

# Guest Perception in Using Service Robots in the Restaurant Industry

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## Abstract

As service robots become increasingly common in restaurant operations, understanding how diners evaluate robot attributes and form behavioral intentions has become an important research issue. This study examines how diners psychologically respond to service robots in restaurants and how these responses shape their behavioral intention. Grounded in the Stimulus–Organism–Response framework, hygiene, reliability, competence, and anthropomorphism are modeled as stimuli, while performance risk, trust, and attitude constitute the organismic states leading to behavioral intention as the response. Data were collected through a convenience online survey of 127 customers in Taiwan who had previously dined in restaurants using service robots, using 29 items adapted from established scales. All eight constructs demonstrated satisfactory reliability and validity, with Cronbach’s alpha and composite reliability values exceeding 0.7, average variance extracted values above 0.5, and HTMT ratios below 0.9. Using partial least squares structural equation modeling, the results indicate that reliability significantly reduces performance risk while enhancing trust. In contrast, anthropomorphism significantly increases performance risk without significantly strengthening trust, suggesting that human-like robot characteristics may not always facilitate favorable customer evaluations in restaurant settings. Competence and hygiene contribute primarily to trust formation rather than risk reduction. Performance risk does not significantly influence attitude, while trust has a strong positive impact on attitude, which in turn strongly predicts diners’ behavioral intention to revisit and recommend restaurants that employ service robots. Overall, the findings suggest that restaurant operators should prioritize reliability, competence, and visible hygiene cues to foster trust, while carefully considering the degree of anthropomorphic design, as excessive human-like characteristics may elevate perceived performance risk.

**Keywords:** service robots; restaurant; Stimulus–Organism–Response; hygiene; reliability; competence; anthropomorphism; performance risk; trust; attitude; behavioral intention