
To buy, or not buy: Aging and understanding of spoken language in a naturalistic ‘stock price monitoring’ task

Michael Falkenstein^{*1} and Stephan Getzmann^{†2}

¹Leibniz Research Centre (IfADo) – Ardeystr.67, 44139 Dortmund, Germany

²Leibniz research centre (IfADo) – Ardeystr.67, D-44139 Dortmund, Germany

Abstract

Numerous studies suggested an age-related decline in speech perception under difficult listening conditions. Here, spoken language understanding of two age groups of listeners was investigated in a naturalistic “stock price monitoring” task. Stock prices of listed companies were simultaneously recited by three speakers at different positions in space and presented via headphones to 14 younger and 14 older listeners (age ranges 19-25 and 54-64 years, respectively). The listeners had to respond when prices of target companies exceeded a specific value, but to ignore all other prices as well as beep sounds randomly interspersed within the stock prices. Older listeners did not produce more missing responses, or longer response times than younger listeners. However, differences in event-related potentials indicated a reduced parietal P3b of older, relative to younger, listeners. Separate analyses for those listeners who performed relatively high or low in the behavioural task revealed a right-frontal P3a that was pronounced especially in the group of high-performing older listeners. Correlational analyses indicated a direct relationship between P3a amplitude and spoken language comprehension in older, but not younger, listeners. Furthermore, younger (especially, low-performing) listeners showed a more pronounced P2 on irrelevant beep sounds than older listeners. These subtle differences in cortical processing between age groups suggest that high performance of older middle-aged listeners in demanding listening situations is associated with increased engagement of frontal brain areas, and thus the allocation of mental resources for compensation of potential declines in spoken language understanding.

*Speaker

†Corresponding author: getzman@ifado.de