

# Structural Equation Modelling

## Introduction

A team of researchers were interested in knowing the effect of perfectionism on exhaustion in a sample of academics. They reasoned that perfectionism would be associated with exhaustion because research shows that perfectionists expend a great deal of cognitive energy ruminating about their performance and that this mediation would be full (i.e., not partial). Accordingly, they used self-report instruments to measure academics' levels of perfectionism, rumination, and exhaustion so that they could test a fully mediated model from perfectionism to exhaustion via rumination. Your task is to check assumptions and address this question of mediation using a two-step modelling procedure beginning with confirmatory factor analysis to test the measurement model and ending with latent variable structural equation modelling to test the hypothesized mediation model. In your answer, please provide details about:

- 1) The data analysis methodology and justification (approx.. 15%)
  - How the student intends to analyze the data and why this approach is chosen.
- 2) The preliminary analyses (approx.. 10%)
- 3) Data screening and assumptions
- 4) The primary analyses (approx.. 60%)
  - The primary data analysis with findings supplemented using relevant Tables and Figures
- 5) The interpretations for each research question (approx.. 15%)
  - What do the analyses reveal in terms of each of the research questions?

## Research Questions

- 1) Does the measurement model for perfectionism, rumination, and exhaustion fit the data?
- 2)
  - a. Does the hypothesized mediation model fit the data?
  - b. What is the size, direction, and statistical significance of the paths in the hypothesized mediation model?
  - c. Does rumination significantly mediate the relationship between perfectionism and exhaustion?

## Participants

- 214 British academics

## Completed a number of items relating to the variables of interest

- Respondents were asked to indicate the extent to which they identify with perfectionistic traits. The items are coded in the data set as:

STEM – “Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree & to what extent...”

per1 – “One of my goals is to be perfect in everything I do”

per2 – “I demand nothing less than perfection of myself”

per3 – “I am perfectionistic in setting my goals”

- Participants indicate the extent to which they agree with each item on a 7-point Likert-type scale ranging from 1 (*not at all true*) to 7 (*very true*).

NOTE: The items together measure perfectionism so cluster them in a “perfectionism” latent variable following screening and cleaning.

- Respondents were asked to rate their tendency to ruminate over their performances. The items in are coded in the data set as:

STEM – “People think and do many different things. In general, please indicate whether you typically experience any of the following work..”

rum1 – “I often think about a recent situation, wishing it had gone better.”

rum2 – “I often think about all my shortcomings, failings, faults, mistakes.”

rum3 – “I often think “I won’t be able to do my job if I don’t snap out of this””

- Participants indicate the extent to which they believed each of the items to be true on a 7-point Likert-type scale ranging from 1 (*not at all true*) to 7 (*very true*).

NOTE: The items together measure rumination so cluster them in a “rumination” latent variable following screening and cleaning.

- Respondents were asked to rate the extent they feel exhausted at work. The items in are coded in the data set as:

STEM – “Below you find a series of statements with which you may agree or disagree. Using the scale, please indicate the degree of your agreement by selecting the number that corresponds with each statement..”

ex1 – “During my work, I often feel emotionally drained.”

ex2 – “After my work, I usually feel worn out and weary.”

ex3 – “There are days when I feel tired before I arrive at work.”

ex4 – “I feel mentally and physical drained from my work.”

- Participants indicate the extent to which they believed each of the items to be true on a 7-point Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

NOTE: The items together measure exhaustion so cluster the items in an “exhaustion” latent variable following screening and cleaning.

### Assignment structure

Please structure your assignment using the following headings:

[TITLE]

[RESEARCH QUESTIONS]

[DATA ANALYSIS METHOD AND JUSTIFICATION]

[PRELIMINARY ANALYSES]

[PRIMARY ANALYSES]

[INTERPRETATIONS]

### Data file

The data file is called 'academic.csv' and can be downloaded from [here](#). It can also be accessed on the github in PB4A7 → SDA → SEM → academic.csv.