

A return to childhood? the retrogenic production/comprehension asymmetry in Chinese older adults

Chenwei XIE¹, William Shiyuan Wang²

^{1,2}Research Centre for Language, Cognition, and Neuroscience, Department of Chinese and Bilingual Studies, Hong Kong Polytechnic University

²Research Institute for Smart Ageing, Hong Kong Polytechnic University

¹chenwei7.xie@connect.polyu.hk ²shiyuan.w.wang@polyu.edu.hk

Abstract: The retrogenesis hypothesis proposes that the order of breakdown of language abilities in older adults is the reverse of children's developmental order (Reisberg et al., 1999). In order to examine the retrogenesis hypothesis, the current study investigated whether production/comprehension asymmetry (PCA), which is frequently observed in children, would reversely occur in older adults. On the other hand, this study further probed the impact of declarative and procedural memory on PCA (Ullman, 2004), since language operates in a mosaic manner by linking various cognitive abilities (Wang, 1982). 21 younger adults (mean age = 24.4 ± 2.7 , range = 19-30; 13 males) and 19 cognitively healthy older adults (mean age = 68.1 ± 2.6 , range = 65-76; 9 males) were recruited to perform language production and comprehension tasks as well as memory tasks. Electroencephalogram (EEG) data were collected during comprehension tasks. The Min-Max normalization method was used to normalize expressive and receptive data. Paired Wilcoxon signed rank tests revealed that semantic PCA emerged in older adults where comprehension is superior to production (expressive semantic complexity: Mdn = 0.20; N400 amplitude: Mdn = 0.49; $V = 158$, $p = 0.009$). As children exhibit PCA that comprehension is acquired earlier or faster than production during semantic development (Benedict, 1979), older adults exhibit the reverse pattern in which comprehension declines slower than production. Furthermore, only the receptive modality of semantic ability was correlated with procedural memory among all participants ($r(38) = .36$, $p = .024$). Language is the hub of various basic cognitive abilities. These cognitive abilities are not strictly connected to certain language abilities in a one-to-one way, rather they can be selectively and purposefully reused to support various language abilities. In addition to declarative memory, the current study found procedural memory also supported semantic processes, but only for comprehension performance. This study replicated and extended previous research on the declarative/procedural model. Furthermore, it is likely that the semantic PCA is caused by this lifelong selective correlation. The current study furthers our understanding of age-related language loss and discusses potential interventions to address it.

Reference

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