PS947: Homework 3

Dr Anna E. Hughes

Deadline: 03/03/23, 1pm

Welcome to Homework 3. This is worth 12.5% of your overall mark. Write your answers in an **Rmarkdown script** and submit the file to FASER. Please include code, comments, plots, output and discussions of what you have done. Please ensure that your submission is your own work, in your own words. For further information see the university webpages on academic offences.

In addition to the marks for each question, you will also be awarded up to:

- **10 marks** for submitting a well-formatted answer file (suitable use of headings and figures, captions, well-presented graphs etc.)

- **10 marks** for code clarity (sensible names for variables, white space, commented code, only printing relevant code and output, etc.)

NB: note the higher weightings for these aspects compared to previous homeworks!

1 Distinction material: using Github

Create an online Github repository for this piece of homework, and make multiple commits while you're completing the work. Share the repository with *scienceanna* by either making me a collaborator, or by making the repository public and sending me the link. NB - you still need to submit via FASER (see above)! [**15 marks**]

2 The effect of recommendations on choice

In a recent study, psychologists investigated the effect of recommendation modality on whether people were likely to follow the recommendation. Their data is available in *'recommendations.csv'*

The column meanings are as follows:

ResponseID	a code for identifying subjects
Mode	the modality the recommendation was presented in (Auditory or Visual)
Gender	preferred gender assignment 1 = male, 2 = female, 3 = other
Age	age
Competent	a rating of the recommender's competence (from 1 'not competent at all' to 9 'very competent')
Intelligent	a rating of the recommender's intelligence (from 1 'not intelligent at all' to 9 'very intelligent'
Thoughtful	a rating of the recommender's thoughtfulness (from 1 'not thoughtful at all' to 9 'very thoughtful'
CompositeIntellect	a composite measure of perceived intellect using the ratings of competence, intelligence and thoughtfulness
Stimulus	the specific stimulus used on the trial (CreditCard, Beer, Restaurant and ExtensionCord)
RecommendationFollowed	whether the recommendation was followed (1) or not (0)

Fit an appropriate model to this data to analyse how recommendation mode affects whether a recommendation is followed. Remember to describe your analysis choices and why you made them. [**10 marks**]

Using this model and any plots you have made, qualitatively assess whether there is evidence for recommendation mode affecting choice [**10 marks**].

Distinction material: The authors of the study wondered whether one explanation for the results could be that participants perceive recommendations in one modality as being more competent, intelligent and/or thoughtful than in the other. Can you find any evidence for this? Does it affect your conclusions about the effect of modality? [**10 marks**]

3 The Dimensions of Social Judgements of Faces

Oosterhof and Todorov (2008) came up with a two component model of social judgements of faces, with the two components being 'valence' and 'dominance'. Their data is available in $'faces.csv'$.

Can you replicate their PCA results? [**10 marks**]

More recently, a group of psychologists have been interested in whether these results generalise to a wider and more diverse sample. Their new data is available in $'faces\_big.csv'$

Dr Hughes wants to test the two factor model on this dataset. She thinks that 'trustworthy', 'caring', 'responsible' and 'sociable' should load onto the

'valence' factor, and 'dominant', 'confident', 'aggressive' and 'mean' should load onto the 'dominance' factor.

Define the latent factors for use in confirmatory factor analysis according to Dr Hughes' predictions. [**10 marks**]

Run the model. What do you conclude about Dr Hughes' hypothesis? [**15 marks**]

4 Rubric

The basic rubric framework we will be using during marking is as follows:

Pass:

- The modelling/statistical tests have been carried out and reported correctly. There may be some minor mistakes.
- Basic plots are included.

Merit:

- R code is mostly clear and well commented.
- Modelling and statistical tests are appropriate. The choice of test has been justified and the results are correctly reported.
- High quality plots are included that outline the key points of the analysis.
- Discussion of results is overall good, but may be lacking in depth in some places.

Distinction:

- Code is extremely clear, concise and well commented.
- Appropriate modelling and statistical tests are carried out, with good explanations of why particular choices have been made.
- Publication-quality formatting, including plots (labels, legends, clarity, etc).
- Discussion of results shows excellent understanding and awareness of limitations.