Likert Scale

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A Likert scale, or more accurately a Likert-type scale, is a psychometric scale commonly used in questionnaires, and is the most widely used scale in survey research, such that the term is often used interchangeably with rating scale even though the two are not synonymous. When responding to a Likert questionnaire item, respondents specify their level of agreement or disagreement on a symmetric agree-disagree scale for a series of statements. Thus the scale captures the intensity of their feelings. The scale is named after its inventor, psychologist Rensis Likert.

Sample question presented using a five-point Likert item

An important distinction must be made between a Likert scale and a Likert item. The Likert scale is the sum of responses on several Likert items. Because Likert items are often accompanied by a visual analog scale (e.g., a horizontal line, on which a subject indicates his or her response by circling or checking tick-marks), the items are sometimes called scales themselves. This is the source of much confusion; it is better, therefore, to reserve the term Likert scale to apply to the summated scale, and Likert item to refer to an individual item.

A Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria; generally the level of agreement or disagreement is measured. It is considered symmetric or "balanced" because there are equal amounts of positive and negative positions. Often five ordered response levels are used, although many psychometricians advocate using seven or nine levels; a recent empirical study found that a 5- or 7- point scale may produce slightly higher mean scores relative to the highest possible attainable score, compared to those produced from a 10-point scale, and this difference was statistically significant. In terms of the other data characteristics, there was very little difference among the scale formats in terms of variation about the mean, skewness or kurtosis.

The format of a typical five-level Likert item is:

Strongly disagree
Disagree
Neither agree nor disagree
Agree
Strongly agree

Likert scaling is a bipolar scaling method, measuring either positive or negative response to a statement. Sometimes a four-point scale is used; this is a forced choice method since the middle option of "Neither agree nor disagree" is not available.

Likert scales may be subject to distortion from several causes. Respondents may avoid using extreme response categories (central tendency bias); agree with statements as presented

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(acquiescence bias); or try to portray themselves or their organization in a more favorable light (social desirability bias). Designing a scale with balanced keying (an equal number of positive and negative statements) can obviate the problem of acquiescence bias, since acquiescence on positively keyed items will balance acquiescence on negatively keyed items, but central tendency and social desirability are somewhat more problematic.

Scoring and analysis

After the questionnaire is completed, each item may be analyzed separately or in some cases item responses may be summed to create a score for a group of items. Hence, Likert scales are often called summative scales.

Whether individual Likert items can be considered as interval-level data, or whether they should be considered merely ordered-categorical data is the subject of disagreement. Many regard such items only as ordinal data, because, especially when using only five levels, one cannot assume that respondents perceive all pairs of adjacent levels as equidistant. On the other hand, often (as in the example above) the wording of response levels clearly implies a symmetry of response levels about a middle category; at the very least, such an item would fall between ordinal- and interval-level measurement; to treat it as merely ordinal would lose information. Further, if the item is accompanied by a visual analog scale, where equal spacing of response levels is clearly indicated, the argument for treating it as interval-level data is even stronger.

When treated as ordinal data, Likert responses can be collated into bar charts, central tendency summarised by the median or the mode (but some would say not the mean), dispersion summarised by the range across quartiles (but some would say not the standard deviation), or analyzed using non-parametric tests, e.g. chi-square test, Mann-Whitney test, Wilcoxon signed-rank test, or Kruskal-Wallis test. Parametric analysis of ordinary averages of Likert scale data is also justifiable by the Central Limit Theorem, although some would disagree that ordinary averages should be used for Likert scale data.

Responses to several Likert questions may be summed, providing that all questions use the same Likert scale and that the scale is a defendable approximation to an interval scale, in which case they may be treated as interval data measuring a latent variable. If the summed responses fulfill these assumptions, parametric statistical tests such as the analysis of variance can be applied. These can be applied only when more than 5 Likert questions are summed.

Data from Likert scales are sometimes reduced to the nominal level by combining all agree and disagree responses into two categories of "accept" and "reject". The chi-square, Cochran Q, or McNemar test are common statistical procedures used after this transformation.

Consensus based assessment (CBA) can be used to create an objective standard for Likert scales

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in domains where no generally accepted standard or objective standard exists. Consensus based assessment (CBA) can be used to refine or even validate generally accepted standards.

Level of measurement

The five response categories are often believed to represent an Interval level of measurement. But this can only be the case if the intervals between the scale points correspond to empirical observations in a metric sense. In fact, there may also appear phenomena which even question the ordinal scale level. For example, in a set of items A,B,C rated with a Likert scale circular relations like A>B, B>C and C>A can appear. This violates the axiom of transitivity for the ordinal scale.

Rasch model

Likert scale data can, in principle, be used as a basis for obtaining interval level estimates on a continuum by applying the polytomous Rasch model, when data can be obtained that fit this model. In addition, the polytomous Rasch model permits testing of the hypothesis that the statements reflect increasing levels of an attitude or trait, as intended. For example, application of the model often indicates that the neutral category does not represent a level of attitude or trait between the disagree and agree categories.

Again, not every set of Likert scaled items can be used for Rasch measurement. The data has to be thoroughly checked to fulfill the strict formal axioms of the model.

Pronunciation

Rensis Likert, the developer of the scale, pronounced his name 'lick-urt' with a short "i" sound. It has been claimed that Likert's name "is among the most mispronounced in field." Although many people use the long "i" variant ('lie-kurt'), those who attempt to stay true to Dr. Likert's pronunciation use the short "i" pronunciation ('lick-urt').

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