

statements vary in different items or indicators, the anchors ("strongly disagree" to "strongly agree") remain the same. Likert scales are ordinal scales because the anchors are not necessarily equidistant, even though sometimes we treat them like interval scales.

How would you rate your opinions on national health insurance?

Table 6.4. A semantic differential scale for measuring attitude toward national health insurance

	Very much	Somewhat	Neither	Somewhat	Very much	
Good						Bad
Useful						Useless
Caring						Uncaring
Interesting						Boring

Semantic differential scale. This is a composite (multi-item) scale where respondents are asked to indicate their opinions or feelings toward a single statement using different pairs of adjectives framed as polar opposites. For instance, the construct "attitude toward national health insurance" can be measured using four items shown in Table 6.4. As in the Likert scale, the overall scale score may be a summation of individual item scores. Notice that in Likert scales, the statement changes but the anchors remain the same across items. However, in semantic differential scales, the statement remains constant, while the anchors (adjective pairs) change across items. Semantic differential is believed to be an excellent technique for measuring people's attitude or feelings toward objects, events, or behaviors.

Guttman scale. Designed by Louis Guttman, this composite scale uses a series of items arranged in increasing order of intensity of the construct of interest, from least intense to most intense. As an example, the construct "attitude toward immigrants" can be measured using five items shown in Table 6.5. Each item in the above Guttman scale has a weight (not indicated above) which varies with the intensity of that item, and the weighted combination of each response is used as aggregate measure of an observation.

How will you rate your opinions on the following statements about immigrants?

Table 6.5. A five-item Guttman scale for measuring attitude toward immigrants

Do you mind immigrants being citizens of your country	Yes	No
Do you mind immigrants living in your own neighborhood	Yes	No
Would you mind living next door to an immigrant	Yes	No
Would you mind having an immigrant as your close friend	Yes	No
Would you mind if someone in your family married an immigrant	Yes	No

Scaling

The previous section discussed how to measure respondents' responses to predesigned items or indicators belonging to an underlying construct. But how do we create the indicators themselves? The process of creating the indicators is called scaling. More formally, scaling is a branch of measurement that involves the construction of measures by associating qualitative judgments about unobservable constructs with quantitative, measurable metric units. Stevens (1946) said, "Scaling is the assignment of objects to numbers according to a rule." This process of measuring abstract concepts in concrete terms remains one of the most difficult tasks in empirical social science research.

The outcome of a scaling process is a scale, which is an empirical structure for measuring items or indicators of a given construct. Understand that "scales", as discussed in this section, are a little different from "rating scales" discussed in the previous section. A rating scale is used to capture the respondents' reactions to a given item, for instance, such as a nominal scaled item captures a yes/no reaction and an interval scaled item captures a value between "strongly disagree" to "strongly agree." Attaching a rating