

Getting Started with Activity 1

Hi everyone –

Some may want more clarification on Activity 1 Part 1. Everyone is assigned a latent variable and must develop six items to measure that latent variable. A latent variable is another term for a variable, but one not directly observed. A latent variable can be measured indirectly in several ways, one being a scale like taught in this course. Once measured with a scale, item responses are combined to form a composite score which is called a construct (i.e., a constructed measured of a latent variable). So, for example, once someone completes the life stress scale, we can use their numeric answers on each item to form a composite score and determine how much life stress that person may experience.

To help explain Activity 1, I will use the following latent variable: test anxiety. Below are the steps I would take to create a scale to measure test anxiety.

Step 1 – Define/Describe the Construct

First, I would search on Google scholar to find two or three descriptions, and definitions, of test anxiety.

<https://scholar.google.com/>

One of the best ways to do this is to find two or three empirical studies of test anxiety, then read the literature reviews because that is where they are likely to both describe and define test anxiety. Since Google scholar provides links to on-line PDFs of some citations, I would use those. From the articles I just found, I have learned the following.

Test anxiety is “an unpleasant feeling or emotional state that has physiological and behavioral concomitants, that is experienced in formal testing or other evaluative situations.” (Hill, K. T., & Wigfield, A. (1984). Test anxiety: A major educational problem and what can be done about it. *The Elementary School Journal*, 85(1), 105-126.)

With this definition, I now know that test anxiety is

- a feeling, so physiological
- an emotion, so psychological
- maybe behavioral too
- occurs in formal testing or evaluations (so more important tests likely to trigger anxiety)

This definition indicates there are two dimensions of test anxiety, a physical type of reaction and a psychological type of reaction. There may also be some type of behavior related to test anxiety, thus maybe a third dimension. Note, sometimes researchers use the term domain instead of dimension.

A more recent definition follows: “Test anxiety has been defined as the emotional, physiological, and behavioral responses surrounding the potential consequences of negative evaluation on an upcoming test or exam....” (Von Der Embse, N., Barterian, J., & Segool, N. (2013). Test anxiety interventions for children and adolescents: A systematic review of treatment studies from 2000–2010. *Psychology in the Schools*, 50(1), 57-71.).

This definition makes clear there three dimensions, or domains, to test anxiety, an emotional reaction, a physiological reaction, and a behavioral reaction. As I reviewed other studies, I found there were other dimensions of anxiety too like social derogation, cognitive obstruction, and tenseness. If many are identified, use those that seem most logical or have the best empirical evidence for support. No need to use more than two or three dimensions since we will develop only 5 or 6 items.

Step 2 – Clarify the Dimensions/Domains

Next step is to think about and find examples of each of the dimensions in practice. What does it mean for someone to experience test anxiety as an emotional reaction, a physiological reaction, or a behavioral reaction? Often the literature review in the relevant articles will provide examples. However, since test anxiety is something that many have personally experienced or observed in others, I can hypothesize about how these dimensions would manifest

among students. See some examples below. These can be confirmed and revised by looking at reviews in the found studies.

- Emotional reaction – fear, worry, concern
- Physiological – upset stomach, headache, muscle knots, vomit feeling
- Behavior – fidgeting, impulse not to participate, distracting others

Step 3 – Develop Items

The next step is to develop scale items. From these three dimensions and the example reactions each contain, we could start developing items for each dimension. Below are some rough idea examples.

Emotional Reaction

- When taking an important test, do you sometimes worry about your performance?
- Are you concerned about how an important test might impact your course or class grade?

Physiological Reaction

- Do you sometimes get an upset feeling just before or during important tests?
- Do you get headaches when taking important tests?

Behavior Reaction

- When taking an important test, do you sometimes find it difficult to sit still?
- Do you want to quit and leave when taking an important test?

Also, there must be the summary, or validity check, item. This is the one item that most directly measures the latent variable and is used to assess the statistical fit of the other items. Below are two examples of a summary item, or a validity check item, for test anxiety.

- When taking an important test, how anxious do you get?
- How much anxiety do you experience when taking an important test?

To help with item development, we could also look at sample test anxiety scales to see how our items overlap with items developed by others. Normally scales used by researchers are discussed in the Method section, specifically the Instrumentation section; this section is sometimes labeled Scales, Variables, Measurement, or other similar names.

One of the best ways to find studies that include such scales is to search with Google scholar using the latent variable name (e.g., “test anxiety”), include the term scale or instrument, include the term reliability or Cronbach, and validity. Here is the search term I used and below is one example I found that listed test anxiety items.

"test anxiety" scale instrument Cronbach validity

Friedman, I. A., & Bendas-Jacob, O. (1997). Measuring perceived test anxiety in adolescents: A self-report scale. *Educational and Psychological Measurement*, 57(6), 1035-1046.

Do Friedman and Bendas-Jacob have items that overlap with items I developed? Below I list my six items and a few sample items from their study.

Emotional Reaction

- When taking an important test, do you sometimes worry about your performance?
- Their item: I am worried that failure in tests will embarrass me socially.
- Are you concerned about how an important test might impact your course or class grade?
- Their item: no true counterpart, but they did have a few that focused on grades like this one: I am very worried about what my teacher will think or do if I fail his or her test.

Physiological Reaction

- Do you sometimes get an upset feeling just before or during important tests?
- Their item: I am very tense before a test, even if I am well prepared.
- Do you get headaches when taking important tests?
- Their item: no true counterpart, but they did have one with reverse polarity (or valence) that partially assessed something similar: During a test my thoughts are clear and I neatly answer all questions.

Behavior Reaction

- When taking an important test, do you sometimes find it difficult to sit still?
- Their item: During a test I keep moving uneasily in my chair.
- Do you want to just quit and leave when taking an important test?
- Their item: there is some overlap with this item: I feel it is useless for me to sit for an examination, I shall fail no matter what.

Reverse scored items. Remember that you are to develop a few reversed scored, or reversed polarity items. The first item I wrote is listed below. How could this be reversed?

- When taking an important test, do you sometimes worry about your performance?

Instead of focusing on worry, focus on confidence which should be inversely related to worry (i.e., the more confident, the less worry).

- When taking an important test, are you confident in your ability to do well?
- When taking an important test, are how certain are you that you will do well?

Another example. Original item:

- When taking an important test, do you sometimes find it difficult to sit still?

Reversed version:

- When taking an important test, are you able to stay focused and complete the test without distracting yourself?

Step 4 – Response Scale

The next step is to determine the best response option for each item. Remember that a 5-step response option is needed. The format of a Likert scale should be used. You can see several Likert type responses in the links below. Review these so you get an idea of the variety that is available. There is no need to simply rely upon the 1 = strongly disagree to 5 = strongly agree format.

- <http://www.bwgriffin.com/gsu/courses/edur9131/2018spr-content/04-questionnaire/04-LikertScaleOptions-Vagias.pdf>
- <http://www.bwgriffin.com/gsu/courses/edur9131/2018spr-content/04-questionnaire/04-LikertScaleOptions-Siegle.pdf>
- <http://www.bwgriffin.com/gsu/courses/edur9131/2018spr-content/04-questionnaire/04-likert-step-descriptions.htm>

Below are the six items I developed with the last being a reversed item. I wrote the items thinking about frequency of occurrence, so this response scale would work for all items.

- 1 = almost never
- 2 = rarely
- 3 = sometimes
- 4 = often
- 5 = almost always

Emotional Reaction

- When taking an important test, do you sometimes worry about your performance?
- Are you concerned about how an important test might impact your course or class grade?

Physiological Reaction

- Do you sometimes get an upset feeling just before or during important tests?
- Do you get headaches when taking important tests?

Behavior Reaction

- When taking an important test, do you sometimes find it difficult to sit still?
- Reversed: When taking an important test, are you able to stay focused and complete the test without distracting yourself?

The summary item, however, does not focus on frequency, instead, it assesses severity of reaction, so it needs a different response scale.

- How much anxiety do you experience when taking an important test?
 - 1 = No anxiety or almost none
 - 2 = Small degree of anxiety
 - 3 = Moderate degree of anxiety
 - 4 = Considerable degree of anxiety
 - 5 = Extreme degree of anxiety

The steps above should help you draft items for Activity 1. Good luck!