

## PSY6210 Assignment 2019/20

### SECTION 1

A team of software developers have devised a fitness app for smartphones, designed to encourage people to walk more during the day. They wish to test whether simply knowing the number of steps you take/calories you burn and whether adding a competitive element to the app will encourage users to walk more than they would otherwise.

- In 'null mode', the user gets no information from the app - though the number of steps the user takes each day is fed back to the research team.
- In 'basic mode' the app informs the user and the research team the number of steps taken by the user each day.
- In 'share mode' the app performs as in basic mode – but also relays back to the user the average number of steps that other app users have taken that day.

To test the effect of the app and its competitive element, they devised the following experiment:

- 300 people were randomly divided into 3 groups of 100.
- Members of group 1, the competitive feedback group, were given the app and asked to use it in share mode.
- Members of group 2, the user feedback only group, were given the app but asked only to use it in basic mode.
- Members of group 3, the control group, were given the app but asked only to use it in null mode.
- Subjects used the app for 20 days.

The data collected and downloaded into SPSS from the app was as follows:

USERID	Unique User ID number
STUDYDAY	Day of study, coded from 1-20
GROUP	Study group, coded 1 = competitive feedback, 2 = user feedback, 3 = no feedback
STEPS	Number of steps taken on this day of the study
DAYOFWEEK	Day of week, coded 1 = Monday, 2 = Tuesday, etc.
WEATHER	Weather on day of the study, coded 1 = Dry, 0 = Wet

*Do encourage them to walk*  
The developers wished to test the following hypotheses:

- 1) There would be non-trivial variation between subjects in their average number of steps taken
- 2) Having controlled for day of the week and the weather, there would, on average, be a linear increase in the number of steps taken over the course of the study period.
- 3) The linear increase in steps will vary between participants
- 4) The number of steps taken on any day will have a positive relationship with the number of steps taken on subsequent days, though this will diminish as the gap between days grows.
- 5) The variation between subjects in the increase in the number of steps taken can be explained by group membership, with the 'share mode' app users likely to walk furthest due to the competitive element introduced, and those using the basic mode likely to walk further than those using the null mode.

[ MARKS - 2 ]

Q1.1) Which analytic method would you use to test these hypotheses, and why?

[ MARKS - 1 ]

Q1.3) Describe the analysis you would perform to test hypothesis 1). Which statistics would you record and present?

[ MARKS - 3 ]

Q1.4) Describe the sequence of analyses you would perform to test hypothesis 2). Which statistics would you record and present? Note

i) the extra parameter(s) that you would add enter into the model?

ii) how you would test for model improvement?

[ MARKS - 4 ]

Q1.5) Describe the analysis you would perform to test hypothesis 3). Which statistics would you record and present? Note

i) the extra parameter(s) that you would add enter into the model?

ii) how you would test for model improvement against the previous model?

iii) any specific decisions/choices that you would need to make, and how you would attempt to make them?

[ MARKS - 3 ]

Q1.6) Describe the analysis you would perform to test hypothesis 4). Which statistics would you record and present? Note

i) the extra parameter(s) that you would add enter into the model?

ii) how you would test for model improvement against the previous model?

iii) any specific decisions/choices that you would need to make, and how you would attempt to make them?

[ MARKS - 3 ]

Q1.7) Describe the sequence of analyses you would perform to test hypothesis 5). Which statistics would you record and present? Note

i) the extra parameter(s) that you would add enter into the model?

ii) how you would test for model improvement against the previous model?

iii) how you would calculate the estimated change over time in steps for each group?

[ MARKS - 3 ]

Q1.8) Which element of hypothesis 2) is likely to be flawed, and why?

[ MARKS - 2 ]

Q1.9) Given your answer to Q1.8), how would you adapt hypothesis 2), and how would you adapt/change the analysis previously used to test hypothesis 2)?

[ MARKS - 3 ]