

PSYC*6380: Minor Assignment 8 (Structural Equation Modelling)

Due: Monday, March 21st, 2022 @ 11:59pm

Part 1:

Background:

After hearing Scott's sordid tale today in class, an applied social psychologist became interested in predicting what makes people see the world as a threatening place. The psychologist was specifically interested in examining whether exposure to negative stories in the media and general negative affect each predicted the extent to which people felt "threatened" in lives. To do this, the psychologist recruited a sample of 1000 participants for a self-report, survey-based study. The psychologist collected data on each participant's state negative affect (using a five-item, Likert-type scale), their frequency of exposure to news and other common media (using a three-item, Likert-type scale), and how threatening they felt the world generally was (rated on a 1-50 scale, with higher ratings indicating a perceived scarier world).

Your task for today is to load the data file that contains participants' responses to these measures; and assess the relation between negative affect, media exposure, and felt threat using a series of structural equation models. The psychologist is specifically interested in assessing the potential mediating and moderating effects of negative affect in explaining the relation between media exposure and felt threat.

Filename: "semAssignmentData.csv"

Structure: Comma-separated values

Variables:

Participant ID Number (*ID*): 1-1000

State-Level Negative Affect (*NAffect1-NAffect5*): 1-15 scale; 5 items

Frequency of Exposure to Media (*MediaExpose1-MediaExpose3*): 1-15 scale; 3 items

Self-Reported Level of Threat (*FeltThreat*): 1-50 scale

Missing Data Code(s): N/A (no values are missing in this file)

Your Task:

Use the techniques we covered in today's class (and draw on material from our first class on using *R* to load and clean data) to load your data and run a series of structural equation models (including confirmatory factor analyses, where appropriate), which examine the relation between negative affect, media exposure, and felt threat.

Once you've done this, please answer the following questions about the results. Unless otherwise indicated, you do not need to provide full-sentence answers; just the numbers the questions request are fine:

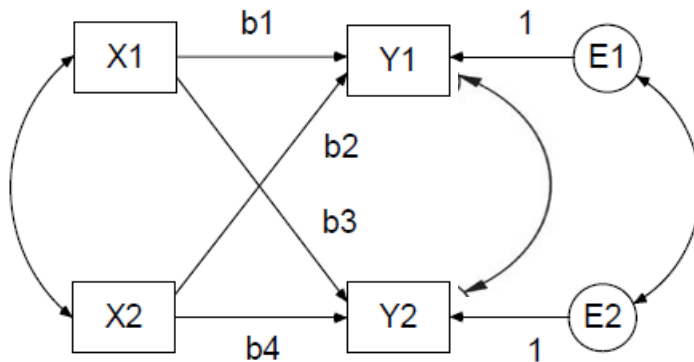
1. Run a confirmatory factor analysis that loads "*NAffect1-5*" onto a latent variable measuring "negative affect"; and "*MediaExpose1-3*" onto a latent variable measuring "media exposure". "*FeltThreat*" does not need to be included in this model. Please report relevant fit indices, including: 1) The chi-square value (i.e., χ^2); 2) the comparative fit index (i.e., *CFI*); 3) the root mean square of approximation (i.e., *RMSEA*); and, 4) the standardized root mean residual (i.e., *SRMR*). **(1 mark).**
2. Take note of any items that have a standardized factor loading of below 0.30 on their corresponding latent factors (these items do not load well onto the factors in question). Remove these items from their corresponding factors. Once you've done this, please run a structural equation model that simultaneously uses both latent negative affect and latent media exposure to predict felt threat. For each predictor, please report: 1) the standardized slope coefficient (i.e., β); and, 2) the 95% confidence intervals around that standardized slope coefficient **(1 mark)**. Based on your interpretation of the confidence intervals, how would you best describe the unique relation between negative affect and felt threat? **(0.5 marks)**. What about the unique relation between media exposure and felt threat? **(0.5 marks)**.
3. Run an alternative structural equation model that tests the indirect effect of latent media exposure on felt threat via its effect on latent negative affect (i.e., using negative affect as a mediator). Please report: 1) the standardized slope coefficient for the indirect effect (i.e., β); and, 2) the 95% confidence intervals around that standardized slope coefficient. **(0.5 marks)**. Do your results support the idea of mediation? **(0.5 marks)**.
4. Run a final structural equation model that tests the interaction between latent media exposure and latent negative affect on felt threat (i.e., using negative affect as a moderator). Please report: 1) the standardized slope coefficient for the interaction effect (i.e., β); and, 2) the 95% confidence intervals around that standardized slope coefficient. **(0.5 marks)**. Do your results support the idea of moderation? **(0.5 marks)**.

Part 2:

Background:

In order to help the researcher better understand how structural equation models work, please answer the following conceptual questions in a short answer (i.e., 1-2 sentences) format:

1. In our class today, Scott said that using latent variables instead of observed variables can help reduce error in our estimates and offer us a better estimate of a construct's "true score". What did he mean by this? Why is often advantageous to specify latent variables in our structural equation models? **(1 mark)**.
2. Imagine that you attempted to test the following path model, and were met with a dreaded *R* error (oh no!):



Please note the issue in this model that would make it impossible to actually test. **(0.5 marks)**. Conceptually, why is this a problem? **(0.5 marks)**.

3. In class today, Scott mentioned that the path loadings for errors are generally constrained to 1.00 when testing a structural equation model. What is the point of doing this? **(1 mark)**.

Please provide your full *R* script with your submission and leave comments in your script (i.e., using “#”) explaining what each command you wrote does. **(1 mark for including a full script; 1 mark for including appropriate commenting)**.

Good Luck!