

Predicting Individual Differences in Working Memory Training Gain: A Machine Learning Approach

Shafee Mohammed

University of California Irvine, Irvine, California, United States

Benjamin Katz

University of Michigan

Chelsea Parlett

University of California, Irvine

Martin Buschkuehl

MIND Research Institute, Irvine, California, United States

Susanne Jaeggi

University of California, Irvine

Abstract: Working memory (WM) capacity is critically important for the success in school and complex cognitive activities across the lifespan. Training WM skills has shown to lead to improvements in a variety of important cognitive tasks. One's performance on an adaptive and challenging longitudinal WM intervention may serve as an assay of cognitive plasticity. With over 400 participants having completed a minimum of 15 sessions of WM training, we have a rich dataset that allows investigating individual differences and other factors that might determine training outcome using a novel machine learning techniques. Preliminary results suggest that factors such as age, type of n-back, and baseline abilities significantly impact one's ability to improve in training. Other factors such as gender and whether or not training was supervised were not significant. Finally, our model allows prediction of training gain with 78% accuracy.