

# Everyone can gesture... and knowing sign language improves gesture processing

## Gesturing influenced by cognitive and linguistic factors

Bradley White, Joseph Palagano, Cryss Padilla and Laura-Ann Petitto  
Brain and Language Center for Neuroimaging, Gallaudet University

### Introduction

Gestures are all around us, and they help us communicate.<sup>1-2</sup> We point instinctively to select a pastry or wave happily to get a friend's attention. However, a lack of gesture use can be observed in environments that could facilitate successful communication across cultural contexts (airports, hospitals, refugees), as well as in spaces that predominantly use sign languages. Using gestures is vital in areas where people come together who do not share a language.

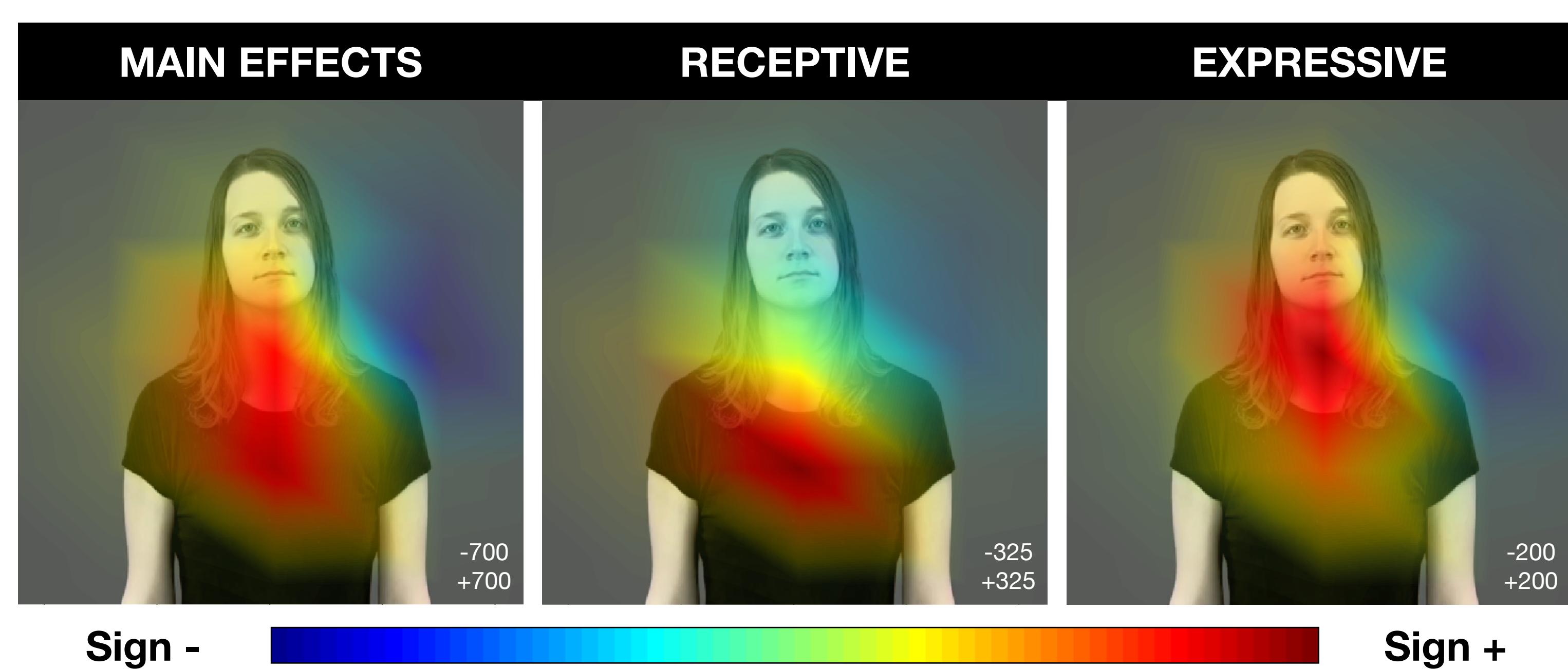
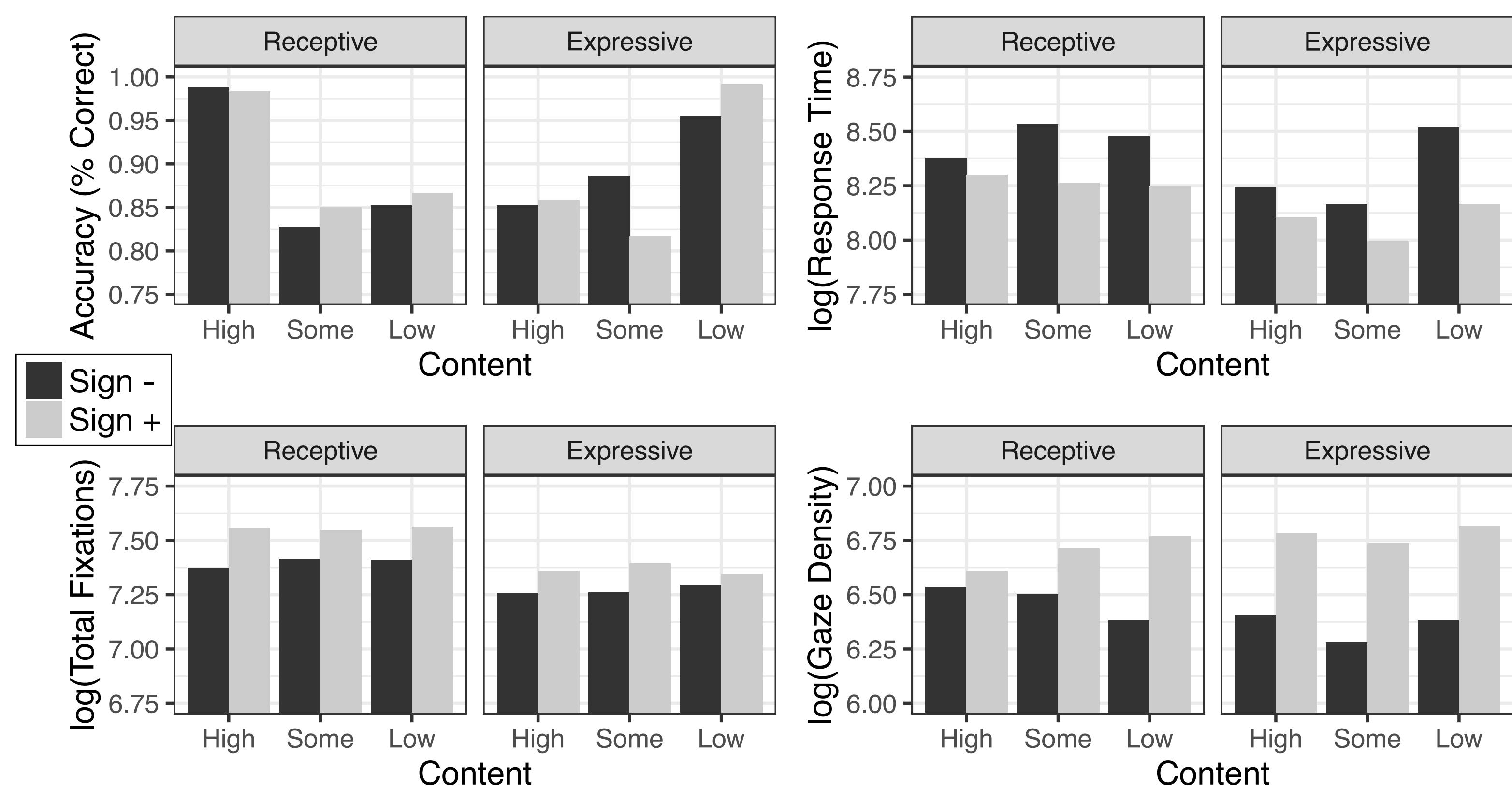
### Methods

We studied factors hypothesized to contribute to successful gesture use (working memory, attention, and sign language experience). Time-locked behavior+eye data were analyzed from 11 *monolinguals* (English only) and 15 *bimodal bilinguals* (English and American Sign Language).



### Results

There were significant main and interaction effects. Both groups were most accurate when perceiving gestures with high semantic content and when producing gestures with low semantic content. Signers were generally more accurate, faster, and used more visual attention (longer fixations, denser gaze) than non-signers, but produced ASL signs more often for gestures with some semantic content.



### Discussion

High semantic content aids in top-down processing when perceiving gestures and low semantic content feeds forward more efficiently to support expressing gestures.<sup>4</sup> There are cognitive and linguistic benefits of visual sign language experience when gesturing, except when there is semantic interference between a sign and a gesture. Gesturing is influenced by cognitive and linguistic factors. Perhaps gesturing could improve with training over time. These results provide new insight into the capacity to communicate with gestures. This knowledge will lead to the creation of optimal gesture learning contexts to best facilitate communication across languages and cultures.

