BASICS OF LIKERT

This issue deals with the use of Likert scale, biases, number of response cate–gories and analyzing Likert data.

Measurements in Quantitative and Qualitative Research. Both quantitative and qualitative research use careful, systematic methods to gather high quality data. The different styles in both types of research mean that the ap–proach to the measurement process are different:

Quantitative researchers contemplate and reflect on concepts before they gather data. They construct measurement techniques that would bridge con–cepts and data, to produce precise numerical information.

Qualitative researchers develop many flexible ongoing processes to measure data in various shapes, sizes and forms. They develop the concepts during data collection, with the new ideas giving them the direction and suggest new ways to measure. Ideas and data are bridged through a continuing interactive process.

Virtually every social phenomenon can be measured directly or indirectly and produce numerical values. Table 1 shows the 4 levels of measurement, from low–est to greatest precision, with each giving a different type of information.

Table 1: Levels of measurement

Precision	Level	Description	Example	Types of variable
Lowest	Nominal, N	Data classified into categories	Ethnic group: C, M, I, O	Discrete
	Ordinal, O	N + categories that can be ranked	Strongly agree, agree, dis–agree, strongly disagree	Discrete
	Interval, I	N + O + able to specify distance between categories	IQ scores: 95, 100, 105	Continuous
Highest	Ratio	N + O + I + there is a zero value that makes it possible to state relations in terms of ratios, rates, proportions	Age, income	Continuous

Likert scale

A scale is commonly used in situation where a re–searcher wants to measure how an individual feels or thinks about something. It arranges responses or obser–vations, mostly ordinal in nature, on a continuum. One commonly used scale is the Likert scale.

Named after psychologist Rensis Likert, the Likert scale is a psychometric scale widely used in surveys and health research. It is a composite measure used only after the respondent has answered all questions which address a common topic. In practice, what is actually a Likert item (a single question) is often mistakenly referred to as a Likert scale.

Example of a Likert item on self-rated health status: Fig 1

Statement: On a scale of 1 – 10, 1 signifying poorest possi–ble health and 10 the best possible health, please rate your current state of health?

- Younger respondents (<65 years) self-rate better health status (scores 9,10) compared to older respon–dents (65+ years).
- Vice verse holds true; i.e. older respondents self-rate poorer health status (scores 5,6,7) compared to the younger respondents.

Fig 1: Distribution of responses on self–rated health status in a survey
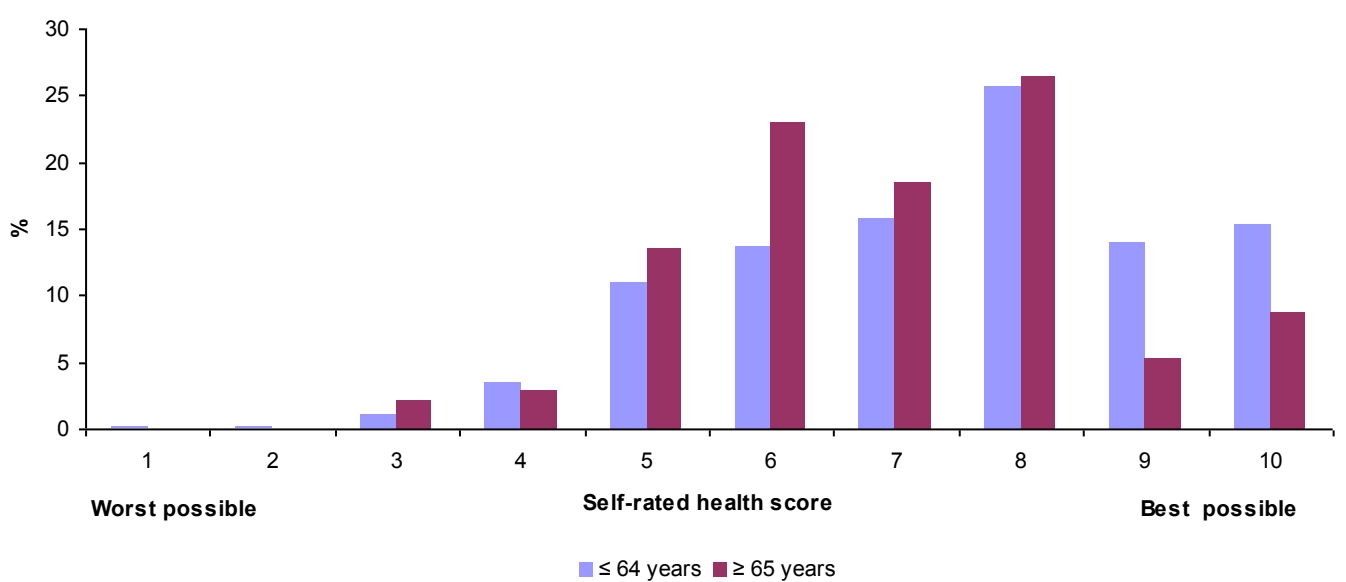
Central tendency bias

Respondents may avoid using extreme response cate–gories, thereby responding neutrally. The problem often arises from respondents either not being properly quali–fied to answer the question, not being engaged, or not understanding part of the question.

Example of central tendency bias: Fig 2

Statement: Staff feel like their mistakes are held against them.

In this example, more than 30% of the responses were neu–tral and hence not much information is gained from the question.

Fig 2: Distribution of staff responses in a survey
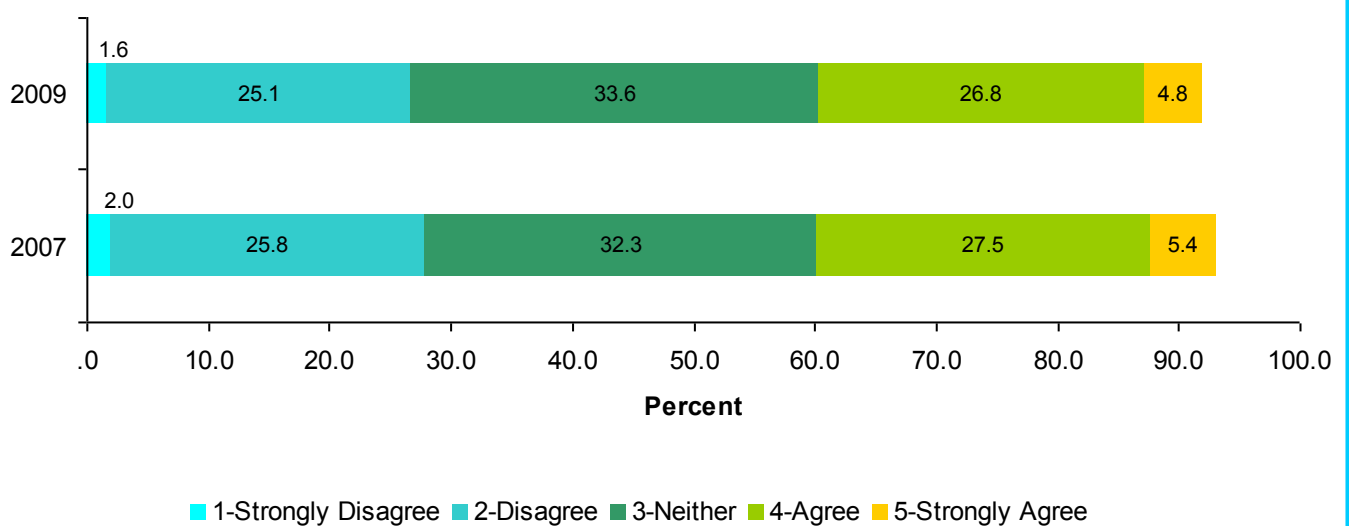
Number of response categories when developing Likert items

- Neutral rating 5-point scale is preferred when respon–dents are expected to truly feel neutral about a given topic. In such situations, the absence of a neu–tral midpoint can introduce respondent bias as the respondents are forced to chose a more positive or negative response.
- 6-point scale without neutral rating (forced choice method) is preferred when respondents are expected to be familiar with the subject. For example, when ask–ing students to rate a professor's performance, a neu–tral rating scale may not be necessary.
- Having 5 to 7 response options is ideal. Data becomes significantly less accurate when the number of scale points drops <5, while there is little gain in reliability when the categories increase to >7.

Analyzing Likert item responses

1. A Likert item is ordinal in nature. When estimating cen–tral tendency, one should use the median or mode. Summary statistics of Fig 1 are shown in Table-2.
2. Ordinal data may likewise be described using fre–quencies/percentages of each response category.
3. Appropriate inferential statistics for ordinal data in–clude non-parametric tests such as chi-square, Spearman's rho, or the Mann-Whitney U-test.

Table 2: Comparison of median, mode and mean self–rated health scores

	Self-rated health status score (1-10)		
	Median score	Modal score	Mean score (SD)
≤ 64 years	8	8	7.5 (1.8)
≥ 65 years	7	8	6.9 (1.6)

Mean and stan–dard deviation are inappropriate for ordinal data

Advantages of Likert scale

- Easy to construct, administer and score
- Easy to read and complete
- Easy to collect and analyze

Pradeep Paul, B.S.M.S , MSc (Epidemiology)

Pradeep is a Senior Analyst with many years of experi–ence in epidemiologic research. His research interests include systematic reviews/Meta-analysis, health tech–nology assessment, program evaluation and community health assessments.