

Lab: Composites and Reliability

Your goal for this assignment is to create a composite score for the personality questionnaire you created a few weeks ago (Lab Week 4). You might recall that you and your group were charged with trying to develop a questionnaire to assess individual differences in something that was of interest to you. Some people created questionnaires designed to assess extraversion, some created questionnaires to assess love for fast food, some created questionnaires designed to assess really, really odd things.

In this assignment you will practice refining some of the skills we have covered recently in class. For example, you should be able to demonstrate your competence in (a) creating z-scores, (b) computing correlations, (c) understanding reverse scored items and how to manage them, (d) computing composite scores, and (d) quantifying the reliability of those composite scores.

Please keep track of how you progress through the steps below and turn those in to your TA for credit. Some of these steps are “check: I did it” kinds of steps. Others will require that you report some statistics.

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1. Download the data you collected when you designed your own personality questionnaire (Lab Week 3).

As a reminder, you can access those data via the following webpage:

<http://www.yourpersonality.net/psych350/fall2015/viewsubmit.pl>

and by entering your username in the textfield. (**For this project, you used a group number as a username, such as group1, group3, etc.**) You may have downloaded these data before, so it is possible that you have a copy somewhere.

I recommend importing the data into SPSS. Be sure to clean up the data if you haven't done so already. For example, you do not want repeat cases in your data file.

2. Begin by computing the **means** and **standard deviations** for each of the 10 questionnaire items. Which item has the highest mean? Which item has the lowest? Why do you think that is?

3. Compute the correlations among all of your 10 items.

If the items are all measuring a common variable, they should be positively correlated with one another. Is that the case? What is the highest correlation? What is the lowest correlation?

Take your reverse keyed items (if you have any) and create a new variable that reverses the scores. Please be sure to create a new variable to represent the reverse scored item; do not simply copy over your original variable.

4. Do you have items that are reverse keyed by design/intent? If so, responses to those items should correlate negatively with the other items.

If you don't have reverse keyed items by design, do you have some by "accident"? In other words, do you have items that are negatively correlated with each other?

If you do, please take your reverse keyed items and create a new variable that reverses the scores. Please be sure to create a new variable to represent the reverse scored item; do not simply copy over your original variable.

5. The next step is to create a composite score for your variables. However, before doing so, please recall the problem of unequal variances we discussed in class. This won't be a big issue in your case because you're using a common scale (e.g., a 1 to 4 scale) for each item. But, in the interest of practicing, let's standardize the variables before creating a composite.

What are the means and SDs for your new standardized variables?

6. After you've standardized your variables, create a new composite variable that averages all the standardized variables together. This is your new individual differences variable that represents variation in the trait/attitude of interest.

7. If you have another variables that you've assessed (e.g., sex), you might want to play around a bit and see if your variable relates to those other variables.

8. The next important task is to consider the reliability of your new composite. Recall that reliability refers to the extent to which a measurement is free of random errors. One way to gauge this is to compute Cronbach's alpha. Do so and report it. (Please note that, in SPSS, you need to make sure all the variables are keyed in the same direction when computing alpha. If you have reverse keyed items, make sure you include the corrected keying of those items when computing alpha.)

9. Is your alpha high or low? As a general rule of thumb, researchers consider composites to be reasonably reliable if alpha is $> .70$. If alpha is less than $.70$, that is sometimes a reason to be concerned, depending on exactly what is being measured.

10. Regardless of whether your alpha is high or low, is it possible to "improve" the reliability of your composite by removing certain items from the scale? You can examine this issue by modifying the options in the reliability menu in SPSS. See if the reliability improves by more than $.05$ units by dropping one or more items.