

Gesture, prosody, and sentence imitation in neurotypical and clinical preschool and primary school children

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Abstract

Imitation has been shown to act as a core mechanism for early social, communicative, and language development (Carpenter et al., 1998, 2005; Hanika & Boyer, 2019), and imitation deficits have been linked to difficulties in social communication skills (Nadel, 2014). While the crucial role of prosodic and gesture imitation is well-documented and sentence imitation tasks are often used as diagnostic tools, few studies have compared imitation developmental paths and fewer still have assessed imitation globally considering both multimodal (gesture, prosody) and verbal aspects. This study compares the development of imitation skills in neurotypical and clinical children of preschool and early school age by focusing on multimodal imitation, that is, the imitation of target sentences, their prosody and accompanying gestures.

A total of 292 Catalan-Spanish bilingual children (129 girls; 237 neurotypical, 55 clinical) between ages 3 and 7 participated in the study ($M_{\text{months}} = 59.6 (\pm 9.5)$). Following a transdiagnostic approach (Astle et al., 2022), the clinical group included children with and at risk of Autistic Spectrum Disorder and Developmental Language Disorder and children with severe linguistic difficulties. All children undertook the Multimodal Imitation Task (Castillo et al., 2023) in which they were asked to repeat pragmatically contextualized sentences at the same time reproducing their prosodic contours (i.e., statements, questions, exclamations) and imitating co-speech gestures (e.g., conventional, iconic). The responses were evaluated perceptually.

Linear mixed effect models showed that the clinical group had overall significantly lower scores for gesture and sentence imitation than the neurotypical group (main effect of group, all $p < .001$) but not for prosody. Moreover, age had a general effect on all three imitation scores, with scores improving with age across the children (all $p < .001$). Interestingly, a significant interaction of age and group was found for gesture ($p < .001$), showing that only the neurotypical group improved significantly in gesture imitation as they got older.

The results show a significant delay in the acquisition of imitation skills in clinical children, with gesture and sentence imitation being particularly impaired. Overall, this study shows clearly different developmental paths of multimodal imitation in neurotypical and clinical children.