Visual Statistical Learning - Honours Year Project, May 2019 (#23994)

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1) Have any data been collected for this study already?
No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?
Does stimulus familiarity improve visual statistical learning of patterns involving those stimuli?
What is the relationship between perceptual fluency and statistical learning performance?
Do people have higher perceptual fluency for familiar visual stimuli over unfamiliar visual stimuli?

3) Describe the key dependent variable(s) specifying how they will be measured.
For each individual we will calculate two measures:
Statistical learning performance (SLscore): total accuracy score out of 42 test items like those in Siegelman, Bogaerts, and Frost (2017)
Perceptual fluency (PFscore): the mean target latency over 48 test trials, as detailed in our previous experiment here: https://psyarxiv.com/7jvx8/

4) How many and which conditions will participants be assigned to?
All participants will experience a similar experiment in which they undergo two statistical learning tasks, one using unfamiliar artificial stimuli and one using Chinese characters as stimuli. The conditions are instead defined by the nature of the participants, with approximately half being native Chinese speakers and the other half speaking no Chinese.

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
Does stimulus familiarity improve visual statistical learning of patterns involving those stimuli?
- We will perform an ANOVA with SLscore as an outcome and participant (Chinese or English) and stimulus (artificial or Chinese) as predictors. We predict an interaction, with Chinese participants performing better on the Chinese stimuli but all other participant/stimulus combinations showing similar performance.

What is the relationship between perceptual fluency and statistical learning performance?
- We will calculate a Pearson correlation coefficient between SLscore and PFscore on the same stimuli for the same person overall. For Chinese and English speakers individually, we will also calculate the same correlations for the different stimulus types.

Do people have higher perceptual fluency for familiar visual stimuli over unfamiliar visual stimuli?
- We will perform an ANOVA with PFscore as an outcome and participant (Chinese or English) and stimulus (artificial or Chinese) as predictors. We predict an interaction, with Chinese participants performing better on the Chinese stimuli but all other participant/stimulus combinations showing similar performance.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.
Following https://psyarxiv.com/7jvx8/, we will remove any outlier PFscores that are greater than 4SD from the mean PFscore value.
- Participants will only be included in the Chinese speaker group if they answer at least 3 of the 4 Chinese competency check questions correct; those with 0, 1, and 2 correct will be in the English speaker group. If any get 3 or more correct but self-identify as a non-native speaker they will be placed in the English group.
- Following https://psyarxiv.com/7jvx8/, participants who correctly report fewer than three of the embedded English words in the sequences will be excluded from all analyses on the grounds that they may not have been paying sufficient attention.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.
We aim to have a sample size of 160: approximately 80 for each participant group. However, we are limited by the number of participants we can recruit due to the deadline in recruitment and the availability of first-year undergraduate Psychology majors that will form the bulk of our sample size, so the total sample size may be less than this and the groups may not be evenly matched.

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
Nothing else to pre-register.