APSY 753 Midterm Examination
Spring 2021

Directions: Complete the following analyses as outlined. Unless otherwise noted, you must use R or RStudio. When creating the write-up for the items, use appropriate citations as needed to justify your decisions. When making tables, please use APA format. You can bullet point in your write-up if you want. Include all script files you use. Make sure you read all items carefully, and provide enough detail when justifying your decisions. (There are two pages to this document.)

Part #1) Dichotomous Data Analysis

Background: The following dataset (Dichotomous Data.csv) contains 15 items scored 0 and 1. Based on these data, respond to the following items:

1. Conduct Classical Test Theory item analyses on these fifteen items.
   a. Compute item difficulties/locations for these fifteen items.
   b. Compute item discriminations for these fifteen items.
   c. Create a table to display (a) and (b).
   d. Based on these item statistics, which, if any, items would you remove and why?

Part #2) Polytomous Data Analysis

Background: The following datasets (EFA.csv and CFA.csv) contain 500 cases each of responses to a ten item measure, scored 1-5. Based on these data, respond to the following items:

1. Conduct a Parallel Analysis and Factor Analysis on the EFA.csv data.
   a. Conduct a parallel analysis for the ten items.
   b. Include the parallel analysis figure in your write-up.
   c. Based on the parallel analysis, how many factors do you choose to extract, and why?
   d. Conduct a factor analysis based on the number of factors determined in (c).
   e. Create a table with the factor loadings.
   f. Based on these item statistics, which, if any, of these items would you remove and why?

2. Conduct Cronbach's Alpha analyses based on the factors you extracted.
   a. Conduct the alpha analysis/analyses.
   b. Include the alpha(s) for this scale in the write-up.
   c. Create a table that includes the correct item-total correlations and alpha-if-item-deleted for each item.
   d. Based on these item statistics, which, if any, of these items would you remove and why?

3. Conduct a Confirmatory Factor Analysis.
   a. Based on the number of factors from the EFA, conduct a confirmatory factor analysis of these data. Note, include all items for this.
   b. Include the fit statistics for the model in your write-up.
   c. Create a table with the standardized factor loadings, standard errors, and z-values.
   d. Based on these item statistics, which, if any, of these items would you remove and why?

Part #3) Short Answer Questions

Directions: The following two questions are intended to be short answer questions (i.e., less than a page). Answer these questions as if you were speaking to someone unfamiliar with psychology, psychometrics, and statistics. Make sure you include citations as needed, though.

1. Imagine you are talking to someone about psychological measurement, and you say, "Well, it's really a breadth-vs-depth issue." He naturally gives you a confused look, not understanding what you mean by that. How would you explain to this person what breadth vs. depth means in the measurement of psychological variables?

2. How would you explain to someone unfamiliar with measurement, statistics, and methods in general the distinction between reliability and validity of psychological measurement?

SUBMISSION TO BLACKBOARD DUE BY 9:30am 3/29/2021