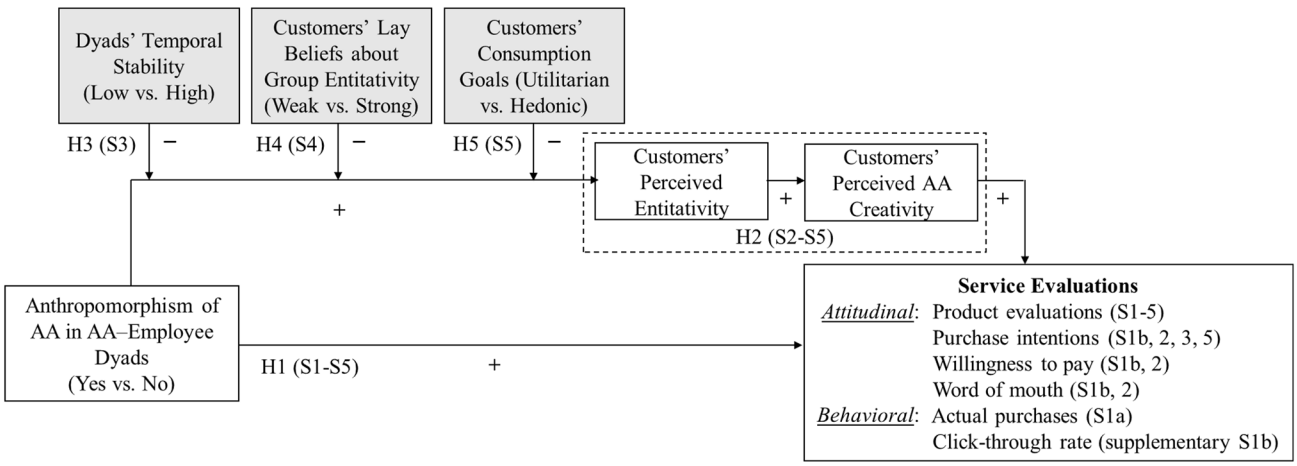


Fig. 1 Theoretical framework of trait (creativity) transference effect in design service dyads

stereotypes to make inferences about group members. People with strong "birds of a feather" beliefs tend to assume that group members are interchangeable and share common attributes and characteristics (McPherson et al., 2001) or that members of the same organization share common personalities and values (Umphress et al., 2007). They often use appearance or behavioral cues to infer entitativity (Hamilton, 2007; Ip et al., 2006; Lickel et al., 2000). In our research context, we predict that customers with strong "birds of a feather" beliefs (Mukhopadhyay & Johar, 2005) think of the humanized AA and employee as an entitative dyad and make inferences derived from the group stereotype of creativity. If such beliefs are weak or challenged, customers instead may perceive the employee and the AA as dissimilar and not coherent as a dyad. Formally:

H4 Customers' lay beliefs about group entitativity moderate the effect of anthropomorphism on service evaluations through the serial mediation of perceived entitativity of the dyad and perceived AA creativity, such that the effect of anthropomorphism on perceived entitativity becomes attenuated when these lay beliefs are weak (vs. strong).

Customers' consumption goals

Whether customers adopt the heuristic of trait transference might be influenced by their consumption goals, which are categorized as hedonic if they meet emotional and experiential consumption goals (e.g., fun, pleasure, entertainment) or utilitarian if they address instrumental and practical goals (e.g., function, performance, usefulness) (Chandon et al., 2000). Customized design services tend to be more hedonic (Dhar & Wertenbroch, 2000), but they can also be utilitarian in certain cases (e.g., renovating an apartment as an investment with high resale value; Crafti, 2022). Different consumption goals activate distinct thinking styles and alter customers' attention to social inferences (Homburg et al., 2006; Novak & Hoffman, 2008). Customers with hedonic motives usually adopt a holistic, intuitive thinking style that relies more on heuristics and contextual cues (Klein & Melnyk, 2016; Novak & Hoffman, 2008). They attend to social cues to fulfil their experiential needs (Avci and Yildiz 2021) and assimilate contextual information when making judgments. For example, people tend to infer the popularity of hedonic products on the basis of social cues, such as other customers waiting in long lines to purchase them (Munichor & Cooke, 2022). They also evaluate new hedonic products using more flexible categorization and emphasize their similarities with base products (Lee & Chu, 2021). In contrast, utilitarian goals activate analytic thinking styles, preferring rational and logical information (e.g., scientific appeal of products) (Philipp-Muller et al., 2023), and judgments are based less on social information (e.g., warmth of a brand) (Peter & Ponzi, 2018). Heuristics therefore have weaker impacts on utilitarian customers. Since the proposed trait transference effect depends on customers' social inferences about the entitativity of the AA–human dyad, we anticipate that customers with utilitarian consumption goals are less attentive to social cues and embrace a well-defined categorization that differentiates the AA from the employee (Hossain, 2018), which reduces the perceived entitativity of the dyad. Formally:

H5 Customers' consumption goals moderate the effect of anthropomorphism on service evaluations through the serial mediation of the perceived entitativity of the dyad and perceived AA creativity, such that the effect of anthropomorphism on perceived entitativity becomes attenuated when the consumption goals are utilitarian (vs. hedonic).

Overview of studies

We conduct five studies, involving participants from multiple countries (China, United Kingdom, and United States) in different contexts (e.g., interior design, painting) to test our hypotheses. Studies 1a–b refer to how anthropomorphism might influence service evaluations of the AA–employee dyads (H1), in field and online experiments. Beyond establishing the main effect, Study 1b highlights the benefit of AA–employee dyads, through a comparison of an anthropomorphized AA–employee dyad with human–human dyad and human-alone conditions. With Study 2, we test the serial mediation of perceived entitativity and perceived AA creativity (H2). Studies 3–5 pertain to the boundary conditions, such that we investigate whether the trait transference effect holds when the temporal stability of the AA–employee dyad is low (H3, Study 3), the implications of customers' lay beliefs about group entitativity for this effect (H4, Study 4), and whether and how different consumption goals influence it (H5, Study 5). Across those studies, we measure service evaluations with both attitudinal (i.e., product evaluations, purchase intentions, willingness to pay [WTP], and WOM) and behavioral (i.e., actual purchases and click-through rate) outcomes. Since the patterns for all these outcomes are similar, we only provide detailed results pertaining to product evaluations and actual purchases herein; the results related to the other outcome variables are specified in detail, as robustness checks, in Web Appendix D. We summarize the studies in Table 1 and provide descriptive statistics for all the variables in Web Appendix E.

Table 1 Summary of studies and key findings

Studies	Design	Context	Effects	Key Findings
Study 1a (Online Store) (n=116)	**Anthropomorphism** (yes vs. no)	Household product design	Main effect on service evaluations	**Product evaluations** Customers indicate higher product creativity and liking when the household product is designed by the anthropomorphized (vs. nonanthropomorphized) AA–human dyad†. **Actual purchases** Customers spend more in the store when the household product is designed by the anthropomorphized (vs. nonanthropomorphized) AA–human dyad.
Study 1b* (Connect) (n=312)	**Anthropomorphism** (yes vs. no vs. human–human vs. human-alone)	Furniture design	Main effect on service evaluations	**Product evaluations, purchase intentions, WTP and WOM†** Participants indicate more favorable product evaluations, purchase intentions, WTP, and WOM for furniture designed by the anthropomorphized AA–human dyad (vs. nonanthropomorphized AA–human dyad or human-alone). Participants indicate equally favorable product evaluations, purchase intentions, WTP, and WOM for furniture designed by the anthropomorphized AA–human dyad and human–human dyad.
Study 2 (Prolific) (n=161)	**Anthropomorphism** (yes vs. no)	Interior design	Main effect on service evaluations	**Product evaluations, purchase intentions, WTP, and WOM** Participants indicate more favorable product evaluations, purchase intentions, WTP, and WOM for interior design created by the anthropomorphized AA–human dyad (vs. nonanthropomorphized AA–human dyad or human-alone).
			Serial mediation	Perceived entitativity and perceived AA creativity serially mediate the effect of anthropomorphism on product evaluations, purchase intentions, WTP, and WOM.
Study 3 (Prolific) (n=331)	**Anthropomorphism** (yes vs. no) × **Temporal stability** (low vs. high)	Painting	Interaction on service evaluations	**Product evaluations and purchase intentions** - *High condition*: The painting created by the anthropomorphized (vs. nonanthropomorphized) AA–human dyad is rated more favorably and elicits higher purchase intentions. - *Low condition*: No significant difference.
			Moderated serial mediation	The temporal stability of the AA–employee dyad moderates the effect of anthropomorphism on product evaluations and purchase intentions through perceived entitativity and perceived AA creativity.
Study 4 (Cloud Research) (n=331)	**Anthropomorphism** (yes vs. no) × **Lay beliefs** (weak vs. strong)	Painting	Interaction on service evaluations	**Product evaluations** - *Strong beliefs*: The painting created by the anthropomorphized AA–human dyad (vs. nonanthropomorphized AA–human dyad) is rated more favorably. - *Weak beliefs*: No significant difference
			Moderated serial mediation	Lay beliefs about group entitativity moderate the effect of anthropomorphism on product evaluations through perceived entitativity and perceived AA creativity.
Study 5 (Prolific) (n=350)	**Anthropomorphism** (yes vs. no) × **Consumption goals** (utilitarian vs. hedonic)	Interior design	Interaction on service evaluations	**Product evaluations and purchase intentions** - *Hedonic*: The interior design created by the anthropomorphized (vs. nonanthropomorphized) AA–human dyad is rated more favorably and elicits higher purchase intentions. - *Utilitarian*: No significant difference.
			Moderated serial mediation	Customers' consumption goals moderate the effect of anthropomorphism on product evaluation and purchase intentions through perceived entitativity and perceived AA creativity.

*We conducted a supplementary study, as detailed in Web Appendix D2. †Notes: AA=artificial agent; WTP=willingness to pay; WOM=word of mouth

Studies 1a–b

To test the main effect of anthropomorphism on service evaluations of the AA–employee dyads (H1), we considered two service settings with different outcomes: an online store selling household products (Study 1a, behavioral and attitudinal outcomes) and an interior design service (Study 1b, attitudinal outcomes). In addition to the focal comparison of anthropomorphized and nonanthropomorphized AAs, we include two pertinent conditions (human–human dyad and human-alone conditions) to assess the impact of an AA–employee dyad in Study 1b.

Study 1a: Online shopping

Method

We sought help from an online store owner for the data collection, such that it involves real customers and their actual purchases. This online store sells more than 700 creative household products to global customers and ranks in the top 10% among its competitors on the e-commerce platform that hosts it (Web Appendix F1). One hundred twenty-three customers who visited the online store participated in this experiment in exchange for a US$2 store coupon that would expire in a month. Seven customers failed the attention check and were excluded from the analyses, leaving a final sample of 116 participants (M_{age} = 33.5 years, SD=9.3; 78.4% women; Web Appendix G specifies the exclusion criteria for all studies). The participants were randomly assigned to the anthropomorphism or nonanthropomorphism condition.

They read that a product designer and an AA worked together. Specifically, the designer Jessica identified the customer's preferences and needs, and then the AA analyzed the collected information and created initial models. Next, the designer added ideas, and the AA finalized the design. We manipulated anthropomorphism through visual features (eyes and a mouth) and communication styles (first-person language and a name), which is a common combination of anthropomorphism features for entities that interact with customers (e.g., Chen et al., 2017; Kim et al., 2016). Specifically, the anthropomorphized AA was framed as "designing assistant Dori." It had two eyes and a mouth on the interface and introduced the service procedure in first-person language, such as "Hi! I am Dori, Jessica's designing assistant throughout the design process." The nonanthropomorphized AA instead was framed as a "designing program," and the visual features were rearranged in a way that did not resemble a human face (Web Appendix F6). The description of the procedure used third-person language, such as "This designing program assists Jessica throughout the design process" (Web Appendix F2). Customers then read an introduction to the human designer, highlighting how creative she was (e.g., "Jessica Wong is a creative product designer. She won the G-Mark Good Design Award in 2019"). They saw a set of brass hooks designed by the AA–designer dyad and rated how "creative/innovative" it was (1 = "not at all," 7 = "very much"; r=.69), as well as their liking of the product design (i.e., clicking "like" or "dislike" button). They completed a four-item anthropomorphism manipulation check scale too (e.g., "I think the AA has a mind of its own"; 1 = "strongly disagree," 7 = "strongly agree"; α=0.91; May & Monga, 2014). Finally, we gathered sales data, which revealed how much participants spent in the store during the valid coupon period (i.e., within a month of completing the survey).

Results

The manipulation check affirmed that customers perceived the anthropomorphized AA (M_A = 4.94, SD=1.34) as more humanlike than the nonanthropomorphized AA (M_{NA} = 4.42, SD=1.10; $F(1, 114)=5.35$, p=.022, η^2=0.05)[3]. With regard to product evaluations, a univariate analysis revealed that when the AA was anthropomorphized, customers rated the product designed by the AA–designer dyad as more creative (M_A = 5.91, SD=1.22) than when the AA was nonanthropomorphized (M_{NA} = 5.32, SD=1.39; $F(1, 114)=5.95$, p=.016, η^2=0.05). According to a chi-square analysis of customers' clicks on the "like" button, they also were more likely to like the product when the AA was anthropomorphized (86.4%) than when it was not (70.2%; $\chi^2(df=1, N=116)=4.54$, p=.033, $\varphi = -0.20$). Then, with another univariate analysis, we determined that customers served by the anthropomorphized AA–designer dyad spent more in the store within a month (M_A= US$12.99, SD= US$14.06) than those served by the dyad with the nonanthropomorphized AA (M_{NA}= US$7.33, SD= US$8.98; $F(1, 114)=6.63$, p=.011, η^2=0.06). Noting that gender and age might influence customers' reactions to anthropomorphism and new technology (Peek et al., 2014; Yang et al., 2020), we included them as covariates in the analyses, but the results remained significant ($ps<0.05$).

Discussion

Overall, Study 1a provides initial evidence of a main effect on real customers' service evaluations, including product evaluations and actual purchases.[4] In support of H1,

[3] The subscript A stands for the anthropomorphism condition, and the subscript NA stands for the nonanthropomorphism condition.

[4] We performed regression analyses with product evaluations as the independent variable and actual purchases as the dependent variable. These results revealed positive effects of both ratings of product

customers regarded the hooks as more creative and likable and spent more in the store when those products were designed by an anthropomorphized (vs. nonanthropomorphized) AA–designer dyad.

Study 1b: Online experiment

Method

To reaffirm the Study 1a findings with different service outcomes, and to examine the potential benefits of adding an AA alongside a creative employee, we added two comparative conditions (human–human dyad and human-alone conditions) to Study 1b. We recruited 320 participants from Connect, an online data collection panel, in return for monetary compensation. Eight participants failed the initial attention checks, leaving a final sample of 312 participants (M_{age} = 41.2 years, SD=11.5; 50.3% women), whom we randomly assigned to the anthropomorphism, nonanthropomorphism, human–human, or human-alone conditions. The instructions asked participants to imagine that they were in search of furniture designs. In the AA–employee conditions, the human designer was named Daniel. Similar to Study 1a, we humanized the AA with visual features and first-person language in the anthropomorphized version; it had a head and arms and was called "the artificial designer Alex." For the nonanthropomorphized version, we used third-person language and visual features without humanlike cues; the AA was represented with a screen and was called "the design machine." In the human–human condition, the designs were provided by Daniel and another human designer, Alex. In the human-alone condition, only Daniel provided the designs. Participants read an introduction of Daniel, emphasizing his creativity, and a brief description of the design process for a fabric chair, which varied across conditions. In the dyadic conditions, Daniel first established each customer's profile, based on their preferences. Then, depending on the condition, the other teammate took charge of the next step (i.e., generating and finalizing designs). In the human-alone condition, Daniel introduced both steps (Web Appendix F2).

Participants in AA–employee conditions completed the manipulation check from Study 1a (α=0.90). Then, all participants viewed the same fabric chair design (Web Appendix F6) and indicated their perceptions of how "creative/innovative" the design was (1 = "not at all," 7 = "very much"; r=.75). They answered three questions to gauge their purchase intentions (e.g., "The likelihood of purchasing the interior design service customized is …" 1 = "very low," 7 = "very high"; α=0.96; Dodds et al., 1991) and indicated their maximum WTP for the chair, on a sliding bar from US$50 to US$500. We also captured WOM with two items on a seven-point scale (e.g., "I will recommend this company to my relatives or friends"; 1 = "strongly disagree," 7 = "strongly agree"; r=.91; Goyette et al., 2010).

Results

Participants viewed the AA as more humanlike when it was anthropomorphized (M_A = 2.75, SD=1.48) than not (M_{NA}= 1.83, SD=1.05; F(1, 152)=19.87, p<.001, η^2=0.12), so the manipulation appeared successful. As expected, the type of service provider had a significant effect on product evaluations (F(3, 308)=4.81, p=.003, η^2=0.05). According to contrast analyses, participants evaluated the chair more positively when it was designed by the anthropomorphized AA–designer dyad (M_A = 5.04, SD=1.17) than by the nonanthropomorphized AA–designer dyad (M_{NA} = 4.47, SD=1.38; t(308)=2.79, p=.006) or by a human alone (M_{HA} = 4.58, SD=1.27; t(308)=2.30, p=.022), but the evaluations did not differ from that evoked by the human–human dyad (M_{HH} = 5.08, SD=1.21; t(308)=−0.23, p=.830). We obtained consistent results for purchase intentions, WTP, and WOM (Web Appendix D1).

Discussion

Study 1b replicates our findings online, with a different service context and different evaluations. The participants offered better service evaluations for the anthropomorphized AA–employee dyad than a sole human employee, which implies a positive impact of adding an anthropomorphized AA to service settings. It might derive from perceptions that two members in a dyad can be more mutually supportive and flexible than a single employee (Kearney & Gebert, 2009), such that participants anticipate better service outcomes. Also, participants assigned to the anthropomorphism condition offered service evaluations similar to those prompted by the human–human condition, which implies that the more cost-efficient service dyad, consisting of an AA and an employee (vs. two human employees), can result in similar customer responses. To check the robustness of these findings, we conducted a Facebook A/B test with a similar design (Web Appendix D2); it replicated the results with a behavioral outcome (i.e., click-through rate on an ad). In summary, Study 1 establishes the main effects of anthropomorphism on both attitudinal (e.g., product evaluations) and behavioral (e.g., actual purchases) outcomes of service evaluations, in support of H1. We next examine the underlying mechanisms.

creativity (b=2.49, SE=0.82, t=3.04, p=.003) and liking (like =1, dislike=0) (b=7.04, SE=2.67, t=2.64, p=.010) on actual purchases.

Study 2

With Study 2, we seek to replicate the main effect (H1) and test the serial mediation of perceived entitativity and perceived AA creativity (H2). We also capture several control variables, beyond age and gender, to check if they might influence service outcomes: perceived skill complimentary, eeriness of the AA, and perceived employee creativity.

Method

We recruited 170 participants from Prolific Academic, a commonly used data collection panel, in return for monetary compensation. Nine participants failed the attention checks, leaving a final sample of 161 participants (M_{age} = 35.4 years, SD = 13.2; 72.0% women), whom we randomly assigned to the anthropomorphism or nonanthropomorphism condition.

Ostensibly, the experiment involved a survey, seeking customers' assessments of an interior design studio that had adopted some new technologies in its design process. We showed participants the studio's Facebook page (Web Appendix F6) and presented design service procedures similar to those in Study 1b, with two variations. First, we showed the participants an unrenovated living room before they learned about the AA–designer dyad, each of which featured the same human designer (Daniel) but an AA (Alex) that differed across conditions. We humanized the anthropomorphized AA using the approach from Study 1b. Second, after reading the introduction of the human designer, participants also read a description of how to get a customized interior design for the room (Web Appendix F2).

Similar to Study 1b, participants in both conditions completed a manipulation check for anthropomorphism (α = 0.92), then indicated their perceptions of AA creativity (r = .82), evaluations of two design outputs (r = .79 and 0.81; Web Appendix F6), purchase intentions (α = 0.95), WTP for the interior design service (sliding bar ranging from US$2,000 to US$5,000), and WOM (r = .96). They answered four questions (α = 0.90), adapted from Callahan and Ledgerwood (2016), that assess perceived entitativity (e.g., "How unified are Daniel and Alex?"; 1 = "not at all," 7 = "very much"). The fourth item was a visual presentation of the closeness of the designer and the AA with seven pairs of circles; the distances between circles varied, and smaller distances represented greater entitativity (Web Appendix H).

In addition to age and gender, we measured three control variables. Skill complementarity between teammates may influence creative behaviors (Janssen & Huang, 2008), so we measured the perceived skill complementarity of the employee and the AA with four items (e.g., "Alex complements Daniel in things he is not good at"; 1 = "strongly disagree," 7 = "strongly agree"; α = 0.87; Oosterhof et al., 2009). The AA in this study is a robot, so we gauged its potential eeriness, in line with the uncanny valley effect. Participants indicated the extent to which they found the AA eerie or creepy (1 = "not at all," 7 = "very much"; r = .90; Mende et al., 2019). Finally, we measured participants' perceptions of the designer's creativity by adapting the items we used for AA creativity (r = .83). To confirm that the cover story and context appeared realistic, we asked participants if they found the scenario realistic and practical (1 = "strongly disagree," 7 = "strongly agree"; r = .96).

Results

Manipulation check

The AA was perceived as more humanlike in the anthropomorphism condition (M_A = 3.05, SD = 1.56) than in the nonanthropomorphism condition (M_{NA} = 2.03, SD = 1.38; $F(1, 160) = 19.36$, $p < .001$, $\eta^2 = 0.11$), confirming that the manipulation was effective. Participants also viewed the scenarios as realistic and practical in both conditions (M_A = 5.04, SD = 1.46, greater than the midpoint of 4, $t = 6.42$, $p < .001$; M_{NA} = 4.88, SD = 1.55, greater than the midpoint of 4; $t = 5.06$, $p < .001$).

Perceived entitativity

Anthropomorphized AA (M_A = 4.97, SD = 1.36) led participants to perceive the dyad as more entitative than not anthropomorphized AA (M_{NA} = 4.33, SD = 1.43; $F(1, 160) = 8.39$, $p = .004$, $\eta^2 = 0.05$).

Perceived AA creativity

Participants perceived the anthropomorphized AA (M_A = 4.76, SD = 1.42) as more creative than the nonanthropomorphized one (M_{NA} = 4.24, SD = 1.70; $F(1, 161) = 4.37$, $p = .038$, $\eta^2 = 0.03$) in the AA–designer dyads.

Product evaluations

Participants rated the two design outputs as more creative when generated by the anthropomorphized AA–designer dyad (Design 1: $M_A = 4.87$, $SD = 1.33$; Design 2: $M_A = 4.99$, $SD = 1.25$) than by the nonanthropomorphized AA–designer dyad (Design 1: M_{NA} = 4.33, SD = 1.46; $F(1, 160) = 6.09$, $p = .015$, $\eta^2 = 0.04$; Design 2: M_{NA} = 4.42, SD = 1.54; $F(1, 160) = 6.65$, $p = .011$, $\eta^2 = 0.04$). Moreover, with PROCESS model 6 (Hayes, 2017) and 5,000 bootstrapped samples, we determined that the effect of anthropomorphism on product

evaluations was mediated by perceived entitativity and AA creativity (Design 1: indirect effect = 0.10, boot SE = 0.05, 95% confidence interval [CI] [0.0173, 0.2157]; Design 2: indirect effect = 0.12, boot SE = 0.06, 95% CI [0.0283, 0.2453]), in support of H2. We observed similar results for purchase intentions, WTP, and WOM (Web Appendix D3). Finally, when we include age, gender, perceived skill complementarity, eeriness of the AA, and perceived creativity of the designer as covariates, all the results remained robust ($p < .10$ for WTP; $ps < 0.05$ for all the other variables).

Discussion

We replicate the findings from Study 1 and offer evidence of an underlying mechanism: Anthropomorphism increased the perceived entitativity of the service dyad, which promoted transference of trait creativity from the designer to the humanized AA, leading to more favorable service evaluations. In Studies 3–5, we explore whether the dyad's temporal stability and customers' lay beliefs and consumption goals might affect the trait transference effect.

Study 3

Temporal stability is a key feature of working teams and one of the cues that people use to judge perceived entitativity. To establish mediating roles of perceived entitativity and AA creativity, we varied the temporal stability of the dyad, with the prediction that if temporal stability is low, the effect of anthropomorphism on service evaluations becomes attenuated (H3). To generalize the findings of Studies 1–2, we also consider a different AA, in a different (art creation) setting. Finally, we check the robustness of the findings by controlling for customers' age, gender, perceived eeriness of the AA, attitude toward AA in general, experience interacting with AAs, and knowledge about paintings.

Method

Three hundred fifty U.S. participants were recruited on Prolific Academic. Nineteen participants failed an attention check, so we rely on data from 331 participants ($M_{age} = 41.7$ years, $SD = 13.8$; 49.5% women), randomly assigned to the conditions of a 2 (anthropomorphism: yes vs. no) × 2 (temporal stability: low vs. high) between-subjects design.

All the participants read about a painting service and imagined purchasing a painting from an art studio that relied on an artist and an AA. Participants saw pictures of the artist Jenny and the AA. The anthropomorphized version, named "painter Mozzie," had a head with two eyes; the nonanthropomorphized AA was called a "painting machine" and had no head or eyes (Web Appendix F6). Participants assigned to the high (low) temporal stability conditions read that the AA was capable of painting solely, but the artist and the AA had worked together for a few years on many paintings (were collaborating for the first time) and would continue working together (it was uncertain if they would work together in the future) (Web Appendix F3). All participants read a short article, reporting that the artist Jenny had won an award for her creativity at a technical art convention, followed by a description of how Jenny and the AA worked together. This description manipulated anthropomorphism (similar to Study 2) by noting that the artist programmed customers' preferences and chose the colors, and then the AA decided on the strokes and layers and carried out the painting.

Participants also completed a four-item manipulation check for temporal stability (e.g., "This team has been together for a long time in the past"; 1 = "strongly disagree," 7 = "strongly agree"; $\alpha = 0.94$; Lee et al., 2015), as well as the scale for the anthropomorphism manipulation check ($r = .86$) and the measures of perceived AA creativity ($r = .53$), product evaluations ($r = .83$), purchase intentions ($r = .95$), and perceived entitativity ($\alpha = 0.90$) from Study 2. For the control variables, participants answered questions about the perceived eeriness of the AA ("eerie/creepy"; $r = .91$); their attitude toward AAs in general, on a 5-item scale adapted from previous research (Hong et al., 2022; Nomura et al., 2006; e.g., "I would feel nervous when interacting with an artificial agent"; 1 = "strongly disagree," 7 = "strongly agree"; $\alpha = 0.83$; Web Appendix H); their experiences interacting with AAs (i.e., "How experienced are you in interacting with artificial agents in your daily life?"); their knowledge about paintings (i.e., "How knowledgeable are you about painting artwork in general?"); and demographic questions.

Results

Manipulation check

A 2 × 2 analysis of variance (ANOVA) for anthropomorphism revealed a significant main effect, such that participants viewed the AA as more humanlike when it was anthropomorphized ($M_A = 2.86$, $SD = 1.39$) than when it was not ($M_{NA} = 2.00$, $SD = 1.00$; $F(1, 327) = 42.12$, $p < .001$, $\eta^2 = 0.11$). This outcome was not affected by temporal stability ($F(1, 327) = 0.66$, $p = .418$) or the interaction ($F(1, 327) = 1.45$, $p = .229$). Another 2 × 2 ANOVA for temporal stability affirmed that participants in the high temporal stability conditions considered the AA–artist dyad more stable over time ($M = 5.57$, $SD = 0.95$) than those in the low temporal stability conditions ($M = 2.46$, $SD = 0.97$; $F(1,$

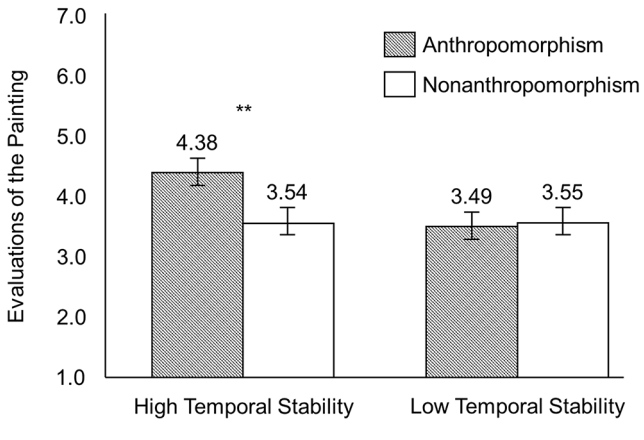
327)=860.69, $p<.001$, $\eta^2=0.73$). Neither anthropomorphism ($F(1, 327)=0.28$, $p=.599$) nor the interaction ($F(1, 327)=0.77$, $p=.381$) influenced perceived temporal stability. Thus, our manipulations were effective.

Perceived entitativity

A 2×2 ANOVA indicated a main effect of anthropomorphism on perceived entitativity, such that participants perceived the AA–artist dyad as more entitative when the AA was anthropomorphized ($M_A = 4.33$, $SD=1.41$) rather than nonanthropomorphized ($M_{NA} = 3.99$, $SD=1.37$; $F(1, 327)=5.33$, $p=.022$, $\eta^2=0.02$). The main effect of temporal stability was significant too: Participants in the high stability conditions viewed the dyad more like an entity ($M_H = 4.60$, $SD=1.26$) than those in the low stability conditions ($M_L=3.71$, $SD=1.40$; $F(1, 327)=39.04$, $p<.001$, $\eta^2=0.11$). More importantly, the interaction between anthropomorphism and temporal stability also was significant ($F(1, 327)=13.45$, $p<.001$, $\eta^2=0.04$). In the contrast analyses, participants encountering the anthropomorphized AA–artist dyad perceived greater entitativity of the dyad when its temporal stability was high ($M_A = 5.03$, $SD=1.08$; $M_{NA} = 4.18$, $SD=1.29$; $F(1, 327)=18.12$, $p<.001$, $\eta^2=0.05$) but not when the dyad indicated low temporal stability ($M_A = 3.61$, $SD=1.36$; $M_{NA}=3.81$, $SD=1.43$; $p=.341$).

Perceived AA creativity

With a 2×2 ANOVA, we determined that participants considered the AA in the high temporal stability dyads more creative than the AA in the low temporal stability dyads ($M_H = 4.35$, $SD=1.39$; $M_L = 3.63$, $SD=1.43$; $F(1, 327)=21.58$, $p<.001$, $\eta^2=0.06$). The interaction was also significant ($F(1, 327)=6.93$, $p=.009$, $\eta^2=0.02$). Contrasts showed that participants evaluated the anthropomorphized AA as more creative than the nonanthropomorphized one when the dyad was highly stable over time ($M_A = 4.63$, $SD=1.28$; $M_{NA} = 4.07$, $SD=1.45$; $F(1, 327)=6.73$, $p=.010$, $\eta^2=0.02$), whereas this difference did not arise if the dyad was less stable ($M_A = 3.51$, $SD=1.39$; $M_{NA} = 3.76$, $SD=1.46$; $p=.255$).



Notes: Error bars = +/-1 SE. **p <.01

Fig. 2 Interaction of anthropomorphism and temporal stability on product evaluations (Study 3)

Product evaluations

Another 2×2 ANOVA revealed that participants expressed higher evaluations of the painting generated by a dyad with an anthropomorphized AA ($M_A = 3.95$, $SD=1.53$) than a nonanthropomorphized AA ($M_{NA} = 3.54$, $SD=1.61$; $F(1, 327)=5.36$, $p=.021$, $\eta^2=0.02$), as well as when the dyad was perceived as more stable ($M_H = 3.96$, $SD=1.58$; $M_L = 3.52$, $SD=1.55$; $F(1, 327)=6.74$, $p=.010$, $\eta^2=0.02$). Notably, the anthropomorphism–temporal stability interaction was significant too ($F(1, 327)=6.96$, $p=.009$, $\eta^2=0.02$). According to the contrasts, the painting generated by the anthropomorphized AA–artist dyad prompted higher evaluations than the one by the nonanthropomorphized AA–artist dyad when the dyad was stable ($M_A = 4.38$, $SD=1.43$; $M_{NA} = 3.54$, $SD=1.62$; $F(1, 327)=12.45$, $p<.001$, $\eta^2=0.04$), but this difference disappeared for the temporary dyad ($M_A = 3.49$, $SD=1.49$; $M_{NA} = 3.55$, $SD=1.61$; $p=.820$; Fig. 2). We observed similar results for purchase intentions (Web Appendix D4).

Moderated serial mediation

In a moderated mediation analysis (Hayes, 2017; PROCESS Model 83, 5,000 bootstrapped samples), we included temporal stability as the moderator, perceived entitativity and perceived AA creativity as serial mediators, anthropomorphism as the predictor, and product evaluations as the outcome. The results revealed a significant moderated serial mediation (index=−0.08, boot SE=0.04, 95% CI [-0.1611, −0.0222]). Specifically, we found an indirect effect of anthropomorphism on product evaluations, significant through perceived entitativity and AA creativity for the dyad with high temporal stability (indirect effect=0.06, boot SE=0.03, 95% CI [0.0205, 0.1251]) but not for the dyad with low temporal stability (indirect effect=−0.01, boot SE=0.02, 95% CI [-0.0557, 0.0190]). We also observed moderated mediation effects on purchase intentions (Web Appendix D4). These results remained significant even after we controlled for customers' age, gender, perceived eeriness of the AA, attitude toward AA in general, experience of interacting with AAs, and knowledge about paintings ($ps<0.05$; CIs of the moderated mediations exclude 0).

Discussion

Study 3 thus extends previous findings with novel insights about the temporal stability of dyads. As predicted, when a dyad was stable over time, anthropomorphism elicited higher product evaluations and purchase intentions, serially mediated by increased perceptions of the entitativity of the AA–artist dyad and AA creativity. In low temporal stability conditions, anthropomorphism did not enhance service evaluations, in support of H3. Echoing the results of our second pilot study (Web Appendix B2), Study 3 offers evidence that the anthropomorphism of an AA alone, without a creative dyad member, might not increase perceptions of its creativity. In the next study, we instead manipulate customers' lay beliefs of group entitativity, to verify the underlying mechanism by which anthropomorphism improves service evaluations through trait transference effects in AA–employee dyads.

Study 4

To provide further evidence of the trait transference mechanism, in Study 4 we examine customers' lay beliefs as a boundary condition (H4). Adopting the painting context from Study 3, we manipulate lay beliefs about group entitativity by indicating that the saying "birds of a feather flock together" is accurate or not. If customers strongly believe that people in a group share similarities, they likely regard the anthropomorphized AA and human employee as an entitative dyad and infer AA creativity based on the employee's creativity. This trait transference effect instead should be attenuated among people with weak such beliefs.

Method

We recruited participants from Cloud Research, a different data collection panel, and obtained 343 responses, in return for monetary compensation. Twelve participants failed the attention checks and were excluded, leaving a final sample of 331 participants (M_{age} = 39.3 years, SD=11.8; 54.7% women), randomly assigned to the conditions of a 2 (anthropomorphism: yes vs. no) × 2 (beliefs: weak vs. strong) between-subjects design.

An opening reading task aimed to strengthen or weaken their beliefs that "birds of a feather flock together." Specifically, participants in both conditions read a 160-word fictitious scientific report (Web Appendix F4). We kept the sentences and structures consistent between the two conditions except for key words that indicated the accuracy of "birds of a feather" beliefs (e.g., "reliable" vs. "unreliable"). In the strong beliefs conditions, the report supported these beliefs and listed evidence of how people in a group are similar, with the implication that making inferences based on such beliefs was appropriate. In the weak beliefs conditions, the report instead emphasized how group members could differ and suggested that inferring people's traits on the basis of these beliefs would lead to inaccurate impressions. After reading the report, all participants summarized the meaning and completed a manipulation check for beliefs, by indicating what they thought about making inferences about a person based on his or her group membership, using a four-item, seven-point scale (e.g., "inaccurate/accurate"; α=0.98). Next, participants read the painting scenario from Study 3 (without the temporal stability manipulation), then completed the anthropomorphism manipulation check (α=0.92) and indicated their perceptions of the AA's creativity (r=.65), the painting (r=.78), and the entitativity of the AA–artist dyad (α=0.91) on the scales from Study 3 (Web Appendix H).

Results

Manipulation check

A 2×2 ANOVA for the anthropomorphism score revealed that participants viewed the AA as more humanlike when it was anthropomorphized (M_A = 3.00, SD=1.62) than when it was not (M_{NA} = 2.29, SD=1.45; F(1, 327)=17.55, p<.001, η^2=0.05). This perception was not affected by the beliefs manipulation (F(1, 327)=2.41, p=.122) or the interaction (F(1, 327)=1.52, p=.218). Another 2×2 ANOVA for the beliefs score indicated that participants in the strong beliefs conditions considered making inferences based on other members of the same group more reliable (M_S = 5.48, SD=1.19) than those in the weak beliefs conditions (M_W = 2.35, SD=1.43; F(1, 327)=476.19, p<.001, η^2=0.59). Anthropomorphism (F(1, 327)=0.93, p=.335) and the interaction (F(1, 327)=2.67, p=.103) did not influence participants' lay beliefs. These results thus validated both manipulations.

Perceived entitativity

A 2×2 ANOVA showed a main effect of anthropomorphism on perceived entitativity, such that participants viewed the AA–artist dyad as more entitative when the AA was anthropomorphized (M_A = 5.17, SD=1.41) rather than nonanthropomorphized (M_{NA} = 4.48, SD=1.49; F(1, 327)=18.76, p<.001, η^2=0.05). The interaction was significant too (F(1, 327)=5.49, p=.020, η^2=0.02). Contrasts revealed that in the strong beliefs conditions, participants perceived the AA–artist dyad as more entitative if the AA was anthropomorphized (M_A = 5.46, SD=1.15) than

if not (M_{NA} = 4.40, SD = 1.47; $F(1, 327) = 22.48$, $p < .001$, $\eta^2 = 0.06$), replicating the effect in Study 2. However, this effect did not arise when participants' beliefs about group entitativity were weak, so dyads with anthropomorphized (M_A = 4.88, SD = 1.59) or nonanthropomorphized (M_{NA} = 4.56, SD = 1.52) AAs were perceived as similarly entitative ($F(1, 327) = 1.96$, $p = .163$). In other words, the participants viewed the AA–artist dyad as entitative only if their "birds of a feather" beliefs were strong (M_S = 5.46, SD = 1.15), not when their beliefs were weak (M_W = 4.88, SD = 1.59; $F(1, 327) = 6.78$, $p = .010$, $\eta^2 = 0.02$).

Perceived AA creativity

A 2 × 2 ANOVA revealed a marginal main effect of anthropomorphism ($F(1, 327) = 2.74$, $p = .099$, $\eta^2 = 0.01$). Participants rated the AA as more creative when anthropomorphized (M_A = 4.09, SD = 1.72) than nonanthropomorphized (M_{NA} = 3.76, SD = 1.80), and the interaction was significant ($F(1, 327) = 5.68$, $p = .018$, $\eta^2 = 0.02$). In line with H4, in the strong beliefs conditions, participants perceived the AA as more creative when it was anthropomorphized (M_A = 4.37, SD = 1.70) than not anthropomorphized (M_{NA} = 3.59, SD = 1.84; $F(1, 327) = 8.23$, $p = .004$, $\eta^2 = 0.03$), replicating the effect from Study 2. This effect disappeared when participants' beliefs about group entitativity were weak (M_A = 3.80, SD = 1.71; M_{NA} = 3.94, SD = 1.76; $F(1, 327) = 0.26$, $p = .608$). That is, the creativity trait transferred to the anthropomorphized AA only if people strongly believed "birds of a feather flock together" (M_S = 4.37, SD = 1.70), but it did not among people with weak such beliefs (M_W = 3.80, SD = 1.71; $F(1, 327) = 4.27$, $p = .040$, $\eta^2 = 0.01$).

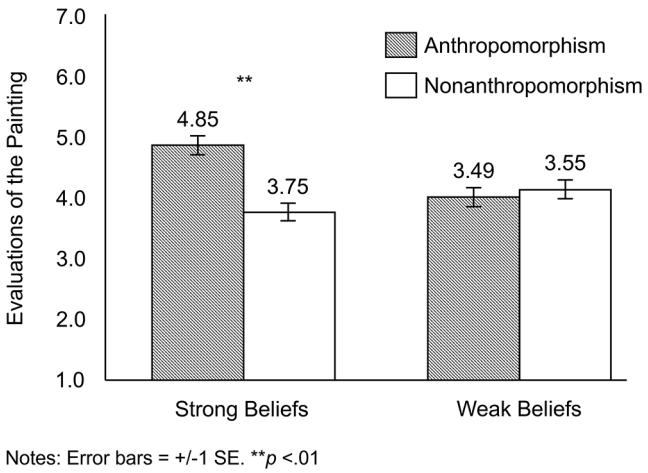


Fig. 3 Interaction of anthropomorphism and lay beliefs on product evaluations (Study 4)

Product evaluations

The 2 × 2 ANOVA for evaluations of the painting suggested a significant main effect of anthropomorphism ($F(1, 327) = 7.44$, $p = .007$, $\eta^2 = 0.02$) and a significant interaction ($F(1, 327) = 11.49$, $p = .001$, $\eta^2 = 0.03$). Consistent with H3, the contrasts confirmed that in the strong beliefs conditions, participants evaluated the painting as more creative if it was produced by an anthropomorphized AA (M_A = 4.85, SD = 1.35) rather than a nonanthropomorphized AA (M_{NA} = 3.75 SD = 1.67; $F(1, 327) = 18.89$, $p < .001$, $\eta^2 = 0.06$), replicating the effect from Study 2. However, the effect did not occur for participants with weak beliefs (M_A = 4.00, SD = 1.83; M_{NA} = 4.12, SD = 1.65; $F(1, 327) = 0.22$, $p = .641$). That is, anthropomorphism of the AA enabled trait transference only among participants with strong "birds of a feather flock together" beliefs (M_S = 4.85, SD = 1.35), not those with weak beliefs (M_W = 4.00, SD = 1.83; $F(1, 327) = 11.00$, $p = .001$, $\eta^2 = 0.03$; see Fig. 3).

Moderated serial mediation

To test the mechanism by which lay beliefs moderate the effect of anthropomorphism on perceived entitativity, which influences perceived AA creativity and product evaluations, we conducted a moderated serial mediation analysis with Hayes's (2017) PROCESS macro (Model 86; 5,000 bootstrapped samples). In support of our prediction, the index of moderated serial mediation was significant (index = 0.13, boot SE = 0.07, 95% CI [0.0142, 0.2744]). In the strong beliefs conditions, anthropomorphism increased perceived entitativity, which increased perceived AA creativity, resulting in higher product evaluations (b = 0.20, SE = 0.05, 95% CI [0.1052, 0.3080]). In the weak beliefs conditions, the indirect effect through the serial mediation of perceived entitativity and perceived AA creativity was not significant (b = 0.07, SE = 0.05, 95% CI [-0.0270, 0.1660]). When we included age and gender as covariates, the key results remained significant ($ps < 0.05$).

Discussion

The results of Study 4 reaffirm the proposed mechanisms of perceived entitativity and AA creativity. Specifically, the null effect in the weak beliefs conditions ruled out the alternative explanation that anthropomorphism itself, without a creative employee as a source of creativity transference, was sufficient to enhance the perceived creativity of the AA. In the next study, we instead manipulate customers' consumption goals to verify these underlying mechanisms again.

Study 5

To determine if the proposed effects hold when customers have different consumption goals (H5), we introduce the interior design service context from Study 2 but ask participants to imagine they are decorating a living room to achieve hedonic or utilitarian goals.[5] If we prompt utilitarian goals, the effect of anthropomorphism on service evaluations should be attenuated.

Method

Three hundred sixty U.K. participants were recruited on Prolific Academic. Ten participants failed an attention check, leaving a final sample of 350 participants (M_{age} = 41.2 years, SD = 12.0; 50% women). We assigned them randomly to a 2 (anthropomorphism: yes vs. no) × 2 (consumption goals: utilitarian vs. hedonic) between-subjects design.

The experimental design was similar to the one we used in Study 2, with one change: Before seeing the AA–designer dyad, participants received instructions designed to manipulate their goals. In the hedonic conditions, participants read that they were renovating the living room to make it more enjoyable and expected the process to be fun. In the utilitarian conditions, they needed to rent out the place, and the renovation aimed to increase their rental income (Botti & McGill, 2011; Web Appendix F5). They read the same introduction about the dyad, interior design service, and creativity of the human designer Daniel. Participants completed a three-item scale as a manipulation check of consumption goals (e.g., "To what extent do you perceive your goal of this interior design service as …?" 1 = "function-oriented," 7 = "pleasure-oriented"; α = 0.89; adapted from Benoit & Miller, 2019). They also completed the anthropomorphism manipulation check (α = 0.86) and the measures of perceived AA creativity (r = .63), product evaluations (r = .75), purchase intentions (r = .96), perceived entitativity (α = 0.92), and control variables, as in Study 3.

[5] To test if creativity is similarly important to customers with different consumption goals, we conducted a pilot test (N = 114) on the same data collection platform (Prolific) and using the stimuli from Study 5, with a 2 (anthropomorphism: yes vs. no) × 2 (consumption goals: hedonic vs. utilitarian) between-subjects design. We measured the importance of creativity to participants' evaluations, using three items (e.g., "When evaluating this interior design service, to what extent do you value the creativity of the design?" 1 = "not at all," 7 = "very much"; α = 0.75). The 2 × 2 ANOVA for importance of creativity revealed no significant effects of consumption goals (p = .622), anthropomorphism (p = .159), or the interaction (p = .744). Thus, the importance of creativity does not appear to vary between the hedonic and utilitarian goal conditions.

Results

Manipulation check

A 2 × 2 ANOVA for anthropomorphism revealed that participants viewed the AA more like a human when it was anthropomorphized (M_A = 2.69, SD = 1.36) than when it was not (M_{NA} = 1.77, SD = 0.88; F(1, 346) = 56.22, p < .001, η^2 = 0.14). This perception was not affected by consumption goals (F(1, 346) = 1.16, p = .282) or the interaction (F(1, 346) = 0.13, p = .723). Another 2 × 2 ANOVA indicated that participants in the hedonic conditions held more hedonic-oriented goals (M = 4.22, SD = 1.46) than those in the utilitarian conditions (M = 2.99, SD = 1.15; F(1, 346) = 75.56, p < .001, η^2 = 0.18). Anthropomorphism (F(1, 346) = 0.32, p = .574) or the interaction (F(1, 346) = 0.13, p = .721) did not influence participants' consumption goals. These results validated our manipulations.

Perceived entitativity

A 2 × 2 ANOVA showed a main effect of anthropomorphism on perceived entitativity, such that participants perceived the AA–designer dyads as more entitative when the AA was anthropomorphized (M_A = 4.70, SD = 1.43) rather than nonanthropomorphized (M_{NA} = 3.68, SD = 1.47; F(1, 346) = 44.69, p < .001, η^2 = 0.11). The main effect of consumption goals also was significant. Participants with hedonic goals viewed the dyad more like an entity (M_H = 4.60, SD = 1.26) than those with utilitarian goals (M_U = 3.71, SD = 1.40; F(1, 346) = 19.73; p < .001, η^2 = 0.05). The interaction was significant (F(1, 346) = 6.46; p = .011, η^2 = 0.02). In the contrasts, participants regarded the anthropomorphized AA–designer dyad as offering greater entitativity if they had been primed with hedonic consumption goals (M_A = 5.21, SD = 1.08; M_{NA} = 3.82, SD = 1.51; F(1, 346) = 42.83, p < .001, η^2 = 0.11). The difference was not significant when they had utilitarian consumption goals (M_A = 4.16, SD = 1.57; M_{NA} = 3.54, SD = 1.42; p = .179). Meanwhile, the dyad with anthropomorphized AA appeared more entitative when customers had hedonic (M_H = 5.21, SD = 1.08) rather than utilitarian (M_U = 4.16, SD = 1.57; F(1, 346) = 24.25, p < .001, η^2 = 0.07) goals.

Perceived AA creativity

With a 2 × 2 ANOVA, we determined that participants considered the anthropomorphized AA more creative than the nonanthropomorphized AA (M_A = 4.49, SD = 1.41; M_{NA} = 3.80, SD = 1.42; F(1, 346) = 21.14, p < .001, η^2 = 0.06). Participants with hedonic goals also perceived the AA as more creative than those with utilitarian goals (M_H = 4.41,

$SD = 1.42$; $M_U = 3.86$, $SD = 1.44$; $F(1, 346) = 13.68$, $p < .001$, $\eta^2 = 0.04$). The interaction between anthropomorphism and consumption goals was significant ($F(1, 346) = 5.49$, $p = .020$, $\eta^2 = 0.02$). Contrasts showed that participants evaluated the anthropomorphized AA as more creative than the nonanthropomorphized AA ($M_A = 4.92$, $SD = 1.22$; $M_{NA} = 3.90$, $SD = 1.42$; $F(1, 346) = 24.24$, $p < .001$, $\eta^2 = 0.07$) if the interior design was for hedonic purposes, but not if it was for utilitarian purposes ($M_A = 4.03$, $SD = 1.45$; $M_{NA} = 3.70$, $SD = 1.41$; $p = .113$). The anthropomorphized AA appeared more creative to customers with hedonic ($M_H = 4.92$, $SD = 1.22$) rather than utilitarian ($M_U = 4.03$, $SD = 1.45$; $F(1, 346) = 18.15$, $p < .001$, $\eta^2 = 0.05$) goals.

Product evaluations

A 2 × 2 ANOVA indicated significant main effects of anthropomorphism and consumption goals. Participants offered higher evaluations of the interior design generated by a dyad with an anthropomorphized rather than nonanthropomorphized AA ($M_A = 4.30$, $SD = 1.51$; $M_{NA} = 3.78$, $SD = 1.28$; $F(1, 346) = 12.36$, $p < .001$, $\eta^2 = 0.03$), as well as when their goals were hedonic ($M_H = 4.25$, $SD = 1.43$; $M_U = 3.82$, $SD = 1.38$; $F(1, 346) = 8.20$, $p = .004$, $\eta^2 = 0.02$). Notably, the anthropomorphism–consumption goals interaction was significant too ($F(1, 346) = 4.85$, $p = .028$, $\eta^2 = 0.01$). According to contrasts, the interior design provided by the anthropomorphized AA earned higher evaluations than that by the nonanthropomorphized AA when the consumption goals were hedonic ($M_A = 4.67$, $SD = 1.45$; $M_{NA} = 3.83$, $SD = 1.29$; $F(1, 346) = 16.44$, $p < .001$, $\eta^2 = 0.05$), whereas this difference disappeared when the consumption goals were utilitarian ($M_A = 3.92$, $SD = 1.48$; $M_{NA} = 3.73$, $SD = 1.27$; $p = .355$). In addition, for the anthropomorphized AA, the product sparked higher evaluations among customers with hedonic goals ($M_H = 4.67$, $SD = 1.45$) rather than utilitarian goals ($M_U = 3.92$, $SD = 1.48$; $F(1, 346) = 12.75$, $p < .001$, $\eta^2 = 0.04$; see Fig. 4). We observed parallel results regarding purchase intentions (Web Appendix D5).

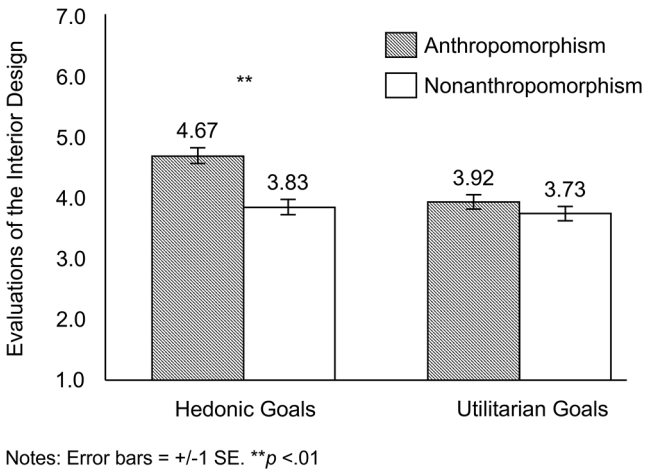


Fig. 4 Interaction of anthropomorphism and consumption goals on product evaluations (Study 5)

Moderated serial mediation

A moderated mediation analysis (Hayes, 2017 PROCESS Model 83, 5,000 bootstrapped samples) included consumption goals as the moderator, perceived entitativity and perceived AA creativity as serial mediators, anthropomorphism as the predictor, and product evaluations as the outcome. The results revealed a significant moderated serial mediation (index = −0.10, boot SE = 0.05, 95% CI [-0.2031, −0.0205]). Specifically, the indirect effect of anthropomorphism on product evaluations was significant through perceived entitativity and AA creativity among customers who held hedonic consumption goals (indirect effect = 0.18, boot SE = 0.05, 95% CI [0.0915, 0.2886]). This effect was present but attenuated among customers with utilitarian goals (indirect effect = 0.08, boot SE = 0.04, 95% CI [0.0204, 0.1589]). Similar moderated mediation effects arose for purchase intentions too (Web Appendix D5).

Discussion

Study 5 extends our previous findings by identifying customers' consumption goals as a boundary condition for the trait transference effect. As predicted, when customers had hedonic goals, anthropomorphism elicited higher service evaluations (product evaluations, purchase intentions), serially mediated by enhanced perceptions of the entitativity of the AA–designer dyad and AA creativity. When people had utilitarian goals, the effects of anthropomorphism on service evaluations were weaker, and customers were less likely to transfer traits from the employee to the AA. These findings reinforce the trait transference mechanism and provide key implications for marketers who serve customers with varied consumption goals.

General discussion

In creative industries, using AAs to augment service employees' efforts in dyadic teams is a common trend, but customers' perceptions of such dyads are unclear. With five main studies, we offer a novel perspective on how and why anthropomorphized AAs in dyadic teams can influence customers' perceptions of AAs' creativity and service evaluations. When an anthropomorphized (vs. nonanthropomorphized) AA pairs with a creative employee, people evaluate the AA as more creative, which prompts higher

evaluations of designs of a household product (Study 1a), interior decoration (Studies 1b, 2, and 5), and art (Studies 3 and 4), as well as greater actual purchases, purchase intentions, WTP, and WOM. Study 1 establishes the benefit of adding an anthropomorphized AA to creative service provision, as well as the similar effectiveness of an anthropomorphized AA–human dyad and a human–human dyad. Study 2 shows that higher perceived entitativity and AA creativity serially mediate these effects. Studies 3–5 demonstrate that the trait transference effect is attenuated when the dyad's temporal stability is low, when customers' lay beliefs about group entitativity is weak, or when customers have utilitarian consumption goals.

Theoretical contributions

The current research makes several important theoretical contributions. First, it advances research on group stereotyping and trait transference (Spencer-Rodgers et al., 2007). We generalize group stereotyping literature from person perceptions to perceptions of humanized technology (Hamilton, 2007) by extending the trait transference effect from human groups (Crawford et al., 2002; Steinmetz et al., 2020) to dyadic service teams with nonhuman entities, thereby uncovering downstream influences for marketing. Moreover, little prior research has cited circumstances that moderate trait transference effects (Carlston et al., 2015); we document a holistic view with three boundary conditions. By examining the dyad's characteristics, we enrich previous research on team performance and reveal that traits are less likely to transfer from employees to AAs when the dyad is perceived as temporary (Lickel et al., 2000). In addition, we expand on research into human–technology interactions by showing the key influences of customers' lay beliefs and the consumption contexts (e.g., hedonic vs. utilitarian) on customers' perceptions of interacting with an AA (e.g., Mende et al., 2019).

Second, we add to growing literature on AA infusion in design service. Although recent conceptual articles begin to discuss some benefits of pairing up AAs with employees (Noble et al., 2022), most research has outlined outcomes of adopting solely AAs, such as conversational AI or service robots (Davenport et al., 2020; Huang & Rust, 2020). Our research looks into AA–human dyads and uncovers the notable influence of anthropomorphism. Furthermore, we extend literature on creativity in services, which is critical to establish innovative solutions that ensure firms' sustainability (Dong et al., 2015). Customers are generally skeptical of AAs when the service requires creativity (Chamberlain et al., 2018; Hong et al., 2022; Kunz et al., 2022). We show that anthropomorphism of an AA in a service dyad improves perceived AA creativity. We also clarify the benefits of adopting anthropomorphized AAs, by comparing different arrangements of service providers. AA–employee dyadic teams can exert effects comparable to those of human–human dyadic teams and outperform individual employees. Perhaps customers assume a dyad (vs. an individual) of two members who are interdependent, share workloads, and offer multiple perspectives can cultivate more creative outcomes and superior service quality (Kearney & Gebert, 2009; Woodman et al., 1993).

Third, these findings advance insights into anthropomorphism. Whereas prior research tends to focus on how customers perceive anthropomorphized entities on a one-to-one basis (Yang et al., 2020), we identify the effect of anthropomorphism beyond such direct interactions. Specifically, we examine how anthropomorphism influences customers' perceptions of nonhuman entities in a dyadic team setting. Beyond applying person perceptions to an anthropomorphized entity (Huang et al., 2019; Wan et al., 2017), we show that people also apply group stereotyping and perceive the anthropomorphized AA as a team member, as they would in interpersonal domains, to judge service outputs from AA–employee dyads. Overall, our findings provide a more nuanced view of how humanizing AAs influences customer service evaluations of AA–employee dyads.

Managerial implications

Due to technology advances and efficiency goals, adoptions of AA–employee dyadic teams are growing (Kannan & Bernoff, 2019; Sampson, 2021), suggesting potentially radical changes to the design service offerings (Berente et al., 2021). Firms must manage the potential drawbacks of pairing employees with AAs when customers seek creative outcomes. We offer some practical implications for maximizing the benefits of AA–employee dyadic teams.

Benefits of adding an anthropomorphized AA in a service dyad

Our findings provide initial evidence of the benefits of an anthropomorphized AA–employee dyad (vs. one employee alone); this dyad improves service evaluations, in line with prior research showing that a dyad is perceived as more flexible and able to satisfy various customer requirements (Verbeke et al., 2011). Customers' service evaluations also do not differ across AA–human and human–human dyads. Approximately one-third of firms that hesitate to adopt AAs cite cost-related concerns (Watson, 2022), but our findings clarify that anthropomorphized AA–human dyads, compared with human–human dyads, could be more cost-effective at the service frontline in the long term.

Anthropomorphism of AAs is necessary but not sufficient

Customers do not see AAs' creativity even they appear widely in creative industries such as fashion (Lake, 2018) and art (Flores & Korsten, 2016). For example, Ai-DA, the world's first humanoid AI artist, has prompted skepticism over its creative authenticity (Shaffi, 2023). Our findings suggest that anthropomorphism is not enough to enhance customers' perceived AA creativity. Rather, for AAs paired with creative service employees, anthropomorphism becomes effective and lead to better service evaluations. Instead of trying to convince customers that AAs are creative, firms should emphasize positive traits of a collaborative employee while also humanizing the AA to encourage trait transference. In the Ai-DA example, people might be more receptive to its artistic outputs if Ai-DA collaborates with a creative human artist.

Enhancing the sense of entitativity

As our studies establish, perceived entitativity enables the transference of creativity from the employee to the anthropomorphized AA, and we thus recommend that companies increase the entitativity of their design teams. For example, a design firm, Brand. new, acknowledges the input of AAs to its creative process. Our findings suggest that it could generate more favorable customer responses by highlights the entitativity, such as outfitting employees and AAs in apparel of the same color (Wang et al., 2018), or explicitly identifying the common goals they share, such as serving the customers and working cohesively on the same tasks (Ip et al., 2006). Service providers also could provide informative content about the close AA–employee collaboration in blog posts, case studies, or whitepapers that explain the concept and showcase successful projects completed by the dyad.

Establishing temporal stability

Our results indicate that customers are not influenced by trait transference if the dyad is not stable over time, which signals low entitativity. However, marketers often highlight technology adoptions as attractive selling points, such as when Coca-Cola announced a campaign for DALL-E: meets with real artists for the first time to create magical marketing outputs (Coca-Cola, 2023). Our research instead suggests to avoid framing the AA as newly introduced or hinting that the service is only for a trial period. Firms should signal stable, ongoing relationships, emphasize long-term collaborations between the AA and the employee and their long-term commitment to customers, such as presenting their past projects and ongoing partnership, to evoke a sense of high temporal stability, especially when reinforced by consistent visual elements and messaging across websites and social media platforms.

Identifying customers' lay beliefs

Our findings show that customers who do not believe that "birds of a feather flock together" are less susceptible to trait transference effect, so managers should cater to customers with varying entitativity beliefs or else influence their beliefs to optimize perceptions of the AA–employee dyad. Identifying customers' lay beliefs is possible in the digital era through quick online surveys directly, or analysis on customers' historical data and digital footprints, and listening to customers' social media related to group affiliations, shared interests with their connections, and engagements with content that support these beliefs (Raitaluoto, 2023). Because lay beliefs generally are grounded in knowledge and environmental cues (Chan & Zhang, 2022), firms also might try to manipulate customers' lay beliefs about group entitativity in general (von Walter et al., 2022). For example, they can use storytelling to convey close collaborations, such as detailing how the group members have worked together to overcome challenges or achieve exceptional results.

Encouraging hedonic consumptions

Compared to utilitarian goals, hedonic consumption goals facilitate the transference of creativity from the employee to AA. Firms can encourage more hedonic consumptions, such as by fostering pleasurable, experiential interactions with the service team (Wu & Holsapple, 2014). Marketers also might link their design services provided by AA–employee dyads with exclusivity, highlighting the unique benefits that only customers of the dyads can enjoy, such as access to innovative technology or personalized design solutions. Customers then may feel more socially superior, which fosters hedonic consumptions (Kivetz & Zheng, 2017; Liao, 2021). Firms could also develop emotional marketing appeals to evoke feelings of pleasure and excitement associated with the design services (Alba & Williams, 2013). For example, marketing messages might feature images of delighted customers or tell stories that highlight the positive emotions evoked by the process with the AA–employee dyad.

Taken together, these findings offer relevant, timely implications for firms that seek to manage service dyads of human employees and AAs. By leveraging the impact of both anthropomorphism and group entitativity, firms can mitigate the potential negative effect of AAs, promote positive service evaluations, and enjoy the lowered costs of AA–employee dyads.

Limitations and further research

Several limitations of our studies suggest directions for continued research. First, we focus on creativity in AA–employee dyads; additional research should explore the robustness of transference effects for other traits in different contexts. For example, physicians and AAs work as teams in medical service encounters, but patients might express concerns about AAs' lack of empathy (Blease et al., 2020). Anthropomorphism of the AA when pair it with an empathetic physician might encourage transference of empathy traits to the AA. To establish the source of the trait transference, we explicitly described the creativity of the human employee in study designs. Firms often showcase their employees' excellent traits in reality, but such designs also might have attracted special attention to creativity and have affected participants' evaluations. A more subtle approach might alleviate this concern. Second, we investigate a specific division of work between the human employee and the AA. As AAs' ability to create continues to evolve, such divisions likely vary across tasks, and it is worth exploring how variance in task divisions affect the trait transference. Notably, customers are more willing to share preference-related information with human employees, and then interact with AAs for efficiency (Adam et al., 2022). The division we described (begins with input from the employee and then efforts by the AA) reflects common interactions known to customers. Further research could address the optimal timing of AAs' involvement and test whether the trait transference holds if the AA were to initiate the design process. Third, the principle of trait transference implies that an observer extracts and infers the trait of a more familiar member (e.g., human employees) and then apply to another, less familiar members (e.g., AAs) (Folkes & Patrick, 2003). Research is needed to determine if this flow shifts as customers become more familiar with AAs. Fourth, our investigation focuses on transference between an employee and an AA in dyads; continued research could expand the investigation to multiple-member service teams. Such teams likely exhibit distinct dynamics (Abrams and der Pütten, 2020; Wolf & Stock-Homburg, 2022), which may influence their perceived entitativity (Hamilton, 2007; Wang et al., 2018).

In offering initial insights into the trait transference effect in AA–employee dyadic service teams, we hope our findings pave the way for more research in this area that can offer valuable insights and implications for both academia and practice.

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Declarations

Conflict of interest The authors have no conflict of interest to declare that are relevant to this article.

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