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Implicit Learning and Lexical Development

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A growing body of work demonstrates that the form of a language emerges ontogenetically from patterns implicit in the input (e.g., MacWhinney, 1998). We propose that implicit learning mechanisms are significantly implicated in the process of language acquisition. While the role of implicit learning has been well-studied in the domain of reading acquisition (e.g., Waber *et al.*, 2003), it has not, to our knowledge, been directly studied in relation to language development. Implicit learning mechanisms are distinct from those of explicit learning at the computational, algorithmic, and implementational levels. One paradigm, the Serial Reaction Time (SRT) task, provides a sensitive measure of implicit learning; furthermore, even young children can perform this task (e.g., Thomas *et al.*, 2004).

Most aspects of morphosyntactic acquisition are completed in early childhood, leading to ceiling effects make the relationship between morphosyntactic skill and implicit learning difficult to measure in adulthood. In contrast, lexical (vocabulary) learning continues through the lifespan: adults do continue to learn new words. The current study marks an initial step in an effort to explore the role of implicit learning in language acquisition by examining implicit learning and lexical abilities in a sample of healthy adults and children.

Methods

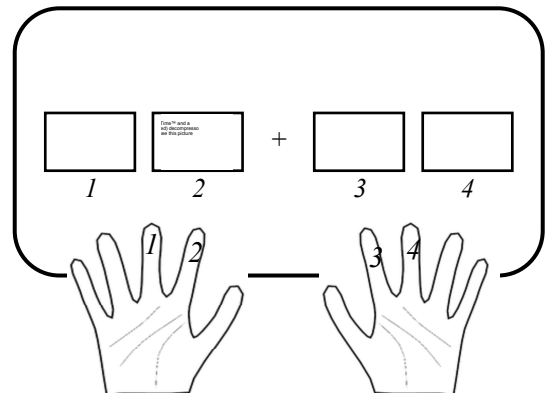
A large sample of college undergraduates ($n = 50$) participated in the study. All of them denied the presence of learning disabilities. A sample of 10 children ages 3-5 also participated; $n = 3$ are included here.

In the SRT task, participants were presented with a cartoon stimulus that appeared in one of four boxes (see Figure 1). A 10-item sequence governed the location in which the stimulus appeared (e.g., it first appeared in Box 2, then Box 1, etc.). Trials alternated between this fixed 10-item sequence and a pseudorandom order. Sequenced and pseudorandom blocks were interleaved over five runs of 192 trials. Learning was measured as the relative decrease in RT for the sequenced, but not random, trials, from Block 1 to Block 5. In addition to the SRT task, participants completed a) the Peabody Picture Vocabulary Test (PPVT) and b) a written questionnaire reporting verbal and quantitative SAT scores. These tasks were intended as an exploratory measure of verbal (specifically, lexical) skill.

Results

The adult data indicated a striking correlation, not driven by outliers, between performance on the SRT (decreases in RT) and PPVT scores, $r = .29, p < .05$, as well as self-reported SAT *verbal* ($r = .38, p < .01$) but not *non-verbal* ($r = .18, p > .3$) scores. While correlations in the child data did not reach significance with $n = 3$, the relationship between PPVT and SRT performance was in the same direction. Data indicate the particular relevance of implicit learning for language, or at least vocabulary, development. Implications for language disorders will be discussed.

Figure 1: Schematic representation of SRT task.



Acknowledgments

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References

- Thomas, K. M., Hunt, R. H., Vizueta, N., Sommer, T., Durston, S., Yang, Y., et al. (2004). Evidence of developmental differences in implicit sequence learning: an fMRI study of children and adults. *Journal of Cognitive Neuroscience*, 16(8), 1339-1341.
- Waber, D., Marcus, D., Forbes, P., Bellinger, D., Weiler, M., Sorensen, L., et al. (2003). Motor sequence learning and reading ability: Is poor reading associated with sequencing deficits? *Journal of Experimental Child Psychology*, 84(4), 338-54.