Quantitative methods ///.

2022-2023

Writing instructions :
- The assignment is expected as a single document in text format: .doc, .docx, etc. If you use open office or libre office, please save your document in .doc format.
- Please avoid pdf to facilitate correction and comments. The code can be appended at the end of the document or attached in .R format in a separate document. If you are submitting your assignment in PDF format, please send your code separately in .R format.
- Tables and graphs must be correctly presented and always briefly commented.
- Graphics must be correctly exported from R and tables re-formatted if necessary on a spreadsheet or directly in the text document.

Reminder of objectives:
- General objective: produce synthetic, rigorous and reflective analyses
- Know how to analyze a pivot table in a synthetic and rigorous manner
- Know how to produce relevant and correctly presented graphs
- Understand how inference works (significance of observations made on a sample and possibility of generalizing them to the reference population studied) and know how to present the results of a test.
- To have acquired a certain reflexivity with regard to the quantification process, enabling the results produced to be put into perspective.

Exercise 1: Gender and paid work (/3)

→ **Objective**: present essential information in a concise yet rigorous way.

A. Identify a quantitative variable in the database indicating the number of paid working hours per week, and synthetically compare the distribution of this variable according to the gender.
   N.B.: In this exercise, the number of paid hours worked per week is expected to be analyzed as a continuous quantitative variable.

B. Suggest a graphic representation to illustrate your point, and comment briefly on it.

C. Using an appropriate statistical inference test, decide on the significance of your

observations.

D. To what extent does analysis of this variable allow conclusions to be drawn about differences in working hours between women and men more generally?

Exercise 2: Gender and domestic work (/10)

→ **Objective**: Carry out a detailed comparative analysis, taking into account a structural effect.

Preamble (/1) :
Propose a recoding of the paid working time variable into 4 methodologically and empirically relevant modalities. You will use this recoded variable for the rest of the exercise.

Part 1: Paid work and family time (/4)
A. Identify a qualitative variable in the database describing the difficulties of reconciling paid work and family life. How relevant do you think this variable is for understanding domestic work?

B. Do constraints on family time differ according to weekly paid working hours? You will answer this question by proposing a cross-tabulation that you will analyze in terms of over- and under-representation.

C. Using an appropriate statistical inference test, conclude on the significance of your observations.

D. In view of this finding, and the one established in Exercise 1, identify a potential structural effect to be neutralized in the study of the link between gender and domestic work.

Part 2: Paid work and family time by gender (/5)
A. Recode the work-life balance variable to reduce it to three methodologically and empirically relevant modalities. 1

B. Does the link between paid work and family time differ according to gender?
? You will answer this question by comparing cross-tabulations to take account of the structural effect identified in part 1, and proposing a detailed analysis. 2.5

C. Justify your answer by comparing the possible correlation of the variables in men and women, and suggest a quick interpretation of the result. 1.5

Exercise 3: Gender, paid work and income (/5)

→ **Objective**: Consider the cross-effect of two variables

A. Identify a variable in the database indicating the income of the household to which the individual belongs, and propose a recoding of this variable into a limited number of classes. /1

B. Propose a synthetic graphical representation of the relationship between income, gender and number of hours worked. of work paid per week, that you comment.

N.B.: for this question, use the number of paid working hours as a quantitative variable. /2

C. To what extent do these observations enrich the results of exercises 1 and 2? /2

Conclusion (/2) :

At the end of this assignment, briefly conclude on the relevance of using this database to capture inequalities in working hours between men and women in France. In particular, identify any shortcomings linked to the construction of the database, and any avenues for improvement.

Optional bonus question (/3) :

Investigate the relationship between the number of paid hours worked per week by women in the lowest income bracket and the number of paid hours worked per week by their partner. Draw the scatterplot with its fitting line. Briefly describe and interpret the relationship studied.