Two types of “scales”

Scales as responses to specific question
- “Likert scales” – do you agree or disagree? 3-point, 5-point, or 7-point scale
  - Variations – true or not true; important or not important

Scales as combination of items (sometimes called an index) – to create a single measure of a complex concept with multiple dimensions
- Ways of combining – usually, average or add or count
- Factor analysis – to create or confirm distinct factors from list of items
- Reliability testing – consistency of responses to items in scale
- Level of measurement – ordinal or interval or ratio?

Examples from articles

Gatersleben, et al. (pg. 339, pp. 342-345):
- Environmental behavior scale – based on 33 items asking how frequently they perform certain environmentally sound consumer behaviors; factor analysis to identify 6 underlying dimensions, used to create 2 scales (scores range from 1=never to 5=always).
- Environmental awareness – based on 12 items, agree-disagree scale; scores on items averaged to get scale (scores range from 1 to 5)

Grob (pg. 211-212):
- Environmental behavior: 21 items representing pro- or anti-environmental behaviors; plus one (if do pro items, if don’t do anti items), minus one (if don’t do pro item, if do anti items) for each item (scores range from -21 to +21).
- Environmental awareness – factual knowledge: six multiple choice questions, one point for each correct answer (scores range from 0 to 6).
- Environmental awareness – recognition of problems: six items, true-not true scale; scores on items averaged to get scale (scores range from 1 to 7).

Nordlund and Garvill (pg. 747):
- Pro-environment behavior: frequency of performing 25 different pro-environmental behaviors (e.g. recycling, saving hot water), scores on items averaged to get scale (scores range from 1 “regularly” to 4 “rarely”).
- Problem awareness: 12 items, agree-disagree scale; scores on items averaged to get scale (scores range from 1 to 7).

Steps for constructing a scale:
- Dimensions of concept
- Items to represent these dimensions *use same format for each item
- Scales for items (e.g. 5 point agree-disagree scale); *use same scale for each item
- Combining scores on each item into composite scale (e.g. add, average)

Note: Researchers often use existing scales developed by other researchers.
Exercise

Let’s say that you and your research team have settled on the following conceptual model for your study of bicycling in Davis:

1. Let’s say you measure frequency of biking to campus using a survey of students, in which you ask them how many times in a usual week they usually bike to campus.
   a. How would you test for reliability?
   b. How would you test for validity?

2. Think about possible dimensions of “pro-bicycling attitude” – how people feel about bicycling as a mode of transportation.
   a. Come up with three items that you could use to construct a scale for “pro-bicycling attitude.”
   b. How would you combine the responses to these items into a scale?

3. Think about possible dimensions of “perceived bicycle safety” – how safe people feel bicycling in their community.
   a. Come up with three items that you could use to construct a scale for “perceived bicycle safety.”
   b. How would you combine the responses to these items into a scale?

*Be sure to turn in your sheets!*

**Reading For Tuesday:** Chapter 14 Quantitative analysis (Chapter 12 in Red Edition)