

INDIVIDUAL DIFFERENCES IN SEMANTIC PROCESSING IN OLDER ADULTS: A NATURALISTIC EEG STUDY ON CANTONESE

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The World Population Aging Report (United Nations, 2019) assumes that the population of seniors aged 65 years and over will double in the next three decades. The largest number of seniors will reside in Eastern and South-Eastern Asia. The number of older persons in Hong Kong (HK) alone will double from 1.27 million in 2018 (17.9% of the population) to 2.44 million in 2038 (31.9%). It is, therefore, important to conduct more research on this population and embrace the demographic shift. Previous studies have reported changes in language comprehension due to healthy aging as indicated by N400 ERP. While linguistic knowledge increases because of healthy aging, decline in domain-general cognitive functions such as processing speed and working memory usually affect semantic processing speed. On the other hand, the healthy aging trajectory is not identical for all humans because little is known about inter-individual differences. Therefore, we here investigate what linguistic and cognitive functions would affect semantic processing in older Cantonese speakers. Forty participants listened to 20 minutes of the story Little Prince in Cantonese. In addition to ERP, we also measured verbal fluency, domain-general processing speed, working memory, inhibitory control, naming speed, and linguistic experience such as proficiency and exposure to the languages. Betas were extracted for the time window 300-500ms (N400) using regression-based ERP (rERP). The dependent variable was the average scalp potential over six channels Cz, C3, C4, Pz, P3, and P4. We used Bayesian mixed effect modelling to analyse the data. Our findings showed that domain-specific processing speed as measured by verbal fluency was the most influential variable in language comprehension in older adults. This demonstrates the importance of lexical access speed in bigger lexicons such as the ones in older people.

Keywords: Cantonese, Bayesian, EEG, Healthy Aging, Naturalistic, Semantic processing