Two types of “scales”

1. Scales as responses to specific question
   - Likert scales: do you agree or disagree? 5-point (or 3-point or 7-point) scale
   - Other scales: how true; how important

   Things to note:
   - Is it a zero to positive or a negative to positive scale?
   - Do you want to include neutral mid-point?

2. Scales as combination of questions (items) – to create a single measure of a complex concept with multiple dimensions.

   Steps for constructing a scale/index:
   - Identify dimensions of concept
   - Write questions (items) to represent these dimensions *use same format for each item
   - Choose scales for items (e.g. 5 point agree-disagree scale) *use same response scale for each item
   - Combine scores on each item into composite scale (e.g. add, average, other)

   Things to note:
   - Ways of combining
     - Simple methods: average or add or count
     - Statistical methods: factor analysis and its variations
   - Testing measures
     - Cronbach’s Alpha for “internal consistency”
     - Others...
   - Level of measurement – ordinal or interval or ratio?

   Scale versus Index? Don’t worry about it but in case you’re wondering...

<table>
<thead>
<tr>
<th>Scale e.g. New Ecological Paradigm scale</th>
<th>Index e.g. Consumer Price Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usually used for subjective things like attitudes, preferences; also for self-reports of behavior</td>
<td>Usually combine objectively measured things such as prices, income, etc.</td>
</tr>
<tr>
<td>Components are all similar, e.g. same type of survey question, same rating scale</td>
<td>Components can be very different from each other</td>
</tr>
</tbody>
</table>

See online text pages 49-53

Researchers often use existing scales developed by other researchers.

See articles with examples of scales on Canvas, plus links to environmental surveys on the website.
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 (questions) that you could use to construct a scale for “pro-bicycling attitude.”
   b. How would you combine the responses to these items (questions) 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 (questions) that you could use to construct a scale for “perceived bicycle safety.”
   b. How would you combine the responses to these items (questions) into a scale?

Be sure to turn in your sheets!