BT 623
Lecture 5
Introduction to Questionnaire
and
Optimal Length of Questionnaires in Research

How short or long should be a questionnaire for any research?

Contents

Introduction

Role in Surveys

- Questionnaires are crucial in epidemiological and mental health surveys, and to understand knowledge, attitude, and practices (KAP).

Designing Complexity

- Creating a well-designed questionnaire saves time and ensures the collection of relevant data but is complex and time-consuming.

Survey Research Methods

- Surveys are the most frequently used method used in **medical education research**.
- Because the medical community is the most frequently surveyed population in any country, response rates are typically low.
- It is critically important that potential respondents perceive surveys as important and interesting so they are more likely to participate in the research.
- Not only must the items be interesting, they must be limited so that the survey is not a burden for busy people.
- If each item provides a critical piece of information and response rate is high, the researcher should be in a good position to answer his/her question.

Protocol: (60 minutes)

1. **Introduction and goal setting (5 minutes).** Establish the extent of experience participants have with conducting surveys and adjust goals to suit their needs.

2. **Elicit from participants research questions they are currently working on**. Together, sharpen the focus of each question when needed. Establish whether they intend to conduct interviews in person or by phone; mailed or web-based surveys, or some other form of survey. (10 minutes)

3. **Alone, elaborate upon the domain to be studied. List the variables involved**. To do this, one might sketch out general questions or points of information of interest (e.g., gender of respondent, satisfaction with current salary). (5 minutes)
4. **Demonstrate for participants how items written to answer a research question failed or succeeded**. Point out which response options were used, and explain why these were preferable to others. (5 minutes)
5. **Alone, generate 2 items based on the rough sketches generated previously**. Select 3 different response options (e.g., Likert scale, rank order, forced option, open-ended) and consider how each would answer the question differently. (5 minutes)

6. **In dyads or small groups, present to others the research question and the 2 items written**. Ask others what the responses to these questions tell them about your research question. Critique the items, trying to identify limitations to later interpretations. (10 minutes)

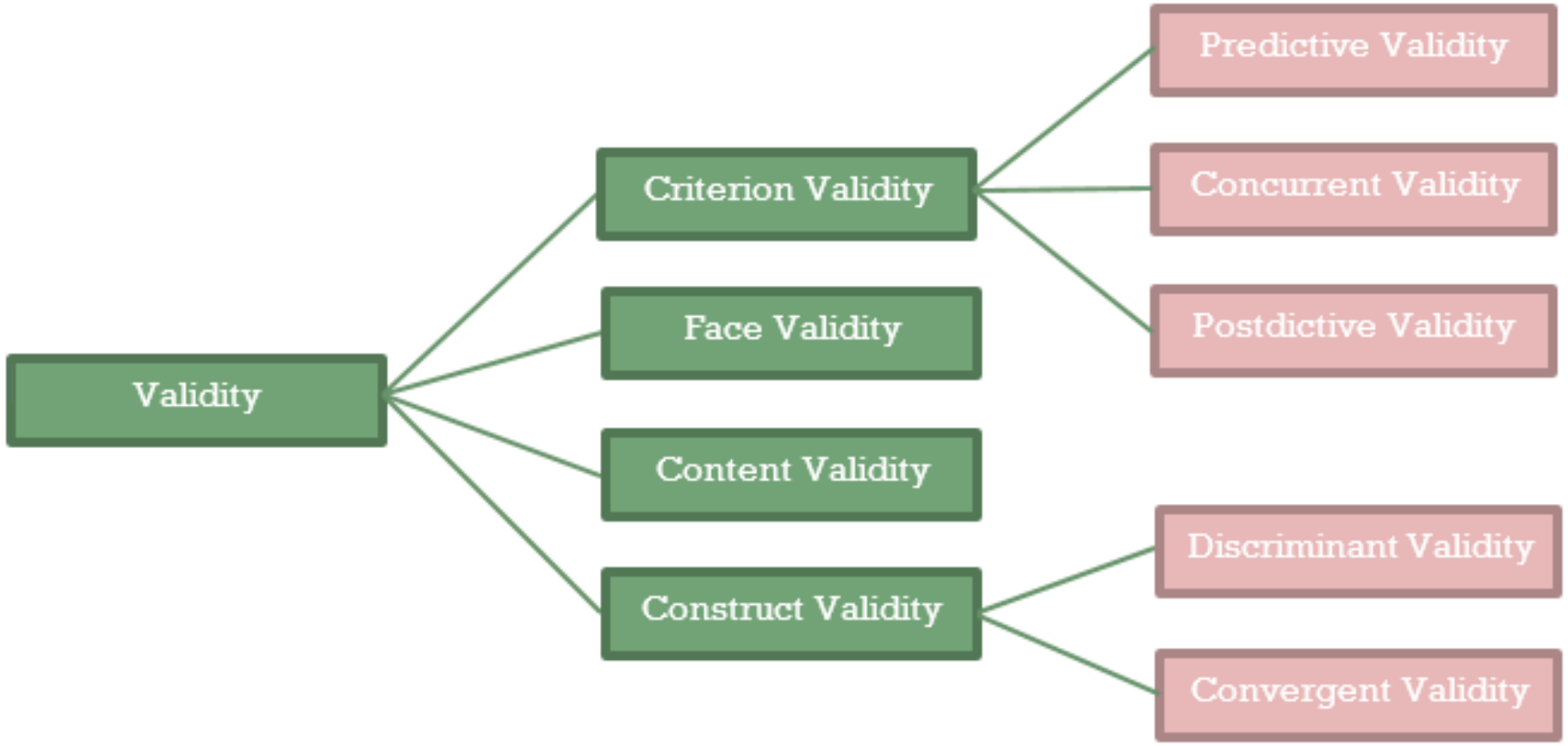
7. **Demonstrate for participants the pros and cons of item response consistency versus variation** (speed of response with possible response habituation versus discrimination), as well as the potential for more powerful analyses given different response formats (e.g., scales versus categorization). Describe possible analyses beyond descriptions (i.e., frequency counts versus inter-correlations amongst items). (5 minutes)

8**. Ask individuals to volunteer to show how their two items are related** and how they might be analyzed together (e.g., “are women more satisfied with their salaries than men are?). (10 minutes)

9. **Summary:** Comment on how one structures surveys to enhance response rate, such as by placing the most interesting items first to capture interest of respondents. Leave demographics for last. Ask only for demographics that are theoretically important to the question. Summarize points the participants have made during the workshop. (5 minutes)

Definitions of validity

Validity has to do with the meaning of a measurement and the inference from that measurement to the construct the researcher intended to measure.



https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3205040

Internal Validity: The extent to which one can claim that the independent variable caused the dependent variable.

External Validity: The extent to which one can generalize the experimental effect.

Criterion Validity: Criterion or concrete validity is the extent to which a measure is related to an outcome. It measures how well one measure predicts an outcome for another measure. A test has this type of validity if it is useful for predicting performance or behavior in another situation (past, present, or future).

Face Validity: The extent to which the measure seems plausibly or intuitively true to a reasonable person.

Content Validity: The extent to which there is consistency between the content of the measurements and the content taught, for example.

Construct Validity: The extent to which the measure truly reflects the underlying trait or construct as it might be measured at another time or place or using a different instrument. Construct validity refers to how well you translated or transformed a concept, idea, or behaviour that is a construct into a functioning and operating reality, the operationalization.

Concurrent Validity: The extent to which a new test correlates with a previously established test that purportedly measures the same construct. Concurrent validity is a type of evidence that can be gathered to defend the use of a test for predicting other outcomes.

Convergent Validity: Convergent validity, often used in sociology, psychology, and other behavioural sciences refers to the extent to which two independent measures of one construct are correlated and are, therefore, indicators of the construct. It tests that constructs that are expected to be related are, in fact, related.

Discriminant Validity: The extent to which the measure of one construct differs from the measure of a second, supposedly independent construct. Discriminant validity is the extent to which latent variable A discriminates from other latent variables (e.g., B, C, D).

Predictive Validity: The extent to which a measure on one test (of one construct) predicts future performance on a different measure (of a different construct). The survey is predictively valid if the test accurately predicts what it is supposed to predict.

Postdictive Validity: For this type of validity, the criterion is in the past. That is, the criterion (e.g., another test) was administered in the past. It is a form of criterion-referenced validity that is determined by the degree to which the scores on a given test are related to the scores on another, already established test or criterion administered at a previous point in time

Taherdoost, Hamed, Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research (August 10, 2016).

Checklist of tasks for survey development

1. **Clarify the research question or hypothesis**
    a. Why do you want to know?
    b. Has the research been done before?
    c. What will you do with the data?
    d. Who cares?
2. **Identify the subjects of interest**
    a. Do you have access to them? Can you gain access to them?
    b. How many do you need to survey to get a meaningful answer? (power calculation)
    c. How many can you get to survey?
    d. What is the likely response rate?
3. **Determine what information will be needed to answer the question**
    a. Brainstorm questions or items that might be included in the survey
    b. Differentiate between critical information & “nice to know”
4. **Decide how to administer the survey**
    a. Paper
    b. Computer (e.g., Survey Monkey)
    c. Telephone
    d. Face to face

5. **Write questions appropriate to the means of administration, question, subjects, time**
    a. 10-20 minutes is the usual tolerance level
    b. Oral surveys require subjects to remember question + response options so be clear and succinct
    c. Using the same response options speeds up response time but may lead to response set & lack of variation
    d. Using different response options heightens focus and variation
    e. Open-ended items provide depth but must be recorded carefully & lengthen survey time
    f. The more response options the more material the survey needs to be (e.g., many items to rank require being able to sort into preliminary and then more refined piles)
6. **Field test survey**
    a. Invite people who are like target subjects but avoid dipping into pool of respondents
    b. Measure time to complete survey
    c. Ask respondents to identify terms or whole questions they did not understand
    d. Ask for general comments & suggestions
7. **Analyze & refine survey items**
    a. Read responses carefully to determine whether data answer your question
    b. Go beyond analysis to write a preliminary paragraph describing responses
    c. If a response is ambiguous, rewrite and retest the item

Quality Factors

Determinants

- Quality depends on length, language, comprehension, population relevance, and administration mode.

Response Rate

- Defined as the ratio of responses to total potential respondents, crucial for the quality and generalizability of survey outcomes.

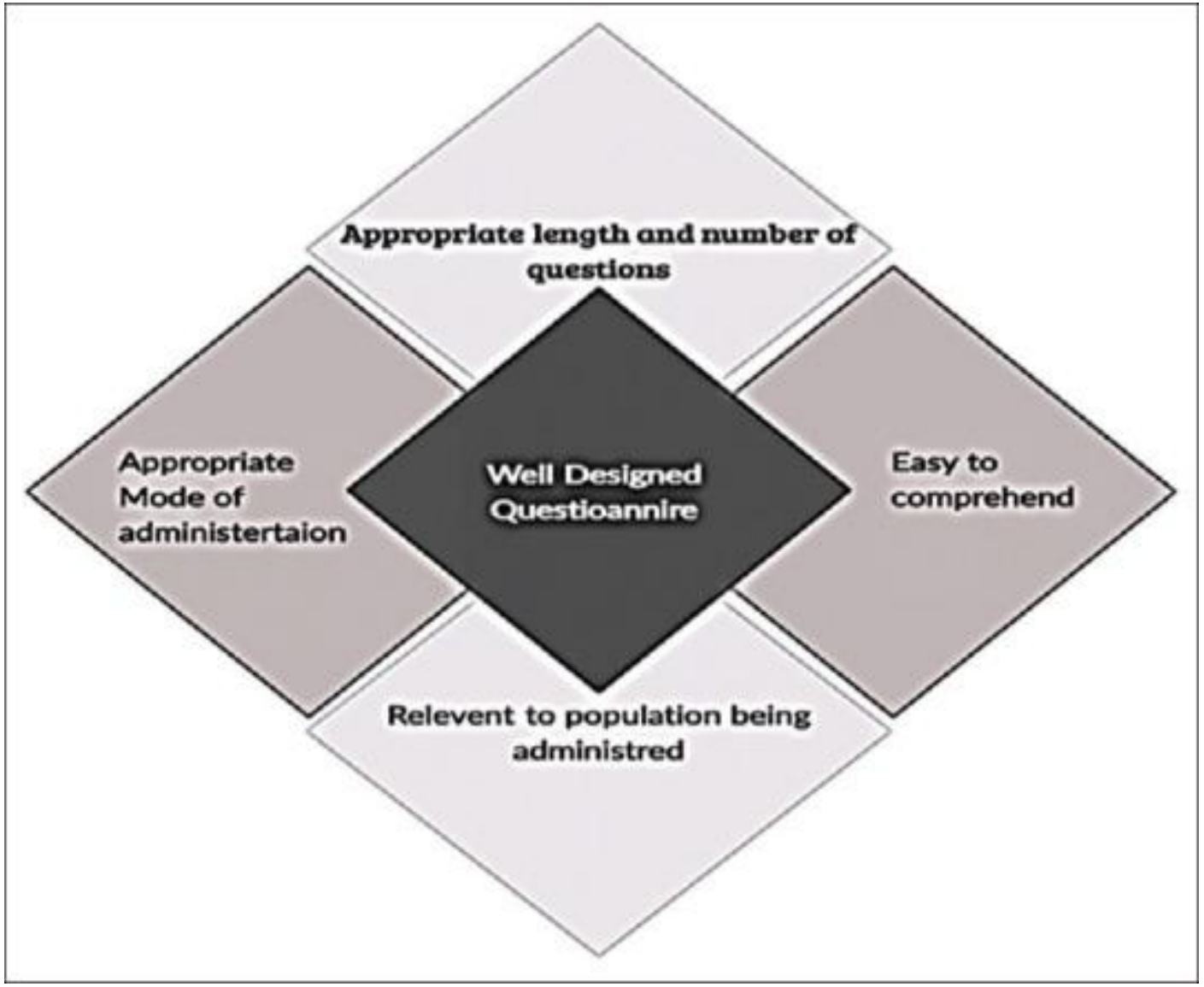


Figure: Qualities of a well-designed questionnaire

Definition of a Questionnaire

- **Merriam Webster** defines the questionnaire as “a set of questions for obtaining statistically useful or personal information from individuals”.

- **Collins** defines a questionnaire as “a questionnaire is a written list of questions which are answered by a lot of people to provide information for a report or a survey.”

- **The Oxford learners’ dictionaries** also give a somewhat similar definition which states that a questionnaire is “a written list of questions that are answered by several people so that information can be collected from the answers.

Definition of a Questionnaire

- ***According to various definitions, a questionnaire is a written list of questions for collecting information from numerous individuals relevant to research aims.***

- It is used in both **quantitative** and **qualitative** research to efficiently gather data from large populations.

Applications

- Questionnaires are generally applied when a large population has to be assessed or surveyed with relative ease where they play a crucial role in gathering information on the perspectives of individuals in the population.

General Uses

- Used in opinion polls, marketing surveys, and in politics.

Biomedical Research

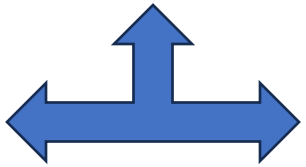
- Applied in epidemiological and mental health surveys, surveys on attitudes towards health services, and to conduction knowledge, attitude, and practice (KAP) studies.

HOW TO DESIGN A QUESTIONNAIRE

https://www.enago.com/academy/research-questionnaires/

Types of Questionnaires

Two types



Paper format

Electronic format

- The questionnaire can further be of **two types** i.e., ***self-administered*** or ***professionally administered*** via interview

The paper format can be administered easily both in self-administered mode or professional administered mode via direct administration when the population is relatively small as it is cumbersome to manage and store the physical questionnaire, paper format can also be administered to a larger population via postal surveys.

Electronic questionnaires can be easily administered to a larger population in self-administered mode via Internet-based services like google forms, e-mails, SurveyMonkey, or Survey Junkie, etc.

When administering professional-administered questionnaires professional telephonic services must be utilized to interview a larger population in a shorter duration of time.

What it is required to answer individual questions in the questionnaire or the burden imparted on respondents

According to Bowling, in general, there are at least **four intricated steps** required in answering a particular question in a questionnaire.

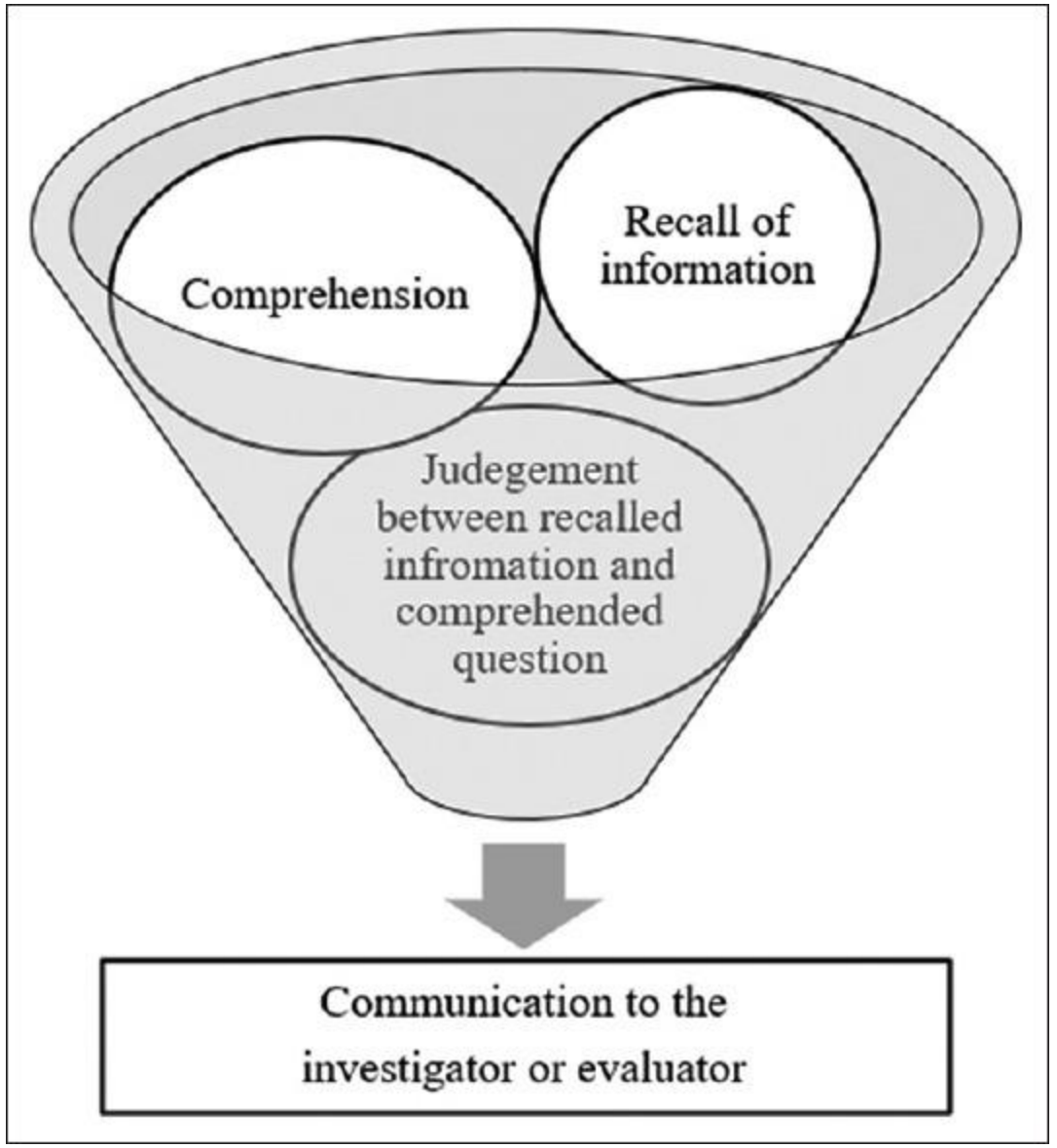


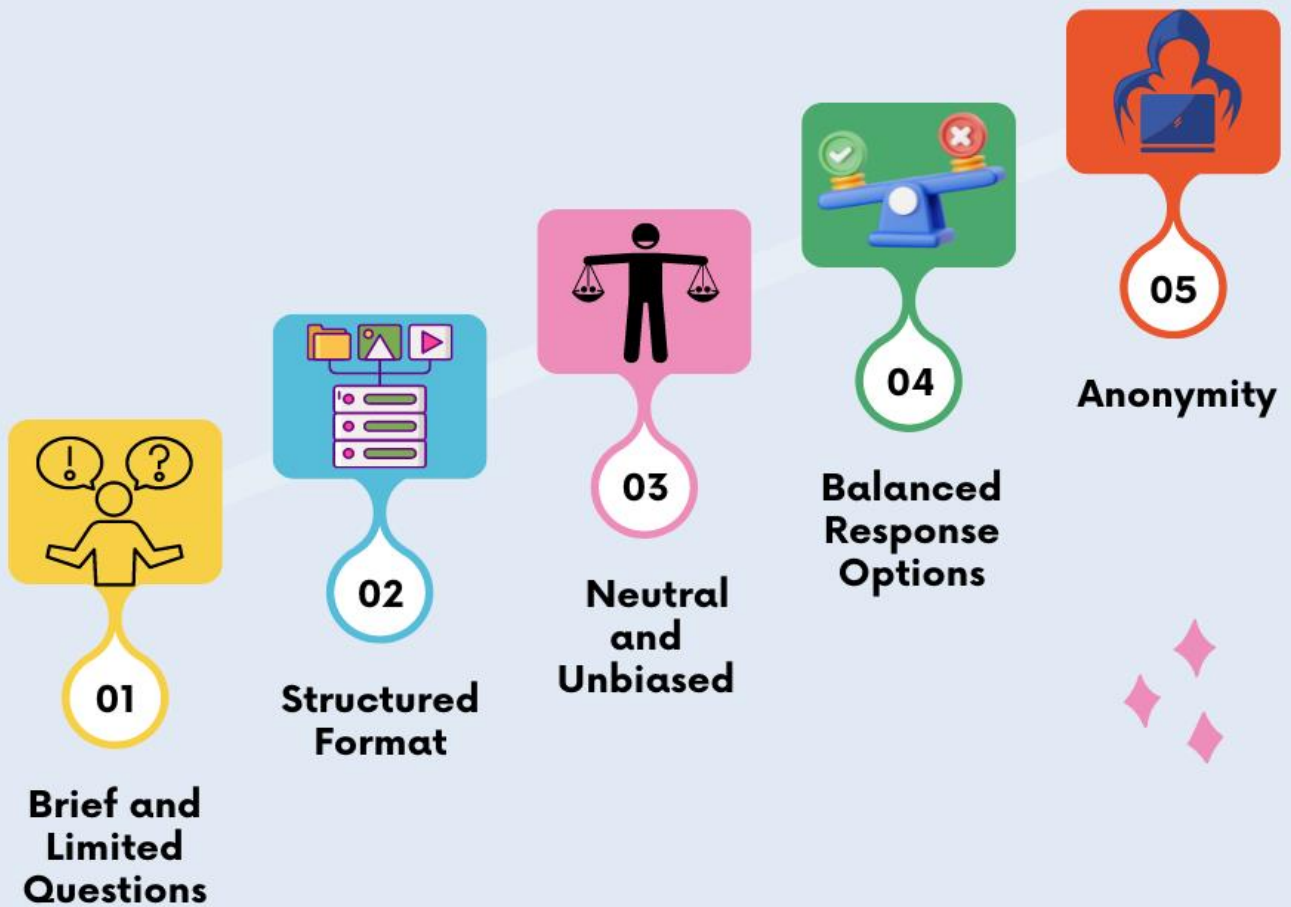
Figure: Steps involved for answering a particular question in the questionnaire

In the case of a self-administered questionnaire, there is also a need for **critical reading skills** which is not required in one-to-one or face-to-face interview which only requires **listening** and **verbal skills** to respond to questions in the same language in which they are being asked or interviewed.

- **Other crucial factors** which play an important role in deciding the utility of questionnaire in various research, one such factor is the literacy of the participants which is a major limiting factor in self-administered questionnaires.

- Whereas, the other factors include the respondent's age, maturity, and level of understanding and cognition, which are some of the other ways related to the comprehension of the questions.

Characteristics of a Good Questionnaire



https://www.formaloo.com/blog/what-is-a-good-questionnaire-everything-you-need-to-know

Length of the Questionnaire and Impact

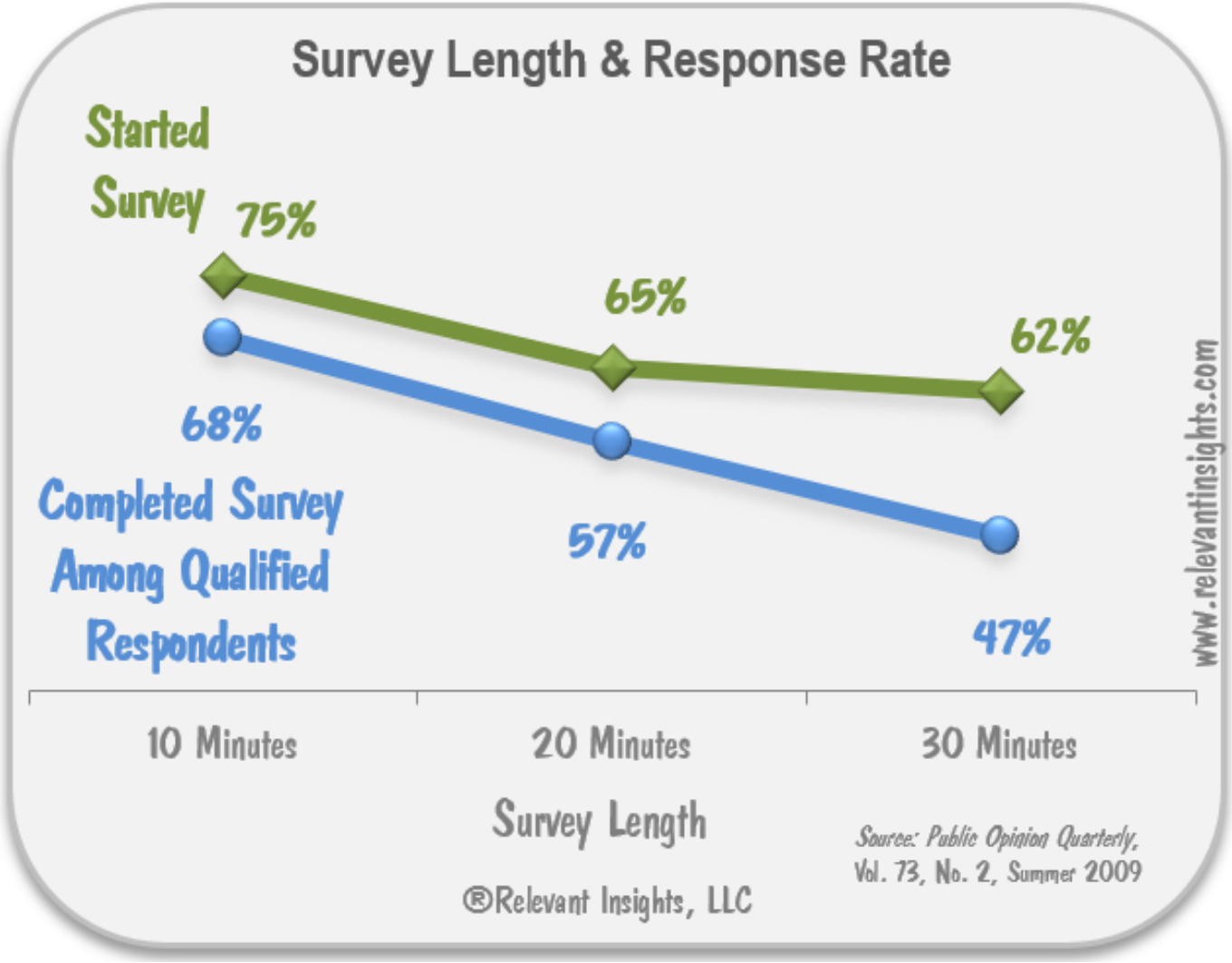
Effects

- Length affects completion time, survey cost, response rate, and data quality.

Studies

- Mixed findings on how length affects response rates, reliability, and data quality.
- Strategies like prenotification and reminders can mitigate negative impacts.

- In an experiment conducted by Galesic and Bosnjac in 2003 to prove this point, 3,472 respondents were divided into 3 groups based on an online survey with different lengths (10, 20, and 30 minutes).
- The adjacent figure shows how the number of respondents who completed the survey declined as the survey length increased.



https://www.jstor.org/stable/25548084

Studies

As evident from the study conducted by Iglesias and Torgerson in 2000, on the response rate of a mailed questionnaire, an increase in the length of the questionnaire from five pages to seven pages reduces the response rate from women aged 70 years and over but on contrary does not seems to affect the quality of response to questions.

Sahlqvist, et al. in 2011 reported that participants were more likely to respond to the short version of the questionnaire as compared to a long questionnaire.

Another study conducted by Koitsalu et al. in 2018 reported that they were able to increase overall participation and information gathered through a long questionnaire with the help of prenotification and the use of a reminder without risking a lower response rate.

Studies

Testing of ultrashort, short, and long surveys of 13, 25, and 75 questions, respectively by Kost et al. in 2018, revealed that a shorter survey utilizing a short questionnaire was reliable and produce high response and completion rates than a long survey.

Bolt in 2014, found a surprising find that reducing the length of a long questionnaire in a physician survey does not mean that it will necessarily improve response rate hence to improve the response rate in nonresponders' researchers may think to utilize a drastically shortened version of the questionnaire to obtain some relevant information rather than no information.

Nonlinear relationship **between the number of questions in a survey and the time spent answering each question.**

- This interesting find comes from the web-based survey giant “Survey Monkey”.

- In other words, it can be explained as **more there are questions in a survey lesser time respondent spend answering each question** which is known as “speeding up” or “satisficing” through the questions.

- It is also observed that as the length of and the number of questions asked increased there is an increase in a nonresponse rate.

- This in term **affects the quantity and reliability of the data** gathered.

Loss of Interest

- Long and detailed questionnaires can lead to respondent fatigue, causing unreliable answers or high nonresponse rates.

- A high nonresponse rate may lead to difficulty impacting data analysis or an unacceptable reduction in sample size and research validity.

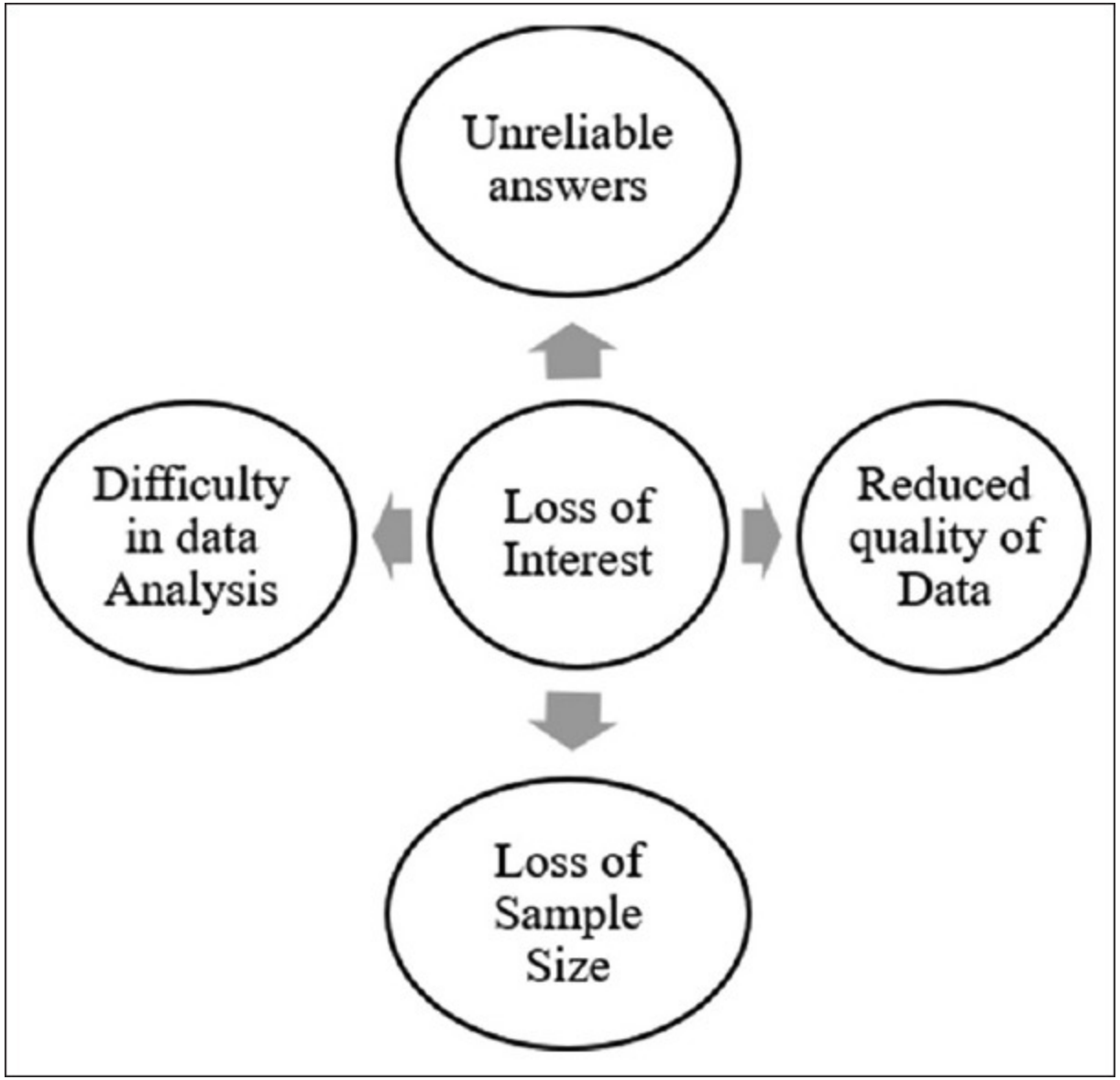


Figure: Consequences of Loss of interest in research participant

Considerations for Long Questionnaires

Nonresponse Management

Anticipate high nonresponse rates and consider data trimming or imputation.

Divide Sections

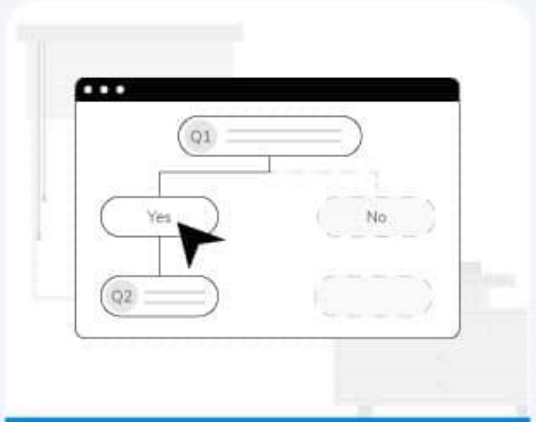
For very long questionnaires, break into sections and administer in separate sessions to maintain respondent engagement.

Interview Guidelines

- Keep telephonic interviews short (about 30 minutes) to avoid fatigue. Longer interviews can be split across multiple sessions.
- A long questionnaire should preferably be administered through face-to-face interviews.

Advantages of a well-designed online questionnaire

Collect a large amount of data in less time.



There is less chance of bias with the help of logic questions.

Online survey software is fast and cost effective to design, distribute and analyze.

It can be customized to reflect your brand voice.

Responses can be compared with historical data.

Respondents can answer the questionnaire without revealing their identity.

https://www.questionpro.com/blog/what-is-a-questionnaire/

Conclusion

- A well-designed questionnaire, ideally with 25-30 questions, should be concise to maintain respondent interest and data quality.
- Longer questionnaires must be managed carefully to avoid nonresponse issues.
- Lengthy questionnaires significantly benefit from being segmented into shorter sections.

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Thank You