Going for the Goal: The Effects of Removing Preparatory Information on the Fast and Unconscious Reading of Action Goals in a Computer-Simulated Competitive Interaction

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Humans are able to quickly and accurately determine intent from early motions of other agents in the social environment. Through real-time analysis of biomechanical patterns, the mind uses preparatory information to read and project action goals during interpersonal exchanges. Research in psychology, neurophysiology, and behavior provides evidence for a ‘reactive advantage’ in motion dynamics and execution time for reaction versus intentional movement in naturalistic competition. Though it is widely assumed that computational involvement alters the naturalistic behavioral and perceptual dynamics of human interaction, here I show that the removal of key preparatory information severely impacts reaction time in simulated competition over a computational interface and elicits response patterns consistent with those expected for real-life models. In this interdisciplinary psychology and computer science study, I designed and programmed an interactive computer game in which participants raced a computerized opponent to one of two on-screen targets. To prevent device bias, participants completed a block of edited and unedited trials on a mouse and a trackpad. Reaction time, measured as the difference between initial finger launch of the opponent and cursor launch of the participant, was significantly faster in unedited trials than in edited trials, in which preparatory information was systematically removed. Results were consistent across devices, closely mimicking patterns found in naturalistic settings and demonstrating that human perceptual patterns in human-to-human interaction are still present in interactions with computers. This can substantially contribute to designing new user interface models for technology and enhancing models for artificially intelligent systems.

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