**Aging changes cognitive biases**

**Background**

Humans operate in a social environment in which attention is influenced not only by the perceptual properties of stimuli (e.g., size, colour) but also by their social relevance – for example, whether a stimulus is associated to ourselves rather than to another person. Previous studies demonstrate that self-related stimuli have high salience for human attention – we term this ‘self salience’ (Sui et al., 2012; Stotle et al., 2017). There is emerging evidence that the salience of the self is not constant across the age range but changes in older adults. For example, memory performance in older adults is more affected by self-related stimuli, when compared with younger participants (Gutchess et al., 2007, 2010), consistent with lay reports that older people become more self-absorbed and inward-looking. To date, though, there is little systematic study of the factors that may be critical in producing greater self-bias, or how increases in self-bias may change perception in older adults. For example, do increases in cognitive bias relate to increased sensitivity to self-related information? Are these increases related to reduced neural control relative to responses to salient stimuli? A differential perceptual bias towards self-related stimuli may also be an important predictor of wider-spread changes in social cognition in older adults. These questions were tested in this project.

**Objectives**

We exploited perceptual matching procedure to evaluate effects of self saliency on perception to assess how self biases change in older adults (Sui & Humphreys, 2017). We assessed whether perceptual changes in older individuals did mirror those in young adults, and (ii) whether increases in self-bias in older adults correlated with self-reported personal distance.

**Methods**

***Participants and Recruitment***

Three age groups (young, 60-69, 70+ group) were recruited.

Elderly participants (60-69 group, 70+ group) were a consecutively selected set of healthy controls at the Oxford Cognitive Neuropsychological Centre.

Inclusion Criteria:

* Aged above 60
* Fluent in written and spoken English
* Normal or corrected-to-normal vision

Younger adults were recruited from the University of Oxford.

***Simple size***

The sample size was determined by the prior studies in order to get a reasonable effect size (e.g., Sui et al., 2012; Stolte et al., 2017). Power analyses showed that 20 participants in each group achieved conventional statistical power (>.80) for the critical comparisons of interest (self vs. others) according to the obtained effect size (d = 1.0 and criteria of α at .01), and 30 participants in each group achieved power of .80 with an alpha of .05 for correlation analyses. To mitigate against missing data and enhance statistical power, we recruited 33~36 participants per group.

**Measures**

***Self matching task***

The matching task measured self-bias in perception where participants were instructed to associate one of three shapes with the self, their best friend, or a stranger. There were no images of stimuli displayed during the instruction stage (circle=you; square=your best friend; triangle= a stranger) (Sui et al., 2012). After the instruction, participants had to judge whether a simultaneously presented shape and label pair matched. Participants were encouraged to make a response as quickly and accurately as possible. A feedback message (correct, incorrect, or too slow) was then given for each response. Participants were also informed of their overall accuracy at the end of each block. There were six blocks of 60 trials following 24 practice trials. Thus there were 60 trials for each match and mismatch condition.

***Self-reported personal distance measurement***

Participants were required to indicate the personal distance between any two people by making two marks on a straight line (i.e., self and stranger, friend and stranger, self and friend), with the physical distance between the marks serving as an index of the personal distance between the individuals (Sui & Humphreys, 2015). There were 10 trials per pairing, half the trials started from one person (e.g., self-friend), and the other started from the other person (friend-self).

**Procedure**

Participants first completed the matching task in which the exposure durations and blank intervals differed across the age groups in order to achieve comparable accuracy of matching associations, which was tested in a pilot session. If older participants failed to complete 24 practice trials, stimuli then were presented on the screen until a response was made.

Following the matching task, participants underwent the personal distance measures.

**References**

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