

Abstract & Bio

Peter Lutes - New researchers: How to Plan and Use Likert Scales for Your Research

This presentation introduces new researchers to the use of Likert scales, highlighting their flexibility in measuring attitudes, opinions, and behaviors. It covers key concepts, such as the difference between ordinal and nominal data, the dual nature of Likert data, and tips for designing effective questionnaires. The focus is on best practices, overcoming challenges, and the importance of well-crafted questions for accurate results. While foundational, this session does not include detailed statistical methods.

Prof. Peter Lutes, DComm specializes in applied communication, language education, and globalized learning. He has expertise in Likert scale survey design, teacher training, and the ethical use of AI in education and research.



Common Likert scale lengths include 5-point 7-point and 9point scales with specific uses

- 5-point scales: Common in general surveys (e.g., agreement levels)
- 7-point scales: Offer more nuance, used in psychological research
- 9-point scales: Known as hedonic scales, used in food testing and preference studies

• Examples:

- 5-point: Strongly Disagree Strongly Agree
- 7-point: Extremely Dissatisfied Extremely Satisfied
- 9-point: Dislike Extremely Like Extremely

Understanding the differences between Nominal data, Ordinal data and Interval data is essential for proper analysis
Nominal Data: Categories without order (e.g., gender).
 Ordinal Data: Categories with order but inconsistent intervals (e.g., Likert scales).
 Interval data: Categories with order and treated as consistent intervals * (There is no "true zero" as with cardinal numbers)
*In the context of Likert scales, responses are ordinal because they represent ordered categories, though some researchers treat them as interval data with caution.
(Jamieson, 2004)

Nominal Data has no meaningful order unlike Ordinal data	
and Interval data	

NominalIdentification or labelingZIP codes, jersey numbersClassification, not numerical valueOrdinalPosition or order1st, 2nd, 3rdRanking or sequencingInterval (Likert)Position or order1st, 2nd, 3rdRanking or sequencing	Туре	Purpose	Examples	Key Use
OrdinalPosition or order1st, 2nd, 3rdRanking or sequencingInterval (Likert)Position or order1st, 2nd, 3rdRanking or sequencing	Nominal	Identification or labeling	ZIP codes, jersey numbers	Classification, not numerical value
Interval (Likert)Position or order1st, 2nd, 3rdRanking or sequencing	Ordinal	Position or order	1st, 2nd, 3rd	Ranking or sequencing
	Interval (Likert)	Position or order	1st, 2nd, 3rd	Ranking or sequencing

Forced-Choice Likert Scale Definition: Respondents must express a preference or opinion, avoiding neutrality. Example: Strongly Disagree Disagree (No neutral option) Agree Strongly Agree

7

Advantages Encourages Decision-Making Forces respondents to critically evaluate their stance rather than default to neutrality. Krosnick (1991) suggests this reduces satisficing, where respondents choose the easiest option. More Discriminative Data Generates polarized responses, helping researchers detect stronger patterns or opinions. Useful for identifying attitudes that lean toward agreement or disagreement. Encourages respondents from choosing the neutral middle to appear non-committal. Podsakoff et al. (2003) highlight the risk of bias reduction with forced scales.



May Lead to Artificial Responses

- Respondents forced to choose may provide inaccurate answers when they genuinely feel neutral.
- Dillman et al. (2014) note this can compromise the validity of responses.

Stress for Respondents

- Can cause frustration among participants who genuinely lack an opinion or knowledge on the subject.
- Fowler (2014) warns that forced scales may increase dropout rates in surveys.

• Overemphasis on Extreme Opinions

• Skews results by overrepresenting strong opinions, potentially missing subtle attitudes.



2. Non-Forced Likert Scale			
 Definition: Includes a middle option, allowing respondents to express neutrality or indecision. 			
• Example:	Strongly Disagree		
	Disagree		
	Neutral		
	Agree		
	Strongly Agree		



- · Reflects the full spectrum of attitudes, including those who are undecided or indifferent.
- Reduces the likelihood of "fake" data created by forcing decisions.

Decreases Response Stress

· Participants feel less pressured, improving their survey experience and participation rates.

11

Disadvantages

• Encourages Satisficing, a common issue in survey design

 Satisficing is a decision-making strategy where individuals choose an option that meets a minimum threshold of acceptability rather than seeking the optimal solution. In the context of surveys, satisficing occurs when respondents provide answers that are "good enough" rather than fully thoughtful or accurate, often due to lack of motivation, fatigue, or cognitive overload

- Examples in Surveys:
 - Selecting the middle option without fully considering the question.
 - Agreeing with statements (acquiescence bias) without evaluating them carefully.
 - Providing random or patterned responses to complete the survey quickly.





The choice between forced-choice and non-forced Likert scales is a trade off

- The choice between forced-choice and non-forced Likert scales depends on the research objectives and context. Each approach has trade-offs that need careful consideration in survey design.
- A deep understanding of your field is essential.



Likert Data Can Be Analyzed as Qualitative Data and Quantitative Data

- Qualitative Perspective: Useful for identifying trends and descriptive patterns.
- Quantitative Perspective: Enables statistical analysis like means and variances.

Clearly defining the analysis purpose ensures valid interpretations.

(Carifio & Perla, 2008)

17

Statistical Tools for Analyzing Likert Data Qualitatively

- Content Analysis: Categorizes responses into themes (e.g., "work environment," "growth").
- Thematic Analysis: Identifies recurring sentiments.
- Word Frequency Analysis: Highlights commonly used terms in responses.*

(Carifio & Perla, 2008)



Differences Between Forced-Choice and Non-Forced Likert Scales

A **forced-choice Likert scale** requires respondents to choose between predefined options without a neutral or middle option,

A **non-forced Likert scale** includes a neutral or undecided middle option (e.g., "Neither Agree nor Disagree").

There are theoretical differences, advantages, and disadvantages for each

Likert data has both ordinal properties and interval-like qualities depending on use

- While Likert data are technically ordinal, some analyses assume interval properties for statistical modeling.
- Example: Calculating the average satisfaction score from a 5-point Likert scale.





Scenario: You conducted a survey asking students to rate their agreement with the statement:

"I feel confident speaking English in class."

Rated on a 5-point Likert scale:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

• You want to compare Male vs Female students.



Aspect	Parametric Tests	Non-Parametric Tests
Assumptions	Assumes specific distribution (usually normal distribution).	No strict assumptions about the distribution (distribution-free).
Data Type	Requires interval or ratio scale data (continuous, e.g., height, weight).	Can handle ordinal, nominal, or non- normally distributed interval data.
Examples	T-test, ANOVA, Pearson correlation.	Mann-Whitney U test, Wilcoxon Signed- Rank test, Kruskal-Wallis, Spearman rho.
Statistical Power	Generally, more powerful if assumptions are met.	Less powerful but more robust with smal samples or non-normal data.
Sample Size	Requires larger sample sizes for valid results.	Works well with small sample sizes.
Robustness	Sensitive to outliers and violations of assumptions.	More robust against outliers and non- normality.
Use Case	When data meets normality, homogeneity of variance, & interval/ratio level.	When data is skewed, ordinal, or assumptions of parametric tests are violated.

1. Mann-Whitney U Test (Ordinal Approach):

• Hypothesis:

- H₀: There is no difference in confidence ratings between males and females.
- H₁: There is a difference in ratings.

• Steps:

- Collect ratings from both groups.
- Rank all data together.
- Compare the sum of ranks for each group.

Interpretation:

• If p < 0.05, reject H₀. There is a significant difference.



Parametric tests (assuming approximate interval-level measurement):

- T-test for comparing means of two groups (independent or paired).
- ANOVA for comparing means of three or more groups.
- **Pearson correlation** for relationships between variables.
- Regression analysis to model relationships.
- **Summed or averaged Likert scales** (multiple items combined) are often treated as interval, allowing for parametric tests.







TIPS: The number of response options affects data granularity and respondent clarity

- Fewer options (3-5) reduce complexity and increase response rates; more options (7-11) increase precision but may overwhelm respondents.
- Example: 5-point scale for beliefs.

31

TIPS: Balanced scales with equal positive and negative options improve reliability

- An unbalanced scale (e.g., more positive than negative options) may skew results.
- Example: A balanced 5-point scale from "Strongly disagree" to "Strongly agree."



TIPS: Avoid leading or biased questions to ensure validity of responses

- Bias can creep in through wording or context.
- Example of biased: "Don't you agree our product is great?"
- Neutral: "How would you rate the quality of our product?"
- I prefer: The product is easy to use.

SA, A, N, D, SD

TIPS: Pre-testing questionnaires helps identify problems and refine questions
Run a small-scale trial of your survey to identify confusing or misleading items.
Example: Test a draft survey with 10 participants and revise unclear items based on feedback.

35

TIPS: Consistent formatting and question order support better data quality

- Inconsistent design can distract or confuse respondents.
- Example: Use the same font and alignment for all items, and group similar questions together.

Measuring how attitudes influence language learning success may help teachers adapt instruction to learner beliefs & improve outcomes

- AMTB (Gardner, 1985): Attitude/Motivation Test Battery Evaluates motivation, attitudes toward learning, and integrative vs instrumental motivation.
- BALLI (Horwitz, 1987): Beliefs About Language Learning Inventory Measures learners' beliefs about language aptitude, difficulty, and strategies
- SAKE (Rifkin, 2000): Survey of Attitudes toward Knowledge about English Explores attitudes toward English as a global language and knowledge about it.
- Sakui, K., and S. Gaies. (1999). Sakui and Gaies Beliefs Survey Instrument Measures Japanese learners' beliefs about language aptitude, difficulty, and strategies
- SILL (Oxford, 1990): Strategy Inventory for Language Learning Assesses the frequency of language learning strategy use among learners.

37

Important demographic information supports contextualizing language learning data

Collecting demographic data helps researchers understand the background factors influencing language learning. Key demographics for university students include:

- - Age: Indicates life stage and cognitive maturity
- · Gender: Helps analyze potential gender-based differences in learning
- - Major/Field of Study: Contextualizes language needs and usage
- - Year of Study: Reflects academic experience and language exposure
- - Native Language: Indicates first language influence
- Previous Language Experience: Shows prior exposure to language learning
- - Study Abroad Experience: Affects language proficiency and motivation

Sample demographic section for a language learning questionnaire **This is terrible!**

· Please provide the following information:

- 1. Age:
- 2. Gender: Male / Female / Other
- 3. Major/Field of Study: _
- 4. Year of Study: 1st / 2nd / 3rd / 4th / Graduate
- 5. Native Language: ____
- · 6. Have you studied another language before? Yes / No
- If yes, which language(s)?
- 7. Have you studied abroad? Yes / No
- If yes, where and how long? _____





