

Testing the putative compensatory role of gestures during expressive difficulties: evidence from child and adult language learners' discourse

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Gesture is an important component of spoken communication. Despite the different formats, speech and gesture are tightly integrated as seen in their semantic and temporal coordination (Kendon, 1980, 2004; McNeill, 1992, 2000), as well as in their parallel development in childhood (e.g., Iverson et al., 1994; Capirci et al., 1996; Colletta, 2004).

Gestures are often considered as a compensatory device that speakers in general and language learners in particular (both children and adults) use to overcome expressive difficulties. This notion is implicit in studies of child language acquisition, in which gestures are seen as precursors to language (e.g., Goldin-Meadow, 2003; Pine et al., 2007), and explicit in many studies of adult second language learners, based on the observation that adult learners typically produce more gestures than native speakers (e.g., Nicoladis et al., 2007). Furthermore, some theoretical proposals concerning the gesture-speech relationship assume that representational gestures in particular, i.e., gestures conveying meaning related to the content of speech (Kendon, 2004), have a facilitating function, either aiding lexical retrieval (Krauss et al., 2000) or helping conceptualisation, or information packaging (Alibali et al., 2000; Kita, 2000).

Under the assumption that learners use representational gestures as compensatory devices, and if gestures facilitate lexical retrieval and conceptualization, this predicts that representational gestures should mainly occur in stretches of disfluent speech. However, there is some evidence to suggest that gestures stop when speech stops (Mayberry et al., 1998; Ragsdale & Silva, 1982; Seyfeddinipur & Kita, 2001). Furthermore, as regards learners, there is some evidence that adult learners gesture more during fluent than disfluent speech and that most gestures during expressive difficulties are not representational but pragmatic (Gullberg, 1998), i.e. conveying non-referential meaning (Kendon, 2004). Very little is known about children's corresponding behaviour.

This study therefore aims to test the putative compensatory role of gestures and their functional distribution relative to disfluencies by comparing child and adult learners' gestural behaviour while producing narrative discourse in the form of cartoon retellings in dyadic, interactive settings.

The analyses draw on gestures accompanying narrative production by 33 Italian children divided into three age groups (4-5; 6-7; 8-10 years), each containing 11 subjects, and 8 Dutch adult learners of French as a second language at low to intermediate levels of proficiency. All spoken disfluencies are identified in the total recordings of the children and in 1,5 minutes from the middle of the recordings in the adults. The disfluencies are classified into filled and unfilled pause, interruption, repetition, lengthening and self-correction. Further, all gestures are identified and grouped depending on whether they occur with fluent or disfluent speech. Gestures are further coded for structural properties (complete vs. interrupted stroke) and for function (referential vs. pragmatic gestures).

Preliminary results indicate (1) that both child and adult L2 learners chiefly produce representational gestures during fluent speech and tend not to produce gestures during disfluencies; (2) gestures that do occur during disfluencies are predominantly pragmatic, although adults also occasionally produce representational gestures. Moreover, the use of pragmatic gestures during disfluencies shows a developmental trend and their use steadily

increases with age; (3) the two learner groups show a different gestural behaviour during the resumption of speech, particularly in the use of modal pragmatic gestures conveying that the spoken element must be interpreted as a "good enough solution". Such gestures are frequent in adult learners, but absent in the four-year-olds, emerging only in six-year-olds, when pragmatic gestures in general begin to appear.

In sum, this study shows that learners' gestural production differs in fluent vs. disfluent stretches of speech. The findings constitute an important challenge both for theories of acquisition and for gesture theories assuming a mainly (lexical) compensatory role for (representational) gestures. The data strongly suggest that when speech stops, so does gesture. Moreover, the observation that gestures that do accompany disfluencies tend to be pragmatic gestures which are subject to development, raises further important challenges for theories concerning the speech-gesture relationship which have hitherto been based on subsets of gestures (representational) and on adult, competent, fluent speakers. Together, the findings provide strong support for the notion that speech and gestures form a tightly integrated system even in developing language users, whether they are children or adults.

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