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Employment of gestures in spontaneous verbal discourse by speakers with aphasia

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Introduction

Gesture refers to the arm and hand movements that synchronize with speech McNeill (1992). Kong et al. (2012) reported a novel approach to independently analyze gesture forms and functions in spontaneous oral discourse. It was found that about one third of normal speakers did not use any gestures. While content-carrying gestures (e.g., iconic and deictic gestures) mainly functioned to help listeners decode verbal messages, those that are non-content-carrying (e.g., beats) mainly served to emphasize speech content and to regulate conversational flow. Moreover, speakers' linguistic proficiency and age also affected the overall employment of gestures.

This study systematically investigated how gesture use was different between speakers with and without aphasia. Whether gestures differed as a function of aphasia severity, semantic processing impairment, and hemiplegia were also examined.

Method

The participants were 48 Cantonese-speaking individuals with aphasia (36 fluent and 12 non-fluent) and their age-matched controls. All participants were right-handed (premorbidly for the aphasic group). Three sets of language samples and video files, collected through the tasks of personal monologue, sequential description, and story-telling, from the Cantonese AphasiaBank database (Kong et al., 2009) were annotated on linguistic features of each utterance in the narrative, form and function of each gesture.

Results

The aphasic group used significantly more gestures per word than normal controls ($p<0.0001$). An absence of gestures was found in about 10% of the speakers with aphasia during their discourse production. Among those who employed gestures, there was a higher proportion of content-carrying gestures compared with normal speakers, which functioned mainly to enhance speech content. Concerning the non-content carrying gestures, beats were used primarily for reinforcing speech prosody or guiding speech flow, while non-identifiable gestures were mainly used for assisting lexical retrieval or with no specific functions.

Results of the Spearman's rho correlation indicated a negative correlation between aphasia quotients and gesture use ($r=-0.510$, $p<0.01$). Speakers with aphasia who produced a higher percentage of complete sentences or simple sentences in their narratives also tended to use fewer gestures. Among the 30 aphasic subjects who were unimpaired in non-verbal semantic skills, their verbal semantics in terms of object and action naming were negatively related to gestures used per word ($r=-0.507$, $p<0.01$). Finally, hemiplegia, as quantified by the Action

Research Arm Test (Yozbatiran et al., 2008), was not found to affect the use of gestures in speakers with aphasia.

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