Age difference in Auditory Pattern Separation and Statistical Learning

Methods

Participants

?? younger

= Stark (2015): 23 young (18-28), 21 old (60-83)

The difference in lure discrimination between younger and older group

1 variable, 2 levels, 2 groups

One-way ANOVA

Questionnaire (age, yrs of education, gender, English speaker, normal hearing, normal vision, Neuropsych history, previous experience of similar task)

Consent / LOI at the beginning

Hearing test at the end

**Effects of aging and depression on mnemonic discrimination ability**

* Overall accuracy (percentage) was lower for elderlies (55-90, n=24) than young adults (18-35, n=52); F(1,67) = 7.819, p = .007, partial **η2 = 0.105**

**Domain general processes moderate age-related performance differences on the mnemonic similarity task**

* There was a significant main effect of group, F(1,48) = 6.74, p = .013, **η2pηp2 = .12**, indicating that YAs (18-27, n=25) performed better than OAs (60-86, n=25) overall

Effect sizes were large for the comparison of young vs. OI (Old-impaired) (**d = 2.31**)

* Old impaired = those who fell below normal range on the HVLT-R test
* Also large difference between Old unimpaired and impaired (***d* = 1.561**)
* But no difference between OU and YA reported
* Accuracy for lure items (“Similar” | Lure)

**Procedure**

* Session I:

1. LOI/Consent
   1. Purpose
   2. Explain the two-session format
   3. Payment after each session is done
   4. Cannot exit or restart the study, if any problem, report to the researcher
   5. Length and nature of the study (demographics, sound stimuli, hearing check etc.)
   6. Sound environment set-up
   7. Ethics stuff (voluntary participation, anonymization, data storage etc.)
   8. Proceed if consent, exit if not
2. Hearing check etc.
3. Study I (MST or SL) – randomized by Psychopy (condition recorded)
4. Exit

* Get participant list. Put into two conditions. Make two follow-up invitations, based on which one they have been randomized to
* Session II:

1. No LOI/consent
2. Hearing check etc.
3. Study II
4. Questionnaire with a link to Shoebox.com
5. Exit

**Data collection**

Session 1

**Screening**

Manually look at the data and exclude anyone who:

1. Does not meet the demographic criteria (based on answers on Qualtrics, including hearing)
2. Failed more than half of the headphone checks
3. Failed on one or more attention checks in the SL task
4. False alarm rate is too high
5. MST recognition is too low

**Analysis plan**

SL

1. Check if average RT for pos3 is *significantly* faster than pos1 for each individual
   1. Repeated measure ANOVA??
2. Check if average RT for pos3 is *significantly* faster than pos1 for group average\
   1. Mixed effects linear regression
      1. Fixed effect: Syllable position (3 levels), order (categorical; 3 levels), position \* order
      2. Random effects: (1+position: Subject)
3. Average RT per syllable (across groups, per age group)
4. Average RT per position (across groups, per age group)
5. Individual familiarity effect
   1. Simple subtraction (ANOVA?)
6. Average familiarity effect
   1. Average difference between Word and Nonword
   2. Any effect of age group?
   3. Mixed effects linear model
      1. Fixed effects: Word type (3 levels), age group (2 levels)
      2. Random effects: Subject
      3. *Check Aedan’s file*
7. Group average difference in AFC accuracy
   1. GLM
      1. Accuracy ~ Group (2 levels)

MST

1. Group comparison of d(discrimination)
   1. GLM (or ANOVA?)
      1. d-prime ~ Group (2 levels)
2. Group comparison of d(recognition)
   1. GLM (or ANOVA?)
      1. d-prime ~ Group (2 levels)
3. Get average accuracy for each word type, per each group
4. *Similarity effect (\*exploratory)*
   1. *Accuracy for lure in each similarity bin, determined based on previous sample*
   2. *Plot the accuracy per bin for each group, see if they differ significantly at each bin level*

MST and SL (\*exploratory)

1. Correlation per group and across group
   1. Correlation between d(discrimination) and familiarity effect
   2. Between d and AFC
   3. Between d and RT effect