Can Age-Related Sensory Degradation Account for Cognitive Slowing and Attentional Deficits in Older Adults?

Older adults often find it more difficult than younger adults to understand conversations in noisy situations and to maintain focused attention in cognitively-demanding tasks. These age-related deficits have been commonly interpreted as reflecting age-related impairment in selective attention or cognitive slowing. Three studies will be presented that support a third possibility, an age-related sensory degradation. In the first study, eye tracking was used to investigate age differences in real-time lexical processing in quiet and in noise. Twenty-four younger and 24 older adults followed spoken instructions referring to depicted objects, e.g., "Look at the candle". Eye movements captured listeners' ability to differentiate the target noun ("candle") from a phonologically similar alternative (e.g., "candy" or "sandal") in quiet and in noise. Having controlled for age-related differences in word recognition accuracy, by tailoring noise levels, similar on-line processing profiles were found for younger and older adults when targets were discriminated from alternatives sharing onset sounds. Hence, real-time spoken word recognition processes appear similar for younger and older adults in most conditions, once sensory demands are equated. In a second study, we tested an alternative sensory origin for the age-related increase in color-word Stroop effects, generally taken as a yardstick for reductions in selective-attention. Eighty-eight younger adults performed a Stroop test with two color-sets, saturated and desaturated, to mimic an age-related decrease in color perception. Color manipulation with younger adults was sufficient to lead to an increase in Stroop effects that mimicked age-effects. This result is consistent with our third study, a meta-analysis linking age-related sensory losses to Stroop declines documented in the literature.