**The earliest stages of L2 learning: A behavioral investigation of age and memory**

 Learning abilities related to declarative and procedural long-term memory have been extensively investigated as individual differences in adult L2 learning in the last ten years (Morgan-Short et al., 2014; Hamrick et al., 2018). Although research in the area of specific language impairment has started to elucidate the role of these cognitive predictors in child populations, no behavioral studies to date have attempted to compare how L2 learning is modulated by long-term memory in learners of different ages.

 The present laboratory study addresses two main research questions: (1) the extent to which children and adults differ in the learning of linking rules between thematic roles and morphosyntax in a novel L2; and (2) the extent to which declarative and procedural learning ability modulate L2 learning in the two groups over the course of L2 practice.

 In the context of a computer board game in incidental instruction conditions, 40 L1 Italian 8-9 year olds and 36 L1 Italian young adults were individually aurally exposed to the artificial language BrocantoJ (a version of Brocanto, Friederici et al., 2002; Morgan-Short, 2007) over three sessions on three consecutive days (264 sentences in total). Behavioral standardized memory tasks, vocabulary learning ability, and an alternating serial reaction time task provided measures of visual/verbal declarative and procedural learning ability respectively. Language learning was assessed via an online measure of comprehension, with a subset of the stimuli specifically probing the learning of form-meaning relationships (linking rules between thematic roles and subject/object positions and between thematic roles and case markers).

 Generalized mixed-effects models fitted to the online training data revealed that, although adults attained higher accuracy levels and were faster learners compared to children, the two groups did not differ qualitatively in what they learned. Clearer age differences emerged relative to the cognitive variables. Whilst declarative learning ability was a significant predictor of accuracy in both groups, a significant increase in the effect of procedural learning ability over the course of practice was found only in the child group.

 Further, whilst there was evidence of a significant negative interaction between declarative and procedural learning ability in children, the interaction was positive in adults. To the best of the author's knowledge, the study provides the first behavioral evidence of a competitive relationship between memory systems in child L2 learning, and its results point towards an important cognitive difference in the early phases of L2 learning in children and adults beyond the evidence offered by L2 attainment measures.