**A behavioral investigation of the role of procedural learning ability in the earliest stages of child L2 learning**

In the last ten years a number of behavioral and electroencephalogram studies have examined the effects of declarative and procedural long-term memory skills on adult L2 learning (e.g., Morgan-Short et al., 2014). Although research in the area of specific language impairment has investigated these cognitive predictors in child populations (e.g., Hedenius, 2013; Lum et al., 2010, 2013), close to no behavioral studies to date have sought to elucidate whether and how declarative and procedural long-term memory modulate L2 learning in children.

The present laboratory study addresses two main research questions: (1) the extent to which procedural learning ability contributes to child L2 learning in its initial stages, and (2) the extent to which declarative and procedural long-term memory competitively or cooperatively interact during child L2 learning.

In the context of a computer board game in implicit instruction conditions, 40 L1 Italian 8-9 year olds 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 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 and a grammaticality judgment task testing morphosyntactic learning.

For the grammaticality judgment test, a mixed-effects model analysis revealed that, unlike declarative learning ability, procedural learning ability was a statistically significant predictor of child L2 learning. By contrast, the model fitted to the online training data showed a significant effect of declarative learning ability with the effect of procedural learning ability significantly increasing as training progressed. In this second model, a significant competitive interaction between declarative and procedural learning ability that decreased over the course of training was also found. To the best of the author's knowledge, this provides the first behavioral evidence of a competitive relationship between memory systems in child miniature L2 learning.

Finally, the grammaticality judgment test results are in contrast with the findings of most adult studies where similar artificial language paradigms have been used, and point towards an important cognitive difference in the early phases of L2 learning in the two age groups.

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