Title: Developmental Trajectory Analysis of Verbal and Every Day Long Term Memory: A Comparison of Persons with Intellectual Disability with and Without Down Syndrome

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Introduction: Down syndrome (DS) is the most common genetic cause of intellectual disability, occurring in approximately 1 in 691 US live births (Parker et al., 2010). In the research presented here, we examined the relationship between verbal and everyday Long-Term Memory (LTM) in persons with DS relative to persons with Intellectual Disability (ID) and not DS. Verbal LTM is used to refer an ability to remember words or other abstractions related to language. It is typically measured by participants’ learning and recall of a series of words or names (e.g., Delis et al., 2000). Everyday LTM is used to refer to an ability to remember relevant facts and episodes of one’s daily activities and can be measured by participants’ recall of a series of real life events or facts such as parents’ names, meals in the last 24 hours and waking up time (e.g., an ecological questionnaire, Pennington et al., 2003). The extant research generally indicates that persons with DS exhibit deficiencies in verbal LTM relative to MA matched groups (e.g., Pennington et al., 2003). Although the available research is limited, persons with DS seem to perform at their intellectual level on measures of everyday LTM (Pennington et al., 2003). To evaluate this relationship, we performed cross-sectional developmental trajectory analyses using nonverbal MA as the developmental variable.

Method: Participants were 25 adolescents/young adults with DS, (mean nonverbal mental age (NVMA)=61.47 months; mean chronological age (CA)=211.36 months), and 25 participants with ID and not DS, (mean nonverbal mental age (NVMA)=65.65 months; mean chronological age (CA)=207.44 months). The Leiter-R (Roid & Miller, 1997) was administered as a measure of NVMA. Verbal Long-Term Memory was assessed by presenting participants a list of 15 one-syllable words by the experimenter (e.g., ball, pen, shoe, box, shovel, doll). After the presentation of the entire list, participants were asked to recall as many words as possible. The list, followed by immediate recall, was repeated for a total of five times. Everyday Long-Term Memory was assessed by asking participants ten questions of their everyday experience including own birthday, teachers’ name, phone number, street name, breakfast, bedtime, afterschool activity, type of pets owned, number of sibling and school name were asked of the participant and one parent (whose responses were used to score the participant).

Results: For the primary analyses of interest, developmental trajectories using MA as the developmental variable were compared. The three-way interaction was significant, F(1,33)=7.78, p=.009, ɳ²p =.191. Persons with ID and not DS demonstrated similar developmental trajectories of everyday and verbal LTM across the MA range tested. However, for persons with DS, only everyday LTM increased with MA whereas verbal LTM did not. In addition, persons with DS performed worse in verbal LTM but similar in everyday LTM relative to persons without DS.

Discussion: Participants with DS exhibited a different pattern of performance relative to their NVMA for the two measures of LTM than did the participants without DS. Hence it appears that verbal LTM presents a unique problem for them. This is true in spite of the fact that response to the everyday memory questions were also learned and recalled verbally. Apparently, it is easier to remember real life events and facts than artificial materials that are not personally relevant such as the word learning task. Perhaps everyday LTM emphasizes what participants know and can retrieve from their LTM, rather than the acquisition process. It may be that the acquisition process is relatively more deficient in LTM than is retrieval for DS relative to ID.

References/Citations: