Why are some individuals better gesturers? Multiple cognitive factors influence performance.

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Gestures are all around us and help us communicate. We instinctively point to select a pastry we want or happily wave to get a friend's attention. Simultaneously, a resistance to gesturing is widely observed, such as in airports and hospitals, where gestures could aid in successful communication across cultural contexts, and in retail spaces that predominately use sign languages. Why are some individuals better gesturers? Using novel online webcam eye tracking during a behavioral task, we investigated key cognitive factors hypothesized to contribute to a person's willingness or resistance to gesturing, specifically language experience, attention, and working memory. Preliminary results from hearing monolinguals (H1, English only, N=5, age=33.5±7.4y) and hearing bimodal-bilinguals (H2, English and ASL, N=10, age=37.9±11.7y) reveal striking group differences. H2 uses a wider visual attention area (VAA) than H1 overall. Comparatively, H2 is more accurate when perceiving gestures (receptive), whereas H1 is more accurate, but slower, when producing gestures (expressive). Higher accuracy relates to larger VAAs, and lower accuracy relates to smaller VAAs. H2 was more accurate when perceiving and producing neutral gestures (no semantic context, "triangle outline"), but H1 was more accurate when producing intangible gestures (low semantic context, "surprised"). This fascinating difference is hypothesized to be due to ASL semantic interference in H2. Both groups performed comparably and most accurately when perceiving and producing tangible gestures (high semantic context, "drinking"). Through combined eye tracking and behavioral analyses, new insight revealed the complex cognitive factors that impact gesture use, such as language experience, attention, and working memory. This work has broad scientific and translational impact by elucidating factors that might drive a person's proclivity to gesturing, and ultimately support successful and robust multi-context gesture use.