EDUR 8331 Applied Measurement Activity 1, Part 2: Scale Validation

Purpose

With Activity 1, Part 1 you and your classmates developed 15 scales to measure the latent variables in the model shown in Figure 1. With Activity 1, Part 2, you will evaluate the item behavior of each scale with data collected from questionnaire responses by graduate students in other classes. You will assess evidence for reliability (internal consistency) and validity (both content and construct).

Figure 1: Predictors of Job Burnout, Job Satisfaction, and Life Satisfaction



Part 2: Item Analysis and Validation

Previously you developed scale items as a group. The remaining steps in Activity 1, detailed below, must be completed individually, not as a group.

For this activity – steps 5, 6, and 7 below – select any two latent variables among the five developed by your group; if you participated in developing items, at least one of the latent variables for which you helped develop items must be selected. Choose two latent variables that should be related, theoretically, so you can use these two variables to assess evidence for construct validity.

5. Expected Relation Between Two Selected Latent Variables

Which two latent variables did you select? What type of relation do you expect between these two latent variables? Make this expectation, this hypothesis, before you conduct steps 6 and 7 below. For example, if I selected job satisfaction and job autonomy, I would predict these two variables would be positively and strongly (or at least moderately) correlated. Those with more autonomy are likely to be more satisfied with their jobs. Do you expect a strong/moderate/weak positive correlation, or do you expect a strong/moderate/weak negative correlation, or do you expect a strong/moderate/weak negative correlation.

6. Item Analysis

The instructor will post a data file of all responses obtained from the questionnaire administered in Part 1 of this activity. Once the data file is posted, you are to perform an **item analysis** (see below) of responses for the two latent variables you selected.

(a) For the first latent variable selected your item analysis report should include:

- frequencies of item responses (counts, n, for each response option on the five-point response scale),
- identification of items that required reverse scoring (i.e., those with a negative polarity),
- (Note perform the reverse scoring, then proceed to the next steps using the appropriate reverse scored items. For example, if you use items Q1, Q2, Q3, Q4, and Q5 for your first latent variable, and items Q4 and Q5 require reverse scoring, then proceed with the rest of the analysis using items Q1, Q2, Q3, Q4R, and Q5R where Q4R and Q5R are the reverse scored versions of the original items Q4 and Q5.)
- one correlation matrix for the items measuring this latent variable,
- various item fit statistics (e.g., item-total correlation, alpha if item deleted, etc.) and overall Cronbach's alpha, and
- interpret and discuss your findings and make recommendations about which items should be used to form a composite variable for that latent variable. If you decide to drop an item due to poor fit, rerun the item analysis with the reduced set of items and present the results.
- The item-total correlation reported in the item-analysis between the validity check item and the total of the other items can also be used as construct validity evidence your items should correlate strongly and positively with the validity check item. If it does not, that suggests a measurement problem either for the validity check item or for the other items.

(b) Repeat the steps above for the second latent variable you select.

7. Validity Assessment

For the validity assessment, there should be two parts. Unlike reliability analysis above where the two latent variable items were analyzed separately, address both latent variables together in (a) and (b) below.

a. **Content validity**: Content validity for each latent variable was partially addressed in Part 1 of this activity. For this report, make suggested revisions to the items you examined, for both latent variables, that might result in improvement for measuring those latent variables. Likely you will notice some items performed unsatisfactorily after examining the item-fit statistics from step 6 above. Usually, this is due to poorly worded items or response options, or the item does not fit well as a measure for the latent variable. Explain how these items might be improved to enhance both reliability and validity.

Note that with the development of any questionnaire, the first data collection attempt should be viewed as a pilot study and the goal is to use this information to make revisions and improve the questionnaire. Thus, explain any revisions you think would improve your items.

b. **Construct validity**: Second, address evidence for construct validity, or relational validity. There are two parts to this analysis.

First, using the results from 6 above, refer to the item correlations with their respective validity check items for each of the two latent variables. The item-total correlation with the validity check can also be useful. Be sure to report these statistics so it is easy for your instructor to identify this information. Do the items correlate positively and strongly (or at least moderately) with their validity check items for each latent variable? One

should expect these correlations to be moderate or strong if all items measure the latent variable well. Discuss these correlations in terms of validity – do these correlations suggest the individual items are correlating well? Explain why or why not.

Next, use the recommendation provided in step 6 above about which items to use to form the composite variable and create a composite variable for your first latent variable, and a composite variable for your second latent variable. Correlate these two constructs (or composite variables – composite variables are constructs used to measure the latent variable) and report the correlation. Use this correlation to assess validity evidence for these two scales. Use the hypothesis you developed in 5 above to assess this validity evidence. If the correlation is as expected, then that provides evidence for construct validity. If the correlation is weaker than expected, but still in the correct direction, that may also be viewed as evidence for construct validity. So, what did you find? Does it seem the composite variable scores are behaving as you anticipated?

Submit your responses to 5, 6, and 7 above as a PDF in the Activity 1 Part 2 Dropbox.