MOD006811 Essential Research Methods – Quantitative assessment for 010 Patchwork Portfolio

**Context**

You are a research assistant on a project which is examining the effect of caffeine on heart rate. Participants were randomly assigned to one of two conditions. In one condition, participants were asked to drink a mug of (caffeinated) coffee. In the other condition, participants were asked to drink a mug of decaffeinated coffee. Psychometric and physiological data were collected at several time points.

**Details of the research study**

Participants were invited to come into the laboratory where they provided informed consent and were offered coffee. The coffee was either caffeinated or decaffeinated. As the coffee was being made, the participants were connected to a heart rate monitor and their baseline heartrate was measured over a 10 minute period. The participants were then presented with their coffee and asked to complete some questionnaires that assessed demographic and health variables including age, gender, body mass index (BMI), cigarettes smoked per day, and alcohol intake per week. They were then asked to complete some psychometric questionnaires which assessed personality characteristics including the “Big Five” characteristics (openness, conscientiousness, extraversion, agreeableness, and neuroticism) and dominance.

One hour later and after completion of these questionnaires, the participant’s heart rate was assessed again (by which time the caffeine should have had its effect). Twelve hours later, the participant’s heart rate was measured one final time when resting (after the effects of the caffeine had worn off).

Heart rate was measured at these three time points (baseline, task, and resting) to ensure reliability of measurement.

The data were collected by another researcher on the project and are available for you in the accompanying data set “ERM Component 1 data”. Supplementary information related to the details of the data set are contained in the data file “Supplementary data set information”.

**Questions**

*There are two questions below, each with three parts to them. Please answer all parts of each question. Indicative word counts are outlined, but there is a maximum total word count of 1000 words for this entire component.*

You research supervisor would like you to answer the following questions and present your findings in a written format for the rest of the research team to consider.

1. The research team would like to know if heart rate differs between the two conditions over the phases of the experiment (baseline, task and resting).
   1. Briefly state what method of analysis you have chosen to address this question and explain why this was a suitable choice (approximately 50 words)
   2. Select, run and report the results of suitable statistical analyses (which you described in part 1a in an appropriate scientific format, with the use of tables or figures if necessary to support the in-text information (approximately 250 words).
   3. The research team would like your recommendations in relation to future directions for the analysis of the data which has been collected. More specifically, stemming from the already-conducted analyses they would like to know what additional analyses of the data could be performed to better understand these results or these variables? (approximately 200 words)
2. The research team would like to know what demographic and personality factors can predict heart rate during the resting phase, regardless of condition. In particular, they are interested to know of the following factors, BMI, smoking, age, alcohol consumption and dominance personality trait, which are the most important in resting heart rate?
3. Briefly state what method of analysis chosen to address this question and explain why this was a suitable choice (approximately 50 words)
4. Select, run and report the results of the statistical analyses (which you described in part 2a in an appropriate scientific format, with the use of tables or figures if necessary to support the in-text information (approximately 250 words).
5. The research team would like your recommendations in relation to future directions for the analysis of the data which has been collected. More specifically, they would like to know what *other* hypotheses / research questions could be investigated using this data set (specifically, looking at variables not used in the previous analyses) which would further enhance their understanding of the data. Please describe your recommendation(s) and state what analytic approaches could be used to address them. (approximately 200 words)