Objectives
In this lab you will have the opportunity to construct your own anxiety scale and to collect a small amount of reliability and validity information about the scale. The exercise will teach you the steps involved in scale construction and let you see some of the difficulties involved in constructing a good scale.

Background
Anxiety is an important construct in the study of clinical problems and the study of personality. Normal anxiety is experienced in different degrees by everyone. The individual differences in the intensity, frequency and eliciting factors in experiencing this emotion are captured in personality scales like the Neuroticism scales from Eysenck’s EPQ-R (Eysenck, Eysenck & Barrett, 1985) where neuroticism is seen as one of three main personality factors. Anxiety is also a major component of neuroticism as measured by the NEO-PI-R (McCrae & Costa, 1987). Neuroticism is one of the 5 main factors in this model of personality. In each of these cases anxiety is not the only component of the neuroticism dimension (which also include other types of negative affect, like anger and frustration). It is however, the main component so that neuroticism scores correlate highly with measures of anxiety. Individual differences in anxiety/fear also play an important role in theories of temperament (Thomas & Chess, 1977, Rothbart & Derryberry, 1981). Fearfulness differences exist in young infants and children.

Anxiety is also a common clinical problem. Clinical anxiety problems may manifest themselves in a variety of ways. The anxiety may be specific to a particular eliciting stimulus as in the case of simple phobias or to a somewhat wider range of situations as in social phobias. It may also be very nonspecific as in anxiety disorders like panic disorder or generalized anxiety disorder (Last, 1993).

The lab exercise you are going to do this week is to try to create your own anxiety scale. After you have generated the questions for the scale you will be collecting split-half reliability data on the scale to see whether your scale is internally consistent (measures a single construct) and construct validity data to see whether your scale is closely related to some commonly accepted measures of normal anxiety. The two commonly accepted measures of anxiety that we will use are the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger, 1983) and the Taylor Manifest Anxiety Scale (MAS) (Taylor, 1953).

The STAI trait anxiety scale is a 20 item scale which asks about the frequency of occurrence of a variety of anxiety symptoms in different situations. The response format is a 4 point Likert Scale from “almost never” to “always”. It is largely a measure of social anxiety, though there are other elements as well. The MAS is a 50 item scale which asks about the presence or absence of anxiety symptoms. The answer format is “true”/”false.” The items from the MAS focus heavily on the autonomic symptoms of anxiety. Both of these measures are reliable. The trait scale of the STAI shows Cronbach’s alpha coefficients (another measure of internal consistency type reliability) in the range of .85-.95. Alpha coefficients for the MAS are in the range of .83-.92. The average score on the STAI trait scale for college students is 41.7 with a standard deviation of 10.25. The average score on the MAS, also for college students, is 11.43 with a standard deviation of 5.68. Despite the differences in item content and response options these 2 scales correlate highly with r=.79 (Tanaka-Matsumi & Kameoka, 1986).
References


Laboratory Activity

You will begin by individually filling out the MAS and STAI. Start up the Excel program on the computers by double clicking it. Type in the numbers indicating your answers to each of the questions. When you have finished, scroll down to the file to find your scores. Label and record these numbers on a scrap piece of paper.

Making up the scale

You will need to work in groups of 3 or 4 students to generate your scale.

1. Begin by generating a conceptual definition for anxiety. When you have a definition the whole group can agree on write it on the work sheet.

2. The next step is to generate an operational definition (the questionnaire questions) that match the conceptual definition. Think of specific examples of your conceptual definition of anxiety, (e.g., specific symptoms of anxiety and specific situations that someone might or might not feel anxiety). Try to think of as many of these as you can without being too critical. Once you have generated a list of possibilities you can look at them critically and choose the ones that best represent your conceptual definition of anxiety.

There are a number of things to keep in mind as you generate items. You are looking for items which people are likely to answer in different ways. Avoid items that everyone will respond to in the same way. They won’t help you measure individual differences in anxiety.

3. You will also have to pick a response format. Some of the options are “yes/no”, “true/false”, 4 to 7 point Likert scales with labels like “almost never” to “almost always” or “extremely true of me” to “not at all true of me.” The response option you choose will influence the wording of the items.
(4) You also need to include some items that are worded in a reverse direction so that participants filling out the scale will not get into a response set where they automatically respond in the same way to all of the items.

(5) Finally be sure your items are clear, unambiguous, and each only ask about a single thing.

As a group, decide on your 6 best items. Write the response options at the top of an overhead, and then clearly print the items under this. Divide your items into 2 halves either randomly using coin tosses or by separating them into odd and even. You will be using these halves to calculate the split-half reliability. Don’t indicate which items belong to which half on the overhead but keep a record of this somewhere.

Collecting the Reliability and Validity Data

Once all groups have completed both steps above. The whole class will respond to each of the scales that you have created. Each student will need a separate response sheet for each scale. So if there are 5 groups you will each need 5 separate pieces of paper. Begin by filling in your MAS and STAI scores on each piece of paper. Then as each group puts their scale on the overhead record your answers to each item on the section of the answer sheet that matches the response options for that scale.

As you finish each scale return the answer sheets to the group that created the scale.

Analyzing the data

When all the scales have been completed, each group needs to score their scales. To do this, look at each answer sheet and assign points for each item. Give 0 for false or no and 1 for true or yes, unless the item is a reversed one, in which case it would be 0 for true and 1 for false. If you have a Likert scale, score 1 for the lowest response option, 2 for the next response option etc. Again remember to reverse the numbers on reverse worded items. Then add up three different scores for each person and write them on the bottom of the sheet. 1 total is the total points for the whole scale. The other 2 are the total points for each of your 2 scale halves. Just add up the points for the items in each half.

Once you have your scores, you will enter them into SPSS so you can analyze them. The name of the data file is ANXIETY. You will be entering the 5 numbers you have for each subject into a data file.

Running SPSS. Start SPSS by clicking on the SPSS button on the right side of the screen. Then open the Anxiety file. You will see a spread sheet window with variable names in the first 5 column headings. You will enter one line of data for each subject (one number for each variable in the order that they appear in the record sheets). Move across the line with tabs or the right arrow.

Once you have your data entered you will generate correlation coefficients for the following pairs:

1. half1 with half2--this is the split-half reliability correlation.
2. total with STAI,
3. total with MAS, and
4. STAI with MAS.

These are for evaluating the construct validity of your scale.
Pull down the analyze menu, move down to correlate, and then across to bivariate. In the
dialogue box that opens, move half1 and half2 variables over into the variables window. Make sure
the Pearson box is checked and click OK. This will generate the correlation between the 2 halves.
Record this information. Return to correlate & bivariate under the analyze menu. This time move
Total, STAI and MAS into the variables window and click OK to generate the correlations between
these variables. Copy the information. Exit the program using exit under the file menu. Go to the
start box in the bottom left corner. Pull up the menu and choose shutdown. When the computer
says it is OK, turn off the computer.

In good scales, split half reliability should be at least .70. .80 or higher is desirable. For
validity you should compare the three correlations you generated. Is your scale as closely related to
the STAI and the MAS as they are to each other? The closer you are to that the better you scale is.
You are hoping for validity correlations of .65 or better.

+2 points: Calculate the item-total reliability (turn in your work)
+2 points: Calculate the cronbach alpha (turn in your work)
A. Conceptual Definition of Anxiety:

B. Response format:

C. Scale Items: Write a “R” next the number of any reversed items, but don’t include the “R” on the overhead.

1.

2.

3.

4.

5.

6.

D. Split-half Reliability: _________

E. Validity Correlations:

    Scale with STAI_______ Scale with MAS_______ STAI with MAS_______
F. Identify the 3 operational definitions of anxiety used in this lab?

G. Is your split-half reliability acceptable? If so discuss the elements that all your items have in common. If not, point out any items that seem different from the other items in the scale. (You will have to look back at your specific items to answer this question either way.)

H. How do your construct validity correlations compare to those between the STAI and MAS? Do your validity correlations meet the standard of .65 or better?

I. Look back over the items and response options in your scale and suggest 3 changes you could make to improve the reliability and the validity of your scale. For each one, indicate whether the change would help validity, reliability or both.

K. In past years many students wanted to improve their split half reliability by recalculating it using different sets of 3 questions. Explain why this is an inappropriate method for improving the split half reliability.