**SCIENTIFIC & NON-SCIENTIFIC RESEARCH**

**Scientific research** is a logically stepped process used for investigating and acquiring or expanding our understanding. The findings of scientific research can be **reproduced** and demonstrated to be consistent.

**Nonscientific research** is acquiring knowledge and truths about the world using techniques that do not follow the scientific method. For instance, Plato was a large proponent of some of these, and Freud's theories use several of them as well.

**Steps involved in designing a research project**

The following steps outline a simple and effective strategy for writing a research paper. Depending on your familiarity with the topic and the challenges you encounter along the way, you may need to rearrange these steps.

**Step 1: Identify and develop your topic**

Selecting a topic can be the most challenging part of a research assignment. Since this is the very first step in writing a paper, it is vital that it be done correctly. Here are some tips for selecting a topic:

1. Select a topic within the parameters set by the assignment. Many times your instructor will give you clear guidelines as to what you can and cannot write about. Failure to work within these guidelines may result in your proposed paper being deemed unacceptable by your instructor.
2. Select a topic of personal interest to you and learn more about it. The research for and writing of a paper will be more enjoyable if you are writing about something that you find interesting.
3. Select a topic for which you can find a manageable amount of information. Do a preliminary search of information sources to determine whether existing sources will meet your needs. If you find too much information, you may need to narrow your topic; if you find too little, you may need to broaden your topic.
4. Be original. Your instructor reads hundreds of research papers every year, and many of them are on the same topics (topics in the news at the time, controversial issues, subjects for which there is ample and easily accessed information). Stand out from your classmates by selecting an interesting and off-the-beaten-path topic.
5. Still can't come up with a topic to write about? See your instructor for advice.

Once you have identified your topic, it may help to state it as a question. For example, if you are interested in finding out about the epidemic of obesity in the American population, you might pose the question "What are the causes of obesity in America ?" By posing your subject as a question you can more easily identify the main concepts or keywords to be used in your research.

**Step 2 : Do a preliminary search for information**

Before beginning your research in earnest, do a preliminary search to determine whether there is enough information out there for your needs and to set the context of your research. Look up your keywords in the appropriate titles in the library's Reference collection (such as encyclopedias and dictionaries) and in other sources such as our catalog of books, periodical databases, and Internet search engines. Additional background information may be found in your lecture notes, textbooks, and reserve readings. You may find it necessary to adjust the focus of your topic in light of the resources available to you.

**Step 3: Locate materials**

With the direction of your research now clear to you, you can begin locating material on your topic. There are a number of places you can look for information:

If you are looking for books, do a subject search in the Alephcatalog. A Keyword search can be performed if the subject search doesn't yield enough information. Print or write down the citation information (author, title,etc.) and the location (call number and collection) of the item(s). Note the circulation status. When you locate the book on the shelf, look at the books located nearby; similar items are always shelved in the same area. The Aleph catalog also indexes the library's audio-visual holdings.

Use the library's [**electronic periodical databases**](http://www.nhcc.edu/student-resources/library/search-article-databases) to find magazine and newspaper articles. Choose the databases and formats best suited to your particular topic; ask at the librarian at the Reference Desk if you need help figuring out which database best meets your needs. Many of the articles in the databases are available in full-text format.

Use search engines ([**Google**](http://www.google.com/), [**Yahoo**](http://www.yahoo.com/), etc.) and subject directories to locate materials on the Internet. Check the [**Internet Resources**](http://www.nhcc.edu/student-resources/library/internet-resources) section of the NHCC Library web site for helpful subject links.

**Step 4: Evaluate your sources**

See the [***CARS Checklist for Information Quality***](http://www.nhcc.edu/student-resources/library/doinglibraryresearch/cars-checklist)for tips on evaluating the authority and quality of the information you have located. Your instructor expects that you will provide credible, truthful, and reliable information and you have every right to expect that the sources you use are providing the same. This step is especially important when using Internet resources, many of which are regarded as less than reliable.

**Step 5: Make notes**

Consult the resources you have chosen and note the information that will be useful in your paper. Be sure to document all the sources you consult, even if you there is a chance you may not use that particular source. The author, title, publisher, URL, and other information will be needed later when creating a bibliography.

**Step 6: Write your paper**

Begin by organizing the information you have collected. The next step is the rough draft, wherein you get your ideas on paper in an unfinished fashion. This step will help you organize your ideas and determine the form your final paper will take. After this, you will revise the draft as many times as you think necessary to create a final product to turn in to your instructor.

**Step 7: Cite your sources properly**

Give credit where credit is due; cite your sources.

Citing or documenting the sources used in your research serves two purposes: it gives proper credit to the authors of the materials used, and it allows those who are reading your work to duplicate your research and locate the sources that you have listed as references. The [**MLA**](http://www.nhcc.edu/student-resources/library/doinglibraryresearch/citing-sources-in-mla-style) and the [**APA**](http://www.nhcc.edu/student-resources/library/doinglibraryresearch/citing-sources-in-apa-style) Styles are two popular citation formats.

Failure to cite your sources properly is plagiarism. Plagiarism is avoidable!

**Step 8: Proofread**

The final step in the process is to proofread the paper you have created. Read through the text and check for any errors in spelling, grammar, and punctuation. Make sure the sources you used are cited properly. Make sure the message that you want to get across to the reader has been thoroughly stated.

## Research objective(s)

#### What are the research objectives?

In general, research objectives describe what we **expect to achieve** by a project.

Research objectives are usually expressed in**lay terms** and are directed as much to the client as to the researcher. Research objectives may be linked with a hypothesis or used as a statement of purpose in a study that does not have a hypothesis.

Even if the nature of the research has not been clear to the layperson from the hypotheses, s/he should be able to understand the research from the objectives.

A statement of research objectives can serve to guide the activities of research. Consider the following examples.

* **Objective:** To describe what factors farmers take into account in making such decisions as whether to adopt a new technology or what crops to grow.
* **Objective:**To develop a budget for reducing pollution by a particular enterprise.
* **Objective:**To describe the habitat of the giant panda in China.

In the above examples the intent of the research is largely descriptive.

* In the case of the first example, the research will end the study by being able to specify factors which emerged in household decisions.
* In the second, the result will be the specification of a pollution reduction budget.
* In the third, creating a picture of the habitat of the giant panda in China.

These observations might prompt researchers to formulate hypotheses which could be tested in another piece of research. So long as the aim of the research is exploratory, ie to describe what is, rather than to test an explanation for what is, a research objective will provide an adequate guide to the research.

**A RESEARCH PROBLEM**

**A research problem is** a statement about an area of concern, a condition to be improved, a difficulty to be eliminated, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. In some social science disciplines the research problem is typically posed in the form of a question. A research problem **does not** state how to do something, offer a vague or broad proposition, or present a value question.

# **Research methods**

## **Types of research**

**Historical research**or historiography**,**"attempts to systematically recapture the complex nuances, the people,meanings,events,and even ideas of the past that have influenced and shaped the present". (Berg & Lure, 2012, p. 305 )

Historical research relies on a wide variety of sources, both primary & secondary including unpublished material.

Primary Sources

* Eyewitness accounts of events
* Can be oral or written testimony
* Found in public records & legal documents, minutes of meetings, corporate records, recordings, letters, diaries, journals, drawings.
* Located in university archives, libraries or privately run collections such as local historical society.

Secondary Sources

* Can be oral or written
* Secondhand accounts of events
* Found in textbooks, encyclopedias, journal articles, newspapers, biographies and other media such as films or tape recordings.

## **Experiments**

People who take part in research involving experiments might be asked to complete various tests to measure their cognitive abilities (e.g. word recall, attention, concentration, reasoning ability etc.) usually verbally, on paper or by computer. The results of different groups are then compared. Participants should not be anxious about performing well but simply do their best. The aim of these tests is not to judge people or measure so-called intelligence, but to look for links between performance and other factors. If computers are used, this has to be done in such a way that no previous knowledge of computers is necessary. So people should not be put off by this either.

The study might include an intervention such as a training programme, some kind of social activity, the introduction of a change in the person’s living environment (e.g. different lighting, background noise, different care routine) or different forms of interaction (e.g. linked to physical contact, conversation, eye contact, interaction time etc.). Often the interaction will be followed by some kind of test (as mentioned above), sometimes before and after the intervention. In other cases, the person may be asked to complete a questionnaire (e.g. about his/her feelings, level of satisfaction or general well-being).

Some studies are just based on one group (within-group design). The researchers might be interested in observing people’s reactions or behaviour before and after a certain intervention (e.g. a training programme). However, in most cases, there are at least two groups (a between-subjects design). One of the groups serves as a **control group** and is not exposed to the intervention. This is quite similar to the procedure in clinical trials whereby one group does not receive the experimental drug. This enables researchers to compare the two groups and determine the impact of the intervention. Alternatively, the two groups might differ in some important way (e.g. gender, severity of dementia, living at home or in residential care, etc.) and it is that difference that is of interest to the researchers.

## **Surveys**

Surveys involve collecting information, usually from fairly large groups of people, by means of questionnaires but other techniques such as interviews or telephoning may also be used. There are different types of survey. The most straightforward type (the “one shot survey”) is administered to a sample of people at a set point in time. Another type is the “before and after survey” which people complete before a major event or experience and then again afterwards.

## **Questionnaires**

Questionnaires are a good way to obtain information from a large number of people and/or people who may not have the time to attend an interview or take part in experiments. They enable people to take their time, think about it and come back to the questionnaire later. Participants can state their views or feelings privately without worrying about the possible reaction of the researcher. Unfortunately, some people may still be inclined to try to give socially acceptable answers. People should be encouraged to answer the questions as honestly as possible so as to avoid the researchers drawing false conclusions from their study.

Questionnaires typically contain multiple choice questions, attitude scales, closed questions and open-ended questions. The drawback for researchers is that they usually have a fairly low response rate and people do not always answer all the questions and/or do not answer them correctly. Questionnaires can be administered in a number of different ways (e.g. sent by post or as email attachments, posted on Internet sites, handed out personally or administered to captive audience (such as people attending conferences). Researchers may even decide to administer the questionnaire in person which has the advantage of including people who have difficulties reading and writing. In this case, the participant may feel that s/he is taking part in an interview rather than completing a questionnaire as the researcher will be noting down the responses on his/her behalf.

## **Interviews**

Interviews are usually carried out in person i.e. face-to-face but can also be administered by telephone or using more advance computer technology such as Skype. Sometimes they are held in the interviewee’s home, sometimes at a more neutral place. It is important for interviewees to decide whether they are comfortable about inviting the researcher into their home and whether they have a room or area where they can speak freely without disturbing other members of the household.

The interviewer (which is not necessarily the researcher) could adopt a formal or informal approach, either letting the interviewee speak freely about a particular issue or asking specific pre-determined questions. This will have been decided in advance and depend on the approach used by the researchers. A semi-structured approach would enable the interviewee to speak relatively freely, at the same time allowing the researcher to ensure that certain issues were covered.

When conducting the interview, the researcher might have a check list or a form to record answers. This might even take the form of a questionnaire. Taking notes can interfere with the flow of the conversation, particularly in less structured interviews. Also, it is difficult to pay attention to the non-verbal aspects of communication and to remember everything that was said and the way it was said. Consequently, it can be helpful for the researchers to have some kind of additional record of the interview such as an audio or video recording. They should of course obtain permission before recording an interview.

## **Case studies**

Case studies usually involve the detailed study of a particular case (a person or small group). Various methods of data collection and analysis are used but this typically includes observation and interviews and may involve consulting other people and personal or public records. The researchers may be interested in a particular phenomenon (e.g. coping with a diagnosis or a move into residential care) and select one or more individuals in the respective situation on whom to base their case study/studies. Case studies have a very narrow focus which results in detailed descriptive data which is unique to the case(s) studied. Nevertheless, it can be useful in clinical settings and may even challenge existing theories and practices in other domains.

## **Participant and non-participant observation**

Studies which involve observing people can be divided into two main categories, namely participant observation and non-participant observation.

In participant observation studies, the researcher becomes (or is already) part of the group to be observed. This involves fitting in, gaining the trust of members of the group and at the same time remaining sufficiently detached as to be able to carry out the observation. The observations made might be based on what people do, the explanations they give for what they do, the roles they have, relationships amongst them and features of the situation in which they find themselves. The researcher should be open about what s/he is doing, give the participants in the study the chance see the results and comment on them, and take their comments seriously.

In non-participant observation studies, the researcher is not part of the group being studied. The researcher decides in advance precisely what kind of behaviour is relevant to the study and can be realistically and ethically observed. The observation can be carried out in a few different ways. For example, it could be continuous over a set period of time (e.g. one hour) or regularly for shorter periods of time (for 60 seconds every so often) or on a random basis. Observation does not only include noting what happened or was said but also the fact that a specific behaviour did not occur at the time of observation.

## **Observational trials**

Observational trials study health issues in large groups of people but in natural settings. **Longitudinal** approaches examine the behaviour of a group of people over a fairly lengthy period of time e.g. monitoring cognitive decline from mid to late life paying specific attention to diet and lifestyle factors. In some cases, the researchers might monitor people when they are middle-aged and then again after 15 years and so on. The aim of such studies is usually to determine whether there is a link between one factor and another (e.g. whether high alcohol consumption is correlated with dementia). The group of people involved in this kind of study is known as a **cohort** and they share a certain characteristic or experience within a defined period. Within the cohort, there may be subgroups (e.g. people who drink moderately, people who drink heavily, people who binge drink etc.) which allow for further comparisons to be made.

Unit 2

### Types of Research Design

A researcher must have a clear understanding of the various types of research design to select which type of research design to implement for a study. Research design can be broadly classified into quantitative and qualitative research design.

## [Exploratory research: Definition](https://www.questionpro.com/blog/exploratory-research/)

Exploratory research is defined as a research used to investigate a problem which is not clearly defined. It is conducted to have a better understanding of the existing problem, but will not provide conclusive results. For such a research, a researcher starts with a general idea and uses this research as a medium to identify issues, that can be the focus for future research. An important aspect here is that the researcher should be willing to change his/her direction subject to the revelation of new data or insight. Such a research is usually carried out when the problem is at a preliminary stage. It is often referred to as grounded theory approach or interpretive research as it used to answer questions like what, why and how.

For example: Consider a scenario where a juice bar owner feels that increasing the variety of juices will enable increase in customers, however he is not sure and needs more information. The owner intends to carry out an exploratory research to find out and hence decides to do an exploratory research to find out if expanding their juices selection will enable him to get more customers of if there is a better idea.

Another example of exploratory research is a [podcast survey template](https://www.questionpro.com/survey-templates/podcast-survey-template/) that can be used to collect feedback about the podcast consumption metrics both from existing listeners as well as other podcast listeners that are currently not subscribed to this channel. This helps the author of the podcast create curated content that will gain a larger audience

**Qualitative Research Design:**[Qualitative research](https://www.questionpro.com/blog/qualitative-research-methods/) is implemented in cases where a relationship between collected data and observation is established on the basis of mathematical calculations. Theories related to a naturally existing phenomenon can be proved or disproved using mathematical calculations. Researchers rely on qualitative research design where they are expected to conclude “why” a particular theory exists along with “what” respondents have to say about it.

**Quantitative Research Design:**[Quantitative research](https://www.questionpro.com/blog/quantitative-research/) is implemented in cases where it is important for a researcher to have statistical conclusions to collect actionable insights. Numbers provide a better perspective to make important business decisions. Quantitative research design is important for the growth of any organization because any conclusion drawn on the basis of numbers and analysis will only prove to be effective for the business.

Further, research design can be divided into five types –

**1. Descriptive Research Design:**In a descriptive research design, a researcher is solely interested in describing the situation or case under his/her research study. It is a theory-based research design which is created by gather, analyze and presents collected data. By implementing an in-depth research design such as this, a researcher can provide insights into the why and how of research.

**2. Experimental Research Design:**[Experimental research](https://www.questionpro.com/blog/experimental-research/) design is used to establish a relationship between the cause and effect of a situation. It is a causal research design where the effect caused by the independent variable on the dependent variable is observed. For example, the effect of an independent variable such as price on a dependent variable such as customer satisfaction or brand loyalty is monitored. It is a highly practical research design method as it contributes towards solving a problem at hand. The independent variables are manipulated to monitor the change it has on the dependent variable. It is often used in social sciences to observe human behavior by analyzing two groups – affect of one group on the other.

**Increased Understanding:** The main objective of exploratory research is to improve a researcher’s knowledge of a topic. It shouldn’t be employed to draw definite conclusions, because of its lack of statistical strength, however it can help an investigator begin to determine why and how things happen.

**Concept Testing:** A typical basis for performing exploratory work is to check concepts before they are put in the marketplace, usually a very costly endeavour.

**Assistance to Researchers:** It assists market researchers to find potential causes to the signs or symptoms conveyed by decision makers. Researchers may carry out research to build up a list of possible causes to the problem. Additional more extensive study may then verify which possibility or possibilities are most the likely causes.

**Flexibility of Data Sources:** Exploratory studies use secondary sources for example published literature. Other resources utilized in exploratory studies include informal discussions, formal structured interviews, pilot studies or case studies. These may well include consumers, colleagues, patients or customers.

**It can help to find out possible ways to achieve decision makers goals:** For instance, assume a marketing manager is provided with a goal to boost product sales by 50 percent in the next couple of years. Selecting strategy might initially require creating a list of available strategies before evaluating which stood the best chance of success. Creating a set of realistic strategy options might first require exploratory study. Then, once created, a bigger more formal  study could estimate which was most likely to achieve the sales goal.

**Exploratory research provides answers to questions related to actually administering a big and costly research project:** One example is, researchers can make use of exploratory study to understand words and phrases important to the individuals being researched. They can also get a feeling of how best to reach the people (e.g., email versus phone versus World wide web).



### **Figure 1 – Merits**

**Better Conclusions:**It can be extremely beneficial in guiding future research techniques. A better knowledge of a topic helps hone subsequent research questions and will significantly raise the effectiveness of a study’s findings. It is also very helpful in figuring out the best approach to achieve a researcher’s objectives.

**Over time it can assist decision makers and research workers cut costs:** In spite of its expense, most often employed techniques cost considerably less than large scale formal research like surveys or experiments. Thus, if exploratory work aids researchers address the correct questions and avoid mistakes in the conduct of these larger research projects, then they merit their expenditure.

**Strategic Planning:** Exploratory design in some circumstances can save a lot of time and money by flagging dead ends early.

Read Also: [**Purpose of Exploratory Research**](https://universalteacher.com/1/purpose-of-exploratory-research/)

## **Disadvantages of Exploratory Research**

The primary disadvantage is that they seldom offer adequate answers to research questions, even though they can hint at the answers and give direction as to which research methods could provide definitive answers. Precisely why exploratory studies are rarely definitive is because individuals studied may not be typical of the larger population of interest. That is, the sample is likely not a representative one.

In this article, we have discussed the **disadvantages and advantages of exploratory research design**. It is usually flexible and dynamic and can be rooted in existing literature. However, it costs a lot and may be unsuccessful.

**opinion poll**

An **opinion poll**, often simply referred to as a **poll** or a **survey**, is a [human research survey](https://en.wikipedia.org/wiki/Survey_%28human_research%29) of [public opinion](https://en.wikipedia.org/wiki/Public_opinion) from a particular [sample](https://en.wikipedia.org/wiki/Sampling_%28statistics%29). Opinion polls are usually designed to represent the opinions of a population by conducting a series of questions and then extrapolating generalities in ratio or within [confidence intervals](https://en.wikipedia.org/wiki/Confidence_intervals).

**Audience research** is **defined** as any communication **research** that is conducted onspecific **audience** segments to gather information about their attitudes, knowledge,interests, preferences, or behaviours with respect to prevention issues

**Viewership ratings**

A published survey which depicts the viewing habits of an audience. The ratings express the size and scope of the viewing audience in terms of total number of viewers, share of the total available audience, and demographic breakdown, to name a few categories. The ratings are used when media outlets market to advertising clients.

**Research Protocol**
A [research protocol](https://hub.ucsf.edu/sites/g/files/tkssra261/f/Protocol_Template_052217.doc)is a document that describes the background, rationale, objectives, design, methodology, statistical considerations, and organization of a clinical research project. According to the ICH Good Clinical Practice guidelines, a protocol should include the following topics:

* Title Page (General Information)
* Background Information
* Objectives/Purpose
* Study Design
* Selection and Exclusion of Subjects
* Treatment of Subjects
* Assessment of Efficacy
* Assessment of Safety
* Adverse Events
* Discontinuation of the Study
* Statistics
* Quality Control and Assurance
* Ethics
* Data handling and Recordkeeping
* Publication Policy
* Project Timetable/Flowchart
* References
* Supplements/Appendices

The [NIH](http://www.nidcr.nih.gov/research/toolkit/) provides many resources for protocol development to assist investigators in writing and developing clinical research protocols that are in compliance with regulatory/GCP requirements. Some NIH institutes have a mandatory requirement for using their protocol template.

UNIT 3

Data collection plays a very crucial role in the statistical analysis. In research, there are different methods used to gather information, all of which fall into two categories, i.e. primary data, and secondary data. As the name suggests, primary data is one which is collected for the first time by the researcher while secondary data is the data already collected or produced by others.

There are many differences between primary and secondary data, which are discussed in this article. But the most important difference is that primary data is factual and original whereas secondary data is just the analysis and interpretation of the primary data. While primary data is collected with an aim for getting solution to the problem at hand, secondary data is collected for other purposes.

## **Content: Primary Data Vs Secondary Data**

1. [Comparison Chart](https://keydifferences.com/difference-between-primary-and-secondary-data.html#ComparisonChart)
2. [Definition](https://keydifferences.com/difference-between-primary-and-secondary-data.html#Definition)
3. [Key Differences](https://keydifferences.com/difference-between-primary-and-secondary-data.html#KeyDifferences)
4. [Conclusion](https://keydifferences.com/difference-between-primary-and-secondary-data.html#Conclusion)

### **Comparison Chart**

| **BASIS FOR COMPARISON** | **PRIMARY DATA** | **SECONDARY DATA** |
| --- | --- | --- |
| Meaning | Primary data refers to the first hand data gathered by the researcher himself. | Secondary data means data collected by someone else earlier. |
| Data | Real time data | Past data |
| Process | Very involved | Quick and easy |
| Source | Surveys, observations, experiments, questionnaire, personal interview, etc. | Government publications, websites, books, journal articles, internal records etc. |
| Cost effectiveness | Expensive | Economical |
| Collection time | Long | Short |
| Specific | Always specific to the researcher's needs. | May or may not be specific to the researcher's need. |
| Available in | Crude form | Refined form |
| Accuracy and Reliability | More | Relatively less |

### **Definition of Primary Data**

Primary data is data originated for the first time by the researcher through direct efforts and experience, specifically for the purpose of addressing his research problem. Also known as the first hand or raw data. Primary data collection is quite expensive, as the research is conducted by the organisation or agency itself, which requires resources like investment and manpower. The data collection is under direct control and supervision of the investigator.

The data can be collected through various methods like surveys, observations, physical testing, mailed questionnaires, questionnaire filled and sent by enumerators, personal interviews, telephonic interviews, focus groups, case studies, etc.

### **Definition of Secondary Data**

Secondary data implies second-hand information which is already collected and recorded by any person other than the user for a purpose, not relating to the current research problem. It is the readily available form of data collected from various sources like censuses, government publications, internal records of the organisation, reports, books, journal articles, websites and so on.

Secondary data offer several advantages as it is easily available, saves time and cost of the researcher. But there are some disadvantages associated with this, as the data is gathered for the purposes other than the problem in mind, so the usefulness of the data may be limited in a number of ways like relevance and accuracy.

Moreover, the objective and the method adopted for acquiring data may not be suitable to the current situation. Therefore, before using secondary data, these factors should be kept in mind.

## **Key Differences Between Primary and Secondary Data**

The fundamental differences between primary and secondary data are discussed in the following points:

1. The term primary data refers to the data originated by the researcher for the first time. Secondary data is the already existing data, collected by the investigator agencies and organisations earlier.
2. Primary data is a real-time data whereas secondary data is one which relates to the past.
3. Primary data is collected for addressing the problem at hand while secondary data is collected for purposes other than the problem at hand.
4. Primary data collection is a very involved process. On the other hand, secondary data collection process is rapid and easy.
5. Primary data collection sources include surveys, observations, experiments, questionnaire, personal interview, etc. On the contrary, secondary data collection sources are government publications, websites, books, journal articles, internal records etc.
6. Primary data collection requires a large amount of resources like time, cost and manpower. Conversely, secondary data is relatively inexpensive and quickly available.
7. Primary data is always specific to the researcher’s needs, and he controls the quality of research. In contrast, secondary data is neither specific to the researcher’s need, nor he has control over the data quality.
8. Primary data is available in the raw form whereas secondary data is the refined form of primary data. It can also be said that secondary data is obtained when statistical methods are applied to the primary data.
9. Data collected through primary sources are more reliable and accurate as compared to the secondary sources.

**SURVEY DATA**

**Survey data** is **defined** as the resultant **data** that is collected from a sample of respondents that took a **survey**. This **data** is comprehensive information gathered from a target audience about a particular topic of interest to conduct **research** on the basis of this collected **data**.

Observation data

Observation is a systematic data collection approach.  Researchers use all of their senses to examine people in natural settings or naturally occurring situations.

Observation of a field setting involves:

* [prolonged engagement](http://www.qualres.org/HomeProl-3690.html) in a setting or social situation
* clearly expressed, self-conscious notations of how observing is done
* methodical and tactical improvisation in order to develop a full understanding of the setting of interest
* imparting attention in ways that is in some sense 'standardized'
* recording one's observations

General accuracy of data collected

**Data collection** is the process of gathering and measuring information on targeted variables in an established system, which then enables one to answer relevant questions and evaluate outcomes. Data collection is a component of research in all fields of study including [physical](https://en.wikipedia.org/wiki/Physical_science) and [social sciences](https://en.wikipedia.org/wiki/Social_science), [humanities](https://en.wikipedia.org/wiki/Humanities),[[2]](https://en.wikipedia.org/wiki/Data_collection#cite_note-VuongetalSdata2018-2) and [business](https://en.wikipedia.org/wiki/Business). While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same. The goal for all data collection is to capture quality evidence that allows analysis to lead to the formulation of convincing and credible answers to the questions that have been posed.



## Contents

* [1Importance](https://en.wikipedia.org/wiki/Data_collection#Importance)
* [2Data integrity issues [4]](https://en.wikipedia.org/wiki/Data_collection#Data_integrity_issues_[4])
	+ [2.1Quality assurance](https://en.wikipedia.org/wiki/Data_collection#Quality_assurance)
	+ [2.2Quality control](https://en.wikipedia.org/wiki/Data_collection#Quality_control)
* [3See also](https://en.wikipedia.org/wiki/Data_collection#See_also)
* [4References](https://en.wikipedia.org/wiki/Data_collection#References)
* [5External links](https://en.wikipedia.org/wiki/Data_collection#External_links)

## **Importance[[edit](https://en.wikipedia.org/w/index.php?title=Data_collection&action=edit&section=1" \o "Edit section: Importance)]**

Regardless of the field of study or preference for defining data ([quantitative](https://en.wikipedia.org/wiki/Quantitative_method) or [qualitative](https://en.wikipedia.org/wiki/Qualitative_method)), accurate data collection is essential to maintaining the integrity of research. The selection of appropriate data collection instruments (existing, modified, or newly developed) and clearly delineated instructions for their correct use reduce the likelihood of [errors](https://en.wikipedia.org/wiki/Measurement_error).

A formal data collection process is necessary as it ensures that the data gathered are both defined and accurate. This way, subsequent decisions based on arguments embodied in the findings are made using valid data.[[3]](https://en.wikipedia.org/wiki/Data_collection#cite_note-3) The process provides both a baseline from which to measure and in certain cases an indication of what to improve.

**Questionnaire medthod**

The **questionnaire** is the main instrument for collecting data in survey research. Basically, it is a set of standardized questions, often called items, which follow a fixed scheme in order to collect individual data about one or more specific topics. Sometimes **questionnaires** are confused with interviews.

**What is Structured Data?**

Most people are familiar with how structured data works. Structured data, as can be assumed from the term, is data that is highly organized and neatly formatted. It’s the type of data that can be put into tables and spreadsheets. It might not be the easiest type of data to look through for a human, but compared to unstructured data, it is certainly the easier of the two types for humans to consume. Computers, on the other hand, can search it with ease.

Structured data is also often referred to as quantitative data. These are objective facts which can be looked up in a relational database or a data warehouse. Customer data, for example, would include facts like the customer’s name and the transactions he or she engaged in. Searching for these terms would be easy for a computer program when using a structured query language or SQL.

Some other examples of structured data include credit card numbers, dates, financial amounts, phone numbers, addresses, product names, and more. These are all data points that aren’t open for interpretation, making it easy for big data applications to collect and analyze.



**What is Unstructured Data?**

As the term suggests, unstructured data isn’t so easily organized or formatted. Collecting, processing, and analyzing unstructured data also represents a significant challenge. That has created some issues since unstructured data makes up the vast majority of available data out there on the web, and it only grows larger every year. With more information becoming available on the web, and most of it unstructured, finding ways to use it has become a vital strategy for many businesses. More traditional data analysis tools and methods aren’t enough to get the job done.

Unstructured data can also be called qualitative data, which basically covers everything that structured data does not. It doesn’t conform to any predefined models, so it is stored in non-relational databases and is queried using NoSQL.

Unstructured data is also quite diverse, so examples can make up a long list. Some of the most common unstructured data examples include reports, audio files, images, video files, text files, social media comments and opinions, emails, and more. From these instances, it’s clear to see how analysis can be more complex, especially for computer programs to understand.

**Telephone Interviews**.

**Telephone interview** is a data collection method when the interviewer communicates with the respondent on the **telephone** in accordance with the prepared questionnaire. Usually, standardised questionnaires with closed-ended questions are recommended for this kind of questioning.

**Personal interview**

**A personal interview survey, also called as a face-to-face survey, is a survey method that is utilized when a specific target population is involved. The purpose of conducting a personal interview survey is to explore the responses of the people to gather more and deeper information.**

Personal interview surveys are used to probe the answers of the respondents and at the same time, to observe the behavior of the respondents, either individually or as a group. The personal interview method is preferred by researchers for a couple of advantages. But before choosing this method for your own survey, you also have to read about the disadvantages of conducting [personal interview surveys](http://www.fao.org/docrep/W3241E/w3241e06.htm). In addition, you must be able to understand the types of personal or face-to-face surveys.

**Questionnaire construction** refers to the design of a [questionnaire](https://en.wikipedia.org/wiki/Questionnaire) to gather [statistically](https://en.wikipedia.org/wiki/Statistic) useful information about a given topic. When properly constructed and responsibly administered, questionnaires can provide valuable data about any given subject.

## **Questionnaires[[edit](https://en.wikipedia.org/w/index.php?title=Questionnaire_construction&action=edit&section=1" \o "Edit section: Questionnaires)]**

*Main article:*[*Questionnaire*](https://en.wikipedia.org/wiki/Questionnaire)

Questionnaires are frequently used in [quantitative marketing research](https://en.wikipedia.org/wiki/Quantitative_marketing_research) and [social research](https://en.wikipedia.org/wiki/Social_research). They are a valuable method of collecting a wide range of information from a large number of individuals, often referred to as respondents.

What is often referred to as "adequate questionnaire construction" is critical to the success of a survey. Inappropriate questions, incorrect ordering of questions, incorrect scaling, or a bad questionnaire format can make the survey results valueless, as they may not accurately reflect the views and opinions of the participants.

Different methods can be useful for checking a questionnaire and making sure it is accurately capturing the intended information. Initial advice may include:

* consulting subject-matter experts
* using questionnaire construction guidelines to inform drafts, such as the Tailored Design Method,[[1]](https://en.wikipedia.org/wiki/Questionnaire_construction#cite_note-1) or those produced by National Statistical Organisations.

Empirical tests also provide insight into the quality of the questionnaire. This can be done by:

* conducting [cognitive interviewing](https://en.wikipedia.org/wiki/Cognitive_pretesting). By asking a sample of potential-respondents about their interpretation of the questions and use of the questionnaire, a researcher can
* carrying out a small pretest of the questionnaire, using a small subset of target respondents. Results can inform a researcher of errors such as missing questions, or logical and procedural errors.
* estimating the measurement quality of the questions. This can be done for instance using test-retest,[[2]](https://en.wikipedia.org/wiki/Questionnaire_construction%22%20%5Cl%20%22cite_note-2) quasi-simplex,[[3]](https://en.wikipedia.org/wiki/Questionnaire_construction#cite_note-3) or mutlitrait-multimethod models.[[4]](https://en.wikipedia.org/wiki/Questionnaire_construction#cite_note-4)
* predicting the measurement quality of the question. This can be done using the software Survey Quality Predictor (SQP).[[5]](https://en.wikipedia.org/wiki/Questionnaire_construction#cite_note-5)

## **Types of questions[**[**edit**](https://en.wikipedia.org/w/index.php?title=Questionnaire_construction&action=edit&section=2)**]**

* [Closed-ended questions](https://en.wikipedia.org/wiki/Closed-ended_question) – Respondents' answers are limited to a fixed set of responses.
	+ [Yes/no questions](https://en.wikipedia.org/wiki/Yes/no_questions) – The respondent answers with a "yes" or a "no".
	+ [Multiple choice](https://en.wikipedia.org/wiki/Multiple_choice) – The respondent has several option from which to choose.
	+ Scaled questions – Responses are graded on a continuum (e.g.: rate the appearance of the product on a scale from 1 to 10, with 10 being the most preferred appearance). Examples of types of scales include the [Likert scale](https://en.wikipedia.org/wiki/Likert_scale%22%20%5Co%20%22Likert%20scale), [semantic differential scale](https://en.wikipedia.org/wiki/Semantic_differential_scale), and rank-order scale. (See [scale](https://en.wikipedia.org/wiki/Scale_%28social_sciences%29) for further information)
	+ Matrix questions – Identical response categories are assigned to multiple questions. The questions are placed one under the other, forming a matrix with response categories along the top and a list of questions down the side. This is an efficient use of page space and the respondents' time.
* [Open-ended questions](https://en.wikipedia.org/wiki/Open-ended_question) – No options or predefined categories are suggested. The respondent supplies their own answer without being constrained by a fixed set of possible responses. Examples include:
	+ Completely unstructured – For example, "What is your opinion on questionnaires?"
	+ [Word association](https://en.wikipedia.org/wiki/Word_association) – Words are presented and the respondent mentions the first word that comes to mind.
	+ [Sentence completion](https://en.wikipedia.org/wiki/Sentence_completion_tests) – Respondents complete an incomplete sentence. For example, "The most important consideration in my decision to buy a new house is..."
	+ Story completion – Respondents complete an incomplete story.
	+ Picture completion – Respondents fill-in an empty [speech balloon](https://en.wikipedia.org/wiki/Speech_balloon).
	+ [Thematic apperception test](https://en.wikipedia.org/wiki/Thematic_apperception_test) – Respondents explain a picture or create a story about what they think is happening in the picture.
* Contingency question – A question that is answered only if the respondent gives a particular response to a previous question. This avoids asking questions of people that do not apply to them (for example, asking men if they have ever been pregnant).