

Scaling Technique

Measurement and Scaling

Measurement means assigning numbers or other symbols to characteristics of objects according to certain pre-specified rules.

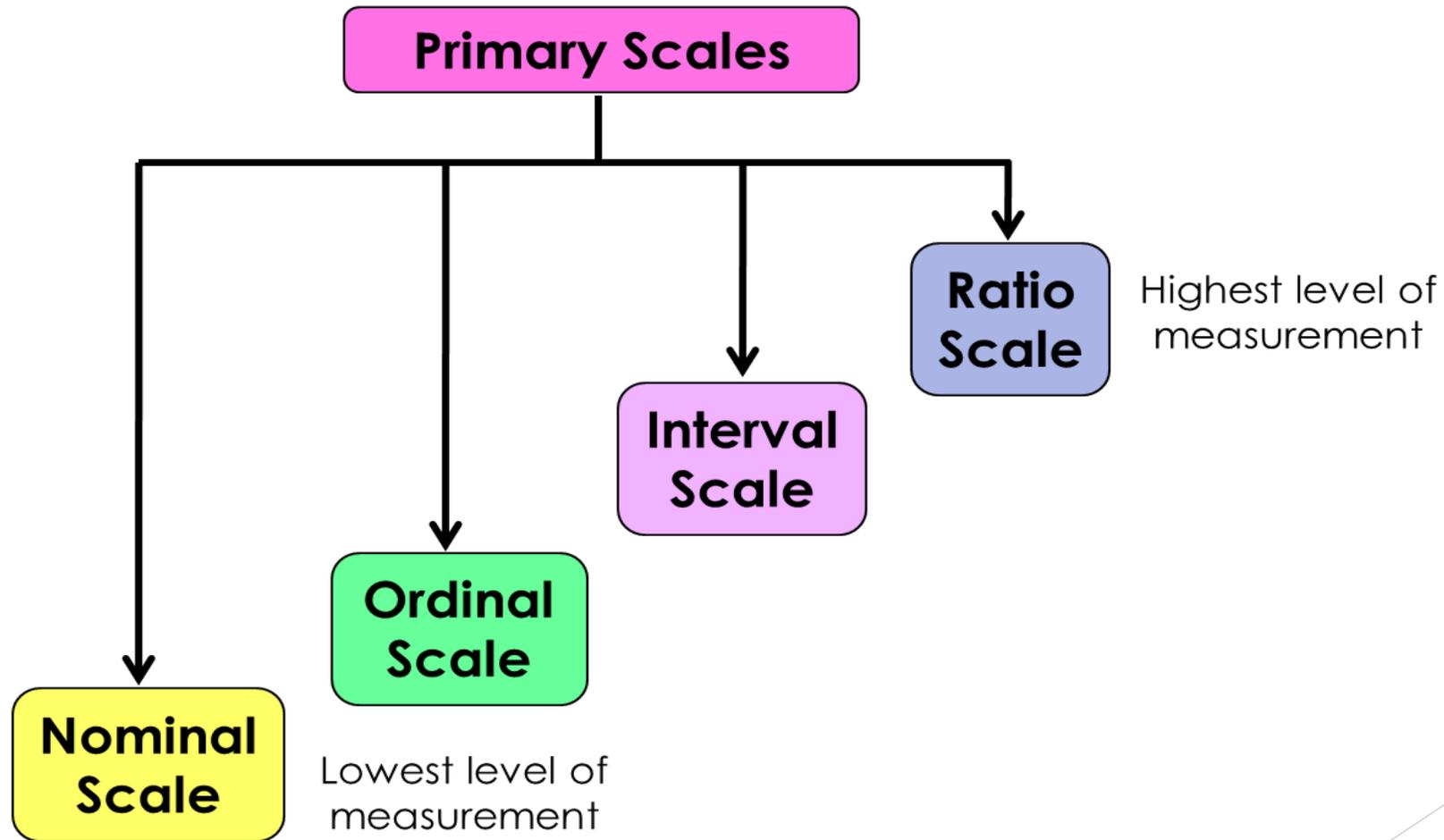
- ▶ One-to-one correspondence between the numbers and the characteristics being measured.
- ▶ The rules for assigning numbers should be standardized and applied uniformly.
- ▶ Rules must not change over objects or time.



Scaling involves creating a continuum upon which measured objects are located.

- ▶ Consider an attitude scale from 1 to 100. Each respondent assigned a number from 1 to 100, with 1 = Extremely Unfavorable, and 100 = Extremely Favorable. Measurement is the actual assignment of a number from 1 to 100 to each respondent. Scaling is the process of placing the respondents on a continuum with respect to their attitude toward department stores.

Primary Scales of Measurement



Nominal Scale

- ▶ The numbers serve only as labels or tags for identifying and classifying objects.
- ▶ The numbers do not reflect the amount of the characteristic possessed by the objects.
- ▶ The only permissible operation on the numbers in a nominal scale is counting.
- ▶ Only a limited number of statistics, all of which are based on frequency counts, are permissible, e.g., percentages, and mode.



Ordinal Scale

- ▶ A ranking scale in which numbers are assigned to objects to indicate the relative extent to which the objects possess some characteristic.
- ▶ Can determine whether an object has more or less of a characteristic than some other object, but not how much more or less.
- ▶ Any series of numbers can be assigned that preserves the ordered relationships between the objects.
- ▶ In addition to the counting operation allowable for nominal scale data, ordinal scales permit the use of statistics based on centiles, e.g., percentile, quartile, median.



Interval Scale

- ▶ Numerically equal distances on the scale represent equal values in the characteristic being measured.
- ▶ It permits comparison of the differences between objects.
- ▶ Statistical techniques that may be used include all of those that can be applied to nominal and ordinal data, and in addition the arithmetic mean, standard deviation, and other statistics commonly used in marketing research.



Ratio Scale

- ▶ Possesses all the properties of the nominal, ordinal, and interval scales.
- ▶ It has an absolute zero point.
- ▶ It is meaningful to compute ratios of scale values.
- ▶ All statistical techniques can be applied to ratio data.



Primary Scales Measurement

Scale					
Nominal	Numbers Assigned to Runners	17	21	13	Finish
Ordinal	Rank Order of Winners	Third Place	Second Place	First Place	Finish
Interval	Performance Rating on a 0 – 100 Scale	74	90	97	
Ratio	Time to Finish, in Seconds	16.0	14.1	13.2	



Comparison of Scaling Techniques

- ▶ **Comparative** scales involve the direct comparison of stimulus objects. Comparative scale data must be interpreted in relative terms and have only ordinal or rank order properties.
- ▶ In **non-comparative** scales, each object is scaled independently of the others in the stimulus set. The resulting data are generally assumed to be interval or ratio scaled.



Paired Comparison Scaling

- ▶ A respondent is presented with two objects and asked to select one according to some criterion.
- ▶ The data obtained are ordinal in nature.
- ▶ Paired comparison scaling is the most widely-used comparative scaling technique.
- ▶ With n brands, $[n(n - 1) / 2]$ paired comparisons are required.
- ▶ Under the assumption of transitivity, it is possible to convert paired comparison data to a rank order.



Rank Order Scaling

- ▶ Respondents are presented with several objects simultaneously and asked to order or rank them according to some criterion.
- ▶ It is possible that the respondent may dislike the brand ranked 1 in an absolute sense.
- ▶ Furthermore, rank order scaling also results in ordinal data.
- ▶ Only $(n - 1)$ scaling decisions need be made in rank order scaling.

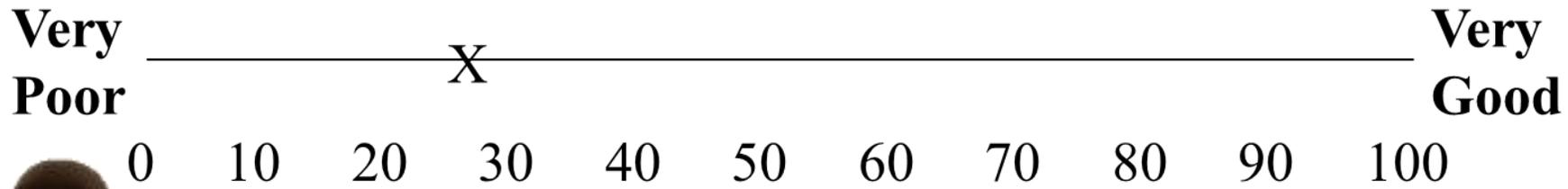


Constant Sum Scaling

- ▶ Respondents allocate a constant sum of units, such as 100 points to attributes of a product to reflect their importance.
- ▶ If an attribute is unimportant, the respondent assigns it zero points.
- ▶ If an attribute is twice as important as some other attribute, it receives twice as many points.
- ▶ The sum of all the points is 100. Hence, the name of the scale.



Continuous Rating Scale Example



The Likert Scale

- ▶ Extremely popular means for measuring attitudes.
- ▶ Respondents indicate their own attitudes by checking how strongly they agree/disagree with statements.
- ▶ Response alternatives:
“strongly agree”, “agree”, “uncertain”, “disagree”, and “strongly disagree”.
- ▶ Generally use either a 5- or 7-point scale



Semantic Differential Scales

- ▶ A series of numbered (usually seven-point) bipolar rating scales.
- ▶ Bipolar adjectives (for example, “good” and “bad”), anchor both ends (or poles) of the scale.
- ▶ A weight is assigned to each position on the rating scale.
- ▶ Traditionally, scores are 7, 6, 5, 4, 3, 2, 1, or +3, +2, +1, 0, -1, -2, -3.



Stapel Scales

- ▶ Modern versions of the Stapel scale place a **single adjective** as a substitute for the semantic differential when it is difficult to create pairs of bipolar adjectives.
- ▶ The advantage and disadvantages of a Stapel scale, as well as the results, are very similar to those for a semantic differential.
- ▶ However, the Stapel scale tends to be easier to conduct and administer.



A Stapel Scale for Measuring a Store's Image

Department Store Name

+3

+2

+1

-1

-2

-3

► Wide Selection



Graphic Rating Scale

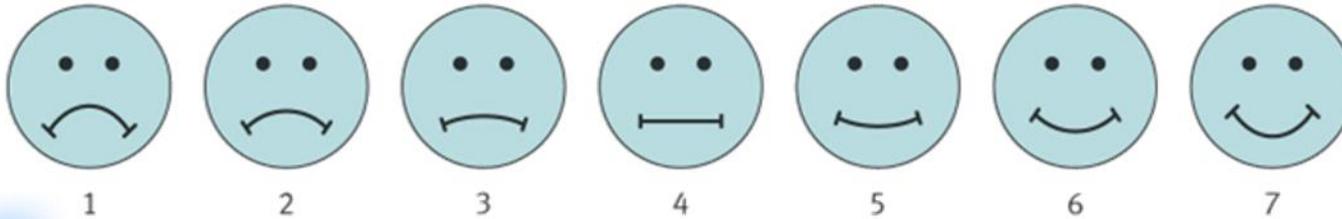
1. Usage (Quantity) Descriptors:

Never Use

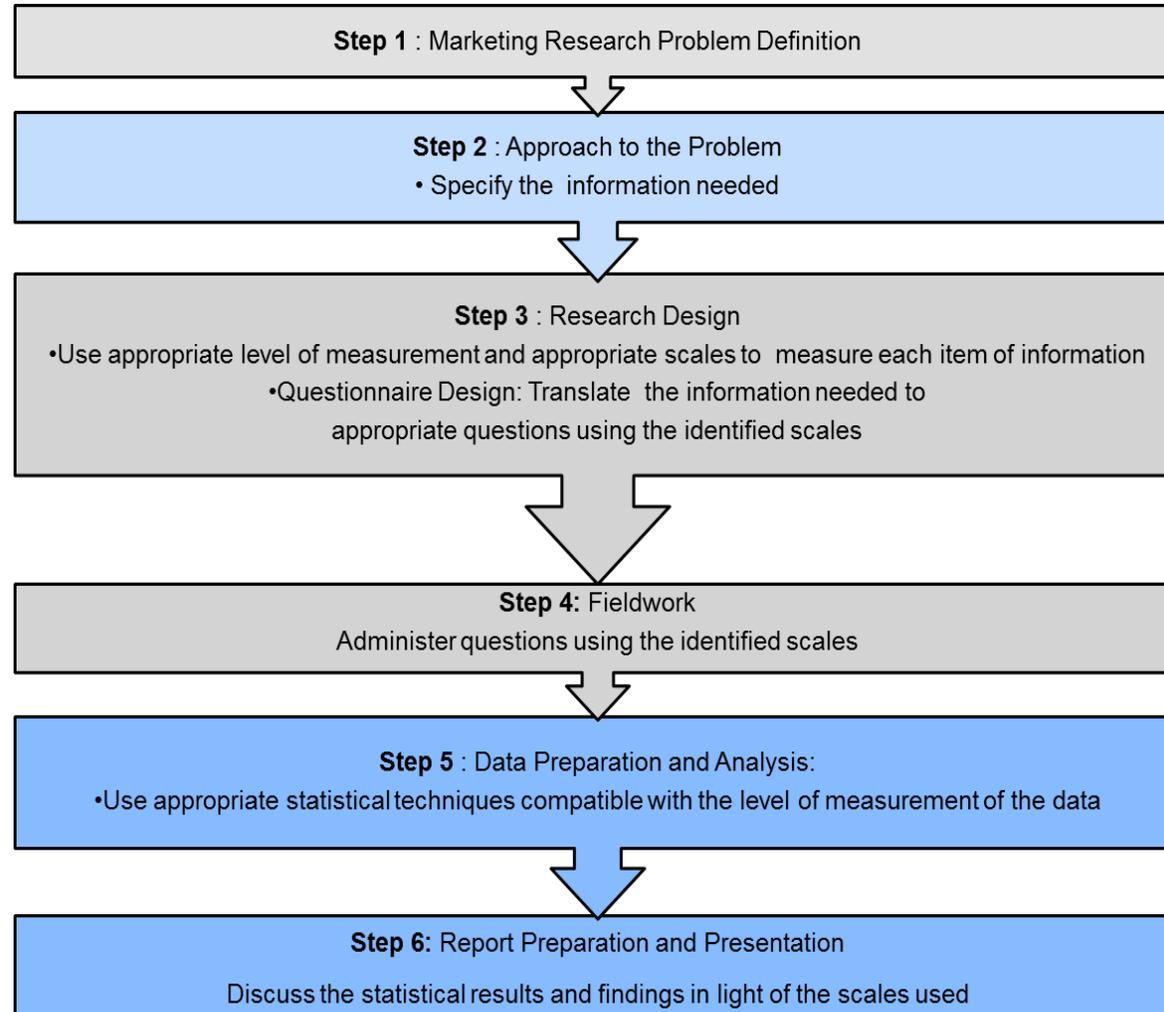
Use All the Time



2. Smiling Face Descriptors:



Relationship of Measurement and Scaling to the Marketing Research Process



THANKS

