Hand gesture reflects visual and motor features from multiple memory systems

Caitlin Hilverman
Vanderbilt University Medical Center, Nashville, Tennessee, United States

Melissa Duff
Vanderbilt University Medical Center, Nashville, Tennessee, United States

Susan Cook
University of Iowa, Iowa City, Iowa, United States

Abstract

Speakers gestures provide a visual-motor representation from memory of what is being communicated. Yet the cognitive and neural contributions to gesture form remain unknown. To examine this, we investigated how prior experience was reflected in gesture in three groups: healthy adults, hippocampal-amnesic patients with declarative memory impairment, and brain-damaged comparisons. Participants completed a computerized TOH with differing visual/motor experience (visual curved disk trajectory/button-pressing; no visual disk trajectory/curved mouse-movements). After a 30-min delay when amnesic patients did not explicitly remember completing the TOH participants explained how to do the TOH. We analyzed the form of the gestures produced. Comparison participants and amnesic patients gestured in systematically different ways based on their prior visual and motor experiences. Thus, gesture reflects visual and motor features from representations in multiple memory systems.