Do You Know if You Trust a Robot? Influences that Mediate Implicit and Explicit Trust

William G. Volante
University of Central Florida, wgvolante@gmail.com

Tracy Sanders
University of Central Florida

Ashley Reardon
University of Central Florida

Peter Hancock
University of Central Florida

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W. G. Volante, T. Sanders, A. Reardon, P. A. Hancock
University of Central Florida

With the widespread expansion in fields of technology, the use of robotics in the average person's everyday life continues to increase. This fast paced shift has brought about issues related to user trust. Here we investigate the effects of robot appearance and reliability on a user's level of trust. Traditionally trust in the field of robotics has measured explicit trust, primarily through the use of self-report questionnaires. While we maintain this paradigm in our current work, we also expand on it by including a measure of implicit trust. This was achieved through the use of the Implicit Associations Test (IAT), administered prior to the experimental trials and aimed at evaluating participant's implicit trust differences between humans and robots. Explicit trust was evaluated by measuring participant response to three different robot forms. Additionally, each robot could behave reliably or unreliably during a series of three experimental trials. A final fourth trial was also used, where we evaluated choice by allowing participants to choose their preferred robot. Explicit trust was measured through the use of two questionnaires: the Trust in Automation Scale (TAS) and the Human-Robot Trust Scale (HRTS). Results from the IAT showed implicit reservations related to trusting a robot over a human. Results from the explicit trust metrics showed differences based on the reliability of the robot, as well as when the participant chose to interact with the robot. We conclude that reliability remains a dominant driver of trust, yet other contextual factors do prove influential.

Keywords: Robotics, HRI, Trust, Implicit Associations