Smooth leader or sharp follower? Playing the Mirror Game with a Robot

Shir Kashi[1], Shelly Levy-Tzedek[2*]
[1]Department of Cognitive Sciences
[2]Department of Physical Therapy
Ben-Gurion University of the Negev, Beer-Sheva, Israel
* corresponding author: shelly@bgu.ac.il

ABSTRACT
The increasing number of opportunities for human-robot interactions in various settings, from industry through home use to rehabilitation, creates a need to understand how to best personalize human-robot interactions to fit both the user and the task at hand. In the current experiment, we explored a human-robot collaborative task of joint movement, in the context of an interactive game. Specifically, we set out to test people's preferences when interacting with a robotic arm, playing a leader-follower imitation game (the mirror game). Twenty two young participants played the mirror game with the robotic arm, where one player (person or robot) followed the movements of the other. Each partner (person and robot) was leading part of the time, and following part of the time. When the robotic arm was leading the joint movement, it performed movements that were either sharp or smooth, which participants were later asked to rate. The greatest preference was given to smooth movements. Half of the participants preferred to lead, and half preferred to follow. We found that the movements of the robotic arm primed the subsequent movements performed by the participants. Our results demonstrate individual differences in preferences, and highlight the importance of personalized human-robot interactions.