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Title: Imitation characteristics of one-year-old children and their relation to language and motor development

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Abstract

Background: Imitation is one of the most fundamental ways of learning, which develops in the first years of life in parallel to the development of cognitive, motor and communication skills. Occupational therapists research imitation because of its importance for the development of play, social participation, and independence in the activities of daily life. There are clinical populations who show deficits in imitation, such as those with autism spectrum disorders (ASD). The study objectives were to develop an evaluation tool for studying the components of imitation and identifying those components that are typical versus atypical at 12-months of age, and thus guide use of imitation in early screening for infants at developmental risk.

Method: This is a secondary analysis of data from a longitudinal early screening study for social-communication disorders at one year of age in Israel, conducted at the University of Haifa by Dr. Ayelet Ben-Sasson. The study included 64 infants aged 11-13 month (mean 12.3+-0.62). Following parent report on the First Year Inventory (FYI), infants participated in an evaluation including the Autism Observation Scale for Infants (AOSI) and the Mullen Scales of Early Learning (MSEL). For the purpose of the current study the AOSI imitation tasks were video coded. Tasks included a repetitive sequence of actions with and without an object and demonstration was accompanied by a vocal effect. Coding was performed according to the Coding Imitation System (CIS) developed for this study. This included coding for the presence of a single motor imitation or a sequence, a single vocal imitation or a sequence, and integration of motor and vocal imitation.

Results: An internal reliability of α =0.91 and inter-rater reliability of Kappa = 0.93 ($p<.001$) demonstrated good reliability of the CIS. Of the observed imitation 98% was motor imitation, and about 20% of infants were able to integrate motor-vocal imitation. In this research, the relationship between motor imitation and motor development was insignificant. However, significant correlations were found between the ability to imitate with an object and the level of expressive language on the MSEL ($r=.40$, $p<0.01$), and between vocal imitation and the average imitation score reported by parents in the FYI ($r=.25$,$p<0.05$). The results also show, that already at the age 13 months CIS imitation score is significantly ($Z= -2.37$, for sum imitation and $Z= -2.30$ for vocal imitation, $p<.05$) higher for infants with high (above T=51, $n=25$) versus low (below T=38, $n=21$) MSEL expressive language.

Conclusions: Validity and reliability results indicate that the CIS can be used to assess different aspects of imitation and in the future, can assist in early detection of infants with poor social-communication development. The high rate of motor imitation and imitation with objects at one-years of age point to the advantages of these imitation parameters for screening infants at developmental risk. Results showed an association between imitation and language development which possibly reflect common symbolic mechanisms. There is need for further research of the relation between early imitation and later developmental patterns and disorders for guiding the utility of imitation in evaluation and intervention for young children.