



Value Co-Creation and Co-Destruction Potentials in Adopting Humanoid Service Robots in Apparel Stores

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Background: With the substantial advancements in Artificial Intelligence (AI) technologies, modern robots are intellectually competent and socially interactive, which has led fashion retailers to actively test their potential use in service platforms (Haenlein & Kaplan, 2021; Ho et al., 2020). Humanoid service robots (HSRs), which resemble human facial and body morphology and social presence, have been portrayed as a key AI resource to enhance consumers' in-store experiences in engagement and personalization, and in turn, co-create new values, which involves joint efforts of multiple actors (i.e., consumers and the robots facilitated by companies) through service interaction (Čaić et al., 2018). According to service-dominant (S-D) logic, value co-creation process can be facilitated by integrating the actors' resources (i.e., use robot technology resources and accept its beneficial functions) (Vargo & Lusch, 2008). Yet, it is evident that not all actors' resources bring new value but could "co-destruct" the value in interaction with HSRs, resulting in diminished user experience and negatively influencing consumers' adoption of HSRs (Neuhofer, 2016; Čaić et al., 2018). While the novel concept of "value co-destruction" has drawn escalated attention in recent disclosures of S-D logic (Vargo et al., 2017), empirical research largely lacks to explore these "value co-creation and co-destruction potentials" in service processes between consumers and frontline apparel robots (Paschen et al., 2020). We explore that users' acceptance and rejection of a HSR could depend on the value it brings to consumers and the value it destroys for the apparel service system. This study examines the network differences and similarities between (1) value co-creation potentials that consist of service delivery expectancy (co-creation enjoyment, customization, entertainment, and contactless shopping) and traits of HSRs (warmth, liveliness, and competence), and (2) value co-destructing potentials (mistrust, complexity, fear of data leak, and irritation) across two HSR user groups (i.e., acceptance and rejection groups).

Theoretical framework: This study is grounded in "value co-creation" and "value co-destruction" potentials that are intertwined at the core of the "continuously evolving S-D logic" (Vargo & Lusch, 2008). Vargo et al. (2017) argue that value co-creation emerges through actors of beneficiaries (i.e., consumers) and service providers (i.e., robot service controlled by the firm) and their resource integration (e.g., utilizing positive/beneficial roles and functions). Yet, service interaction can also result in some reluctance to accept AI service robots due to user discomfort

in interacting with them, collaboratively destroying the value of the service (Čaić et al., 2018). To this end, this study proposes the conceptual framework of adoption of HSRs in Figure 1.

Methods and analytic strategies: The study incorporated (1) 14 personal interviews, (2) one video clip stimulus with two pretests, (3) empirical data collected via an online survey using US consumer panelists ($n = 474$) in 2021, and (4) psychological network analyses performed using R statistical software. The respondents' gender was evenly distributed (51.1% were female), with a median age of 40 and a median household income of \$60,000–\$79,999. Among the respondents, 284 were a user-acceptance (“Would use”) group of HSRs and 190 were a user-rejection (“Would not use”) group. All scale items were modified from existing scales and were measured on a 5-point Likert-type scale. We conducted psychological network analyses of individual networks and a jointly estimated network with a Network Comparison Test (NCT) for both groups. Analyses of predictability (R^2), network stability, centrality of node strength, edge-weights, and assessment of network invariance between the two networks were conducted to explore defining factors of consumers' intentions to accept or reject an HSR in apparel retail stores. We jointly estimated the two groups' networks using Fused Graphical Lasso (FGL) method.

Results: A one-factor CFA revealed that all factor loadings were greater than 0.50. In the network of the acceptance group, “complexity” and “irritation” as well as “competence” had high predictability with strong effect sizes (R^2 : 0.70 to 0.77), whereas “co-creation enjoyment,” “liveliness,” “warmth,” “customization,” and “entertainment” had the greatest variance of the nodes in the network of the rejection group (R^2 : 0.71 to 0.77). The correlation stability coefficients for strength centrality were 0.70 for the acceptance group and 0.68 for the rejection group, exceeding the threshold of 0.50 for stable estimation (Epskamp et al., 2018). The NCT results indicated statistical differences between the two networks: network structure ($M = 0.40$, $p < 0.001$) and differences in three edges' strengths ($E = 0.17 - 0.40$, $p < 0.001$).

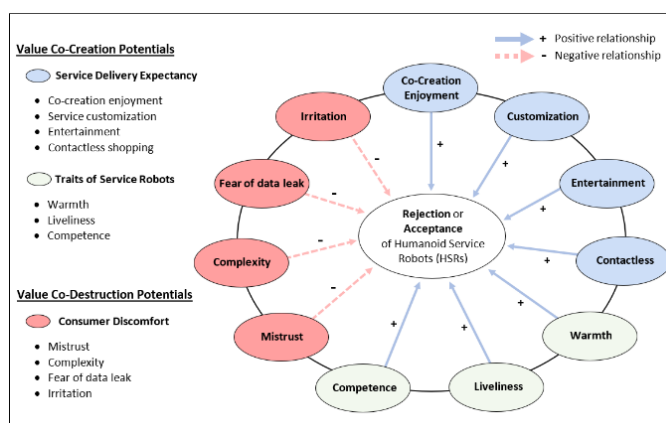


Figure 1. Conceptual framework of HSRs

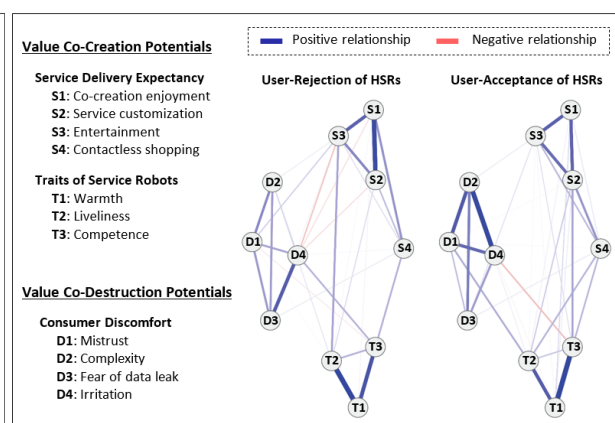


Figure 2. Jointly estimated networks

Specifically, the edge strengths (1) between customization and competence, (2) between competence and irritation, and (3) between complexity and irritation in the acceptance group were significantly stronger than the ones in the rejection group. Figure 2 visualizes the jointly estimated networks and all associated edges' strengths for the two groups.

Conclusion/Implication: The study demonstrates high levels of competence and customization of HSRs, and low levels of complexity and irritation were substantial factors in the user-acceptance of HSRs. Notably, the relationships between these four variables are significantly stronger for the acceptance group than the rejection group. Further, the findings indicate that low levels of co-creation enjoyment, entertainment, and liveliness consistently play an essential role in user-rejection of HSRs. By uncovering value co-creation and co-destruction potentials in psychological networks, we suggest fashion retailers should balance the role of HSRs in apparel stores in multiple directions: (1) providing socially intelligent, data-driven customized, and emotionally caring high-touch service by the robot; (2) reducing the system's complexity by improving the autonomy of user-operation; and (3) minimizing user irritation and value destruction by providing alternative options of directly interacting with human staff and "digitally-disconnecting" or "technology-free" shopping spaces.

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