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Data-Driven Insights into Trust for Decision-Making in Social Robot Interaction

Trust is a key determinant of successful human-robot interaction across diverse application domains. This study investigates the formation of trust in robots through an online experiment where participants viewed curated videos showcasing varied robotic behaviors. Conducted within the I-CATER project, which focuses on social robots in workplace environments, the research explores how communication strategies and social behaviors influence trust perceptions. The video scenarios included differences in error communication, task initiation approaches, and facial expressions. Participants completed a questionnaire integrating the Godspeed Questionnaire Series (GQS) and the Big Five Inventory-10 (BFI-10), supporting a multifaceted assessment of trust-related dimensions. Statistical analyses using Friedman and Wilcoxon tests revealed that verbal justifications and apologies significantly improved perceived likeability and intelligence, while dynamic facial expressions increased perceptions of anthropomorphism, likeability, and animacy. Although demographic factors such as age, technological background, and robot ownership showed no significant correlation with trust, a weak gender trend indicated lower trust ratings among male participants. Clustering analysis further identified distinct participant profiles based on trust responses. The study provides valuable insights to support decision-making in robot design and interaction strategies.

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