The Effect of Stimulus Age Range on Facial Age Estimations

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Introduction

Biases in facial age estimation could stem from different sources:

- A *regression to the mean* causes younger faces to be overestimated, while older faces are largely underestimated compared to their chronological age. This bias is likely related to people's tendency to use the estimated mean of a given age distribution as a reference point for their judgments (1,2). Such an effect could be local (created by the immediate experimental context) or long-term (based on participants' priors).
- A serial dependency effect biases age estimates systematically towards the age of previously presented face, demonstrating a different source of immediate perceptual effect (1).

The current study

- We examined the contribution of local and long-term effects on biases in age estimations. To this end, we manipulated the age range of the experimental context.
- A total of 240 facial images were divided to three age-range groups: Young (20–40), Middle aged (41–60) and Old adults (61–80) faces.

Stimuli and design

- Each stimulus was presented individually. A total of 80 stimuli were presented sequentially for each participant.

Method

- Participants completed an online age estimation task with facial stimuli presented with a narrow age range (young, middle, or old adults) or a wide age range (20-80 years).
- Participants were asked to evaluate the age of each person in years.

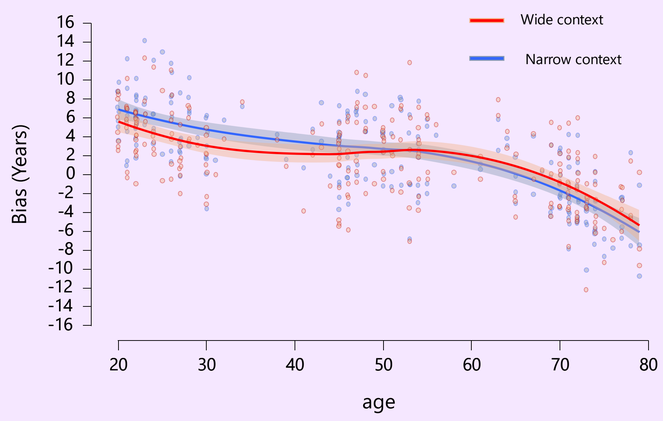
Results

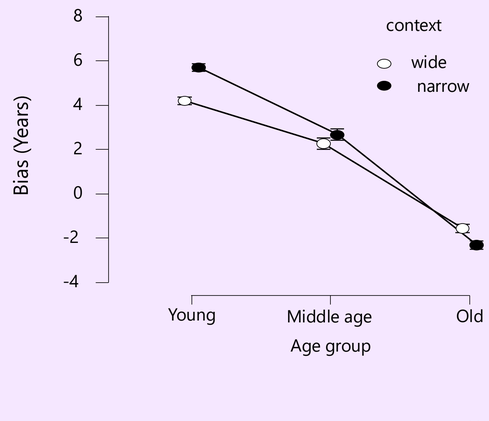
Two different errors in age estimation:

Bias = ∑(estimated − chronological age)/n.
Absolute accuracy = ∑ ABS(estimated − mean perceived age)/n.

Mean bias

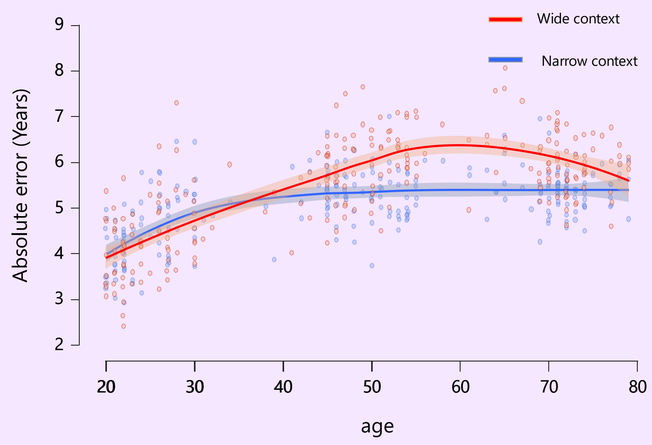
- A main effect of context: $F(1,237) = 18.91$, $p < .001$.
- A main effect of age group: $F(2,237) = 79.61$, $p < .001$.
- A context × age group interaction: $F(2,237) = 55.36$, $p < .001$.
- Biases were larger under the narrow context, especially for young and old adults faces.

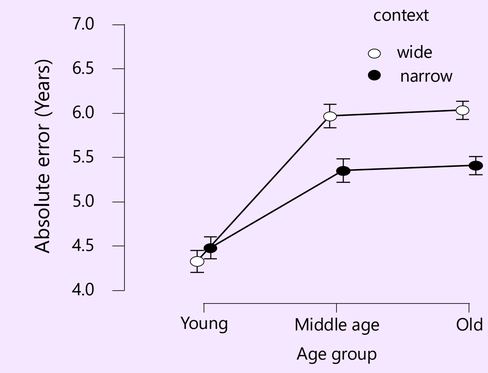




Absolute accuracy:

- A main effect of context: $F(1,237) = 53.33$, $p < .001$.
- A main effect of age group: $F(2,237) = 129.98$, $p < .001$.
- A context × age group interaction: $F(2,237) = 26.71$, $p < .001$.
- Accuracy was lower in the wide context, but only for middle and old adults' faces.





Conclusions

- Contrary to our predictions, age estimation biases were greater under the narrow-range context, which is also in contrast to the predictions of assimilative serial dependency effects.
- Accuracy was higher in the narrow context, presumably due to increased resolution under smaller ranges.
- The results highlight the complexity of contextual effects in facial age estimation.

Reference

(1) Clifford, C. W. G., Watson, T. L., & White, D. (2018). Two sources of bias explain errors in facial age estimation. *Royal Society Open Science*, *5*(10), 180841–180841.

(2) Voelkle, M. C., Ebner, N. C., Lindenberger, U., & Riediger, M. (2012). Let Me Guess How Old You Are: Effects of Age, Gender, and Facial Expression on Perceptions of Age. *Psychology and Aging*, *27*(2), 265–277.