

1: Difference between research question and hypothesis?

Definitions

A hypothesis is defined as an educated guess, while a research question is simply the researcher wondering about the world. Hypothesis are part of the scientific research method. They are employed in research in science, sociology, mathematics and more. Research questions are part of heuristic research methods, and are also used in many fields including literature, and sociology.

Structure

As its name suggests, research questions are always written as questions. Hypothesis are written as statements preceded with the words "I predict." For example, a research question would ask, "What is the effect of heat on the effectiveness of bleach?" A hypothesis would state, "I predict heat will diminish the effectiveness of bleach."

Before Writing

Before writing a hypothesis, the researcher must determine what others have discovered about this subject. On the other hand, a research question requires less preparation, but focus and structure is critical.

For example, a researcher using a hypothesis would look up studies about bleach, information on the chemical properties of the chemical when heated and data about its effectiveness before writing the hypothesis. When using a research question, the researcher would think about how to phrase the question to ensure its scope is not too broad, too narrow or impossible to answer.

Writing Conclusions

When writing the conclusion for research conducted using a hypothesis, the researcher will write whether the hypothesis was correct or incorrect, followed by an explanation of the results of the research. The researcher using only a research question will write the answer to the question, followed by the findings of the research.

2: Difference between quantitative and qualitative approach?

Quantitative research

Quantitative research is expressed in numbers and graphs. It is used to test or confirm theories and assumptions. This type of research can be used to establish generalizable facts about a topic.

Common quantitative methods include experiments, observations recorded as numbers, and surveys with closed-ended questions.

Qualitative research

Qualitative research is expressed in words. It is used to understand concepts, thoughts or experiences. This type of research enables you to gather in-depth insights on topics that are not well

understood.

Common qualitative methods include interviews with open-ended questions, observations described in words, and literature reviews that explore concepts and theories.

The differences between quantitative and qualitative research

Quantitative and qualitative research use different research methods to collect and analyze data, and they allow you to answer different kinds of research questions.

Qualitative vs. quantitative research

Quantitative research Qualitative Research

Focuses on testing theories and hypotheses Focuses on exploring ideas and formulating a theory or hypothesis

Analyzed through math and statistical analysis Analyzed by summarizing, categorizing and interpreting

Mainly expressed in numbers, graphs and tables Mainly expressed in words

Requires many respondents Requires few respondents

Closed (multiple choice) questions Open-ended questions

Key terms: testing, measurement, objectivity, replicability Key terms: understanding, context, complexity, subjectivity

How to analyze qualitative and quantitative data

Qualitative or quantitative data by itself can't prove or demonstrate anything, but has to be analyzed to show its meaning in relation to the research questions. The method of analysis differs for each type of data.

Analyzing quantitative data

Quantitative data is based on numbers. Simple math or more advanced statistical analysis is used to discover commonalities or patterns in the data. The results are often reported in graphs and tables.

Applications such as Excel, SPSS, or R can be used to calculate things like:

Average scores

The number of times a particular answer was given

The correlation or causation between two or more variables

The reliability and validity of the results

Analyzing qualitative data

Qualitative data is more difficult to analyze than quantitative data. It consists of text, images or videos instead of numbers.

Some common approaches to analyzing qualitative data include:

Qualitative content analysis: Tracking the occurrence, position and meaning of words or phrases

Thematic analysis: Closely examining the data to identify the main themes and patterns

Discourse analysis: Studying how communication works in social contexts

3: Difference between probability and non probability sampling?

Definition of Probability Sampling

In statistics, probability sampling refers to the sampling method in which all the members of the population has a pre-specified and an equal chance to be a part of the sample. This technique is based on the randomization principle, wherein the procedure is so designed, which guarantees that each and every individual of the population has an equal selection opportunity. This helps to reduce the possibility of bias.

Statistical inferences can be made by the researchers using this technique, i.e. the result obtained can be generalised from the surveyed sample to the target population. The methods of probability sampling, are provided below:

Simple Random Sampling

Stratified Sampling

Cluster Sampling

Systematic Sampling

Definition of Non-Probability Sampling

When in a sampling method, all the individuals of the universe are not given an equal opportunity of becoming a part of the sample, the method is said to be Non-probability sampling. Under this technique as such, there is no probability attached to the unit of the population and the selection relies on the subjective judgment of the researcher. Therefore, the conclusions drawn by the sampler cannot be inferred from the sample to the whole population. The methods of non-probability sampling are listed below:

Convenience Sampling

Quota Sampling

Judgment or Purposive Sampling

Snowball Sampling

Key Differences Between Probability and Non-Probability Sampling

The significant differences between probability and non-probability sampling

The sampling technique, in which the subjects of the population get an equal opportunity to be selected as a representative sample, is known as probability sampling. A sampling method in which it is not known that which individual from the population will be chosen as a sample, is called nonprobability sampling.

The basis of probability sampling is randomization or chance, so it is also known as Random sampling. On the contrary, in non-probability sampling randomization technique is not applied for selecting a sample. Hence it is considered as Non-random sampling.

In probability sampling, the sampler chooses the representative to be part of the sample randomly, whereas, in non-probability sampling, the subject is chosen arbitrarily, to belong to the sample by the researcher.

The chances of selection in probability sampling, are fixed and known. As opposed to non-probability sampling, the selection probability is zero, i.e. it is neither specified nor known.

Probability sampling is used when the research is conclusive in nature. On the other hand, when the research is exploratory, nonprobability sampling should be used.

The results generated by probability sampling, are free from bias while the results of non-probability sampling are more or less biased.

As the subjects are selected randomly by the researcher in probability sampling, so the extent to which it represents the whole population is higher as compared to the nonprobability sampling. That is why extrapolation of results to the entire population is possible in the probability sampling but not in non-probability sampling.

Probability sampling tests hypothesis but nonprobability sampling generates it.

Conclusion

While probability sampling is based on the principle of randomization where every entity gets a fair chance to be a part of the sample, non-probability sampling relies on the assumption that the characteristics are evenly distributed within the population, which make the sampler believe that any sample so selected would represent the whole population and the results drawn would be accurate.

4: Difference between MLA and APA?

MLA vs. APA

If you are comparing MLA and APA citation styles, it'll come to your attention that they are formatted

a little differently. The differences aren't going to jump out at you and say, "Hey look at me." While they are subtle, the differences between them come down to what they were created for.

MLA (Modern Language Association) is for arts and humanities. It helps you to break down citing paintings, books, and other literature. APA (American Psychological Association) is designed for technical works found in social sciences. This format makes citing journals and technical reports a breeze.

While you can write a paper in either format, using the right style can make your life a whole lot easier. Therefore, it is important to break down the differences of each.

What's in a Title?

The most obvious difference that you'll see in an MLA paper and an APA paper is the title of the citation page. Papers written in MLA format will have a Works Cited page. The APA citation page, on the other hand, will be labeled References. Both titles will be centered at the top of the page and the list of references will be double spaced. The title is an easy way to know which one you are looking at.

It's All About the Author

Students comparing APA vs MLA citations

Each different style formats how they attribute the author a little differently, as well. And, if you get into multiple authors, this is unique too. Check out each in turn to examine the difference in making a citation.

MLA

Author's name in MLA will take the format: Last Name, First Name

Henry, John

The formatting of the author will vary based on how many there are. Two authors will be written out with an "and" separating them. With three or more authors, you'll include the first author and then et al., which is Latin for "and others."

Two Authors:

Gillespie, Paula and Neal Lerner

Note: Notice the second name is written in the first name last name format

Three or More Authors:

Gillespie, Paula, et al.

APA

In APA format, you only write out the last name followed by the first and middle initial.

Henry, J.

When it comes to multiple authors in APA, you have three different categories. With two authors, you'll list both with an ampersand (&) separating them. When there are less than twenty authors, you'll list all the names with commas separating them and an ampersand before the last one. If the source has more than twenty authors, you'll list the first nineteen authors, separated by commas, then include an ellipsis (. . .) followed by the last author. Look at a few examples to really understand.

Two Authors:

Gillespie, P. H., & Lerner, N.

Twenty or Fewer Authors:

Gillespie, P. H., Corn, D. P., Son, C. R., Barry, A. B., Harlow, T., & Beck, J.

More Than Twenty Authors:

Gillespie, P. H., Corn, D. P., Son, C. R., Barry, A. B., Harlow, T., Beck, J., Jones, A., Robins, C., Jackson, S., Smith, J. P., Johnson, T., Turney, W., White, K. L., Hunter, B. A., Lewis, H., Beck, J., Winters, N. I., Young, L., Crow, J., . . . Ruben, H.

Title Capitalization

Title capitalization is important to style. MLA goes for header capitalization where every major word in the title is capitalized. Also called title case, this looks like:

Gleason, Jeff. *Chaos: A Look at the Stars*. RedRiver, 2010.

APA takes its own road. In APA, book titles and such will only capitalize the first word. This is sometimes called sentence case:

Gleason, J. (2010). *Chaos: a look at the stars*. RedRiver.

Look at That Period

The final difference that you'll notice in the basic format for each style is the period. MLA puts a period at the end of all works cited entries. In APA style, a period is not added if the entry ends in a URL or DOI.

Other Subtle Differences

You might notice other little differences between these two styles on the citation page, but these will vary based on what is being cited. For example, MLA typically includes the publication date, at or near the end of the citation. In APA, however, you'll see the publication date after the author's name.

Knowing Your Citations

MLA and APA are very similar, but they have their own unique styles. They both use a reference page at the end of the work, align entries to the left and have the title centered. But, how they format their entries is distinctly their own. Follow your teacher's instructions on which style to use when writing your school paper.

5: What do you understand by validity and reliability in research?

Reliability and validity are concepts used to evaluate the quality of research. They indicate how well a method, technique or test measures something. Reliability is about the consistency of a measure, and validity is about the accuracy of a measure.

It's important to consider reliability and validity when you are creating your research design, planning your methods, and writing up your results, especially in quantitative research.

Reliability vs validity

What does it tell you?

The extent to which the results can be reproduced when the research is repeated under the same conditions.

The extent to which the results really measure what they are supposed to measure.

How is it assessed?

By checking the consistency of results across time, across different observers, and across parts of the test itself.

By checking how well the results correspond to established theories and other measures of the same concept.

How do they relate?

A reliable measurement is not always valid: the results might be reproducible, but they're not necessarily correct.

A valid measurement is generally reliable: if a test produces accurate results, they should be reproducible.

Understanding reliability vs validity

Reliability and validity are closely related, but they mean different things. A measurement can be reliable without being valid. However, if a measurement is valid, it is usually also reliable.

What is reliability?

Reliability refers to how consistently a method measures something. If the same result can be

consistently achieved by using the same methods under the same circumstances, the measurement is considered reliable.

You measure the temperature of a liquid sample several times under identical conditions. The thermometer displays the same temperature every time, so the results are reliable.

A doctor uses a symptom questionnaire to diagnose a patient with a long-term medical condition. Several different doctors use the same questionnaire with the same patient but give different diagnoses. This indicates that the questionnaire has low reliability as a measure of the condition.

What is validity?

Validity refers to how accurately a method measures what it is intended to measure. If research has high validity, that means it produces results that correspond to real properties, characteristics, and variations in the physical or social world.

High reliability is one indicator that a measurement is valid. If a method is not reliable, it probably isn't valid.

If the thermometer shows different temperatures each time, even though you have carefully controlled conditions to ensure the sample's temperature stays the same, the thermometer is probably malfunctioning, and therefore its measurements are not valid.

If a symptom questionnaire results in a reliable diagnosis when answered at different times and with different doctors, this indicates that it has high validity as a measurement of the medical condition.

However, reliability on its own is not enough to ensure validity. Even if a test is reliable, it may not accurately reflect the real situation.

The thermometer that you used to test the sample gives reliable results. However, the thermometer has not been calibrated properly, so the result is 2 degrees lower than the true value. Therefore, the measurement is not valid.

A group of participants take a test designed to measure working memory. The results are reliable, but participants' scores correlate strongly with their level of reading comprehension. This indicates that the method might have low validity: the test may be measuring participants' reading comprehension instead of their working memory.

Validity is harder to assess than reliability, but it is even more important. To obtain useful results, the methods you use to collect your data must be valid: the research must be measuring what it claims to measure. This ensures that your discussion of the data and the conclusions you draw are also valid.

How are reliability and validity assessed?

Reliability can be estimated by comparing different versions of the same measurement. Validity is harder to assess, but it can be estimated by comparing the results to other relevant data or theory. Methods of estimating reliability and validity are usually split up into different types.

Types of reliability

Different types of reliability can be estimated through various statistical methods.

Types of reliability

Test-retest

The consistency of a measure across time: do you get the same results when you repeat the measurement?

A group of participants complete a questionnaire designed to measure personality traits. If they repeat the questionnaire days, weeks or months apart and give the same answers, this indicates high test-retest reliability.

Interrater

The consistency of a measure across raters or observers: do you get the same results when different people conduct the same measurement?

Based on an assessment criteria checklist, five examiners submit substantially different results for the same student project. This indicates that the assessment checklist has low inter-rater reliability (for example, because the criteria are too subjective).

Internal consistency

The consistency of the measurement itself: do you get the same results from different parts of a test that are designed to measure the same thing?

You design a questionnaire to measure self-esteem. If you randomly split the results into two halves, there should be a strong correlation between the two sets of results. If the two results are very different, this indicates low internal consistency.

Types of validity

The validity of a measurement can be estimated based on three main types of evidence. Each type can be evaluated through expert judgement or statistical methods.

Types of validity

Construct

The adherence of a measure to existing theory and knowledge of the concept being measured.

A self-esteem questionnaire could be assessed by measuring other traits known or assumed to be related to the concept of self-esteem (such as social skills and optimism). Strong correlation between the scores for self-esteem and associated traits would indicate high construct validity.

Content

The extent to which the measurement covers all aspects of the concept being measured.

A test that aims to measure a class of students' level of Spanish contains reading, writing and speaking components, but no listening component. Experts agree that listening comprehension is an essential aspect of language ability, so the test lacks content validity for measuring the overall level of ability in Spanish.

Criterion

The extent to which the result of a measure corresponds to other valid measures of the same concept.

A survey is conducted to measure the political opinions of voters in a region. If the results accurately predict the later outcome of an election in that region, this indicates that the survey has high criterion validity.

To assess the validity of a cause-and-effect relationship, you also need to consider internal validity (the design of the experiment) and external validity (the generalizability of the results).

What can proofreading do for your paper?

Scribbr editors not only correct grammar and spelling mistakes, but also strengthen your writing by making sure your paper is free of vague language, redundant words and awkward phrasing.

How to ensure validity and reliability in your research

The reliability and validity of your results depends on creating a strong research design, choosing appropriate methods and samples, and conducting the research carefully and consistently.

Ensuring validity

If you use scores or ratings to measure variations in something (such as psychological traits, levels of ability or physical properties), it's important that your results reflect the real variations as accurately as possible. Validity should be considered in the very earliest stages of your research, when you decide how you will collect your data.

Choose appropriate methods of measurement

Ensure that your method and measurement technique are high quality and targeted to measure exactly what you want to know. They should be thoroughly researched and based on existing knowledge.

For example, to collect data on a personality trait, you could use a standardized questionnaire that is

considered reliable and valid. If you develop your own questionnaire, it should be based on established theory or findings of previous studies, and the questions should be carefully and precisely worded.

Use appropriate sampling methods to select your subjects

To produce valid generalizable results, clearly define the population you are researching (e.g. people from a specific age range, geographical location, or profession). Ensure that you have enough participants and that they are representative of the population.

Ensuring reliability

Reliability should be considered throughout the data collection process. When you use a tool or technique to collect data, it's important that the results are precise, stable and reproducible.

Apply your methods consistently

Plan your method carefully to make sure you carry out the same steps in the same way for each measurement. This is especially important if multiple researchers are involved.

For example, if you are conducting interviews or observations, clearly define how specific behaviours or responses will be counted, and make sure questions are phrased the same way each time.

Standardize the conditions of your research

When you collect your data, keep the circumstances as consistent as possible to reduce the influence of external factors that might create variation in the results.

For example, in an experimental setup, make sure all participants are given the same information and tested under the same conditions.

Where to write about reliability and validity in a thesis

It's appropriate to discuss reliability and validity in various sections of your thesis or dissertation. Showing that you have taken them into account in planning your research and interpreting the results makes your work more credible and trustworthy.

Reliability and validity in a thesis

Literature review

What have other researchers done to devise and improve methods that are reliable and valid?

Methodology

How did you plan your research to ensure reliability and validity of the measures used? This includes the chosen sample set and size, sample preparation, external conditions and measuring techniques.

Results

If you calculate reliability and validity, state these values alongside your main results.

Discussion

This is the moment to talk about how reliable and valid your results actually were. Were they consistent, and did they reflect true values? If not, why not?

Conclusion

If reliability and validity were a big problem for your findings, it might be helpful to mention this here.

6: Discuss sources for literature review?

The Literature

The Literature refers to the collection of scholarly writings on a topic. This includes peer-reviewed articles, books, dissertations and conference papers.

When reviewing the literature, be sure to include major works as well as studies that respond to major works. You will want to focus on primary sources, though secondary sources can be valuable as well.

Primary Sources

The term primary source is used broadly to embody all sources that are original. Primary sources provide first-hand information that is closest to the object of study. Primary sources vary by discipline.

In the natural and social sciences, original reports of research found in academic journals detailing the methodology used in the research, in-depth descriptions, and discussions of the findings are considered primary sources of information.

Other common examples of primary sources include speeches, letters, diaries, autobiographies, interviews, official reports, court records, artifacts, photographs, and drawings.

Secondary Sources

A secondary source is a source that provides non-original or secondhand data or information.

Secondary sources are written about primary sources.

Research summaries reported in textbooks, magazines, and newspapers are considered secondary sources. They typically provide global descriptions of results with few details on the methodology. Other examples of secondary sources include biographies and critical studies of an author's work.

7: Uses of literature review?

The purpose of a literature review is to:

Provide foundation of knowledge on topic

Identify areas of prior scholarship to prevent duplication and give credit to other researchers

Identify inconsistencies: gaps in research, conflicts in previous studies, open questions left from other research

Identify need for additional research (justifying your research)

Identify the relationship of works in context of its contribution to the topic and to other works

Place your own research within the context of existing literature making a case for why further study is needed.

Adopting data collection methods?

Data Collection Definition

Data collection is defined as the procedure of collecting, measuring and analyzing accurate insights for research using standard validated techniques. A researcher can evaluate their hypothesis on the basis of collected data. In most cases, data collection is the primary and most important step for research, irrespective of the field of research. The approach of data collection is different for different fields of study, depending on the required information.

The most critical objective of data collection is ensuring that information-rich and reliable data is collected for statistical analysis so that data-driven decisions can be made for research.

Data Collection Methods: Phone vs. Online vs. In-Person Interviews

Essentially there are four choices for data collection – in-person interviews, mail, phone and online. There are pros and cons to each of these modes.

In-Person Interviews

Pros: In-depth and a high degree of confidence on the data

Cons: Time consuming, expensive and can be dismissed as anecdotal

Mail Surveys

Pros: Can reach anyone and everyone – no barrier
Cons: Expensive, data collection errors, lag time

Phone Surveys

Pros: High degree of confidence in the data collected, reach almost anyone

Cons: Expensive, cannot self-administer, need to hire an agency

Web/Online Surveys

Pros: Cheap, can self-administer, very low probability of data errors

Cons: Not all your customers might have an email address/be on the internet, customers may be wary of divulging information online.

In-person interviews always are better, but the big drawback is the trap you might fall into if you don't do them regularly. It is expensive to regularly conduct interviews and not conducting enough interviews might give you false positives. Validating your research is almost as important as designing and conducting it. We've seen many instances where after the research is conducted – if the results do not match up with the “gut-feel” of upper management, it has been dismissed off as anecdotal and a “one-time” phenomenon. To avoid such traps, we strongly recommend that data-collection be done on an “ongoing and regular” basis. This will help you in comparing and analyzing the change in perceptions according to marketing done for your products/services. The other issue here is sample size. To be confident with your research you have to interview enough people to weed out the fringe elements.

A couple of years ago there was quite a lot of discussion about online surveys and their statistical validity. The fact that not every customer had internet connectivity was one of the main concerns. Although some of the discussions are still valid, the reach of the internet as a means of communication has become vital in the majority of customer interactions. According to the US Census Bureau, the number of households with computers has doubled between 1997 and 2001.

Learn more: Quantitative Market Research

In 2001 nearly 50% of the households had a computer. Nearly 55% of all households with an income of more than 35,000 have internet access, and this jumps to 70% for households with an annual income of 50,000. This data is from the US Census Bureau for 2001.

There are primarily three modes of data collection that can be employed to gather feedback – Mail, Phone, and Online. The method actually used for data-collection is really a cost-benefit analysis. There is no slam-dunk solution but you can use the table below to understand the risks and advantages associated with each of the mediums:

8: Define the term transliteration with example?

Transliteration involves rendering a language from one writing system to another. Though it sounds similar to translation, they are two different processes with very different goals.

Here's a look at what transliteration is and why it's used.

What is transliteration?

Transliteration is utilized when a word or phrase must be conveyed in a language with a different writing system. Think of writing words in Russian or Japanese (which originally use Cyrillic and Kanji, respectively) by using Latin letters.

Keep in mind that transliteration doesn't really render the words in a new language – just a new

format. (I.e. transliteration does not change a Russian sentence into an English sentence, but instead it switches the Cyrillic symbols for Latin ones.)

For example, when you go to a Chinese restaurant, the menu might feature Chinese characters that you don't understand. When those characters are transliterated, they approximate the Chinese word's pronunciation using Latin letters. If you can't read or speak Chinese, you still won't understand the transliterated language. Only when that Chinese word on the menu is translated into English will you be able to comprehend it. For instance, let's take the Chinese word 面条. If you just wanted 面条 transliterated it would be *mein* (as in the Chinese menu item *lo mein*). *Mein* does not tell you what the original word means in English, but it does help you pronounce it the way a Chinese speaker would. If you wanted to translate the word it would be *noodles*.

One detail to note when it comes to transliteration: While many words have standard spelling when transliterated, proper nouns often end up being spelled differently. For instance, you'll find that Muhammad can be spelled several ways, with Mahomet, Mohamed, and Mohammad being a few common spelling variants.

What are the differences between transliteration and translation?

Many people assume transliteration is equivalent to translation. However, there are some important distinctions.

Translation allows words in one language to be understood by those who speak another language. Essentially, translation of a foreign word involves interpreting its meaning.

Transliteration, on the other hand, makes a language a little more accessible to people who are unfamiliar with that language's alphabet. Transliteration focuses more on pronunciation than meaning, which is especially useful when discussing foreign people, places, and cultures.

Therefore, if you need to read text in another language, and are more interested in pronouncing it than understanding it, you need transliteration. But if you want to know what it means, you need translation services.

Transliteration is a type of conversion of a text from one script to another that involves swapping letters (thus *trans-* + *liter-*) in predictable ways, such as Greek ⟨α⟩ → *a*, Cyrillic ⟨д⟩ → *d*, Greek ⟨χ⟩ → the digraph ⟨ch⟩, Armenian ⟨ն⟩ → *n* or Latin ⟨æ⟩ → *ae*).[1]

For instance, for the Modern Greek term "Ελληνική Δημοκρατία", which is usually translated as "Hellenic Republic", the usual transliteration to Latin script is ⟨Ellēniké Dēmokratía⟩, and the name for Russia in Cyrillic script, "Россия", is usually transliterated as ⟨Rossiya⟩.

Transliteration is not primarily concerned with representing the sounds of the original but rather with representing the characters, ideally accurately and unambiguously. Thus, in the Greek above example, ⟨λλ⟩ is transliterated ⟨ll⟩ though it is pronounced [l], ⟨Δ⟩ is transliterated ⟨D⟩ though pronounced [ð], and ⟨η⟩ is transliterated ⟨ē⟩, though it is pronounced [i] (exactly like ⟨ι⟩) and is not long.

Conversely, transcription notes the sounds rather than the orthography of a text. So "Ελληνική Δημοκρατία" could be transcribed as [elinikí ðimokratía], which does not specify which of the [i] sounds are written with the Greek letter (η) and which with (ι).

Angle brackets < > may be used to set off transliteration, as opposed to slashes / / for phonemic transcription and square brackets for phonetic transcription. Angle brackets may also be used to set off characters in the original script. Conventions and author preferences vary.

9: Benefits of participants observations?

It gives the researcher a better understanding of what is happening in the culture and lends credence to one's interpretations of the observation. Participant observation also enables the researcher to collect both quantitative and qualitative data through surveys and interviews.

Participant observation is a specific type of data collection typically used in ethnography or qualitative research. Several disciplines use this methodology as scholar-practitioners work to gain a close or intimate familiarity with a specific group of individuals in a targeted demographic.

Any community can become part of a participant observation method of data collection. Occupational, religious, and geographical demographics are common points of interest when evaluating communication studies, social psychology, or cultural anthropology.

List of the Advantages of Participant Observation

1. It provides results that lend validity to a proposed theory.

The participant observation approach collects an abundant amount of qualitative data that is useful in a variety of postulations. It allows researchers to receive a clear picture of how people are living and interacting with each other. Because each person involved in this work gets to see these social encounters personally, the first-hand information becomes useful to prove the validity of proposed theories.

It also provides the advantage of disproving specific ideas because of the direct observations that create data.

2. Participant observation provides high levels of flexibility for researchers.

Participant observation provides more flexibility with regard to qualitative research than other methods that use this approach. It allows researchers to maintain an open mind, giving them opportunities to follow up on different ideas, theories, and directions if something interesting occurs during their work.

This approach allows researchers to learn answers to questions that they may not know to ask when they first start their participant observation work. Participant observation is not bound by the same rules as the quantitative methods if something does not fit an expectation.

3. More insights become available because of participant observation.

Researchers using the participant observation method gain an opportunity to develop empathy through their personal experiences with the targeted demographic. Each person gets to act as a member of that small group so that it is possible to glean more insight into specific points of view, social values, and the meaning of other actions. It provides factual data instead of forcing people to make assumptions about the behaviors or decisions that people make.

4. It provides practical advantages to data collection that other methods cannot use.

When a specific demographic has trust issues with researchers or the people live in isolation, then accessing these groups can be challenging. The individuals are naturally more suspicious of anything or anyone that is different. Participant observation allows data collectors to gain more trust and rapport so that we can get more information about particular groups.

Participant observation is useful for studying groups like gangs, issues like juvenile delinquency, and cult-based religious indoctrination.

5. Participant observation can capture changing attitudes.

This option for qualitative research does not always need to focus on the big picture. Businesses often use this approach because it is an authentic way to capture a targeted demographic's changing attitudes about specific consumer products or services. Organizations can also use it to examine shifting perspectives in their workplace. By taking a proactive approach to ideas or circumstances that could be problematic if left unchecked, researchers can ensure the survival of a project, idea, or commercial venture.

6. It opens the door for researcher speculation.

Participant observation allows researchers to capture data through speculative means regarding the areas they choose to investigate within a population group. Shifting decisions about how to gather this information are also part of the experience. That means someone can choose to act on their instincts to determine where useful info is possible instead of relying on structures designed by someone who falls outside of the targeted demographic.

7. Researchers have more ways to produce real results.

The targeting processes of qualitative research are on full display when using participant observation as the primary data collection method. This advantage allows an entire organization or demographic to account for all processes, parts, and participants so that sampling groups can go through a comparison process. It helps to speed up the work of collecting information to prove or disprove an idea while keeping the overall costs of the project down compared to other methods of information gathering.

8. The information gathered by participant observation as a predictive quality.

Although it is challenging to generalize the information gathered by participant observation, the data that researchers collect does have a protective quality to it. That means a similar population group will have an experience that is somewhat the same if an equal set of variables impacts them. It gives

us a way to see how people could react in future situations when they have a specific set of experiences or values that drive their decision-making processes.

9. Participant observation can be an open-ended process.

Quantitative research works within a specific structure where there is a defined beginning and end to the data collection process. Qualitative research, such as participant observation, use more of an open-ended approach. Although a defined starting point is necessary for almost any information-gathering effort, this method can continue pressing forward until funding stops coming in for the work. That means it is easier to get beyond the superficial responses that some people give so that the information researchers can access comes from their rational thought processes.

10. It provides insight into an individual or group attitude.

Even though people can be unpredictable, humans are creatures of habit. Each person tends to react the same way whenever a similar set of circumstances happen to them. This process occurs because most people prefer to live life in a routine. That means qualitative research through participant observation can turn these activities into usable data for studies in marketing, psychology, anthropology, and other fields.

List of the Disadvantages of Participant Observation

1. Participant observation has a high risk of bias entering the data.

Researchers must get directly involved with the particular demographic they want to study so that the data they collect is authentic. This approach comes with a severe risk of getting involved in the social dynamics of those individuals, which means the collected information has a higher risk of bias than you can find in other forms of qualitative research. If someone begins to sympathize with the perspectives or attitudes of the studies group, then the information is no longer reliable.

2. The representative sample being studied is relatively small.

Participant observation works well when researchers have an opportunity to directly study a small sample size. When the targeted demographic that tiny, then it is almost impossible to draw generalizations that impact the rest of society from the data of being gathered. The information applies only to a group of individuals. That means this time-consuming approach may not be beneficial unless the theory or idea under consideration can receive direct study through the particular group in question.

3. It takes a lot of time to gather factual data using participant observation.

Most participant observation studies require several years of data collection work before it can start producing results. You must have trained researchers who can establish rapport with a targeted demographic while also having the willingness to become part of that element of society for the duration of the work. It is very demanding work that can become extremely stressful when the only

way to gather information is through covert methods.

This disadvantage is another reason why bias can creep into the collected data. When you spend most of your time around people, it is difficult to avoid forming relationships with them that impact you in some way.

4. Ethical questions exist for this qualitative research method.

This disadvantage of participant observation is specific to the covert methods that are sometimes used to gather data. If researchers must deceive individuals about who they are or what they do, then the information collected from direct observations may not be entirely accurate. Deceiving people to gain information about them is typically seen as being wrong, and there may be ethical choices about participating in an immoral or illegal activity during the course of research.

5. Self-selection can cause information bias to appear in the collected data.

When researchers put out a call for participants because of the need to gather qualitative research, then self-selection can create an issue with bias. The people who readily make themselves available to projects like this tend to have a specific agenda that they want to fulfill. That means the information that gets collected through the participant observation process is not authentic, even if it appears to be.

The only way to avoid this disadvantage is to randomize the individuals in the studied demographic so that no one can unduly influence the information gathering process. That means quantitative influences can come into the participant observation work, sometimes negating the benefits that they can achieve.

6. Participant observation relies heavily on the skills of the researcher.

Researchers using the participant observation method must know where to look for data and how to ask the right questions to gather information. A failure to recognize circumstances where info might not be accurate or available (or the reverse) results in errors that could influence the outcome of this work. Failing to ask the correct questions can mean a critical insight gets missed.

7. The data collected through participant observation is somewhat subjective.

Researchers are in full control over the information that they feel is important to gather when performing participant observation work. That means the perspective of the person who collects the info can influence the results in a way that they might prefer individually. If one researcher feels like the pursuit of a data tangent is worthless while another feels like it is a critical ingredient to a successful outcome, then the information that each person gathers will have a slightly different purpose to it.

8. Participant observation gathers situation-specific data.

The human mind remembers things in ways that are unique to the individual. That means the interaction between the participant and the researchers is a critical component to the success of

this work. Without clear documentation and transcription, the different perspectives will cause less data rigidity to be present in the final postulation. Most people make decisions in the heat of the moment instead of taking a well-thought, logical stance – especially in reactionary circumstances.

That means participant observation captures more of a snapshot in time than a long-term perspective when gathering data. It can produce useful results in a variety of industries, but it isn't information that has value when considering future circumstances.

9. It can be challenging to duplicate the results of participant observation work.

The subjective nature of participant observation and qualitative research means that it may be difficult, if not impossible, to duplicate the results with future efforts. That means the findings produced from these efforts may not qualify for acceptance in some scientific and sociological circles. Although a highly structured study in a specific population group could receive independent verification, the boundaries one would need to create for such a result would turn the work more toward quantitative research instead.

10. Researchers must have familiarity with the subject matter they study.

A participant observation study has the most success when researchers have a high level of familiarity with the population group and the theory under consideration. If both of these elements are not available in the group of workers who will collect information, then the lack of understanding can leave information uncollected, even though someone with experience might identify it as useful data.

Imagine a journalist trying to conduct an interview about magnetic fields when their experience involves sports reporting. Would that person know the right questions to ask? Do they understand the subject well enough to pursue a tangent if one should appear in an answer? That's why qualitative research is often seen as being a weaker process to follow unless one can verify the skills of the people who gather the data.

11. It does not provide a statistical representation of the gathered intervention.

Any form of qualitative research, including participant observation, collects data passed on individual perspectives, reactions, and responses. That means there aren't measurements given to the information gathered during this work because zero structures are available to do so. You can make comparisons with this info to look at how specific situations occur in unique population groups, but there is also no way to provide a quantitative sample or statistical representation of what is presented.

Conclusion

Participant observation requires researchers to become subjective participants in the sense that they use the information gained from personal involvement to interact with or gain further access to the group being studied. This activity implies a dimension of information that is often lacking when conducting surveys or direct interviews.

It is a method that also requires researchers to be objective and record everything that happens around them without letting their emotions or feelings influence their findings.

When reviewing the participant observation advantages and disadvantages, it is essential to remember that authentic objectivity is an ideal situation, but it is rarely an actuality. All of us see the world we live in through different eyes because of our environment, individual choices, and personalized influences. That means the only researcher that is 100% accurate is an unbiased individual who is already familiar with the small demographic in question.

10: Enlist few pros and cons of email interview?

What is an email interview?

First off, what do we mean by an email interview?

This description is a good starting point:

“...online, asynchronous, in-depth interviewing, which is usually conducted via e-mail, is, unlike e-mail surveys, semi-structured in nature and involves multiple e-mail exchanges between the interviewer and interviewee over an extended period of time.” (Meho, 2006, p.1284)

It's not just a matter of putting a few questions in an email and awaiting the response.

An email interview is more like an asynchronous conversation – you need to build rapport and follow-up with questions that help participants to expand on their ideas.

For example, your plan for email interviewing might include:

Time boxing the interview process (for example, 3 months)

Setting expectations for length of responses (2 or 3 paragraphs)

Setting the context and explaining your approach

Starting with 3 or 4 broad questions derived from your research design or framework

Developing further questions based on initial responses

First, let's take a look at the reasons you might choose to conduct email interviews:

Pro 1. Save on travel costs

If you're on a limited budget, email interviews offer an inexpensive way to avoid the costs associated with travel – which can be significant when your participants are geographically dispersed.

A team of Czech researchers, who studied women experiencing perinatal loss, cited travel as a key reason for conducting email interviews:

“The women involved in our research lived in different parts of the Czech Republic and the cost of travelling was significant.” (Ratislavová & Ratislav, 2014, p.453)

If you're struggling with limited access to local research participants, email interviews can help to broaden your scope.

Pro 2. Avoid transcription

Transcribing interviews is a hurdle for many researchers, it can be labour intensive and expensive to outsource.

Email interviews relieve this pressure because participants do the transcribing for you.

Of course, your data collection methods shouldn't be driven by issues of transcription, but where time and money are barriers to investigation, they are worth considering.

Pro 3. Give people time to think

In a face-to-face interview, participants are put on the spot. They need to come up with responses in real time and, while this may promote authenticity, it can also hinder deeper reflexivity and thought.

Email interviews provide more opportunity for participants to consider their responses and use their own (carefully chosen) words to express them.

As the researcher, you also benefit from the luxury of time – you can review the responses closely before following up with more targeted or probing questions.

Pro 4. Capture events as they unfold

If you're looking to engage with the daily lives of your participants, then email interviewing could be the way to go.

This is particularly true if you're working with respondents who already use email as a key communication tool in their day-to-day lives.

For example, in her study on middle manager's work place experiences, Dr Melissa Parris was attracted to email interviews because they offered a way to “capture stories of workplace experiences as they occurred while, at the same time, allow respondents time to reflect on these experiences and their effects.” (Parris, 2008, p. 4)

Pro 5. Deal with sensitive issues

If your area of study is sensitive or emotionally demanding, respondents may be reluctant to participate in face-to-face interviews.

An email exchange offers more privacy and puts respondents in control of the interview. They can answer questions in the comfort of their own home and may feel safer about sharing personal stories.

Interestingly, email interviews can also have a therapeutic effect on respondents in certain situations:

“The participants’ written responses helped them make sense of their situation and writing their thoughts down may have helped them achieve closure and let go of the past.” (Ratislavová & Ratislav, 2014, p.45)

Now, let’s review the disadvantages of email interviewing:

Con 1. Frustrating delays

Email interviews allow participants to respond in their own time – convenient for them but a potential nightmare for you.

Continually prompting participants for a response can be a frustrating waste of time and cause damage to the researcher/participant relationship.

The time lag can also increase the likelihood of losing participants at various stages of a project.

To mitigate the problem, you’ll need to develop a good rapport and provide very clear guidelines about expected time frames.

Con 2. Missing the non-verbal clues

A face-to-face interview is more than just words.

There are all sorts of social clues going on during this kind of interaction; body language, pauses, inflection and tone – all of which is missing in an email interview.

This can be a big stumbling block for many researchers – it is difficult to demonstrate empathy and ‘active listening’ via email.

There’s some research to suggest that encouraging participants to use emoticons and acronyms can lessen the loss of non-verbal clues and add depth to the data (Meho, 2006). This makes sense given that emojis have become an acceptable part of our digital lexicon.

Con 3. Light-weight responses

In theory, email interviews give participants time to formulate detailed responses.

Unfortunately, things aren’t always so straightforward in practice.

Interviewees can get tired of typing out detailed responses and might cut corners – particularly if they are time-poor or uncomfortable with writing.

You'll need to ask questions that inspire meaty descriptions and provide clear guidelines about your expectations.

It might pay to run a few pilot email interviews to see if you're getting enough detail to support your research objectives.

11: Significance of examining document and record keeping in research?

Document analysis is a form of qualitative research in which documents are interpreted by the researcher to give voice and meaning around an assessment topic (Bowen, 2009). Analyzing documents incorporates coding content into themes similar to how focus group or interview transcripts are analyzed (Bowen, 2009). A rubric can also be used to grade or score document. There are three primary types of documents (O'Leary, 2014):

Public Records: The official, ongoing records of an organization's activities. Examples include student transcripts, mission statements, annual reports, policy manuals, student handbooks, strategic plans, and syllabi.

Personal Documents: First-person accounts of an individual's actions, experiences, and beliefs. Examples include calendars, e-mails, scrapbooks, blogs, Facebook posts, duty logs, incident reports, reflections/journals, and newspapers.

Physical Evidence: Physical objects found within the study setting (often called artifacts). Examples include flyers, posters, agendas, handbooks, and training materials.

Rationale

Document analysis is a social research method and is an important research tool in its own right, and is an invaluable part of most schemes of triangulation, the combination of methodologies in the study of the same phenomenon (Bowen, 2009). In order to seek convergence and corroboration, qualitative researchers usually use at least two resources through using different data sources and methods. The purpose of triangulating is to provide a confluence of evidence that breeds credibility (Bowen, 2009). Corroborating findings across data sets can reduce the impact of potential bias by examining information collected through different methods. Also, combining qualitative and quantitative sometimes included in document analysis called mixed-methods studies.

Process

Before actual document analysis takes place, the researcher must go through a detailed planning process in order to ensure reliable results. O'Leary outlines an 8-step planning process that should take place not just in document analysis, but all textual analysis (2014):

Create a list of texts to explore (e.g., population, samples, respondents, participants).

Consider how texts will be accessed with attention to linguistic or cultural barriers.

Acknowledge and address biases.

Develop appropriate skills for research.

Consider strategies for ensuring credibility.

Know the data one is searching for.

Consider ethical issues (e.g., confidential documents).

Have a backup plan.

A researcher can use a huge plethora of texts for research, although by far the most common is likely to be the use of written documents (O'Leary, 2014). There is the question of how many documents the researcher should gather

The Advantages of Document Analysis

There are many reasons why researchers choose to use document analysis. Firstly, document analysis is an efficient and effective way of gathering data because documents are manageable and practical resources. Documents are commonplace and come in a variety of forms, making documents a very accessible and reliable source of data. Obtaining and analysing documents is often far more cost efficient and time efficient than conducting your own research or experiments (Bowen, 2009). Also, documents are stable, "non-reactive" data sources, meaning that they can be read and reviewed multiple times and remain unchanged by the researcher's influence or research process (Bowen, 2009, p. 31).

Document analysis is often used because of the many different ways it can support and strengthen research. Document analysis can be used in many different fields of research, as either a primary method of data collection or as a compliment to other methods. Documents can provide supplementary research data, making document analysis a useful and beneficial method for most research. Documents can provide background information and broad coverage of data, and are therefore helpful in contextualizing one's research within its subject or field (Bowen, 2009). Documents can also contain data that no longer can be observed, provide details that informants have forgotten, and can track change and development. Document analysis can also point to questions that need to be asked or to situations that need to be observed, making the use of document analysis a way to ensure your research is critical and comprehensive (Bowen, 2009).

Concerns to Keep in Mind When Using Document Analysis

The disadvantages of using document analysis are not so much limitations as they are potential

concerns to be aware of before choosing the method or when using it. An initial concern to consider is that documents are not created with data research agendas and therefore require some investigative skills. A document will not perfectly provide all of the necessary information required to answer your research questions. Some documents may only provide a small amount of useful data or sometimes none at all. Other documents may be incomplete, or their data may be inaccurate or inconsistent. Sometimes there are gaps or sparseness of documents, leading to more searching or reliance on additional documents than planned (Bowen, 2009). Also, some documents may not be available or easily accessible. For these reasons, it is important to evaluate the quality of your documents and to be prepared to encounter some challenges or gaps when employing document analysis.

Another concern to be aware of before beginning document analysis, and to keep in mind during, is the potential presence of biases, both in a document and from the researcher. Both Bowen and O'Leary state that it is important to thoroughly evaluate and investigate the subjectivity of documents and your understanding of their data in order to preserve the credibility of your research (2009; 2014).

The reason that the issues surrounding document analysis are concerns and not disadvantages is that they can be easily avoided by having a clear process that incorporates evaluative steps and measures, as previously mentioned above and exemplified by O'Leary's two eight-step processes. As long as a researcher begins document analysis knowing what the method entails and has a clear process planned, the advantages of document analysis are likely to far outweigh the amount of issues that may arise.

What is documentary research?

Documentary research is defined as the research conducted through the use of official documents or personal documents as the source of information.

Documents can include anything from the following:

Newspapers

Stamps

Diaries

Maps

Handbills

Directories

Paintings

Government statistical publications

Gramophone records

Photographs

Computer files

Tapes

The above may not fit the traditional bill of a “document” but since they contain information, they can be used towards documentary research.

Social scientists often conduct documentary research. It is mainly conducted to assess various documents in the interest of social or historical value. Sometimes, researchers also conduct documentary research to study various documents surrounding events or individuals.

Documentary research is similar to content analysis, which involves studying existing information recorded in media, texts, and physical items. Here, data collection from people is not required to conduct research. Hence, this is a prime example of secondary research.

It is important to consider the quality of the documents while using it as evidence on social relations and social meanings. Keep in mind that unlike surveys and research interviews, the documents are originally published/generated without keeping the purpose of research in mind. It is good practice to cross-verify documents against other similar documents before reaching a decision.

Documentary research examples

Here are a few real-life examples of documentary research.

Documentary research in social research studies

Although documentary research is not used extensively today, it is the go-to research method to conduct social research studies. For example, Karl Marx and Emile Durkheim used documentary research extensively for their research.

Karl Marx used documents like – Her Majesty Inspectors of Factories Reports, Royal Commission and Inland Revenue Reports, reports by the Medical Officer of the Privy Council, reports on children’s employment in factories, the Corn-laws, the Banking Acts, and Census Reports for Wales and England to name a few.

Durkheim, one of sociology’s founders, wrote a book on suicide which is recognized as the first modern example of an organized and a consistent use of documents for social research.

Documentary research for archival inquiry

The field of sociology has a popular, longstanding tradition of documentary inquiry. Many historians refer to and rely on primary documents for their research. Historians give historical

documents more emphasis while conducting research. Of course, as we evolve, virtual documents like emails will play a large role in research activities conducted by these researchers.

Documentary research for aesthetic interpretation

Documentary research is not limited to text only. Pictures, paintings, videos, audio files, monuments are also used to conduct research. Documentary researchers use these tools in addition to texts while studying social sciences. The use of these tools adds to the authenticity of the textual research, or may very well point out deviations in the findings. This deviation suggests researchers to research more to draw accurate conclusions.

Documentary research methodology

Documentary research, if conducted thoroughly, can help develop a hypothesis or prove or disprove an existing hypothesis. This of course depends on the methodology applied and the depth of research conducted. The researcher must conduct his/her own secondary research to analyze the contents before extracting it. The data must be handled scientifically.

Follow this four-step approach to control the quality of the content:

Authenticity of the documents

Credibility of the documents

Representativeness of the documents

Meaning derived from the documents

Let's take a look at these in detail.

The authenticity of the documents

Authenticity implies whether the origin of the document is reliable, is the evidence genuine, are the intentions sincere, and what were the commitments to creating the document. The authenticity of the source is the primary criterion of documentary research.

The credibility of the documents

Credibility means the subjective and objective components that make one believe the source of information and whether the data is free from distortion and error. The information must be trustworthy and must have some level of expertise.

Representativeness of the documents

Representativeness refers to whether the document represents a larger collection of the data point, and it is an aggregation of the topic being studied. That said, documents get distorted

with time due to the inclusion of new factors, and a check has to be made to ensure the documents are representative.

The meaning derived from the documents

Meaning means whether the findings are understandable and clear to be called evidence. The goal of examining documents is to understand its significance and meaning. Researchers must find out whether the document fits within the historical context or not.

Advantages of documentary research method

Here are the advantages of the documentary research method:

Data readily available: Data is readily available in various sources. You only need to know where to look and how to use it. The data is available in different forms, and harnessing it is the real challenge.

Inexpensive and economical: The data for research is already collected and published in either print or other forms. The researcher does not need to spend money and time like they do to collect market research insights and gather data. They need to search for and compile the available data from different sources.

Saves time: Conducting market research is time-consuming. Responses will not come in quickly as expected, and gathering global responses will take a huge amount of time. If you have all the reference documents available (or you know where to find them), research is relatively quick.

Non-bias: Primary data collection tends to be biased. This bias depends on a lot of factors like the age of the respondents, the time they take the survey, their mentality while taking the survey, their gender, their feelings towards certain ideas, to name a few. The list goes on and on when it comes to surveying bias.

Researcher not necessary during data collection: The researcher doesn't need to be present during data collection. It is practically impossible for the researcher to be present at every point of the data source, especially thinking about the various data sources.

Useful for hypothesis: Use historical data to draw inferences of the current or future events. Conclusions can be drawn from the experience of past events and data available for them.

Disadvantages of documentary research method

Here are the disadvantages of the documentary research method:

Limited data: Data is not always available, especially when you need to cross-verify a theory or strengthen your argument based on different forms of data.

Inaccuracies: As the data is historical and published, there is almost no way of ascertaining if the data is accurate or not.

Incomplete documents: Often, documents can be incomplete, and there is no way of knowing if there are additional documents to refer to on the subject.

Data out of context: The data that the researcher refers to may be out of context and may not be in line with the concept the researcher is trying to study. Its because the research goal is not thought of when creating the original data. Often, researchers have to make do with the available data at hand.

12: What is the aim of university education?

Aims and purposes: the history

5.7 The first question which we asked in our written consultation exercise was:

'What should be the aims and purposes of higher education over the next twenty years?'

Most of those who responded took as their starting point the Robbins report of 1963.¹ The Robbins Committee identified four aims and objectives of higher education which can be summarised as:

instruction in skills for employment;

promoting the general powers of the mind;

advancing learning;

transmitting a common culture and common standards of citizenship.

5.8 The Secretary of State for Education and Employment undertook a consultation exercise in the autumn of 1994 which invited views on what changes to the Robbins' aims were needed in the light of modern circumstances. The Education Departments reported to us on the outcome of that consultation exercise which showed that there was still widespread support for the Robbins' aims, but that there needed to be a shift in the balance between them and some amplification and development to reflect the changing context in which higher education now operates.²

5.9 In the light of that, the Departments offered us their updated version of the objectives as a basis for our consideration. Their suggested objectives were:

imparting employment skills;

providing opportunities for adult lifetime learning to enable individuals, employers and the nation as a whole to adapt to changing circumstances;

promoting the general powers of the mind;

advancing learning and research;

promoting culture and high standards in all aspects of society;

serving local and regional communities, as well as national interests at home and abroad.

Our views

5.10 The aim of higher education is to enable society to make progress through an understanding of itself and its world: in short, to sustain a learning society. There are numerous ways in which we could classify and describe what we see as the main components of this aim, but, in the interests of clarity, we have summarised four broad purposes. They all overlap and interlink in important ways and are described in more detail below. The first relates specifically to the needs of individuals and the others to society's requirements.

5.11 The four main purposes of higher education are:

to inspire and enable individuals to develop their capabilities to the highest potential levels throughout life, so that they grow intellectually, are well-equipped for work, can contribute effectively to society and achieve personal fulfilment;

to increase knowledge and understanding for their own sake and to foster their application to the benefit of the economy and society;

to serve the needs of an adaptable, sustainable, knowledge-based economy at local, regional and national levels;

to play a major role in shaping a democratic, civilised, inclusive society.

Inspiring and enabling individuals to develop their capabilities to the highest levels

13: Ethical considerations in research?

Ethics are broadly the set of rules, written and unwritten, that govern our expectations of our own and others' behaviour.

Effectively, they set out how we expect others to behave, and why. While there is broad agreement on some ethical values (for example, that murder is bad), there is also wide variation on how exactly these values should be interpreted in practice.

Research ethics are the set of ethics that govern how scientific and other research is performed at research institutions such as universities, and how it is disseminated.

This page explains more about research ethics, and how you can ensure that your research is compliant.

What are Research Ethics?

When most people think of research ethics, they think about issues that arise when research involves human or animal subjects.

While these issues are indeed a key part of research ethics, there are also wider issues about standards of conduct. These include the importance of publishing findings in a transparent way, not plagiarising others' work, and not falsifying work.

The Importance of Research Ethics

Research ethics are important for a number of reasons.

They promote the aims of research, such as expanding knowledge.

They support the values required for collaborative work, such as mutual respect and fairness. This is essential because scientific research depends on collaboration between researchers and groups.

They mean that researchers can be held accountable for their actions. Many researchers are supported by public money, and regulations on conflicts of interest, misconduct, and research involving humans or animals are necessary to ensure that money is spent appropriately.

They ensure that the public can trust research. For people to support and fund research, they have to be confident in it.

They support important social and moral values, such as the principle of doing no harm to others.

Source: Resnick, D. B. (2015) What is Ethics in Research and Why is it Important?

Codes of Ethics

Government agencies who fund or commission research often publish codes of conduct for researchers, or codes of ethics.

For example, the US National Institutes of Health (NIH) and Food and Drug Administration (FDA) both publish ethical codes. Some ethical codes may have the force of law behind them, while others may simply be advisable.

Be aware that even if you do nothing illegal, doing something unethical may end your research career.

Many or even most ethical codes cover the following areas:

Honesty and Integrity

This means that you need to report your research honestly, and that this applies to your methods (what you did), your data, your results, and whether you have previously published any

of it. You should not make up any data, including extrapolating unreasonably from some of your results, or do anything which could be construed as trying to mislead anyone. It is better to undersell than over-exaggerate your findings.

When working with others, you should always keep to any agreements, and act sincerely.

Objectivity

You should aim to avoid bias in any aspect of your research, including design, data analysis, interpretation, and peer review. For example, you should never recommend as a peer reviewer someone you know, or who you have worked with, and you should try to ensure that no groups are inadvertently excluded from your research. This also means that you need to disclose any personal or financial interests that may affect your research.

Carefulness

Take care in carrying out your research to avoid careless mistakes. You should also review your work carefully and critically to ensure that your results are credible. It is also important to keep full records of your research. If you are asked to act as a peer reviewer, you should take the time to do the job effectively and fully.

Openness

You should always be prepared to share your data and results, along with any new tools that you have developed, when you publish your findings, as this helps to further knowledge and advance science. You should also be open to criticism and new ideas.

Respect for Intellectual Property

You should never plagiarise, or copy, other people's work and try to pass it off as your own. You should always ask for permission before using other people's tools or methods, unpublished data or results. Not doing so is plagiarism. Obviously, you need to respect copyrights and patents, together with other forms of intellectual property, and always acknowledge contributions to your research. If in doubt, acknowledge, to avoid any risk of plagiarism.

Confidentiality

You should respect anything that has been provided in confidence. You should also follow guidelines on protection of sensitive information such as patient records.

Responsible Publication

You should publish to advance to state of research and knowledge, and not just to advance your

career. This means, in essence, that you should not publish anything that is not new, or that duplicates someone else's work.

Legality

You should always be aware of laws and regulations that govern your work, and be sure that you conform to them.

Animal Care

If you are using animals in your research, you should always be sure that your experiments are both necessary and well-designed. You should also show respect for the animals you are using, and make sure that they are properly cared for.

Human Subjects Protection

If your research involves people, you should make sure that you reduce any possible harm to the minimum, and maximise the benefits both to participants and other people.

This means, for example, that you should not expose people to more tests than are strictly necessary to fulfil your research aims. You should always respect human rights, including the right to privacy and autonomy. You may need to take particular care with vulnerable groups, which include, but are not limited to, children, older people, and those with learning difficulties.

Source: Resnick, D. B. (2015) What is Ethics in Research and Why is it Important? List adapted from Shamoo A and Resnik D. 2015. Responsible Conduct of Research, 3rd ed. (New York: Oxford University Press).

The Role of the Ethics Committee

Most universities have an ethics committee. This is required to scrutinise all research proposals, to ensure that they do not raise any ethical issues. This will generally include research for master's and undergraduate degrees, although undergraduate research may be covered by a broader research proposal from your supervisor.

There is likely to be a standard form to complete for ethical approval, which will cover who will be involved, how you will recruit your participants, and what steps you will take to ensure that they have provided informed consent.

There is an example form on our page Writing a Research Proposal, which also contains more detail about how to go about preparing a proposal.

The ethics committee's role is to consider that what you are doing is appropriate and proportionate to your research aims.

If a research proposal raises ethical issues, the committee will ask the researcher to look again at the issue, and consider whether they could do it differently.

For example, if you are proposing to carry out a study on a particular disease, and you want to ask all your participants whether they are married and have any children, the committee may want to know why this is relevant. It may be relevant (for example, if you think the disease may be reduced by living in a family), in which case, you will need to justify this.

The committee may also suggest alternative methods that they think are more suitable for the target group, or additional precautions that you should take.

You cannot start your research until you have been granted ethical approval, which will be granted formally, together with an approval number.

When you publish your research, whether as a thesis or in one or more journal articles, you will need to provide details of the ethical approval, including this number.

If you are unsure how to behave in a particular situation...

...and think you may have an ethical dilemma, then you should always seek advice before you act.

If you are a student, your supervisor should be happy to help and advise you. If necessary, they will be able to advise you about who else to ask.

As a researcher, you should consult more senior colleagues around, either at your own institution or others, who should be happy to help you.

After all, it is in everyone's interests to promote research ethics, and support the integrity and reputation of research

14: Tools for data collections?

Here are 7 top data collection methods and tools for Academic, Opinion or Product Research

The following are the top 7 data collection methods for Academic, Opinion-based or product research. Also discussed in detail is the nature, pros and cons of each one. At the end of this segment, you will be best informed about which method best suits your research.

INTERVIEW

An interview is a face-to-face conversation between two individuals with the sole purpose of collecting relevant information to satisfy a research purpose. Interviews are of different types namely; Structured, Semi-structured and unstructured with each having a slight variation from the other.

Use this interview consent form template to let interviewee give you consent to use data gotten from your interviews for investigative research purpose.

Structured Interviews - Simply put, it is a verbally administered questionnaire. In terms of depth, it is

surface level and is usually completed within a short period. For speed and efficiency, it is highly recommendable, but it lacks depth.

Semi-structured Interviews - In this method, there subsist several key questions which cover the scope of the areas to be explored. It allows a little more leeway for the researcher to explore the subject matter.

Unstructured Interviews - It is an in-depth interview that allows the researcher to collect a wide range of information with a purpose. An advantage of this method is the freedom it gives a researcher to combine structure with flexibility even though it is more time-consuming.

Pros

In-depth information

Freedom of flexibility

Accurate data.

Cons

Time-consuming

Expensive to collect.

What are the best Data Collection Tools for Interviews?

For collecting **data through interviews**, here are a few tools you can use to easily collect data.

Audio Recorder

An audio recorder is used for recording sound on disc, tape, or film. Audio information can meet the needs of a wide range of people, as well as provide alternatives to print data collection tools.

Digital Camera

An advantage of a digital camera is that it can be used for transmitting those images to a monitor screen when the need arises.

Camcorder

A camcorder is used for collecting data through interviews. It provides a combination of both an audio recorder and a video camera. The data provided is qualitative in nature and allows the respondents to answer questions asked exhaustively. If you need to collect sensitive information during an interview, a camcorder might not work for you as you would need to maintain your subject's privacy.

Want to conduct an interview for qualitative data research or special report? Use this online interview consent form template to allow the interviewee to give their consent before you use the interview

data for research or report. With premium features like e-signature, upload fields, form security, etc., Formplus Builder is the perfect tool to create your preferred online consent forms without coding experience.

QUESTIONNAIRES

This is the process of collecting data through an instrument consisting of a series of questions and prompts to receive a response from individuals it is administered to. Questionnaires are designed to collect data from a group.

For clarity, it is important to note that a questionnaire isn't a survey, rather it forms a part of it. A survey is a process of data gathering involving a variety of data collection methods, including a questionnaire.

On a questionnaire, there are three kinds of questions used. They are; fixed-alternative, scale, and open-ended. With each of the questions tailored to the nature and scope of the research.

Pros

Can be administered in large numbers and is cost-effective.

It can be used to compare and contrast previous research to measure change.

Easy to visualize and analyze.

Questionnaires offer actionable data.

Respondent identity is protected.

Questionnaires can cover all areas of a topic.

Relatively inexpensive.

Cons

Answers may be dishonest or the respondents lose interest midway.

Questionnaires can't produce qualitative data.

Questions might be left unanswered.

Respondents may have a hidden agenda.

Not all questions can be analyzed easily.

What are the best Data Collection Tools for Questionnaire?

Formplus Online Questionnaire

Formplus lets you create powerful forms to help you collect the information you need. Formplus

helps you create the online forms that you like. The Formplus online questionnaire form template to get actionable trends and measurable responses. Conduct research, optimize knowledge of your brand or just get to know an audience with this form template. The form template is fast, free and fully customizable.

Paper Questionnaire

A paper questionnaire is a data collection tool consisting of a series of questions and/or prompts for the purpose of gathering information from respondents. Mostly designed for statistical analysis of the responses, they can also be used as a form of data collection.

Sign up on Formplus Builder to create your preferred online surveys or questionnaire for data collection. You don't need to be tech-savvy! Start creating quality questionnaires with Formplus.

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REPORTING

By definition, data reporting is the process of gathering and submitting data to be further subjected to analysis. The key aspect of data reporting is reporting accurate data because of inaccurate data reporting leads to uninformed decision making.

Pros

Informed decision making.

Easily accessible.

Cons

Self-reported answers may be exaggerated.

The results may be affected by bias.

Respondents may be too shy to give out all the details.

Inaccurate reports will lead to uninformed decisions.

What are the best Data Collection Tools for Reporting?

Reporting tools enable you to extract and present data in charts, tables, and other visualizations so users can find useful information. You could source data for reporting from Non-Governmental Organizations (NGO) reports, newspapers, website articles, hospital records.

NGO Reports

Contained in NGO reports is an in-depth and comprehensive report on the activities carried out by the NGO, covering areas such as business and human rights. The information contained in these reports are research-specific and forms an acceptable academic base towards collecting data.

NGOs often focus on development projects which are organized to promote particular causes.

Newspapers

Newspaper data are relatively easy to collect and are sometimes the only continuously available source of event data. Even though there is a problem of bias in newspaper data, it is still a valid tool in collecting data for Reporting.

Website Articles

Gathering and using data contained in website articles is also another tool for data collection. Collecting data from web articles is a quicker and less expensive data collection. Two major disadvantages of using this data reporting method are biases inherent in the data collection process and possible security/confidentiality concerns.

Hospital Care records

Health care involves a diverse set of public and private data collection systems, including health surveys, administrative enrollment and billing records, and medical records, used by various entities, including hospitals, CHCs, physicians, and health plans. The data provided is clear, unbiased and accurate, but must be obtained under the legal means as medical data is kept with the strictest regulations.

EXISTING DATA

This is the introduction of new investigative questions in addition to/other than the ones originally used when the data was initially gathered. It involves adding measurement to a study or research. An example would be sourcing data from an archive.

Pros

Accuracy is very high.

Easily accessible information.

Cons

Problems with evaluation.

Difficulty in understanding.

What are the Best Data Collection Tools for Existing Data?

The concept of Existing data means that data is collected from existing sources to investigate research questions other than those for which the data were originally gathered. Tools to collect existing data include:

Research Journals - Unlike newspapers and magazines, research journals are intended for an academic or technical audience, not general readers. A journal is a scholarly publication containing articles written by researchers, professors, and other experts.

Surveys - A survey is a data collection tool for gathering information from a sample population, with the intention of generalizing the results to a larger population. Surveys have a variety of purposes and can be carried out in many ways depending on the objectives to be achieved.

OBSERVATION

This is a data collection method by which information on a phenomenon is gathered through observation. The nature of the observation could be accomplished either as a complete observer, an observer as a participant, a participant as an observer or as a complete participant. This method is a key base of formulating a hypothesis.

Pros

Easy to administer.

There subsists a greater accuracy with results.

It is a universally accepted practice.

It diffuses the situation of an unwillingness of respondents to administer a report.

It is appropriate for certain situations.

Cons

Some phenomena aren't open to observation.

It cannot be relied upon.

Bias may arise.

It is expensive to administer.

Its validity cannot be predicted accurately.

What are the best Data Collection Tools for Observation?

Observation involves the active acquisition of information from a primary source. Observation can also involve the perception and recording of data via the use of scientific instruments. The best tools for Observation are:

Checklists - state specific criteria, allow users to gather information and make judgments about what they should know in relation to the outcomes. They offer systematic ways of collecting data about specific behaviors, knowledge, and skills.

Direct observation - This is an observational study method of collecting evaluative information. The

evaluator watches the subject in his or her usual environment without altering that environment.

FOCUS GROUPS

The opposite of quantitative research which involves numerical based data, this data collection method focuses more on qualitative research. It falls under the primary category for data based on the feelings and opinions of the respondents. This research involves asking open-ended questions to a group of individuals usually ranging from 6-10 people, to provide feedback.

Pros

Information obtained is usually very detailed.

Cost-effective when compared to one-on-one interviews.

It reflects speed and efficiency in the supply of results.

Cons

Lacking depth in covering the nitty-gritty of a subject matter.

Bias might still be evident.

Requires interviewer training

The researcher has very little control over the outcome.

A few vocal voices can drown out the rest.

Difficulty in assembling an all-inclusive group.

What are the best Data Collection Tools for Focus Groups?

A focus group is a data collection method that is tightly facilitated and structured around a set of questions. The purpose of the meeting is to extract from the participants' detailed responses to these questions. The best tools for tackling Focus groups are:

Two-Way - One group watches another group answer the questions posed by the moderator. After listening to what the other group has to offer, the group that listens are able to facilitate more discussion and could potentially draw different conclusions.

Dueling-Moderator - There are two moderators who play the devil's advocate. The main positive of the dueling-moderator focus group is to facilitate new ideas by introducing new ways of thinking and varying viewpoints.

COMBINATION RESEARCH

This method of data collection encompasses the use of innovative methods to enhance participation to both individuals and groups. Also under the primary category, it is a combination of Interviews and Focus Groups while collecting qualitative data. This method is key when addressing

sensitive subjects.

Pros

Encourage participants to give responses.

It stimulates a deeper connection between participants.

The relative anonymity of respondents increases participation.

It improves the richness of the data collected.

Cons

It costs the most out of all the top 7.

It's the most time-consuming.

What are the best Data Collection Tools for Combination Research?

The Combination Research method involves two or more data collection methods, for instance, interviews as well as questionnaires or a combination of semi-structured telephone interviews and focus groups. The best tools for combination research are:

Online Survey - The two tools combined here are online interviews and the use of questionnaires. This is a questionnaire that the target audience can complete over the Internet. It is timely, effective and efficient. Especially since the data to be collected is quantitative in nature.

Dual-Moderator - The two tools combined here are focus groups and structured questionnaires. The structured questioners give a direction as to where the research is headed while two moderators take charge of proceedings. Whilst one ensures the focus group session progresses smoothly, the other makes sure that the topics in question are all covered. Dual-moderator focus groups typically result in a more productive session and essentially leads to an optimum collection of data.

WHY FORMPLUS IS THE BEST DATA COLLECTION TOOL

Vast Options for Form Customization

With Formplus, you can create your unique survey form. With options to change themes, font colour, font, font type, layout, width, and more, you can create an attractive survey form. The builder also gives you as many features as possible to choose from and you do not need to be a graphic designer to create a form.

Extensive Analytics

Form Analytics, a feature in formplus helps you view the number of respondents, unique visits, total visits, abandonment rate, and average time spent before submission. This tool eliminates the need for a manual calculation of the received data and/or responses as well as the conversion rate for your poll.

Embed Survey Form on Your Website

Copy the link to your form and embed as an iframe which will automatically load as your website loads, or as a popup which opens once the respondent clicks on the link.

15: Sampling and its types?

It would normally be impractical to study a whole population, for example when doing a questionnaire survey. Sampling is a method that allows researchers to infer information about a population based on results from a subset of the population, without having to investigate every individual. Reducing the number of individuals in a study reduces the cost and workload, and may make it easier to obtain high quality information, but this has to be balanced against having a large enough sample size with enough power to detect a true association. (Calculation of sample size is addressed in section 1B (statistics) of the Part A syllabus.)

If a sample is to be used, by whatever method it is chosen, it is important that the individuals selected are representative of the whole population. This may involve specifically targeting hard to reach groups. For example, if the electoral roll for a town was used to identify participants, some people, such as the homeless, would not be registered and therefore excluded from the study by default.

There are several different sampling techniques available, and they can be subdivided into two groups: probability sampling and non-probability sampling. In probability (random) sampling, you start with a complete sampling frame of all eligible individuals from which you select your sample. In this way, all eligible individuals have a chance of being chosen for the sample, and you will be more able to generalise the results from your study. Probability sampling methods tend to be more time-consuming and expensive than non-probability sampling. In non-probability (non-random) sampling, you do not start with a complete sampling frame, so some individuals have no chance of being selected. Consequently, you cannot estimate the effect of sampling error and there is a significant risk of ending up with a non-representative sample which produces non-generalisable results. However, non-probability sampling methods tend to be cheaper and more convenient, and they are useful for exploratory research and hypothesis generation.

Probability Sampling Methods

1. Simple random sampling

In this case each individual is chosen entirely by chance and each member of the population has an equal chance, or probability, of being selected. One way of obtaining a random sample is to give each individual in a population a number, and then use a table of random numbers to decide which individuals to include.¹ For example, if you have a sampling frame of 1000 individuals, labelled 0 to 999, use groups of three digits from the random number table to pick your sample. So, if the first three numbers from the random number table were 094, select the individual labelled “94”, and so on.

As with all probability sampling methods, simple random sampling allows the sampling error to be calculated and reduces selection bias. A specific advantage is that it is the most straightforward

method of probability sampling. A disadvantage of simple random sampling is that you may not select enough individuals with your characteristic of interest, especially if that characteristic is uncommon. It may also be difficult to define a complete sampling frame and inconvenient to contact them, especially if different forms of contact are required (email, phone, post) and your sample units are scattered over a wide geographical area.

2. Systematic sampling

Individuals are selected at regular intervals from the sampling frame. The intervals are chosen to ensure an adequate sample size. If you need a sample size n from a population of size x , you should select every x/n th individual for the sample. For example, if you wanted a sample size of 100 from a population of 1000, select every $1000/100 = 10$ th member of the sampling frame.

Systematic sampling is often more convenient than simple random sampling, and it is easy to administer. However, it may also lead to bias, for example if there are underlying patterns in the order of the individuals in the sampling frame, such that the sampling technique coincides with the periodicity of the underlying pattern. As a hypothetical example, if a group of students were being sampled to gain their opinions on college facilities, but the Student Record Department's central list of all students was arranged such that the sex of students alternated between male and female, choosing an even interval (e.g. every 20th student) would result in a sample of all males or all females. Whilst in this example the bias is obvious and should be easily corrected, this may not always be the case.

3. Stratified sampling

In this method, the population is first divided into subgroups (or strata) who all share a similar characteristic. It is used when we might reasonably expect the measurement of interest to vary between the different subgroups, and we want to ensure representation from all the subgroups. For example, in a study of stroke outcomes, we may stratify the population by sex, to ensure equal representation of men and women. The study sample is then obtained by taking equal sample sizes from each stratum. In stratified sampling, it may also be appropriate to choose non-equal sample sizes from each stratum. For example, in a study of the health outcomes of nursing staff in a county, if there are three hospitals each with different numbers of nursing staff (hospital A has 500 nurses, hospital B has 1000 and hospital C has 2000), then it would be appropriate to choose the sample numbers from each hospital proportionally (e.g. 10 from hospital A, 20 from hospital B and 40 from hospital C). This ensures a more realistic and accurate estimation of the health outcomes of nurses across the county, whereas simple random sampling would over-represent nurses from hospitals A and B. The fact that the sample was stratified should be taken into account at the analysis stage.

Stratified sampling improves the accuracy and representativeness of the results by reducing sampling bias. However, it requires knowledge of the appropriate characteristics of the sampling frame (the details of which are not always available), and it can be difficult to decide which characteristic(s) to stratify by.

4. Clustered sampling

In a clustered sample, subgroups of the population are used as the sampling unit, rather than individuals. The population is divided into subgroups, known as clusters, which are randomly selected to be included in the study. Clusters are usually already defined, for example individual GP practices or towns could be identified as clusters. In single-stage cluster sampling, all members of the chosen clusters are then included in the study. In two-stage cluster sampling, a selection of individuals from each cluster is then randomly selected for inclusion. Clustering should be taken into account in the analysis. The General Household survey, which is undertaken annually in England, is a good example of a (one-stage) cluster sample. All members of the selected households (clusters) are included in the survey.¹

Cluster sampling can be more efficient than simple random sampling, especially where a study takes place over a wide geographical region. For instance, it is easier to contact lots of individuals in a few GP practices than a few individuals in many different GP practices. Disadvantages include an increased risk of bias, if the chosen clusters are not representative of the population, resulting in an increased sampling error.

Non-Probability Sampling Methods

1. Convenience sampling

Convenience sampling is perhaps the easiest method of sampling, because participants are selected based on availability and willingness to take part. Useful results can be obtained, but the results are prone to significant bias, because those who volunteer to take part may be different from those who choose not to (volunteer bias), and the sample may not be representative of other characteristics, such as age or sex. Note: volunteer bias is a risk of all non-probability sampling methods.

2. Quota sampling

This method of sampling is often used by market researchers. Interviewers are given a quota of subjects of a specified type to attempt to recruit. For example, an interviewer might be told to go out and select 20 adult men, 20 adult women, 10 teenage girls and 10 teenage boys so that they could interview them about their television viewing. Ideally the quotas chosen would proportionally represent the characteristics of the underlying population.

Whilst this has the advantage of being relatively straightforward and potentially representative, the chosen sample may not be representative of other characteristics that weren't considered (a consequence of the non-random nature of sampling).²

3. Judgement (or Purposive) Sampling

Also known as selective, or subjective, sampling, this technique relies on the judgement of the researcher when choosing who to ask to participate. Researchers may implicitly thus choose a "representative" sample to suit their needs, or specifically approach individuals with certain characteristics. This approach is often used by the media when canvassing the public for opinions and in qualitative research.

Judgement sampling has the advantage of being time-and cost-effective to perform whilst resulting in a range of responses (particularly useful in qualitative research). However, in addition to volunteer bias, it is also prone to errors of judgement by the researcher and the findings, whilst being potentially broad, will not necessarily be representative.

4. Snowball sampling

This method is commonly used in social sciences when investigating hard-to-reach groups. Existing subjects are asked to nominate further subjects known to them, so the sample increases in size like a rolling snowball. For example, when carrying out a survey of risk behaviours amongst intravenous drug users, participants may be asked to nominate other users to be interviewed.

Snowball sampling can be effective when a sampling frame is difficult to identify. However, by selecting friends and acquaintances of subjects already investigated, there is a significant risk of selection bias (choosing a large number of people with similar characteristics or views to the initial individual identified).

Bias in sampling

There are five important potential sources of bias that should be considered when selecting a sample, irrespective of the method used. Sampling bias may be introduced when:

Any pre-agreed sampling rules are deviated from

People in hard-to-reach groups are omitted

Selected individuals are replaced with others, for example if they are difficult to contact

There are low response rates

An out-of-date list is used as the sample frame (for example, if it excludes people who have recently moved to an area)

Further potential problems with sampling strategies are covered in chapter 8 of this section ("Sources of variation, its measurement and control").

16: Difference between reference and citation?

Key Differences Between Citation and Reference

The difference between citation and reference can be drawn clearly on the following grounds:

Citation can be understood as a formal abbreviated reference, in the main part of your text, which clearly and uniquely identifies the author and publication year, from which the details are derived. On the other hand, a reference list is nothing but a list of resources which you have used particularly for writing your article or assignment and also while performing the research.

With the help of citation, you inform your readers, about the source, from where the information is extracted. As against, in the case of reference, the reader gets to know about the complete source of information.

Citations are mainly used to show the source of the material taken. Conversely, references are mainly used to support or critique an argument or point.

While reference is found as endnote or at the end of the page, the citation is the bracketed piece of information, which informs the reader about the source of material.

When it comes to information, the reference provides more information than citation. A reference provides all the details of the source, such as author's name, the title of the book, date of publication and page number, whereas in citation provides a few details only such as year of publication and last name of the author.

Conclusion

Basically, reference and citation are provided to give the user or reader, the source of facts, images, statistics, charts, tables and diagrams, which are a part of the article or assignment. It may also be used when you are talking about a theory, method or model, discovered by or linked to a specific person or writer.

With the help of these two, the author shows acknowledgement to those scholars, whose work or ideas has been used in the article or assignment.

17: Inductive and Deductive approaches?

Inductive and deductive approaches to research are quite different, but they can also be complementary. Let's start by looking at each one and how they differ from one another. Then we'll move on to thinking about how they complement one another.

Inductive approaches and some examples

When a researcher utilizes an inductive approach, they begin by collecting data that is relevant to their topic of interest. Once a substantial amount of data have been collected, the researcher will take a break from data collection to step back and get a bird's eye view of their data. At this stage, the researcher looks for patterns in the data, working to develop a theory that could explain those patterns. Thus, when researchers take an inductive approach, they start with a set of observations and then they move from those particular experiences to a more general set of propositions about those experiences. In other words, they move from data to theory, or from the specific to the general. Figure 6.1 outlines the steps involved with an inductive approach to research.

logic of inductive reasoning from specific level of focus to general

Figure 6.1 Inductive research

There are many good examples of inductive research, but we'll look at just a few here. One

fascinating study in which the researchers took an inductive approach is Katherine Allen, Christine Kaestle, and Abbie Goldberg's (2011) study [1] of how boys and young men learn about menstruation. To understand this process, Allen and her colleagues analyzed the written narratives of 23 young men in which the men described how they learned about menstruation, what they thought of it when they first learned about it, and what they think of it now. By looking for patterns across all 23 men's narratives, the researchers were able to develop a general theory of how boys and young men learn about this aspect of girls' and women's biology. They conclude that sisters play an important role in boys' early understanding of menstruation, that menstruation makes boys feel somewhat separated from girls, and that as they enter young adulthood and form romantic relationships, young men develop more mature attitudes about menstruation. Note how this study began with the data—men's narratives of learning about menstruation—and tried to develop a theory.

In another inductive study, Kristin Ferguson and colleagues (Ferguson, Kim, & McCoy, 2011) [2] analyzed empirical data to better understand how best to meet the needs of young people who are experiencing homelessness. The authors analyzed data from focus groups with 20 young people at a homeless shelter. From these data they developed a set of recommendations for those interested in applied interventions that serve youth that are experiencing homelessness. The researchers also developed hypotheses for people who might wish to conduct further investigation of the topic. Though Ferguson and her colleagues did not test the hypotheses that they developed from their analysis, their study ends where most deductive investigations begin: with a theory and a hypothesis derived from that theory.

Deductive approaches and some examples

Researchers taking a deductive approach will start with a compelling social theory and then test its implications with data. In other words, they utilize the same steps as inductive research, but they will reverse the order, moving from general to more specific levels. Deductive research approach is most associated with scientific investigation. The researcher studies what others have done, reads existing theories of whatever phenomenon they are studying, and then tests hypotheses that emerge from those theories. Figure 6.2 outlines the steps involved with a deductive approach to research.

logic of deductive research from general level of focus to specific

Figure 6.2 Deductive research

Although not all social science researchers utilize a deductive approach, there are some excellent, recent examples of deductive research. We'll take a look at a couple of those next.

In a study of US law enforcement responses to hate crimes, Ryan King and colleagues (King, Messner, & Baller, 2009) [3] hypothesized that law enforcement's response would be less vigorous in areas of the country that had a stronger history of racial violence. The authors developed their hypothesis from their reading of prior research and theories on the topic. They tested the hypothesis by analyzing data on states' lynching histories and hate crime responses. Overall, the authors found support for their hypothesis. One might associate this research with critical theory.

In another recent deductive study, Melissa Milkie and Catharine Warner (2011) [4] studied the effects

of different classroom environments on first graders' mental health. Based on prior research and theory, Milkie and Warner hypothesized that negative classroom features, such as a lack of basic supplies and even heat, would be associated with emotional and behavioral problems in children. One might associate this research with systems theory. The researchers found support for their hypothesis, demonstrating that policymakers should be more attentive to the mental health outcomes of children's school experiences, just as they track academic outcomes (American Sociological Association, 2011). [5]

Complementary approaches

While inductive and deductive approaches to research seem quite different, they can be rather complementary. In some cases, researchers will plan for their study to include multiple components, one inductive and the other deductive. In other cases, a researcher might begin their study planning to utilize only one approach but then discover along the way that the other approach is needed to help illuminate findings. Here is an example of each such case.

The original author of the textbook from which this textbook is adapted, Dr. Amy Blackstone, relates a story about her collaborative research on sexual harassment.

We began the study knowing that we would like to take both a deductive and an inductive approach in our work. We therefore administered a quantitative survey, the responses to which we could analyze in order to test hypotheses, and also conducted qualitative interviews with a number of the survey participants. The survey data were well suited to a deductive approach; we could analyze those data to test hypotheses that were generated based on theories of harassment. The interview data were well suited to an inductive approach; we looked for patterns across the interviews and then tried to make sense of those patterns by theorizing about them.

For one paper (Uggen & Blackstone, 2004), [6] we began with a prominent feminist theory of the sexual harassment of adult women and developed a set of hypotheses outlining how we expected the theory to apply in the case of younger women's and men's harassment experiences. We then tested our hypotheses by analyzing the survey data. In general, we found support for the theory that posited that the current gender system, in which heteronormative men wield the most power in the workplace, explained workplace sexual harassment—not just of adult women but of younger women and men as well. In a more recent paper (Blackstone, Houle, & Uggen, 2006), [7] we did not hypothesize about what we might find but instead inductively analyzed interview data, looking for patterns that might tell us something about how or whether workers' perceptions of harassment change as they age and gain workplace experience. From this analysis, we determined that workers' perceptions of harassment did indeed shift as they gained experience and that their later definitions of harassment were more stringent than those they held during adolescence. Overall, our desire to understand young workers' harassment experiences fully—in terms of their objective workplace experiences, their perceptions of those experiences, and their stories of their experiences—led us to adopt both deductive and inductive approaches in the work. (Blackstone, n.d., p. 21)

Researchers may not set out to employ both approaches in their work, but sometimes their use of one approach leads them to the other. One such example is described eloquently in Russell Schutt's *Investigating the Social World* (2006). [8] As Schutt describes, researchers Lawrence Sherman and

Richard Berk (1984) [9] conducted an experiment to test two competing theories of the effects of punishment on deterring deviance (in this case, domestic violence). Specifically, Sherman and Berk hypothesized that deterrence theory would provide a better explanation of the effects of arresting accused batterers than labeling theory. Deterrence theory predicts that arresting an accused spouse batterer will reduce future incidents of violence.

The inductive approach begins with a set of empirical observations, seeking patterns in those observations, and then theorizing about those patterns.

The deductive approach begins with a theory, developing hypotheses from that theory, and then collecting and analyzing data to test those hypotheses.

Inductive and deductive approaches to research can be employed together for a more complete understanding of the topic that a researcher is studying.

Though researchers don't always set out to use both inductive and deductive strategies in their work, they sometimes find that new questions arise in the course of an investigation that can best be answered by employing both approaches.

18: Research statement of problem and its characteristics?

A statement of the problem is used in research work as a claim that outlines the problem addressed by a study.

A good research problem should address an existing gap in knowledge in the field and lead to further research.

To write a persuasive problem statement, you need to describe (a) the ideal, (b), the reality, and (c) the consequences.

Research is a systematic investigative process employed to increase or revise current knowledge by discovering new facts. It can be divided into two general categories: (1) Basic research, which is inquiry aimed at increasing scientific knowledge, and (2) Applied research, which is effort aimed at using basic research for solving problems or developing new processes, products, or techniques.

The first and most important step in any research is to identify and delineate the research problem: that is, what the researcher wants to solve and what questions he/she wishes to answer. A research problem may be defined as an area of concern, a gap in the existing knowledge, or a deviation in the norm or standard that points to the need for further understanding and investigation. Although many problems turn out to have several solutions (the means to close the gap or correct the deviation), difficulties arise where such means are either not obvious or are not immediately available. This then necessitates some research to reach a viable solution.

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A statement of the problem is used in research work as a claim that outlines the problem addressed by a study. The statement of the problem briefly addresses the question: What is the problem that the research will address?

What are the goals of a statement of the problem?

The ultimate goal of a statement of the problem is to transform a generalized problem (something that bothers you; a perceived lack) into a targeted, well-defined problem; one that can be resolved through focused research and careful decision-making.

Writing a statement of the problem should help you clearly identify the purpose of the research project you will propose. Often, the statement of the problem will also serve as the basis for the introductory section of your final proposal, directing your reader's attention quickly to the issues that your proposed project will address and providing the reader with a concise statement of the proposed project itself.

A statement of problem need not be long and elaborate: one page is more than enough for a good statement of problem.

What are the key characteristics of a statement of the problem?

A good research problem should have the following characteristics:

It should address a gap in knowledge.

It should be significant enough to contribute to the existing body of research

It should lead to further research

The problem should render itself to investigation through collection of data

It should be of interest to the researcher and suit his/her skills, time, and resources

The approach towards solving the problem should be ethical

19: Importance of literature review?

Doing a careful and thorough literature review is essential when you write about research at any level. It is basic homework that is assumed to have been done vigilantly, and a given fact in all research papers. By providing one, usually offered in your introduction before you reach your thesis statement, you are telling your reader that you have not neglected the basics of research.

It not only surveys what research has been done in the past on your topic, but it also appraises, encapsulates, compares and contrasts, and correlates various scholarly books, research articles, and other relevant sources that are directly related to your current research. Given the fundamental nature of providing one, your research paper will be not considered seriously if it is lacking one at the beginning of your paper.

1. It Creates a Rapport with Your Audience

A literature review helps you create a sense of rapport with your audience or readers so they can trust that you have done your homework. As a result, they can give you credit for your due diligence: you have done your fact-finding and fact-checking mission, one of the initial steps of any research writing.

As a student, you may not be an expert in a given field; however, by listing a thorough review in your research paper, you are telling the audience, in essence, that you know what you are talking about. As a result, the more books, articles, and other sources you can list in the literature review, the more trustworthy your scholarship and expertise will be. Depending on the nature of your research paper, each entry can be long or short. For example, if you are writing a doctoral dissertation or master's thesis, the entries can be longer than the ones in a term paper. The key is to stick to the gist of the sources as you synthesize the source in the review: its thesis, research methods, findings, issues, and further discussions mentioned in the source.

2. It Helps You Avoid Incidental Plagiarism

Imagine this scenario. You have written a research paper, an original paper in your area of specialization, without a literature review. When you are about to publish the paper, you soon learn that someone has already published a paper on a topic very similar to yours. Of course, you have not plagiarized anything from that publication; however, if and when you publish your work, people will be suspicious of your authenticity. They will ask further about the significance of repeating similar research. In short, you could have utilized the time, money, and other resources you have wasted on your research on something else. Had you prepared a literature review at the onset of your research, you could have easily avoided such mishap. During the compilation of your review, you could have noticed how someone else has done similar research on your topic. By knowing this fact, you can tailor or tweak your own research in such a way that it is not a mere rehashing of someone else's original or old idea.

3. It Sharpens Your Research Focus

As you assemble outside sources, you will condense, evaluate, synthesize, and paraphrase the gist of outside sources in your own words. Through this process of winnowing, you will be able to place the relevance of your research in the larger context of what others researchers have already done on your topic in the past (See Reference 1).

The literature review will help you compare and contrast what you are doing in the historical context of the research as well as how your research is different or original from what others have done, helping you rationalize why you need to do this particular research (See Reference 2).

Perhaps you are using a new or different research method which has not been available before, allowing you to collect the data more accurately or conduct an experiment that is more precise and exact thanks to many innovations of modern technology. Thus, it is essential in helping you shape and guide your research in the direction you may not have thought of by offering insights and different perspectives on the research topic.

Many Different Types

Depending on your area of specialization, a literature review can take various forms: argumentative review, integrative review, historical review, methodological review, systematic review, and theoretical review (See Reference 1).

An argumentative review is written to present an opposing view to a given position. This will be valuable to persuade others to join you in supporting your thesis.

An integrative review is composed of examinations and critical analysis on a given topic to introduce a need for a new research. For example, you can use it on the spreading of a pandemic plague, arguing how the old methods of gathering and analyzing the data were inadequate and how modern technology, such as DNA analysis, will help make the same research more accurate.

Similarly, a historical review will assess all the historical records of scholarship chronologically while methodological review examines the research methods alone—collection of data, their critical analysis, interpretation, and research results, for example.

A literature review in any field is essential as it offers a comprehensive overview and recapitulation on the given scholarship from past to present, giving the reader a sense of focus as to which direction your new research is headed (See Reference 3).

Benefits of Conducting a Literature Review

While there might be many reasons for conducting a literature review, following are four key outcomes of doing the review.

Assessment of the current state of research on a topic. This is probably the most obvious value of the literature review. Once a researcher has determined an area to work with for a research project, a search of relevant information sources will help determine what is already known about the topic and how extensively the topic has already been researched.

Identification of the experts on a particular topic. One of the additional benefits derived from doing the literature review is that it will quickly reveal which researchers have written the most on a particular topic and are, therefore, probably the experts on the topic. Someone who has written twenty articles on a topic or on related topics is more than likely more knowledgeable than someone who has written a single article. This same writer will likely turn up as a reference in most of the other articles written on the same topic. From the number of articles written by the author and the number of times the writer has been cited by other authors, a researcher will be able to assume that the particular author is an expert in the area and, thus, a key resource for consultation in the current research to be undertaken.

Identification of key questions about a topic that need further research. In many cases a researcher may discover new angles that need further exploration by reviewing what has already been written on a topic. For example, research may suggest that listening to music while studying might lead to

better retention of ideas, but the research might not have assessed whether a particular style of music is more beneficial than another. A researcher who is interested in pursuing this topic would then do well to follow up existing studies with a new study, based on previous research, that tries to identify which styles of music are most beneficial to retention.

Determination of methodologies used in past studies of the same or similar topics. It is often useful to review the types of studies that previous researchers have launched as a means of determining what approaches might be of most benefit in further developing a topic. By the same token, a review of previously conducted studies might lend itself to researchers determining a new angle for approaching research.

Upon completion of the literature review, a researcher should have a solid foundation of knowledge in the area and a good feel for the direction any new research should take. Should any additional questions arise during the course of the research, the researcher will know which experts to consult in order to quickly clear up those questions.

20: Mixed Method approach?

Mixed methods research is a methodology for conducting research that involves collecting, analysing and integrating quantitative (e.g., experiments, surveys) and qualitative (e.g., focus groups, interviews) research. This approach to research is used when this integration provides a better understanding of the research problem than either of each alone.

Quantitative data includes close-ended information such as that found to measure attitudes (e.g., rating scales), behaviours (e.g., observation checklists), and performance instruments. The analysis of this type of data consists of statistically analysing scores collected on instruments (e.g., questionnaires) or checklists to answer research questions or to test hypotheses.

Qualitative data consists of open-ended information that the researcher usually gathers through interviews, focus groups and observations. The analysis of the qualitative data (words, text or behaviours) typically follows the path of aggregating it into categories of information and presenting the diversity of ideas gathered during data collection.

By mixing both quantitative and qualitative research and data, the researcher gains in breadth and depth of understanding and corroboration, while offsetting the weaknesses inherent to using each approach by itself. One of the most advantageous characteristics of conducting mixed methods research is the possibility of triangulation, i.e., the use of several means (methods, data sources and researchers) to examine the same phenomenon. Triangulation allows one to identify aspects of a phenomenon more accurately by approaching it from different vantage points using different methods and techniques. Successful triangulation requires careful analysis of the type of information provided by each method, including its strengths and weaknesses.

When to use it?

Mixed methods research is particularly suited:

When one wants to validate or corroborate the results obtained from other methods.

When one needs to use one method to inform another method. For instance, when little is known about a topic and it is necessary to first learn about what variables to study through qualitative research, and then study those variables with a large sample of individuals using quantitative research.

When one wants to continuously look at a research question from different angles, and clarify unexpected findings

and/or potential contradictions.

When one wants to elaborate, clarify, or build on findings from other methods. For instance, if a causal relationship has been established through experimental research but one wants to understand and explain the causal processes involved through qualitative research.

When one wants to develop a theory about a phenomenon of interest and then test it. Usually, qualitative research is more suitable to build theory, while quantitative research provides a better way of testing theories.

When one wants to generalize findings from qualitative research.

Advantages

The use of mixed method research provides a number of advantages, namely:

Provides strengths that offset the weaknesses of both quantitative and qualitative research. For instance, quantitative research is weak in understanding the context or setting in which people behave, something that qualitative research makes up for. On the other hand, qualitative research is seen as deficient because of the potential for biased interpretations made by the researcher and the difficulty in generalizing findings to a large group. Quantitative research does not have these weaknesses. Thus, by using both types of research, the strengths of each approach can make up for the weaknesses of the other.

Provides a more complete and comprehensive understanding of the research problem than either quantitative or qualitative approaches alone.

Provides an approach for developing better, more context specific instruments. For instance, by using qualitative research it is possible to gather information about a certain topic or construct in order to develop an instrument with greater construct validity, i.e., that measures the construct that it intends to measure.

Helps to explain findings or how causal processes work.

Disadvantages and limitations

Mixed method research has some disadvantages and limitations, namely:

The research design can be very complex.

Takes much more time and resources to plan and implement this type of research.

It may be difficult to plan and implement one method by drawing on the findings of another.

It may be unclear how to resolve discrepancies **that arise in the interpretation of the findings.**

Types of mixed method research design:

Sequential explanatory design

This design involves the collection and analysis of quantitative data followed by the collection and analysis of qualitative data. The priority is given to the quantitative data, and the findings are integrated during the interpretation phase of the study.

Sequential exploratory design

In this design, qualitative data collection and analysis is followed by quantitative data collection and analysis. The priority is given to the qualitative aspect of the study, and the findings are integrated during the interpretation phase

of the study.

Concurrent triangulation

In this design only one data collection phase is used, during which quantitative and qualitative data collection and analysis are conducted separately yet concurrently. The findings are integrated during the interpretation phase of the study. Usually, equal priority is given to both types of research.

Concurrent nested

In this design only one data collection phase is used, during which a predominant method (quantitative or qualitative) nests or embeds the other less priority method (qualitative or quantitative, respectively). This nesting may mean that the embedded method addresses a different question than the dominant method or seeks information from different levels. The data collected from the two methods are mixed during the analysis phase of the project.

21: Variables and its types?

A variable is a quantity that may change within the context of a mathematical problem or experiment. Typically, we use a single letter to represent a variable. The letters x, y, and z are common generic symbols used for variables. Sometimes, we will choose a letter that reminds us of the quantity it represents, such as t for time, v for voltage, or b for bacteria.

Dependent Variable

The variable that depends on other factors that are measured. These variables are expected to change as a result of an experimental manipulation of the independent variable or variables. It is the presumed effect.

Independent Variable

The variable that is stable and unaffected by the other variables you are trying to measure. It refers to the condition of an experiment that is systematically manipulated by the investigator. It is the presumed cause.

: A variable is an object, event, idea, feeling, time period, or any other type of category you are trying to measure. There are two types of variables-independent and dependent.

Question: What's an independent variable?

Answer: An independent variable is exactly what it sounds like. It is a variable that stands alone and isn't changed by the other variables you are trying to measure. For example, someone's age might be an independent variable. Other factors (such as what they eat, how much they go to school, how much television they watch) aren't going to change a person's age. In fact, when you are looking for some kind of relationship between variables you are trying to see if the independent variable causes some kind of change in the other variables, or dependent variables.

Question: What's a dependent variable?

Answer: Just like an independent variable, a dependent variable is exactly what it sounds like. It is something that depends on other factors. For example, a test score could be a dependent variable because it could change depending on several factors such as how much you studied, how much sleep you got the night before you took the test, or even how hungry you were when you took it. Usually when you are looking for a relationship between two things you are trying to find out what makes the dependent variable change the way it does.

Many people have trouble remembering which is the independent variable and which is the dependent variable. An easy way to remember is to insert the names of the two variables you are using in this sentence in the way that makes the most sense. Then you can figure out which is the independent variable and which is the dependent

variable:

(Independent variable) causes a change in (Dependent Variable) and it isn't possible that (Dependent Variable) could cause a change in (Independent Variable).

For example:

(Time Spent Studying) causes a change in (Test Score) and it isn't possible that (Test Score) could cause a change in (Time Spent Studying).

We see that "Time Spent Studying" must be the independent variable and "Test Score" must be the dependent variable because the sentence doesn't make sense the other way around.

22: Data and methods for data analysis?

Data are units of information, often numeric, that are collected through observation. In a more technical sense, data are a set of values of qualitative or quantitative variables about one or more persons or objects, while a datum (singular of data) is a single value of a single variable.

What is Data Analysis? Definition & Example

The systematic application of statistical and logical techniques to describe the data scope, modularize the data structure, condense the data representation, illustrate via images, tables, and graphs, and evaluate statistical inclinations, probability data, and derive meaningful conclusions known as Data Analysis. These analytical procedures enable us to induce the underlying inference from data by eliminating the unnecessary chaos created by its rest. Data generation is a continual process; this makes data analysis a continuous, iterative process where the collection and performing data analysis simultaneously. Ensuring data integrity is one of the essential components of data analysis.

There are various examples where data analysis is used, ranging from transportation, risk and fraud detection, customer interaction, city planning healthcare, web search, digital advertisement, and more.

Considering the example of healthcare, as we have noticed recently that with the outbreak of the pandemic, Coronavirus hospitals are facing the challenge of coping up with the pressure in treating as many patients as possible, considering data analysis allows to monitor machine and data usage in such scenarios to achieve efficiency gain.

Before diving any more in-depth, make the following pre-requisites for proper Data Analysis:

Ensure availability of the necessary analytical skills

Ensure appropriate implementation of data collection methods and analysis.

Determine the statistical significance

Check for inappropriate analysis

Ensure the presence of legitimate and unbiased inference

Ensure the reliability and validity of data, data sources, data analysis methods, and inferences derived.

Account for the extent of analysis

Data Analysis Methods

There are two main methods of Data Analysis:

1. Qualitative Analysis

This approach mainly answers questions such as 'why,' 'what' or 'how.' Each of these questions is addressed via quantitative techniques such as questionnaires, attitude scaling, standard outcomes, and more. Such analysis is usually in the form of texts and narratives, which might also include audio and video representations.

2. Quantitative Analysis

Generally, this analysis is measured in terms of numbers. The data here present themselves in terms of measurement scales and extend themselves for more statistical manipulation.

The other techniques include:

3. Text analysis

Text analysis is a technique to analyze texts to extract machine-readable facts. It aims to create structured data out of free and unstructured content. The process consists of slicing and dicing heaps of unstructured, heterogeneous files into easy-to-read, manage and interpret data pieces. It is also known as text mining, text analytics, and information extraction.

The ambiguity of human languages is the biggest challenge of text analysis. For example, humans know that "Red Sox Tames Bull" refers to a baseball match. Still, if this text is fed to a computer without background knowledge, it would generate several linguistically valid interpretations. Sometimes people who are not interested in baseball might have trouble understanding it too.

4. Statistical analysis

Statistics involves data collection, interpretation, and validation. Statistical analysis is the technique of performing several statistical operations to quantify the data and apply statistical analysis. Quantitative data involves descriptive data like surveys and observational data. It is also called a descriptive analysis. It includes various tools to perform statistical data analysis such as SAS (Statistical Analysis System), SPSS (Statistical Package for the Social Sciences), Stat soft, and more.

5. Diagnostic analysis

The diagnostic analysis is a step further to statistical analysis to provide a more in-depth analysis to answer the questions. It is also referred to as root cause analysis as it includes processes like data discovery, mining, and drill down and drill through.

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The functions of diagnostic analytics fall into three categories:

Identify anomalies: After performing statistical analysis, analysts are required to identify areas requiring further study as such data raise questions that cannot be answered by looking at the data.

Drill into the Analytics (discovery): Identification of the data sources helps analysts explain the anomalies. This step

often requires analysts to look for patterns outside the existing data sets. It requires pulling in data from external sources, thus identifying correlations and determining if they are causal in nature.

Determine Causal Relationships: Hidden relationships are uncovered by looking at events that might have resulted in the identified anomalies. Probability theory, regression analysis, filtering, and time-series data analytics can all be useful for uncovering hidden stories in the data.

6. Predictive analysis

Predictive analysis uses historical data and feeds it into the machine learning model to find critical patterns and trends. The model is applied to the current data to predict what would happen next. Many organizations prefer it because of its various advantages like volume and type of data, faster and cheaper computers, easy-to-use software, tighter economic conditions, and a need for competitive differentiation.

The following are the common uses of predictive analysis:

Fraud Detection: Multiple analytics methods improves pattern detection and prevents criminal behavior.

Optimizing Marketing Campaigns: Predictive models help businesses attract, retain, and grow their most profitable customers. It also helps in determining customer responses or purchases, promoting cross-sell opportunities.

Improving Operations: The use of predictive models also involves forecasting inventory and managing resources. For example, airlines use predictive models to set ticket prices.

Reducing Risk: The credit score used to assess a buyer's likelihood of default for purchases is generated by a predictive model that incorporates all data relevant to a person's creditworthiness. Other risk-related uses include insurance claims and collections.

7. Prescriptive Analysis

Prescriptive analytics suggests various courses of action and outlines the potential implications that could be reached after predictive analysis. Prescriptive analysis generating automated decisions or recommendations requires specific and unique algorithmic and clear direction from those utilizing the analytical techniques.

23: Components of a research report?

Krathwohl (2005) suggests and describes a variety of components to include in a research proposal. The following sections – Introductions, Background and significance, Literature Review; Research design and methods, Preliminary suppositions and implications; and Conclusion present these components in a suggested template for you to follow in the preparation of your research proposal.

Introduction

The introduction sets the tone for what follows in your research proposal – treat it as the initial pitch of your idea. After reading the introduction your reader should:

understand what it is you want to do;

have a sense of your passion for the topic; and

be excited about the study's possible outcomes.

As you begin writing your research proposal, it is helpful to think of the introduction as a narrative of what it is you want to do, written in one to three paragraphs. Within those one to three paragraphs, it is important to briefly answer

the following questions:

What is the central research problem?

How is the topic of your research proposal related to the problem?

What methods will you utilize to analyze the research problem?

Why is it important to undertake this research? What is the significance of your proposed research? Why are the outcomes of your proposed research important? Whom are they important?

Note: You may be asked by your instructor to include an abstract with your research proposal. In such cases, an abstract should provide an overview of what it is you plan to study, your main research question, a brief explanation of your methods to answer the research question, and your expected findings. All of this information must be carefully crafted in 150 to 250 words. A word of advice is to save the writing of your abstract until the very end of your research proposal preparation. If you are asked to provide an abstract, you should include 5 to 7 key words that are of most relevance to your study. List these in order of relevance.

Background and significance

The purpose of this section is to explain the context of your proposal and to describe, in detail, why it is important to undertake this research. Assume that the person or people who will read your research proposal know nothing or very little about the research problem. While you do not need to include all knowledge you have learned about your topic in this section, it is important to ensure that you include the most relevant material that will help to explain the goals of your research.

While there are no hard and fast rules, you should attempt to address some or all of the following key points:

State the research problem and provide a more thorough explanation about the purpose of the study than what you stated in the introduction.

Present the rationale for the proposed research study. Clearly indicate why this research is worth doing. Answer the "so what?" question.

Describe the major issues or problems to be addressed by your research. Do not forget to explain how and in what ways your proposed research builds upon previous related research.

Explain how you plan to go about conducting your research.

Clearly identify the key or most relevant sources of research you intend to use and explain how they will contribute to your analysis of the topic.

Set the boundaries of your proposed research, in order to provide a clear focus. Where appropriate, state not only what you will study, but what will be excluded from your study.

Provide clear definitions of key concepts and terms. Since key concepts and terms often have numerous definitions, make sure you state which definition you will be utilizing in your research.

Tip: Conceptual categories generally reveal themselves only after one has read most of the pertinent literature on the topic at hand. It is not uncommon to find that one is continually adding new themes or revising themes already discovered

Literature review

This key component of the research proposal is the most time-consuming aspect in the preparation of your research

proposal. As described in Chapter 5, the literature review provides the background to your study and demonstrates the significance of the proposed research. Specifically, it is a review and synthesis of prior research that is related to the problem you are setting forth to investigate. Essentially, your goal in the literature review is to place your research study within the larger whole of what has been studied in the past, while demonstrating to your reader that your work is original, innovative, and adds to the larger whole.

As the literature review is information dense, it is essential that this section be intelligently structured to enable your reader to grasp the key arguments underpinning your study. However, this can be easier to state and harder to do, simply due to the fact there is usually a plethora of related research to sift through. Consequently, a good strategy for writing the literature review is to break the literature into conceptual categories or themes, rather than attempting to describe various groups of literature you reviewed. Chapter 5 describes a variety of methods to help you organize the themes.

Here are some suggestions on how to approach the writing of your literature review:

Think about what questions other researchers have asked, what methods they used, what they found, and what they recommended based upon their findings.

Do not be afraid to challenge previous related research findings and/or conclusions.

Assess what you believe to be missing from previous research and explain how your research fills in this gap and/or extends previous research.

It is important to note that a significant challenge related to undertaking a literature review is knowing when to stop. As such, it is important to know when you have uncovered the key conceptual categories underlying your research topic. Generally, when you start to see repetition in the conclusions or recommendations, you can have confidence that you have covered all of the significant conceptual categories in your literature review. However, it is also important to acknowledge that researchers often find themselves returning to the literature as they collect and analyze their data. For example, an unexpected finding may develop as you collect and/or analyze the data; in this case, it is important to take the time to step back and review the literature again, to ensure that no other researchers have found a similar finding. This may include looking to research outside your field.

This situation occurred with one of this textbook's authors' research related to community resilience. During the interviews, the researchers heard many participants discuss individual resilience factors and how they believed these individual factors helped make the community more resilient, overall. Sheppard and Williams (2016) had not discovered these individual factors in their original literature review on community and environmental resilience. However, when they returned to the literature to search for individual resilience factors, they discovered a small body of literature in the child and youth psychology field. Consequently, Sheppard and Williams had to go back and add a new section to their literature review on individual resilience factors. Interestingly, their research appeared to be the first research to link individual resilience factors with community resilience factors.

Research design and methods

The objective of this section of the research proposal is to convince the reader that your overall research design and methods of analysis will enable you to solve the research problem you have identified and also enable you to accurately and effectively interpret the results of your research. Consequently, it is critical that the research design and methods section is well-written, clear, and logically organized. This demonstrates to your reader that you know what you are going to do and how you are going to do it. Overall, you want to leave your reader feeling confident that you have what it takes to get this research study completed in a timely fashion.

Essentially, this section of the research proposal should be clearly tied to the specific objectives of your study; however, it is also important to draw upon and include examples from the literature review that relate to your design and intended methods. In other words, you must clearly demonstrate how your study utilizes and builds upon past

studies, as it relates to the research design and intended methods. For example, what methods have been used by other researchers in similar studies?

While it is important to consider the methods that other researchers have employed, it is equally, if not more, important to consider what methods have not been but could be employed. Remember, the methods section is not simply a list of tasks to be undertaken. It is also an argument as to why and how the tasks you have outlined will help you investigate the research problem and answer your research question(s).

Tips for writing the research design and methods section:

Specify the methodological approaches you intend to employ to obtain information and the techniques you will use to analyze the data.

Specify the research operations you will undertake and the way you will interpret the results of those operations in relation to the research problem.

Go beyond stating what you hope to achieve through the methods you have chosen. State how you will actually implement the methods (i.e., coding interview text, running regression analysis, etc.).

Anticipate and acknowledge any potential barriers you may encounter when undertaking your research, and describe how you will address these barriers.

Explain where you believe you will find challenges related to data collection, including access to participants and information.

Preliminary suppositions and implications

The purpose of this section is to argue how you anticipate that your research will refine, revise, or extend existing knowledge in the area of your study. Depending upon the aims and objectives of your study, you should also discuss how your anticipated findings may impact future research. For example, is it possible that your research may lead to a new policy, theoretical understanding, or method for analyzing data? How might your study influence future studies? What might your study mean for future practitioners working in the field? Who or what might benefit from your study? How might your study contribute to social, economic or environmental issues? While it is important to think about and discuss possibilities such as these, it is equally important to be realistic in stating your anticipated findings. In other words, you do not want to delve into idle speculation. Rather, the purpose here is to reflect upon gaps in the current body of literature and to describe how you anticipate your research will begin to fill in some or all of those gaps.

Conclusion

The conclusion reiterates the importance and significance of your research proposal, and provides a brief summary of the entire proposed study. Essentially, this section should only be one or two paragraphs in length. Here is a potential outline for your conclusion:

Discuss why the study should be done. Specifically discuss how you expect your study will advance existing knowledge and how your study is unique.

Explain the specific purpose of the study and the research questions that the study will answer.

Explain why the research design and methods chosen for this study are appropriate, and why other designs and methods were not chosen.

State the potential implications you expect to emerge from your proposed study,

Provide a sense of how your study fits within the broader scholarship currently in existence, related to the research problem.

Citations and references

As with any scholarly research paper, you must cite the sources you used in composing your research proposal. In a research proposal, this can take two forms: a reference list or a bibliography. A reference list lists the literature you referenced in the body of your research proposal. All references in the reference list must appear in the body of the research proposal. Remember, it is not acceptable to say “as cited in ...” As a researcher you must always go to the original source and check it for yourself. Many errors are made in referencing, even by top researchers, and so it is important not to perpetuate an error made by someone else. While this can be time consuming, it is the proper way to undertake a literature review.

In contrast, a bibliography, is a list of everything you used or cited in your research proposal, with additional citations to any key sources relevant to understanding the research problem. In other words, sources cited in your bibliography may not necessarily appear in the body of your research proposal. Make sure you check with your instructor to see which of the two you are expected to produce.

Overall, your list of citations should be a testament to the fact that you have done a sufficient level of preliminary research to ensure that your project will complement, but not duplicate, previous research efforts. For social sciences, the reference list or bibliography should be prepared in American Psychological Association (APA) referencing format. Usually, the reference list (or bibliography) is not included in the word count of the research proposal. Again, make sure you check with your instructor to confirm.

24: What is research procedure?

These 8 stages in the research process are;

Identifying the problem.

Reviewing literature.

Setting research questions, objectives, and hypotheses.

Choosing the study design.

Deciding on the sample design.

Collecting data.

Processing and analyzing data.

Writing the report.

25: What is Hypothesis?

Hypothesis is an assumption that is made on the basis of some evidence. This is the initial point of any investigation that translates the research questions into a prediction. It includes components like variables, population and the relation between the variables. A research hypothesis is a hypothesis that is used to test the relationship between two or more variables.

Types of Hypothesis

There are six forms of hypothesis and they are:

Simple hypothesis

Complex hypothesis

Directional hypothesis

Non-directional hypothesis

Null hypothesis

Associative and casual hypothesis

Simple Hypothesis

It shows a relationship between one dependent variable and a single independent variable. For example – If you eat more vegetables, you will lose weight faster. Here, eating more vegetables is an independent variable, while losing weight is the dependent variable.

Complex Hypothesis

It shows the relationship between two or more dependent variables and two or more independent variables. Eating more vegetables and fruits leads to weight loss, glowing skin, reduces the risk of many diseases such as heart disease, high blood pressure and some cancers.

Directional Hypothesis

It shows how a researcher is intellectual and committed to a particular outcome. The relationship between the variables can also predict its nature. For example- children aged four years eating proper food over a five-year period are having higher IQ levels than children not having a proper meal. This shows the effect and direction of effect.

Non-directional Hypothesis

It is used when there is no theory involved. It is a statement that a relationship exists between two variables, without predicting the exact nature (direction) of the relationship.

Null Hypothesis

It provides the statement which is contrary to the hypothesis. It's a negative statement, and there is no relationship between independent and dependent variables. The symbol is denoted by "H₀".

Associative and Causal Hypothesis

Associative hypothesis occurs when there is a change in one variable resulting in a change in the other variable. Whereas, causal hypothesis proposes a cause and effect interaction between two or more variables.

Examples of Hypothesis

Following are the examples of hypothesis based on their types:

Consumption of sugary drinks every day leads to obesity is an example of a simple hypothesis.

All lilies have the same number of petals is an example of a null hypothesis.

If a person gets 7 hours of sleep, then he will feel less fatigue than if he sleeps less.

